



# Delinea

Secret Server

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## Introduction

Delinea Secret Server is an enterprise-grade password management solution designed to help organizations securely store, manage, and control access to privileged credentials. It aims to improve the security of sensitive data, reduce the risk of data breaches, and streamline the password management process.

Here are the key features of Delinea Secret Server:

- **Secure Password Storage:** Secret Server stores privileged credentials in an encrypted format, protecting sensitive information from unauthorized access.
- **Access Control:** Secret Server implements role-based access control, allowing administrators to set permissions and control who has access to sensitive information.
- **Privilege Escalation Management:** Secret Server integrates with Windows systems to provide privilege escalation management, helping to reduce the risk of data breaches.
- **Auditing and Reporting:** Secret Server provides detailed audit logs and reports, making it easier for organizations to track access to sensitive information and detect any unauthorized activity.
- **Automated Password Management:** Secret Server supports automated password management, helping to streamline the password management process and reduce the risk of manual errors.
- **Multi-Factor Authentication:** Secret Server supports multi-factor authentication, helping to improve the security of sensitive information.
- **Integration with Other Tools:** Secret Server integrates with a variety of other tools, including Active Directory, Microsoft Azure, and cloud-based applications, making it easier for organizations to manage their passwords and access controls.

This section of the Delinea documentation portal supports Secret Server.

**Note:** Navigate using the dynamic table of contents on the left, the page contents on the right, or by entering a search term above. Many pages in this documentation have sub-pages. The container (parent) pages can have introductory text or simply a heading with no text. Please click the table of contents on the left to see any sub-pages it might have.

## Documentation

- [Delinea Documentation Portal](#): You are at the home page of the current Delinea Document Portal for Secret Server. It contains:
  - New material.
  - Converted knowledge base articles. These are usually marked as *deprecated* in the legacy knowledge base. They also may be missing all together because they were archived.
  - Links to legacy knowledge bases article that have yet to be converted or archived. There are very few of these left.
  - Links to legacy PDF documentation. These are also rare, and if you do find one, its target is very likely out of date.
- [Knowledge Base Articles](#): Use the Search text box at the top of the page. This is the legacy platform that almost completely replaced with the Delinea Documentation Portal (where you are right now). There might still be a few locations here where this online documentation links to legacy documentation.
- [End User Guide](#) (for non-technical users)
- [Getting Started Tutorial](#) (for technical users)
- [Installation Guides](#)

- [System Requirements](#)
- [Best Practices](#)
- [Discovery Best Practices](#)
- [Secret Server Government Edition—Common Criteria Hardening Guide](#) (PDF)
- [Security Hardening Guide](#)
- [Distributed Engine Security](#) (PDF)
- [Launcher Security](#) (PDF)
- [Meltdown and Spectre Security Information](#) (PDF)
- [\\*nix Management](#) (PDF)
- [Security Model](#) (PDF)
- [Web Services Security](#) (PDF)

## Help

- [Document Conventions](#)
- [Self-Help Resources](#)
- [Technical Support](#)

### [Product Downloads](#)

[Release Notes](#) (On-Premises and Cloud)

[Delinea Secret Society](#): An educational community, replacing the Forum.

**Note:** Some of these tutorials feature legacy versions of Secret Server.

### [Video Tutorials](#)

## Developer Resources

### [Developer Resources](#)

## Getting Started Tutorial

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server is a powerful application with many facets. As such, approaching it for the first time can be daunting. To counter that, we created this section, which is an introductory guided tutorial, for new users. The tutorial suggest an order to learn topics and points to specific sections of documentation for details.

**Important:** This tutorial is for system administrators and other technical professionals. We recommend that non-technical users start with our [End User Guide](#). For Secret Server Cloud, see the [Secret Server Cloud Quick Start](#).

Below are our suggested guidelines for preparing to run a trial or proof-of-concept (POC) of Secret Server.

## System Requirements

Please review the detailed [System Requirements for Secret Server](#). The *Minimum Requirements* are for trial, sandbox, and POC environments. The *Recommended Requirements* are for production deployments.

## Hardware Requirements

Secret Server can be installed on a physical server or virtual machine.

If you would like to set up front-end (application) clustering, you need to have two or more servers available.

For testing of high availability for the SQL Server, you can use either existing Microsoft AlwaysOn infrastructure or database mirroring. If you choose to test this, this is something your database team needs to prepare in advance.

## Software Requirements

### Checklist

- Windows Server 2012 or newer (recommended) (one server, minimum)
- SQL Server (one instance, minimum)
- Application server prerequisites
- SSL certificate

### SQL Server

You can create the SQL database in an existing SQL instance, or a new installation of SQL Server. For high availability, this needs to be a paid edition of SQL Server (not SQL Express). If you are using a new installation of SQL Server, please have this installed beforehand.

Detailed instructions for installation and configuration of SQL Server are included in one of the installation guides below (choose the guide matching the OS that SQL server will be installed on).

### Application Server

We recommend installing Secret Server on Windows Server 2012 or greater. Include IIS, ASP.NET and .NET Framework. Refer to the System Requirements KB above to view prerequisite details.

## Application Configuration

### Service Account

Set up a service account:

1. Log on as a batch job (on the server that Secret Server runs on)
2. Modify permissions to the Secret Server application directory (typically C:\inetpub\wwwroot) and C:\Windows\temp.
3. Provide access to your SQL Server instance by adding the db\_owner permission to the Secret Server database.

For detailed instructions on how to configure the permissions for the service account, see [Running Secret Server IIS Application Pool with a Service Account](#). The installation guides include instructions for assigning db\_owner permission to the service account in SQL Server.



If you would like to test features that rely on Active Directory, such as AD group sync or discovery, you should also have accounts available with the appropriate permissions (described below). One option is to use the same account for both features.

## Active Directory Group Sync

Active Directory group synchronization means that Secret Server can automatically add users and enable or disable them to log into Secret Server based off of their Active Directory group membership. You can choose which groups to sync. When configuring AD group sync in Secret Server, you are required to specify an account that can read the properties of users and groups. See [AD Synchronization Rights for Synchronization Account](#) for a detailed list of required permissions.

## Discovery

To test discovery, please have some machines available for Secret Server to connect to for discovering accounts. An account is required to sync with AD and also scan the machines found for Windows local account and service account discovery. [Account Permissions for Discovery](#) describes the permissions required for an AD account to be used for discovery.

## Test Accounts

We recommend having a few test accounts available to represent the types of accounts you want to manage using Secret Server. These could be local Windows accounts, service accounts running scheduled tasks or services, SQL server accounts, and others.

## Email Notifications

To test email notifications, which can be used for event subscription notifications or requests for approval to passwords, you need configuration information for the company SMTP server:

- Service account to run the application and connect to SQL
- Domain (test or production)
- Domain account to be used for AD sync and discovery
- Test machines (if testing discovery)
- Test accounts
- SMTP server settings

## SSL Certificate

We recommend setting up SSL (or https) for access to Secret Server. To do so, you will need an SSL certificate. You may use an existing wildcard certificate, create your own domain certificate, or purchase a third-party SSL certificate for the Secret Server.

## Firewalls and Ports

Secret Server must connect directly to a target system to change its password. For devices that are firewalled off from Secret Server, remote agent can provide connectivity to them, but they also require connectivity from them to the target systems for password changing.

Please see [Ports Used by Secret Server](#) for a list of ports needed by Secret Server for password changing, discovery, and other features.

## Process

Run the Installer: Secret Server comes with an installer that walks you through the entire process from start to finish. Once you have the prerequisites ready to go, download and run your installer, and the wizard will take you through the installation process. Please see our [installation articles](#).

## Licenses

See the [Licensing](#) section.

The Secret Server Dashboard is the main page for searching and viewing secrets. Nearly everything you do in Secret Server starts with the Dashboard. See [Secret Server Dashboard](#) for details.

As you start using Secret Server, we strongly recommend configuring the following security settings. While these are optional, setting them is a best practice.

## Local Admin Account Best Practices

Even if you plan to [integrate with Active Directory](#) to log into Secret Server, chances are you will need to use this account again. This is the first account you created during the installation process. Keep this account secure and avoid being locked out of Secret Server by following these suggestions:

- Store the credentials in a secure location that you can access if you lose all access to Secret Server.
- Enable the **Allow Users to Reset Forgotten Passwords** setting to provide a way of resetting the password if account is locked out or if the password is forgotten:
  1. Select **Admin > Configuration**. The Configuration page appears.
  2. Click the **Local User Passwords** tab to locate the setting.
  3. Click the **Edit** button to edit the setting.
  4. Click the **Save** button when finished.

**Note:** This requires having an [SMTP server configured](#) (KB).

- Configure the other **Local User Passwords** settings to enforce your password requirements, expiration, password history, and other password policies.

## SSL (HTTPS) Best Practice

We recommend requiring SSL access to Secret Server. This requires setting up an SSL certificate for the website, preferably with a domain certificate. However, if you don't have a certificate, see [Installing a Self-Signed Certificate](#) (KB). Once you have your certificate:

1. Configure the HTTPS binding for your Secret Server website using the certificate you choose.
2. Ensure your certificate is trusted on the Secret Server users' machines. See [Trusting an SSL Certificate on a Client Machine](#) (KB) for instructions.
3. Enable **Force HTTPS/SSL** on the **Security** tab of the Secret Server **Configuration** settings.

Configure backups to avoid losing your data. Secret Server provides the option to automatically take a backup on the interval you specify, sending the backups to a local or network location. There are two components of an entire backup of Secret Server: the Web application files and the database. Find these settings by selecting **Backup** from the **Admin** menu. See [Backup and Disaster Recovery](#) for more information.

To configure the backup paths, see [Backup Configuration File Path Settings](#) (KB).

**Note** The file paths configured on this page by default need to be either changed or created on each server that the Secret Server application and database reside on.

To allow users to log in with their Active Directory (AD) credentials, you can configure your AD domain settings in Secret Server and then add users either individually or by group.

## **Setting up Active Directory**

See [Configuring Active Directory](#).

## **Enabling Active Directory Users**

See [Enabling and Disabling Active Directory Users](#).

## **Managing Active Directory Users via a Distributed Engine**

See [Syncing and Authenticating AD Users via a Distributed Engine](#).

To try out Secret Server, you must have folders, roles, users, and secrets to operate on:

1. Setup some folders and roles: We encourage is for you to setup a folder structure and a few roles. The folder structure is how you will keep your secrets organized, and provide access to shared secrets. Additionally, roles ensure you are able to control access to different parts of Secret Server and assign permissions to view certain folders and secrets. See [Secret Folders](#) and [Roles](#).
2. Add users if you have not already from AD. See [Creating Users](#) and [Creating User Groups](#).
3. Add an Active Directory or other secrets. If you plan on using discovery, the account will also need permissions to scan computers on the network for accounts. See [Managing Secrets](#).

Secret Server has a discovery feature that can automatically find local Windows accounts, Active Directory service, Unix, VMware ESX/ESXi, and Active Directory domain accounts. Account and dependency types not supported out-of-the-box in Secret Server can still be discovered by writing PowerShell scripts that can be run as custom scanners. This allows administrators to quickly import accounts found by Secret Server on specified domains or IP addresses.

**Note:** Please see the [Discovery Topic](#) for a comprehensive guide to configuring and using discovery.

To run discovery on a domain, IP address range, or a custom source, you need to first enable the discovery feature for Secret Server. Second, you must enable discovery for each discovery source you would like to be scanned.



Secret Server remote password changing (RPC) provides the ability to either start a password change manually or schedule automatic password changes to occur at a regular interval.

## **Enabling Remote Password Changing**

See [Enabling RPC](#).

## **Performing a Manual RPC**

See [Run a Manual RPC](#).

## **Common RPC Error Codes**

See [RPC Error Codes](#).

Heartbeat allows you to determine from Secret Server whether the credentials in a secret authenticate successfully with their target system. By default, heartbeat is turned off in Secret Server. See [Heartbeats: Automatically Testing Secret Credentials](#) for general information.

## **Enabling Heartbeat**

See [Enabling Heartbeat in RPC](#).

## **Running Heartbeat**

See [Running Heartbeat for a Secret](#).

Before running reports and audits, you must create something to report on—to that end:

- Import a few accounts or create secrets manually
- Rotate passwords a few times
- View a couple of your secrets

This generates enough audit logs to provide meaningful outputs in your reports:

- Security Hardening Report
- What secrets have been accessed
- What secrets failed heartbeat
- Failed login attempts
- Secret activity

See [List of Built-In Reports](#) for the most up-to-date list of reports included.

For details on using reports, see:

- [Creating and Editing Reports](#)
- [Viewing Reports](#)

Sometimes, depending on your scenario, you want to add extra protections to highly sensitive secrets. Secret Server has a access request and workflow features:

- [Secret Check-Outs](#): Grant access to a single user
- [Basic Secret-Access Requests](#): Require approval prior to accessing a secret for a defined time period
- [Advanced Secret-Access Requests with Workflow Templates](#): Require multi-level and multi-user approval prior to accessing a secret for a defined time period
- [Secret DoubleLocks](#): Add another security layer by encrypting secret data with a supplemental custom encryption key that is only accessible with an additional password, regardless of regular permissions.

A secret *launcher* opens a connection to the remote computer or device or logs into a website using the secret's credentials directly from the Web page. While this provides a convenient method of opening RDP and PuTTY connections, it also circumvents users being required to know their passwords. A user can still gain access to a needed machine, but it is not required to view or copy the password out of Secret Server. A Web launcher automatically logs into websites using the client's browser. SS launchers, also called protocol handlers, come in three primary types:

- **Remote Desktop:** Launches a Windows Remote Desktop session and automatically authenticates the user to the machine.
- **PuTTY:** Opens a PuTTY session and authenticates the user to a Unix system.
- **Web Password Filler:** Uses a Chrome extension to automatically log the user into a website with secret credentials. See our separate documentation for Web Password Filler.
- **Web Launcher:** An alternative method to automatically log on websites. See [Web Launcher](#).

See [Secret Launchers](#) for more information.

Session recording provides an additional level of security by recording a user's actions after a launcher is used. Session recording works for any launcher, including PuTTY and SSH, Windows Remote Desktop, Microsoft SQL Management Studio, and custom executables. The resulting movie is viewable from the secret audit. There are two types of session recording:

- [Basic Session Recording](#)
- [Advanced Session Recording](#)

You can access Secret Server without using the user interface for automation and integration purposes. Currently, there are two APIs:

- An asynchronous REST (representational state transfer) API for Web services, which is based on JSON (JavaScript Object Notation). This is the preferred method. It is faster and easier to read than the SOAP API and is still actively updated.
- A synchronous SOAP (Simple Object Access Protocol) for Web services, which is based on XML. This method is deprecated, but we still support it. It is based on an older technology, which has largely been replaced in recent years. There will be no enhancements to this API. There are, however, a few, rarely used capabilities that only our SOAP API has.

We offer a software development kit (SDK) that contains a .NET framework and a command line interface (CLI) for accessing the REST API with Windows applications or scripting languages.

Both APIs, the .NET framework, and the CLI support:

- GET Requests: Retrieve information from Secret Server, including entire secrets, individual secret fields, and security tokens
- POST Requests: Create Secret Server data
- PUT Requests: Update Secret Server data
- DELETE Requests: Remove Secret Server data
- Once-per-session permissions (tested once and then based on the IP address), administered with a Secret Server rule

SDK Documentation:

- [Secret Server SDK Guide](#): Includes these topics:
  - Secret Server configuration
  - Roles and permissions
  - SDK client installation
  - Connecting to Secret Server
  - SDK client caching
  - Examples
- [Secret Server SDK Downloads](#): Includes these topics:
  - SDK downloads
  - Download
  - SDK release notes
  - NuGet packages
- [SDK Integration Document](#): Includes these topics:
  - Integrating using C#
  - Integrating using the web.config file
  - Methods of the SecretServerClient() class

REST API Documentation:

- [REST Web Services API - Secret Server](#): Links to online reference guides (by Secret Server release)
- [REST API PowerShell Scripts - Getting Started](#)
- [REST API Python Examples](#)

SOAP API Documentation:

- [SOAP Web Services API - Secret Server](#): Reference guide in a downloadable PDF

You have finished this "Getting Started" introduction to Secret Server. There is much more to explore within Secret Server, such as scripting, third-party Integrations (SIEM, CRM, HSM, and more), and connecting to Privilege Manager to monitor and protect endpoints. We look forward to working with you!

See [Additional Resources](#) to learn more about Secret Server and other Delinea products.



## Help

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Capitalization

Technical writing is typically so awash in capitalization that it often denotes nothing and harms legibility. To counter that, in general, this document follows the IBM Style Guide rule:

*"Do not capitalize the names of features and components unless they are sold separately or are trademarked."*

More specifically, the only things capitalized in this document are:

- Company, person, country, geographic place, or organization names
- Official or trademarked products or services, unless they officially have atypical capitalization, for instance *iPod*.
- Acronyms and initializations
- When referring to any UI labels that are capitalized
- When the word begins a sentence or phrase

## Code and Command Line Text

Variable text in literal typed-in text and command-line parameters follow these industry-wide standards:

- All code and command-line interface text appears in monospaced text.
- Required parameters appear in angle brackets: `ping <hostname>`
- Optional parameters appear in square brackets: `mkdir [-p] <dirname>`
- Repeated parameters are followed by ellipses: `cp <source1> [source2...] <dest>`
- Multiple choice items are separated by vertical bars and grouped by curly brackets: `netstat {-tl-u}`

## Keyboard Shortcuts

- Keyboard keys are bolded and surrounded with square brackets: **[Enter]**
- Concurrent key presses are denoted with plus signs: **[Ctrl]+[Alt]+[Del]**
- Sequential key presses are denoted by commas: **[Page Down], [Enter]**

## Notes

There are three types of notes: *regular*, *important* and *warning*.

**Note:** Regular notes have a title, either "Note" or something custom, which appears as a phrase followed by a colon at the beginning of the note. A note contains tangential (an aside) or supplemental information (a tip or clarification).

**Important:** Important notes contain substantive information that should be heeded, or negative consequences can occur, involving frustration, wasted time, or minor data loss.

**Warning:** Warning notes contain substantive information that should be heeded, or negative consequences can occur, involving injury, major data loss, or equipment damage.

## Other Special Text

- Email addresses and URLs are usually denoted by a colored underline: [support@delinea.com](mailto:support@delinea.com).
- When URLs are part of the instruction, as opposed to clickable link, they appear in monospaced text: Type `https://www.somewhere.com` or click `https://www.somewhere.com`.
- Cross-references to headings are hyperlinks: See [Booting a Server](#).
- Document or article names (not sections) appear in italics: See the *Server Administration Guide*. They may or may not be hyperlinks.
- All file and folder paths appear in monospaced text: `app\bin\web_config.xml`

- File names by themselves do *not* appear in monospaced text: web\_config.xml. If the file name contains spaces, the name is surrounded by quotation marks: "web config.xml".

**Note:** Ending punctuation may be omitted for clarity when following typed-in text, including URLs.

## Screen Components and Attentional Targets

- Mouse-click, keyboard, and other attentional targets (anything a looks for) are denoted by bold type: **OK** button or **Login** link.
- Attentional Targets and screen component names in system *responses* are not bolded: "The OK button appears" verses "Click the **OK** button."
- Names of screen components, such as tabs, buttons, and text boxes, are corrected for spelling and capitalization. The component type appears in lowercase. Example: **SERVER CONFIGURATION** window becomes **Server Configuration** window.

## Forums

[Forums](#). Forums are oriented toward admins and other technical users.

## Delinea Blog

[Delinea Blog](#)

To have access to Delinea Technical Support, you must have an equal number of unexpired user and support licenses. All support licenses expire 365 days after they are issued.

## Technical Support Coverage

Please see our *Getting Technical Support* section below.

**Note:** Please see the **Support** link on the menu above for details about our support policies.

## Accessing Upgrades

Supported customers have access to all new releases (both minor and major). See [Secret Server Installation and Upgrade Guides](#).

## Requesting New Features

We encourage customers with active support licensing to [provide feedback](#).

## Getting Technical Support

**Important:** Please see the **Support** link on the menu above for details about our support policies.

### Step One: Gather Information You May Need

Before you contact Support, gather the following information:

- Your Delinea Support username and password
- The email account already associated with your account (if using email)
- Your company name
- The technical contact name
- The technical contact phone number
- The product name
- Issue symptoms and details
- Any other relevant details, such as hours the technical contact is present

### Step Two: Get a Mandatory Support PIN

#### Secret Server

The support PIN validates that your license includes support, and you must provide the PIN in your email or when you call. The PIN also makes it easier for Delinea Support to locate your customer records and give you better support.

To get your PIN:

1. Get the log on the credentials you received when you became a Delinea customer.
2. Log on the [Support Portal](#) using your credentials.
3. On the main page, click the large blue **PIN** bar to get your PIN. The PIN appears on the button.
4. Record your PIN.
5. If you want to use our ticketing system for support, leave the browser tab open, and return for step four.

## Secret Server Cloud

The support PIN validates that your license includes support, and you must provide the PIN in your email or when you call. The PIN also makes it easier for Delinea Support to locate your customer records and give you better support. In addition, there is an additional "privileged PIN" for accessing your cloud instance.

To get your PIN:

1. Log on the [Cloud Manager Dashboard](#).
2. Click the **Generate Tech Support** PIN button. A Tech Support PIN popup appears.
3. Record your PIN.
4. Click the Generate Privilege PIN button. Another Tech Support PIN popup appears.
5. Record your privileged PIN. Note that privileged PINs begin with "p"

**Important:** Providing us a privileged PIN gives Delinea Technical Support write access to your cloud database for one day. Secrets and other sensitive data remain encrypted and unreadable.

## Step Three: Choose a Support Method

Delinea customers have access to support by phone, email, and our support ticketing system (best for issue tracking). In all cases, **you must first obtain a support PIN**.

**Important:** For Severity 1 issues you **must** use phone support. Otherwise, use the method you prefer. Severity 1 means a critical problem that has caused *complete loss of service* and work cannot reasonably continue at your worksite.

## Step Four: Contact Support

Click the **Support** link on the menu above for Support email addresses and phone numbers.

Using one of the below methods, contact Delinea Support.

### Phone Support

Delinea delivers support by phone worldwide. Select the applicable number from the list on the **Support** link in the menu above.

### Email Support

Send your email to support@delinea.com **with the PIN number as part of the subject line** of your email. For example: PIN 345 Workflow Stopped Unexpectedly. Include all the information listed in step one.

**Important:** You must send your email using an email address already noted in your account with Delinea. Otherwise, it might delay our response.

### Ticketing System Support

Open a support ticket and track your issue to resolution.

- Visit the [Support Portal Login Page](#) and login using the credentials you received when you became a customer.
- After logging on, click the **Log a Case** button to create a new case or click **Case Management > Cases** to manage an existing one.

## Access Requests

The access request feature allows a secret to require approval prior to accessing the secret. Note the following:

- Establishing a workflow model, the user must request access from the approval group or groups.
- An email is sent to everyone in the approval groups, notifying them of the request.
- The request can be approved or denied by any members of the approval groups. Approvals can be set using the setting **Require Approval Type** to control who requires approval.
- Access is granted for a set time period.
- If **Owners and Approvers also Require Approval** is enabled, then even owners or those in an approval group needs to request access.
- Requesters cannot approve their own requests.

Once a request for access to a secret has been made, approvers receive an email.

The email contains one link to the secret **Access Request Approval** page for that request in Secret Server, and five additional links to approve or deny the request if the **Allow Approval for Access from Email** configuration setting is enabled.

The approver can either click one of the links contained in the email or navigate to the **Notification Center** in the user menu within Secret Server.

Alert Notification Center



FILTER

Notification Type

☒ Event Subscription
 ☒ Secret Access Requests
 ☒ Application Access Requests
 ☒ System Alerts
 ☐ Include Archived

Priority

☒ Requires Interaction
 ☒ Critical
 ☐ Informational

PRIORITY	NAME	DESCRIPTION
	 Pending Engine	

If choosing the latter, in the displayed grid click the access request name. This takes you to the secret's Access Request Approval page.

From here, you can accept or deny the request as well as set an expiration date.

The requestor has access to the secret until the specified date.

Selecting the current date is the smallest window of time allowed and grants access to the end of the day.

With **Allow Approval for Access from Email** enabled, clicking one of the five additional links in the email allows access for 1, 2, 4, or 8 hours or deny the request, per the link description in the email.

**Note:** The expiration date referred to in approval requests is **not** the same as secret expiration.



When implementing the "Requires Approval For Access" feature to force a user to request access to a Secret and "Allow Approval For Access from Email" is turned on, an email with approval links is sent out to all the approvers. To customize this email, follow the steps below:

1. Find the Secret Server directory, which is typically C:\inetpub\wwwroot\SecretServer
2. Under the customresources directory:
  - If it does not already exist, create a directory named by a digit corresponding to your language Locale ID (LCID). For English, use the digit 9.
  - If it does not already exist, create a pages.xml file.
  - Insert the code below into pages.xml The hours value can be any integer greater than 0:

```
<resources>
<page name="legacyhome.aspx">
<control controlId="SearchTermTextBox">
  <property name="ToolTip" value="This is a customer set resource." />
</control>
</page>
<messages>

  <message name="SecretAccessRequestEmailSubject">Application : {0}, Secret : {1}, Requestor : {2}</message>
  <message name="SecretAccessRequestEmailMessage">Requestor : {0}{2}Secret : {1}{2}Beginning : {6}{2}Ending : {7}{2}Reason : {3}{2}Link : {4}{2}Ticket Number :
  {5}{2}Secret Field : #${DOMAIN#}</message>

  <message name="SecretAccessRequestEmailMessageApprovalPart">
    <![CDATA[
      Approve for 3 hours from start date: #URL#RequestApproval.aspx?op=approve&id=#UNIQUEID#&hours=3

      Approve for 24 hours from start date: #URL#RequestApproval.aspx?op=approve&id=#UNIQUEID#&hours=24

      Deny Request: #URL#RequestApproval.aspx?op=deny&id=#UNIQUEID#
    ]]>
  </message>
  <message name="SecretAccessRequestEmailMessageTicketReferencePart">{0}{1}</message>
</messages>
</resources>
```

#URL# = the URL of your Secret Server instance

#UNIQUEID# = the approver's unique ID

hours = X is the number of hours approval will apply

#\$SECRETFIELD# = the name of a Secret Field

For example #\${MACHINE#} will be replaced with the value from the machine field on the Secret. If no field with that name is present, it will be blanked out. Please note the location of the field name in the xml. The fields will not resolve in the CDATA section.

3. Perform IIS reset

Users can now approve secret access requests and workflows using Duo push notifications. The push notification includes information, displayed on the user's screen, that helps the approver make the access decision.

## Prerequisites

To use Duo push notifications:

- Duo must be set up for Secret Server. See [Duo Security Authentication](#).
- Duo user must be set up for Duo two-factor authentication. See [Setting up Duo \(User\)](#).
- The permission "Approve via DUO" must be granted to a role that is assigned to a group that includes all who will be approving requests via Duo. This allows enough flexibility so that those not wanting Duo push approvals can be configured to not receive them.

## Assigning the Duo Approval Permission

To associate the permission with users:

1. Go to **Admin > Roles**.
2. Click the **Create New** button to create a new role. Name it "Duo Push Approver" or another name of your choosing.
3. Assign the **Approve Via DUO Push** permission to the new role.
4. Click the **Save** button.
5. If you choose to create a separate group for approvers, do this by navigating to **Admin > Groups**.
6. Click the **Create New** button to create a new group.
7. Add the desired users (chosen approvers) to that group.

**Note:** You can also assign users to the group later. This method is a shortcut when creating a group.

8. Click the **Save** button.
9. Go to **Admin > Roles**.
10. Click the **Assign Roles** button. The View Role Assignment page appears.
11. Click the **Role** dropdown list to select the role you created. Note that there are no groups or users.
12. Click the **Edit** button. The Role Assignment page appears.
13. Assign the **Approve via DUO Push** role to the **Assigned** list box.
14. Click the **Save Changes** button. Setup is now complete.

**Note:** In addition to having the role you created, the user must be properly set up to receive Duo push notifications. See [Setting up Duo \(User\)](#).

**Note:** Any notifications will all be sent out at the same time, and the first response (approve or deny) will be the determinant response. A non-response will not result in either an approve or deny response.

To start the request process for access to a secret, the user must simply attempt to view the secret. The user is then sent to the Request page. In there, the user can explain the reason for the request and then click **Request Access** to submit the request.

If a member of the Approval Group either approves or denies the request (see below for details), the requestor is sent an email with the details. If approved, the requestor can access the secret via the link contained in the email.

To enable Access Request for a secret, navigate to the **Secret View** page for the secret:

1. Go into the **Security** tab and click the **Edit** button.
2. Check the **Enable Requires Approval for Access** checkbox to enable the setting.
3. Once enabled, select users or groups as approvers for the secret. Unless the **Owners and Approvers also Require Approval** option is turned on, owners or users that are members of the Approvers group do not need to request access to view the secret.

**Note:** Users need at least view access to the secret to be able to access the secret even with **Access Request** enabled. If the users do not have view permission they are unable to find the secret with search or browse.

**Note:** The email configuration settings need setting up, including valid email addresses, for the users in the approval group for emailing to work.

## Secret Server Administration

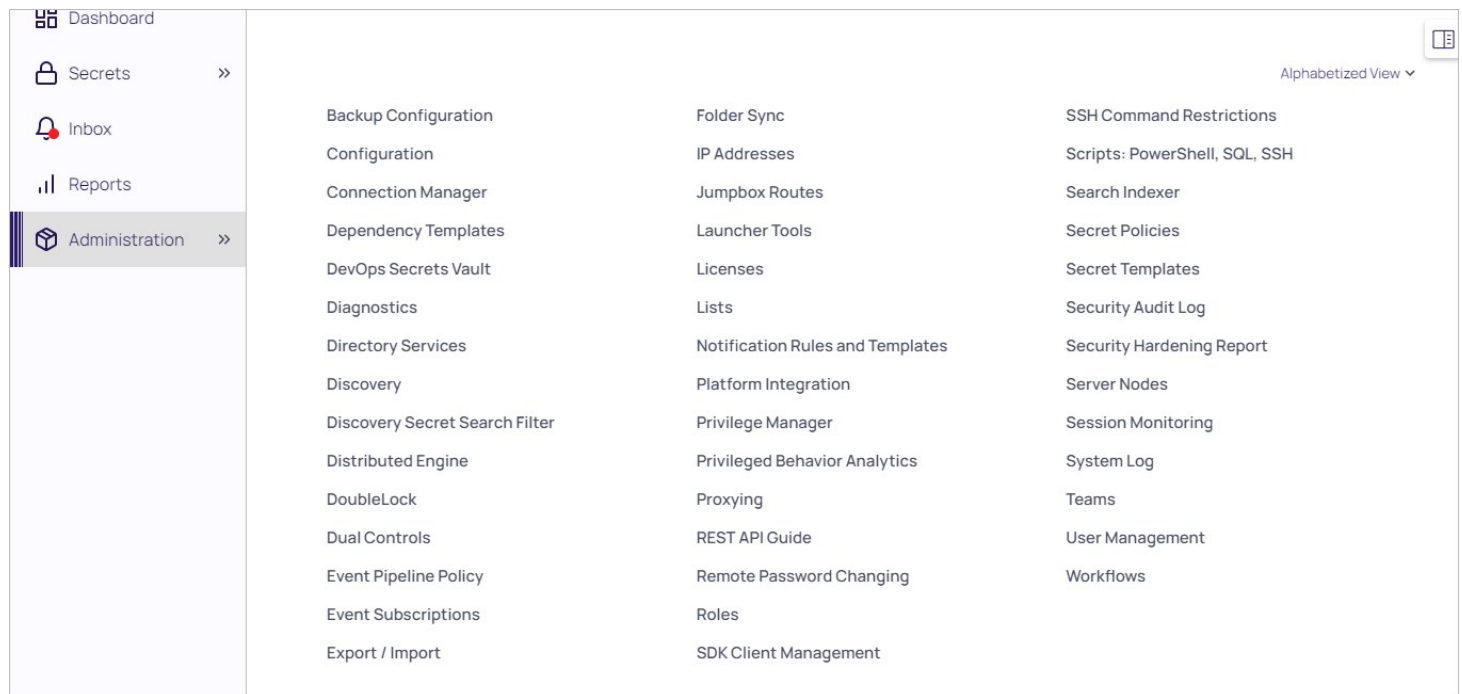
**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server is highly customizable. Administrators can increase site security through various configuration settings such as force inactivity timeouts and specifying a SMTP server. This level of configuration allows Secret Server to be altered to meet the needed requirements for the instance. The settings are explained in this section.

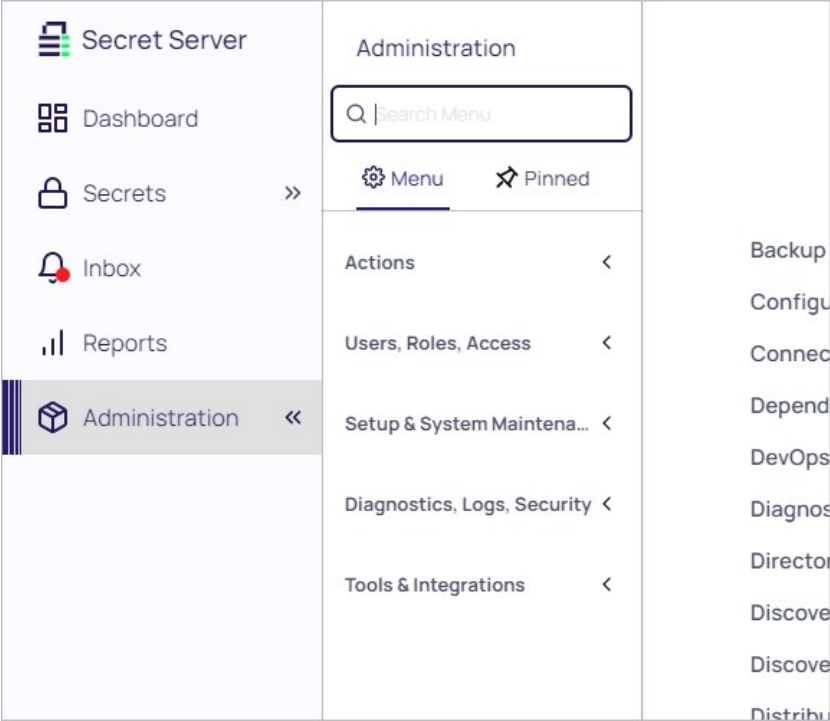
The administration side panel and page is a control panel for administering Secret Server. You access it by clicking or hovering over the **Administration** main menu item and clicking the >> icon. Clicking the << icon closes the side panel.

**Note:** The most commonly sought items appear in the same list, so you can go directly to them without having to go to the Admin page.

**Figure:** Administration Page (alphabetized view with side panel closed)



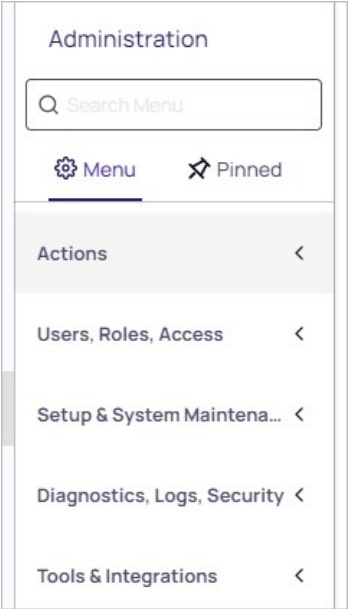
**Figure:** Administration Page Side Panel



With the page and side panel, you can quickly and easily find administration controls in several ways:

Administration Side Panel

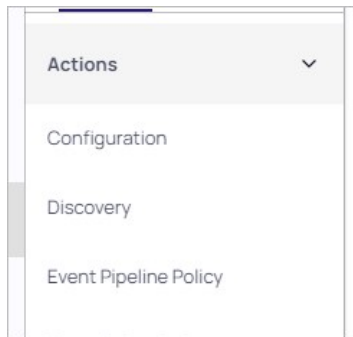
Figure: Administration Side Panel



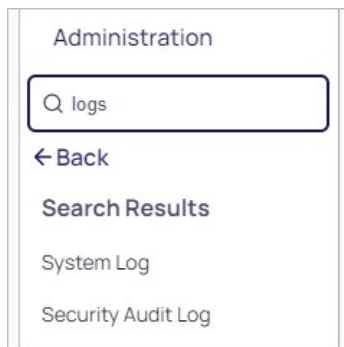
Navigation

Click the double chevron icon to view the side panel. You can find admin controls in two ways:

- **Menu Navigation:** Click the admin menu to drill down to a topic of your choice. As you click each top-level choice, subtopics appear. Once you see the item you desire, click and you are brought to that page.



- **Dynamic Search:** You can search for a concept, configuration, or component by typing a search term in the search text box on the side panel. The text box automatically suggests items as you type. Once you see the item you desire, click and you are brought to that page.



## Pinning Commonly Used Items

You can build your own admin panel on the Pinned tab by hovering the mouse pointer over a side panel item and clicking the pin icon. Pinned items remain on the Pinned tab until you remove them.

## Administration Page

The administration page is an alternative to the side panel. You have three views to choose from, which you set by clicking the unlabeled view dropdown list. The link text states the current view. The views are:

- **Simple View:** Hover over or click the large panel buttons to see a menu of topics.

**Note:** The legacy search feature is essentially the same as that in the administration side panel.



What are you looking for?

Search for an admin option



Simple View 



## Actions

Features that perform important jobs



## Setup & System Maintenance

Setup your system and keep it running with Licensing, Backups, Imports, Networking options, and more



## Users, Roles, Access

These features help you organize users & permission settings



## Diagnostics, Logs, Security

Reference options for diagnostics, logs, and security features



## Tools & Integrations

Find tools and other product integrations here

- **Alphabetized View:** A text list of the available items:

Alphabetized View ▾	
Backup Configuration	Platform Integration
Configuration	Privilege Manager
Connection Manager	Privileged Behavior Analytics
Dependency Templates	Proxying
DevOps Secrets Vault	REST API Guide
Diagnostics	Remote Password Changing
Directory Services	Roles
Discovery	SDK Client Management
Discovery Secret Search Filter	SSH Command Restrictions
Distributed Engine	Scripts: PowerShell, SQL, SSH
DoubleLock	Search Indexer
Dual Controls	Secret Policies
Event Pipeline Policy	Secret Templates
Event Subscriptions	Security Audit Log
Export / Import	Security Hardening Report
Folder Sync	Server Nodes
IP Addresses	Session Monitoring
Jumpbox Routes	System Log
Launcher Tools	Teams
Licenses	User Management
Lists	Workflows
Notification Rules and Templates	

- **Categorized View:** A text list of the available items bunched by category:

Categorized View ▾

## CORE ACTIONS

- Configuration
- Discovery
  - Dependency Templates
  - Discovery Secret Search Filter
- Event Pipeline Policy
- Event Subscriptions
- Notification Rules and Templates
- Lists
- Remote Password Changing
- Session Monitoring
- Secret Policies
- Secret Templates

## IMPORT, EXPORT, SYNC

- Export / Import
- Folder Sync

## NETWORKING

- Distributed Engine
- Server Nodes

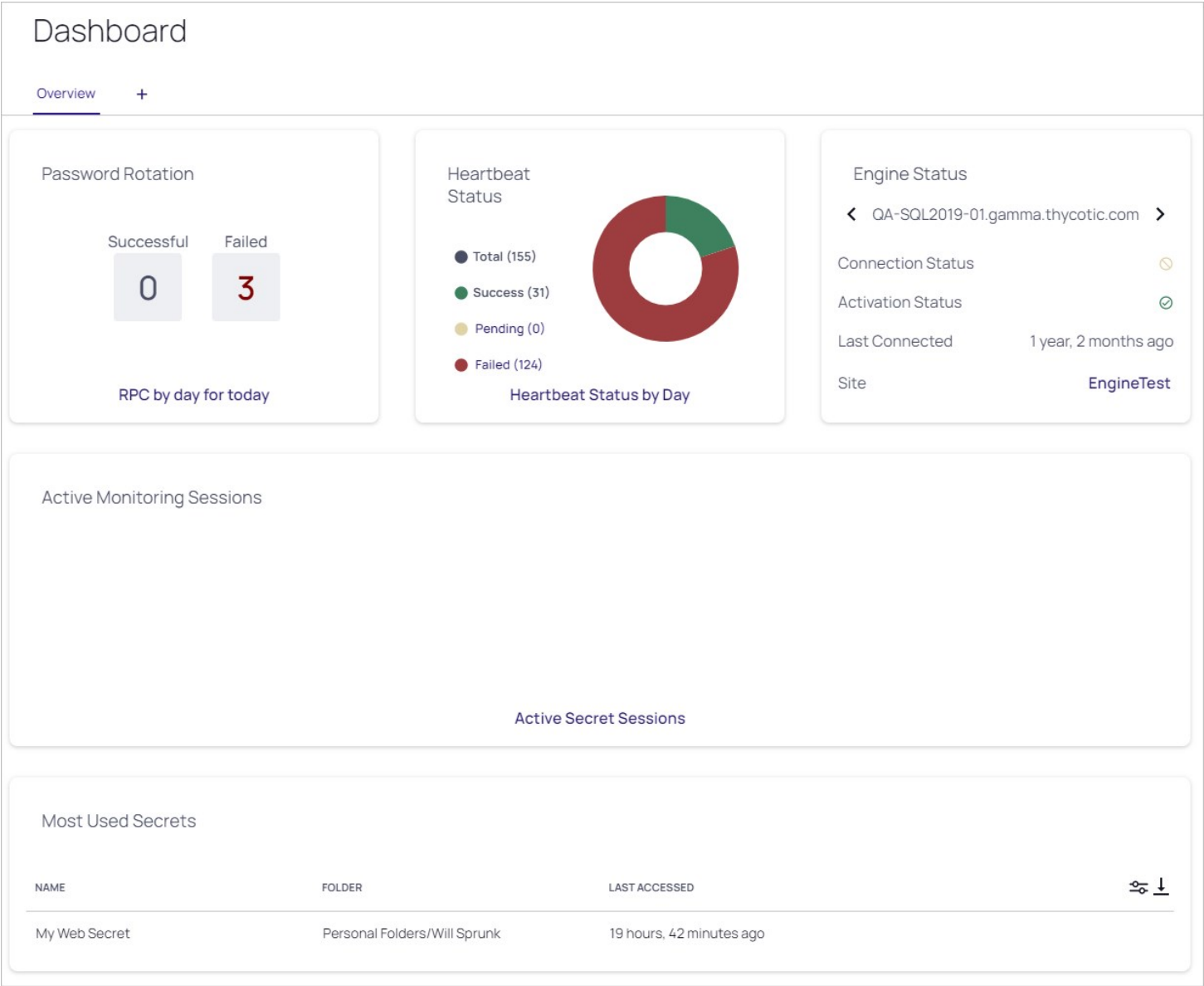
## USERS, ROLES, ACCESS MANAGEMENT

- Directory Services
- User Management
- Roles
- Teams
- IP Addresses

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

The Secret Server dashboard is the main page for searching and viewing secrets. You access it by clicking the Dashboard menu item.

Figure: Secret Server Dashboard



## Color Modes

### Overview

**Important:** As of version 11.4, the classic UI is no longer be available to anybody.

Color mode is a color scheme (skin) for the UI. The color modes are System Default, Light, and Dark. System default means whatever color was chosen on your system for the Windows application default.

### Setting Your Default Color Mode

1. Click the user icon at the top right of any page and select **User Preferences**. The User Preferences Page appears.
2. Click the **Settings** tab.
3. Click the **Color Mode** dropdown list to select the desire color mode. Your choices are:
  - Light Mode
  - Dark Mode
  - System Default: The color chosen for your Windows default application color.

The mode changes right away—no need to save the change.

## Dashboard Components

### Overview Tab

The Overview tab provides several fixed widgets for getting a quick understanding of your Secret Server installation:

- **Active Monitoring Sessions:** Your current monitored sessions. See [Session Recording](#).
- **Approvals:** Your current in-process approvals. See [Secret Access Requests](#).
- **Engine Status:** A scrollable list of distributed engine connection and activation statuses.
- **Heartbeat Status:** A graphic of the current status of your heartbeats: success, pending, or failed. When you click on one of the statuses, you are brought to a report page for that status. For example, **Reports > Secrets Failing Heartbeat**. When you click the **Current** link, you are brought to the **Reports > Heartbeat Status by Day** page. See [Secret Heartbeats](#).
- **Most Used Secrets:** A table of the most recently accessed secrets, listed by date and folder.
- **Password Rotation:** The state of your current password rotations. When you click the **Today** link you are brought to the **Reports > RPC by Day** report page. See [Remote Password Changing](#).

**Note:** To see an overview of incoming system and subscription alerts, see the [Alert Notification Center \(Inbox\)](#).

### Customized Tabs

#### Tab Management

The following operations are available for creating custom tabs:

- **Create:** Click the **+** to the right of the tabs to create a new empty tab.
- **Delete:** Click the **▼** icon on a tab and select **Delete** to delete a tab. You can cancel changes by clicking the **Cancel** button. A confirmation pop up page appears.
- **Rename:** Click the **▼** icon on a tab and select **Rename** to change the tab name. You can cancel changes by clicking the **Cancel** button.
- **Sort:** Click and drag a tab to the left or right of an existing tab.

### Dashboard Widgets

By default, the Overview tab contains the Favorite Secrets, Recent Secrets, and + Add Widget widgets (function boxes). You can add these widgets on custom tabs:

- Expired Secrets
- Out-of-Sync Secrets
- Reports
- Request Management

#### Widget Types


#### Table: Dashboard Widgets

Expired Secrets	Displays expired secrets.
Favorite Secrets	Displays secrets marked as favorites. Also appears on the Secret Navigation Slideout.

Out-of-Sync Secrets	Displays secrets that are out-of-sync—the heartbeat or RPC have failed.
Recent Secrets	Displays the secrets viewed most recently. Also appears on the Secret Navigation Slideout.
Report	Displays a report. Click the <b>Report Category</b> list to select a report from the drop-down menu. One report can be displayed per widget. Click the title of the report to navigate to the Report View page.
Request Management	Displays any requests pending for the logged in user.
+ Add Widget	Default widget that appears on an empty custom tab. When clicked, adds a widget that is not currently displayed to the Dashboard. This widget's function is duplicated automatically when you add a new Dashboard tab. You cannot remove this widget.

**Note:** The Search and Browse widgets cannot be rearranged. They always remain in the top left region of the tab.

## Managing Widgets

The following operations are available (by clicking the  icon) for managing widgets:

- **Delete:** Delete the widget from this custom tab.
- **Refresh:** Update the information in the widget. This is not available for all widgets.

## Dashboard Tools and Help Menu

The Dashboard Tools Menu is available via the  button on the Dashboard. It includes links to:

### Help Section

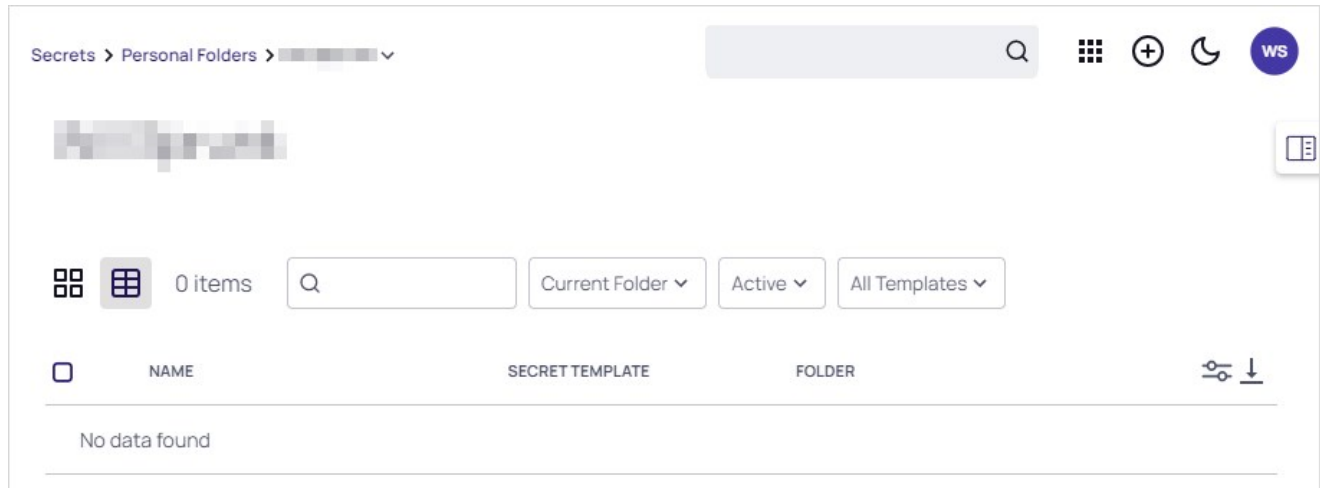
- [About](#)
- [Secret Server REST API Guide](#)
- [User Guide](#)



## Running Dashboard Bulk Operations

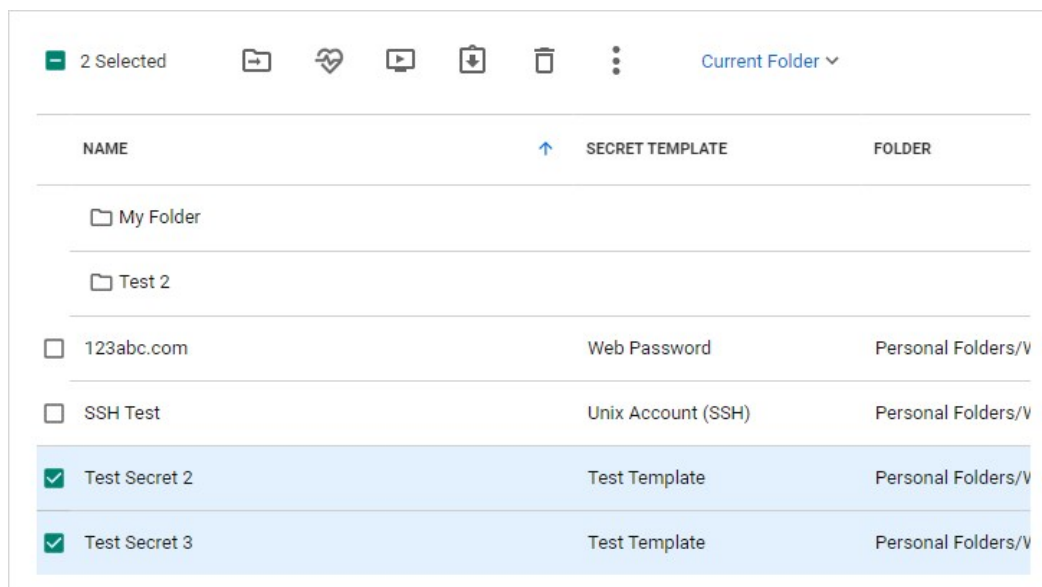
You can perform bulk operations from the Dashboard on multiple secrets:

1. Navigate to the folder containing the secrets you wish to perform a bulk operation on:

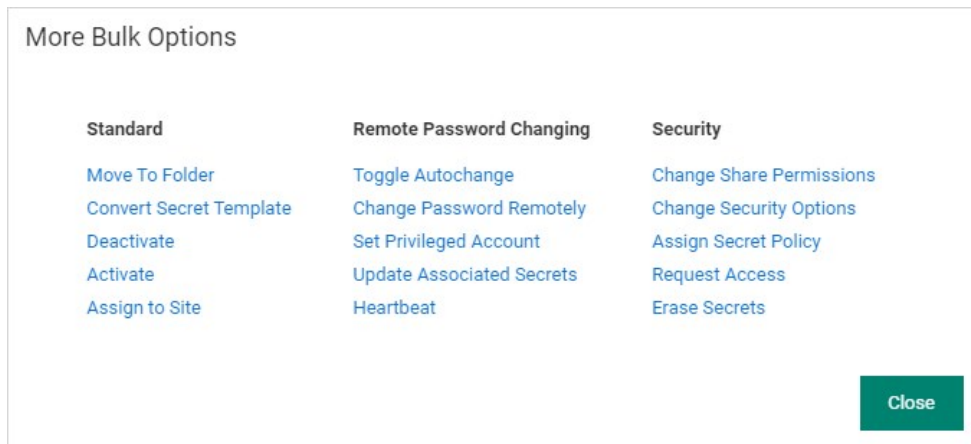


**Note:** You can also run a bulk operation on the All Secrets page.

2. Click the **Current Folder** link if you want to display the secrets in subfolders too. If so, the link changes to Include Subfolders.
3. Click to select the secrets you wish to include. To check them all, check the check box in the column header row. The bulk operations toolbar appears at the top:



The most common operations have icons. Hover over each to see a text label. The sideways ellipsis (three stacked dots) icon opens a text menu of all the bulk operations:



**Note:** Many of the available operations (below) are accessed via menus that appear when you click the links. For example, to disable check out, you click Change Security Options.

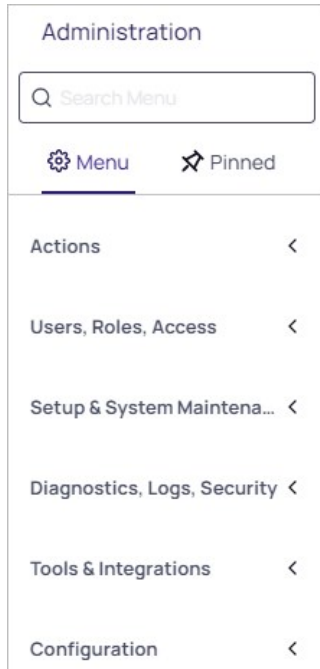
4. Click to select the bulk operation via either an icon or the **More Bulk Operations** menu . Available bulk operations include:

- Add share
- Assign secret policy
- Assign to site
- Change password remotely
- Change to inherit permissions
- Convert secret template
- Deactivate (was "Delete" in earlier versions)
- Disable autochange
- Disable check out
- Disable comment on view
- Disable heartbeat
- Edit share
- Enable autochange
- Enable check out
- Enable comment on view
- Enable heartbeat
- Erase secrets
- Hide launcher password
- Move to folder
- Run heartbeat
- Set privileged account
- Undelete
- Unhide launcher password

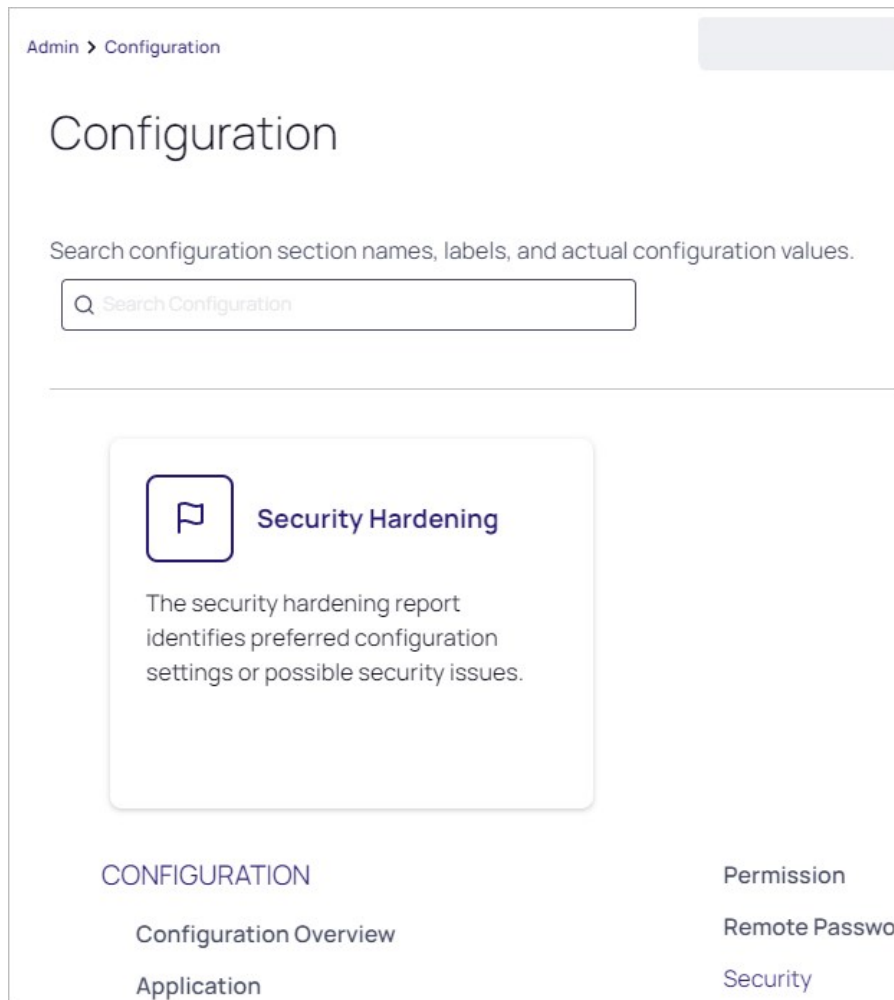
**Note:** Bulk operations differ by Secret Server version.

The Configuration Overview page (also called the "configuration preview") is a dynamic, one-stop locator for Secret Server configurations. To use the page:

1. Click the **Administration** menu item.
2. Click the > > button to view the admin side panel:



3. Click **Configuration > Configuration Overview**. The configuration overview page appears:



4. Either choose a configuration section from the links at the bottom or type a configuration name in the dynamic search box. Either way, the matching configuration sections appear at the bottom (replacing the original links).
5. Refer to the documentation topics for the specific configuration you navigated to.

You can add your own branding by adding customized logos to Secret Server. The logos only apply to the current UI—the classic UI is not supported. The logos and their requirements are listed in the table below.

**Table:** Custom Logo Specifications

Light	Full-sized	200×50	1 MB
Light	Sidebar Collapsed	50×50	1 MB
Dark	Full-sized	200×50	1 MB
Dark	Sidebar Collapsed	50×50	1 MB
Light	Login	400×400	1 MB
Dark	Login	400×400	1 MB

To use custom logos:

1. Create images for all six of the listings in the table above. The images can be svg, png, or jpg. The images must be the exact dimensions listed and not over the maximum file size.
2. Go to **Admin > Configuration > General > User Interface:**

## Configuration

Search configuration section names, labels, and actual configuration values.

### User Interface

Define new or classic UI, logos, and whether or not users can select a classic theme.

[Edit](#)

Disable Legacy UI	Yes  This option is available only for this minor release, and will be removed in future releases. If you need to enable the legacy UI, please prepare for it to be removed in the 11.4 release.
Enable New User Interface as Default for New Users	Yes
Allow Users to Select Classic Theme	Yes
Default Classic Theme	Secret Server Classic - Blue
Custom Logo Light Mode (Full Size)	
Custom Logo Light Mode (Collapsed)	
Custom Logo Dark Mode (Full Size)	
Custom Logo Dark Mode (Collapsed)	
Custom Login Logo (light mode)	
Custom Login Logo (dark mode)	
Show Custom Banner	No

- Click the **Edit** button. The page becomes editable:

## User Interface

Define new or classic UI, logos, and whether or not users can select a classic theme.

Disable Legacy UI	<input checked="" type="checkbox"/>	This option is available only for this minor release, and will be removed in future releases. If you need to enable the legacy UI, please prepare for it to be removed in the 11.4 release.
Enable New User Interface as Default for New Users	<input checked="" type="checkbox"/>	
Allow Users to Select Classic Theme	<input checked="" type="checkbox"/>	
Default Classic Theme	<div>Secret Server Classic - Blue ▾</div>	
Custom Logo Light Mode (Full Size)	<a href="#">Change</a>	
Custom Logo Light Mode (Collapsed)	<a href="#">Change</a>	
Custom Logo Dark Mode (Full Size)	<a href="#">Change</a>	
Custom Logo Dark Mode (Collapsed)	<a href="#">Change</a>	
Custom Login Logo (light mode)	<a href="#">Change</a>	
Custom Login Logo (dark mode)	<a href="#">Change</a>	
Show Custom Banner	<input type="checkbox"/>	

Cancel

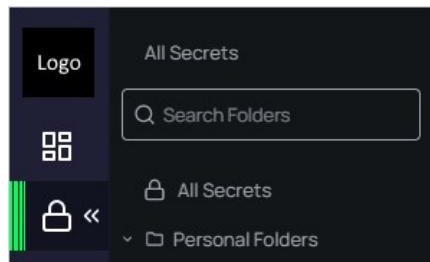
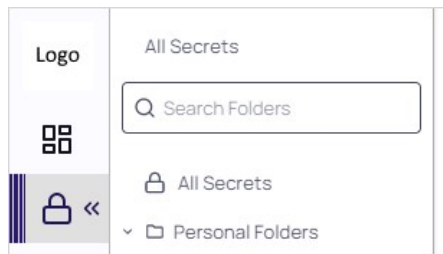
Save

4. For each of the listed custom logos:

1. Click the **Change** link. A file selection dialog box appears.
2. Navigate to and select the image matching the description. The image name and size appears in the list:

Custom Logo Light Mode (Full Size)	full-logo-light.png (1.33 KB) <a href="#">Change</a> <a href="#">Clear</a>
------------------------------------	---

5. Click the **Save** button. The images appear in the listing, and the logos are deployed to the application:





If your company requires the login banner for usage agreements and conditions to be visible when users log into Secret Server:

To enable the login banner, follow the procedure below:

1. Click the **Administration** menu item and search for and select **Configuration**.
2. In the **Configuration** window, select the **Login** tab.

## Configuration

General	Login	SAML	Folders	Local User I
<b>Allow Remember Me</b>				
<b>Allow Two Factor Remember Me</b>				
<b>Allow AutoComplete</b>				


3. On the **Login** tab, scroll down to the bottom options and click **Login Policy Agreement**.

Key Integration (for SSH Terminal)	Yes
Authentication Method	Pl
FA Validation Bypass	No
Expiration in	81

Edit
Login Policy Agreement
Test Radiu

4. In the **Administration Login Policy** window, click **Edit**.

## Administration Login Policy



Note: You may change the contents of the Login Policy Statement by editing the file "policy.txt". Your changes will \*NOT\* be lost during upgrades.

Enable Login Policy ☐ No

Force Login Policy ☐ No

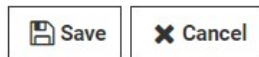


5. Select the checkbox for **Enable Login Policy** and click **Save**.

## Administration Login Policy

Enable Login Policy ☒

Force Login Policy ☐



6. Log out of Secret Server and re-try logging in.

On the Secret Server Login page, users logging into Secret Server will see the default message provided in the login policy box.

Access to this system is restricted to authorized users. Users (authorized or unauthorized) have no explicit or implicit expectation of privacy. Any or all secrets may be modified, copied, audited, inspected, and disclosed to company management, law enforcement personnel, and other authorized individuals. I understand that I am responsible for protecting the confidentiality of company secrets and will comply with the company Information Security Policy. Unauthorized or improper use of this system may result in administrative disciplinary


Log In

**Note:** The login policy is not applicable to the mobile app and will not be shown.



Turning on maintenance mode allows you to temporarily prevent users from changing roles, secrets, or secret-related data such as dependencies, templates, and password requirements. For example, you would want to enable Maintenance Mode while migrating the Secret Server application to a new server with a different domain.

To turn on Maintenance Mode:

1. On the **Admin** page, click **Setup & System Maintenance**.
2. Click **Server Nodes**.
3. In the **Maintenance Mode** column, click the edit icon next to Disabled.

MAINTENANCE MODE	
Disabled	

4. Check the box that appears and click the Save icon. If you change your mind, you can click the **X** next to the Save icon.

MAINTENANCE MODE	
<input checked="" type="checkbox"/>	 


A notice appears stating, "Enabling Maintenance Mode will take 5 minutes. Are you sure you want to proceed?"

5. Click **OK**.

While Maintenance Mode is setting up, a spinner appears.

MAINTENANCE MODE	
<input checked="" type="checkbox"/>	


When Maintenance Mode is enabled, "Enabled" appears in the Maintenance Mode column.

MAINTENANCE MODE	
Enabled	


**Note:** When Secret Server is in Maintenance Mode; a notification bar is displayed to alert users.

To return Secret Server from Maintenance Mode to normal operation, return to the Server Nodes window, then follow these steps:

1. In the Maintenance Mode column, click the edit icon next to Enabled.

MAINTENANCE MODE	
Enabled	

2. Uncheck the box that appears and click the Save icon. If you change your mind, you can click the **X** next to the Save icon.

MAINTENANCE MODE	
<input type="checkbox"/>	 

**Note:** When Secret Server is in its normal running mode, the Maintenance Mode notification bar is no longer displayed to users.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

This section discusses built-in security features of the Secret Server application, including encryption and compliance standards.

## Advanced Encryption Standard

Secret Server uses different types of encryption to ensure data security. Every text-entry field, except name, on a secret is encrypted at the database level with the Advanced Encryption Standard (AES) 256-bit algorithm. Database encryption prevents unauthorized access of sensitive data on the server.

The AES encryption algorithm provides a high security level for sensitive data. The National Institute of Standards and Technology (NIST) and National Security Agency (NSA) search for a replacement for the Data Encryption Standard (DES), which had numerous issues, namely small key size and efficiency, and finally settled on AES.

**Note:** Encryption algorithms use keys to obfuscate the data. While DES only had a key size of 56 bits, AES can have a key size of 128, 192 or 256 bits. Larger keys provide more security as their size makes brute force attacks infeasible.

**Note:** To address concerns from the cryptographic community, NIST embarked on a transparent selection process. During the selection process NIST solicited designs from the global cryptographic community and voted for a winner from within fifteen finalists. The eventual winner was a team of Belgian cryptographers with their submission of the Rijndael encryption method, which became AES. For more information about the technical specifications of AES, please see the official standard.

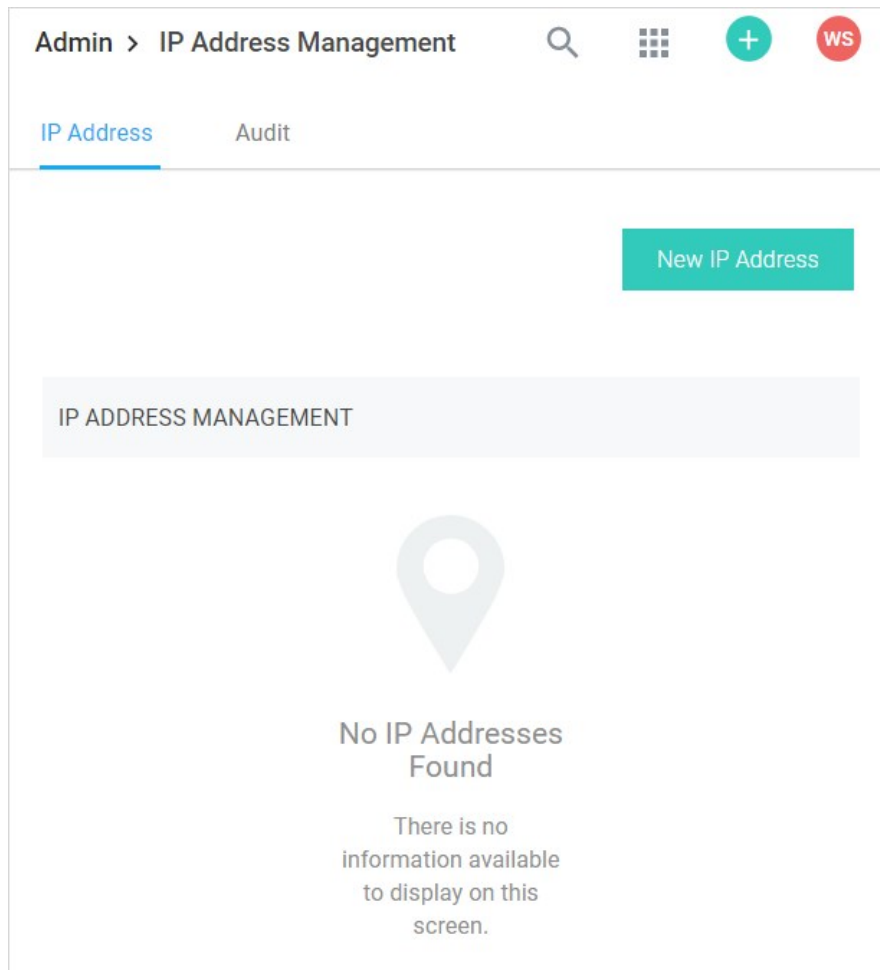
## Restricting IP Addresses

IP address restrictions allow you to control which IP address ranges users can use to log in to Secret Server.

### Creating IP Address Ranges

To create an IP address range:

1. Go to **Admin > IP Addresses** under Administration. The IP Address Management page appears:



2. Click the **New IP Address** button. The Add New IP Address Range popup page appears:

### Add New IP Address Range

IP Address User/Network Name \*

IP Address Range \*

192.168.3.12  
192.168.42.147-192.168.42.194  
192.168.3.52/22

Cancel


Save

- In the **IP Address User/Network Name** text box, type a descriptive name for your range.
- In the **IP Address Range** text box, enter an IP Address or IP Address range. Secret Server supports single IP Addresses (10.0.0.4), a range separated by a hyphen (10.0.0.1-10.0.0.255), and CIDR notation (10.0.0.0/24).
- Click the **Save** button. The new address or range appears in the IP Address Management table:

New IP Address

IP ADDRESS MANAGEMENT

NAME	
IP ADDRESS RANGE	
Generic Internal	
192.168.1.1	<div>Edit Delete</div>

**Note:** You can show or hide columns in the table by clicking the  button.

## Editing and Deleting IP Address Ranges



To edit an IP address range, go to the **IP Address Management** page, click on a range, and click **Edit**. To delete a range, click on the range and click the **Delete** button.

## Assigning an IP Address Range

1. To assign a range to a user:
2. Go to **Admin > Users** page. The View User page appears:

### View User

User Name	wsprunk
Display Name	Will Sprunk
Email Address	
Domain	gamma.thycotic.com
Two Factor	< None >
Enabled	Yes
Locked Out	No
Application Account	No

#### IP Address Restrictions

None


Restricted By Team


No

3. Scroll to the bottom of the page and click the **Change IP Restrictions** button. The Edit IP Address Restrictions Page appears:

### Edit IP Address Restrictions

RESTRICTED	NAME	IP ADDRESS RANGE
<input type="checkbox"/>	Generic Internal	192.168.1.1

 Save

 Cancel

4. Click to select or deselect check boxes next to the ranges to choose which IP Addresses a user can use to access Secret Server. If no boxes are checked, the user can access Secret Server through any IP Address.
5. Click the **Save** button.

**Note:** Regardless of the restrictions, users can always log in when accessing Secret Server on the server using a local IP address (127.0.0.1). This prevents total lockout from Secret Server.

## Secret Key Rotation

### Overview

Secret key rotation is a somewhat similar process to RPC by which the encryption key, used for securing secret data, is changed and that secret data is re-encrypted. Each secret receives a new, unique AES-256 key. Secret key rotation can be used to meet compliance requirements that mandate encryption keys be changed on a regular basis.

### How to Perform Secret Key Rotation

**Note:** Secret key rotation requires the Rotate Encryption Keys permission.

1. Go to **Admin > Configuration > Security**.
2. In the **Key Rotation** section, click the **Rotate Secret Keys** button.

Secret key rotation begins as soon as Secret Server enters maintenance mode. Because maintenance mode disables various functionality (such as secrets cannot be updated), the timing of secret key rotation merits consideration of Secret Server processing time. We recommend running secret key rotation during off-peak or non-business hours.

Note: To learn more about maintenance mode, see the [Maintenance Mode FAQ](#).

### Estimated Processing Time

Maintenance mode takes five minutes to enable before secret key rotation is started. The processing time for secret key rotation varies greatly, depending on the following factors:

- Total number of secrets
- Total number of secrets with file attachments and the size of those file attachments
- Hardware configuration:
  - Number of CPUs and cores
  - Memory size
  - Network latency
- HSM key size, if applicable

As a general guideline, use the following:

**Table:** Secret Key Rotation Processing Time

Without HSM (default)	2,000-12,000 secrets per minute
HSM with a 2048-bit key	240-600 secrets per minute
HSM with a 4096-bit key	120-300 Secrets per minute

## Security Compliance Standards

### FIPS Compliance

The Federal Information Processing Standard 140-1 (FIPS 140-1) and its successor (FIPS 140-2) are United States Government standards that provide a benchmark for implementing cryptographic software. Secret Server has been tested within environments that are FIPS compliant. For instructions to enabling FIPS in Secret Server, see the [Enabling FIPS Compliance in Secret Server](#) KB article.

### PCI Datacenter Compliance

Secret Server can make it easier to comply with PCI-DSS requirements:

- **Requirement 8:** Assign a unique ID to each person with computer access: Secret Server helps you comply with Requirement 8 by providing a secure repository for you to maintain an automated password changing schedule, forcing each user to have a unique, secured password. Secret Server's Web-based access makes it easy to access these passwords.
- **Requirement 10:** Track and monitor all access to network resources and cardholder data: Secret Server can monitor all access to network resources. By employing remote password changing to force password changes, administrators can monitor and update network resources on a customized scheduled. You can create a password changing schedule that best suits your environment.
- **Requirement 11:** Regularly test security systems and processes.
- **Requirement 12:** Maintain a policy that addresses information security: You can optimize Secret Server's software's global configuration and template-driven data structure to fit the requirements of your current information security policy or assist in creating a policy based on Secret Server. Configuration options include:
  - Applying two-factor authentication
  - Enabling launchers
  - Enabling Web services
  - Enforcing local-user password requirements
  - Forcing HTTPS/SSL
  - Requiring folders for secrets (for uniform permissions)

## SSH Key Rotation

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

SSH Key Rotation allows you to manage your Unix account private keys and passphrases as well as their passwords. With key rotation, whenever the password is changed on the secret (manually, during a scheduled auto-change, or when checking in a secret that changes the password on check-in), the public/private key pair will be regenerated and the private key encrypted using a new passphrase. The public key will then be updated on the Unix machine referenced on the secret.

There are two topics addressed here:

- [Basic SSH Key Rotation](#): A step-by-step tutorial on quickly getting started with the default SSH key rotation secret types and password changers.
- [Custom SSH Key Rotation](#): Provides additional information for users who need to customize the default commands for their environment.

## Basic SSH Key Rotation

This topic is a tutorial on how to quickly get started using SSH key rotation to change a Unix account's public and private key and automatically update a remote machine using Remote Password Changing (RPC).

### Introduction

SSH key rotation allows you to manage your Unix account private keys and passphrases as well as their passwords. With key rotation, whenever the password is changed on the secret (manually, during a scheduled auto-change, or when checking in a secret that changes the password on check-in), the public/private key pair is regenerated and the private key encrypted using a new passphrase. The public key is then be updated on the Unix machine referenced on the secret.

This document is a tutorial showing you how to quickly get started using SSH key rotation using our default key rotation password changers. For an in-depth description of SSH key rotation including modifying the command sets for your environment, see our [Custom SSH Key Rotation](#) topic.

### Requirements

To use our default SSH key rotation commands, the following minimum requirements must be met on the machine being managed:

- SSH key logins should be enabled on the target using keys in OpenSSH format. A secret can be created with keys in PuTTY format but they will be converted to OpenSSH when the key is rotated.
- Public keys should be stored in `[-userhome]/.ssh/authorized_keys` (not `authorized_keys2`).
- Grep and Sed should be installed on the target.
- If doing a privileged SSH key rotation, where a privileged user sets the key for another user, the privileged user must have sudo permissions that do not prompt for a password and the permissions to edit the user's `authorized_keys` file with sudo.

If a system does not meet these requirements it may still be possible to do key rotation by modifying the key rotation command sets. Our [Custom SSH Key Rotation](#) topic describes how to do this.

### Configuring a Secret for SSH Key Rotation

Secret Server comes with two secret templates for SSH key rotation: **Unix Account (SSH key rotation)** and **Unix Account (Privileged Account SSH Key Rotation)**.

Use **Unix Account (SSH Key Rotation)** if:

- The account is able to change its own password and modify its own `authorized_keys` file.
- The account password and key should only be changed by Secret Server (Secret Server will always have the current password and keys).

Use **Unix Account (Privileged Account SSH Key Rotation)** if:

- The account is not able to change its own password or modify its own `authorized_keys` file.
- The account password and key may be changed outside of Secret Server, and Secret Server may not have the current account credentials. A privileged account that is able to change the password and `authorized_keys` files of other users will still be able to change the account credentials.

### SSH Key Rotation Using the Secret's Credentials

#### Creating the Secret

1. Create a new secret in Secret Server using the **Unix Account (SSH Key Rotation)** template.

2. Enter the account user name and password.
3. Upload the private key file.
4. If the private key is encrypted using a passphrase, enter the passphrase.
5. Uploading a public key is optional but recommended. If a public key is not provided, Secret Server will regenerate it from the private key during key rotation, but if the key in `authorized_keys` is not in the same format as the generated key or does not match exactly (including comments), the rotation will fail because it could not find the public key that needs to be removed.
6. After the secret is created you should see a successful heartbeat status. If heartbeat isn't running, make sure heartbeat and RPC are enabled under **Admin > Remote Password Changing**.

## Rotating the Key

1. Go to the **Remote Password Changing** tab and click **Change Password Remotely**.
2. Enter the new password or click **Generate** next to the **Next Password** field to generate a random password.
3. Click to select **Generate New SSH Key** to create a new, random SSH key. If you want to supply your own private key, uncheck this option and paste the key into the **Next Private Key** text box that appears.
4. If you have unchecked **Generate New SSH Key** you must enter the passphrase that was used to encrypt the private key at the time it was created. Leave this field blank if the private key was not encrypted with a passphrase. If you have checked **Generate New SSH Key** you have the option to enter your own passphrase, leave it blank (for an unencrypted private key), or click the **Generate** button next to the field to create a new, random passphrase. If you want to change the key without changing the passphrase, you must put the current passphrase in the **Next Private Key Passphrase** text box.
5. Click **Change** to start the key rotation and a password change. After you start the change, you can check the status either in **Admin > Remote Password Changing** or on the **Remote Password Changing** tab of the secret.
6. Once the password change / key rotation is complete the heartbeat status should be successful. You can check the audit log to see notes that the key was rotated and start a session using the key with the PuTTY Launcher.

## SSH Key Rotation Using a Privileged Account

To use **Unix Account (Privileged Account SSH Key Rotation)**, you must have a secret that is able to use the `sudo` command to access other accounts' `authorized_keys` files and change their passwords. This can be any type of Unix secret and can use a password and/or private key to authenticate. If you have a secret that meets these requirements, you can set up SSH key rotation using a privileged account as follows.

## Creating the Secret

1. Create a new secret in Secret Server using the **Unix Account (Privileged Account SSH key rotation)** template.
2. Enter the account user name and password.
3. Upload the private key file.
4. If the private key is encrypted using a passphrase, enter the passphrase.
5. Uploading a public key is optional, but recommended. If it is not provided, Secret Server will regenerate it from the private key during key rotation, but if the key in `authorized_keys` is not in the same format as the generated key or does not match exactly (including comments), the rotation will fail because it could not find the public key that needs to be removed.
6. After the Secret is created you should see a successful heartbeat status. If heartbeat is not running, make sure that heartbeat and RPC

are enabled under **Admin > Remote Password Changing**.

7. Next go to the **Remote Password Changing** tab and choose the privileged secret that can authenticate to the machine and modify the user's `authorized_keys` file.
8. Click the **Back** button after adding the associated secret.

## Rotating the Key

1. Go to the **Remote Password Changing** tab and click **Change Password Remotely**.
2. Enter the new password or click **Generate** next to the **Next Password** field to generate a random password.
3. Click to select **Generate New SSH Key** to create a new, random SSH key. If you want to supply your own private key, uncheck this option and paste the key into the **Next Private Key** text box that appears.
4. If you have unchecked **Generate New SSH Key** you must enter the passphrase that was used to encrypt the private key at the time it was created. Leave this text box blank if the private key was not encrypted with a passphrase. If you have checked **Generate New SSH Key** you have the option to enter your own passphrase, leave it blank (for an unencrypted private key), or click the **Generate** button next to the field to create a new, random passphrase. If you want to change the key without changing the passphrase, you must put the current passphrase in the **Next Private Key Passphrase** text box.
5. Click **Change** to start the key rotation and a password change. After you start the change, you can check the status either in **Admin > Remote Password Changing** or on the **Remote Password Changing** tab of the secret.
6. Once the password change / key rotation is complete the heartbeat status should be successful. You can check the audit log to see notes that the key was rotated and start a session using the key with the PuTTY Launcher.

## Troubleshooting

- The SSH Password Changers are targeted to OpenSSH. If using a different SSH library or if the user keys are not in the user's `/.ssh/authorized_keys` file you can check the commands used and modify them as appropriate under **Admin > Remote Password Changing** and clicking **Configure Password Changers**. The password changers used are **SSH Key Rotation** and **SSH Key Rotation Privileged Account**.
- Errors are logged to **Admin > Remote Password Changing**. Additional logs can be found in the Secret Server directory in the log subfolder. That is: `C:\inetpub\wwwroot\secretserver\log`.
- A change was made to how SSH script variables are named to differentiate them from tokens when testing command sets on the Configure Password Changers page. Non-token script variables should begin with an underscore. Anything in the script beginning with a dollar sign not followed by an underscore will be treated as a token and displayed as a field in the test dialog. For example:
  - `$USERNAME` References the username from the secret.
  - `${1}$USERNAME` References the username from the first linked secret.
  - `$_USERNAME` References a bash variable defined in the script.
- The default command set for the SSH key rotation privileged account password changer assumes that the `sudo` command will not prompt for a password. If your environment prompts for a password when using `sudo` the command sets will need to be modified to supply the password. If your environment caches the `sudo` credentials, the easiest way to handle this is to add the following two lines at the top of each command set on the SSH key rotation privileged account password changer:

```
sudo -i echo
${1}$PASSWORD
```

This caches the credentials for the rest of the script.



## Custom SSH Key Rotation

This topic discusses how to change public keys for Unix accounts using Remote Password Changing (RPC) in Secret Server. For a step-by-step tutorial on quickly getting started with the default SSH key rotation secret types and password changers, see our [Basic SSH Key Rotation](#). The current topic provides additional information for users who need to customize the default commands for their environment.

### Introduction

SSH key rotation allows you to manage your Unix account private keys and passphrases as well as their passwords. With key rotation, whenever the password is changed on the secret (manually, during a scheduled auto-change, or when checking in a secret that changes the password on check-in), the public/private key pair is regenerated and the private key encrypted using a new passphrase. The public key will then be updated on the Unix machine referenced on the secret.

Secret Server provides secret templates and password changers for SSH key rotation.

### Requirements

To use our default SSH key rotation commands, the following minimum requirements must be met on the machine being managed:

- SSH key logins should be enabled on the target using keys in OpenSSH format. A secret can be created with keys in PuTTY format but they will be converted to OpenSSH when the key is rotated.
- Public keys should be stored in `[-userhome]/.ssh/authorized_keys` (not `authorized_keys2`).
- Grep and Sed should be installed on the target.
- If doing a privileged SSH key rotation, where a privileged user sets the key for another user, the privileged user must have sudo permissions that do not prompt for a password and the permissions to edit the user's `authorized_keys` file with sudo.

The default command sets have been tested in the following Linux environments:

- CentOS Linux release 7.0.1406
- FreeBSD bsdRadiusServer 9.3-RELEASE-p5 i386
- Linux ubuntu 3.13.0-32-generic

If a system does not meet these requirements or has a different configuration than the tested Linux environments, it may still be possible to do key rotation by modifying the key rotation command sets. The command sets that may need to be edited and the process for doing so are described later in this topic.

### Secret Templates

Secret Server includes two secret templates for SSH key rotation: **Unix Account (SSH Key Rotation)** and **Unix Account (Privileged Account SSH Key Rotation)**. The first template changes the password and key on the account using the account's credentials. Use this template if both of the following conditions apply:

- The account is able to change its own password and modify its own `authorized_keys` file.
- The account password and key should only be changed by Secret Server, which will always have the current password and keys.

**Unix Account (Privileged Account SSH Key Rotation)** uses an additional secret to provide the credentials for the connection that performs the password change and key rotation commands. You should use this template if either of the following conditions apply:

- The account is not able to change its own password or modify its own `authorized_keys` file.
- The account password and key may be changed outside of Secret Server, and Secret Server may not have the current account credentials. A privileged account that is able to change the password and `authorized_keys` files of other users will still be able to change the account credentials.

### Creating a New SSH Key Rotation Secret

When creating a new secret based on either of these templates you will see the following form:

## Create New Secret

Secret Template	Unix Account (SSH Key Rotation) <a href="#">Change</a>
Folder	No Folder Selected
Secret Name *	<input type="text"/>
Machine *	<input type="text"/>
Username *	<input type="text"/>
Password *	<input type="password"/> <span>Show</span> <span>Generate</span>
Generate SSH Key	<input type="checkbox"/>
Private Key	<a href="#">Change</a>
Private Key Passphrase	<input type="password"/> <span>Show</span> <span>Generate</span>
Public Key	<a href="#">Change</a>
Notes	<input type="text"/>

Cancel
Create Secret

1. Type the secret name in the **Secret Name** text box.
2. Type the machine in the **Machine** text box.
3. Type the username in the **Username** text box.
4. Click the **Generate** button to create a user password.
5. Click **Private Key** link to upload a file containing the private key.
6. If you are creating a new secret and want to generate a new, random private key, click to select the **Generate New SSH Key** check box. This disables the "Change" links for both the private and public keys.
7. If your uploaded private key was encrypted with a passphrase or you are generating a new key and wish to encrypt it with a passphrase, type that passphrase in the **Private Key Passphrase** text box. Otherwise, leave it empty.
8. If you are creating a new key and want to create a random passphrase for it, click this **Generate** button.

9. If you are uploading a private key, click the **Public Key Change** link to upload the corresponding public key. Uploading a public key is optional, but recommended. If not provided, Secret Server regenerates it from the private key during key rotation, but if the key in the `authorized_keys` file is not in the same format as the generated key, the old key will not be removed when the new key is added.

If neither private key nor public key is attached to the secret, a key rotation creates a new key pair, attaches them to the secret, and adds the new public key to `authorized_keys`.

After the secret is created, you should see a successful heartbeat status. If heartbeat is not running, make sure that heartbeat and RPC are enabled under **Admin > Remote Password Changing**.

**Note:** Heartbeat status when either the private key/passphrase or password are incorrect is indeterminate and based on the host configuration. If the system allows log on as long as one of the two is correct, it will return a successful heartbeat when the password is wrong but the key is valid and vice-versa.

If you are adding a secret using the **Unix Account (Privileged Account SSH Key Rotation)** you will also need to specify which privileged account to use during key rotation. To do this:

1. Switch to the **Remote Password Changing** tab.
2. Click the **Edit** button.
3. Click the **No selected secret** link.
4. Choose a privileged Secret that can authenticate to the machine and use the `sudo` command to access other accounts' `authorized_keys` files and change their passwords. This can be any type of Unix secret and can use a password and/or private key to authenticate.
5. Click the **Back** button to exit edit mode.

#### Editing the SSH Key Rotation Templates

To edit a template, go to **Admin > Secret Templates**, choose the template you want to edit in the dropdown list of templates, then click **Edit**.

You can add, remove, or edit any fields you like, but if you change or replace any of the following fields you will need to update the password changer mapping for the template:

- Machine
- Username
- Password
- Private Key
- Private Key Passphrase
- Public Key

**Note:** Private key and public key must remain field type "File".

If you change any of the fields listed above, click the **Configure Password Changing** button to map the fields to the password changer. Click the **Edit** button and assign all the password changer fields to the corresponding fields on the secret template.

#### Password Changers

Secret Server includes two password changers for SSH key rotation: **SSH Key Rotation** and **SSH Key Rotation Privileged Account**. The **Unix Account (SSH Key Rotation)** secret template uses the **SSH Key Rotation** password changer and the **Unix Account (Privileged Account SSH Key Rotation)** secret template uses the **SSH Key Rotation Privileged Account** password changer. Each of these password changers includes a set of command sets designed to change the password and public key on an account using the

secret's credentials and using sudo with a privileged account, respectively.

Although you can edit these password changers through **Admin > Remote Password Changing > Configure Password Changers**, clicking on the password changer and then **Edit** and **Edit Commands**, the recommended practice is to copy the existing password changers and then modify the copies. To do this:

1. Go to **Admin > Remote Password Changing**.
2. Click the **Configure Password Changers** button.
3. Scroll down to the bottom of the page and click the **New** button.
4. Select the password changer you want to copy in the **Base Password Changer** list and give the new password changer a name.
5. Click **Save**. This creates a new password changer and copies the command sets from the original password changer.
6. Enter the authentication information (see below for more information), clicking the **Save** button in each authentication field set.
7. Make the required changes to the command sets for your environment by editing existing lines, deleting lines, adding new lines, and rearranging lines.

## Authentication

The authentication section defines the credentials that will be used to connect to the machine and run the command set. These can be either the credentials of the secret or credentials from an associated secret. The command sets on the **SSH Key Rotation** password changer are designed to be run with the secret's credentials. Any customized password changer based on this password changer should use the secret's credentials in the authentication section.

For more information about tokens beginning with a dollar sign used in the above screenshot, see the [Dependency Token List](#).

The command sets on the **SSH Key Rotation Privileged Account** password changer are designed to be run with the credentials of an account that can change the password and public key on behalf of other users. Any customized password changer based on **SSH Key Rotation Privileged Account** should use the credentials off one of the secret's associated secrets. This is typically the first associated secret but can be any associated secret if your password changer requires more than one associated secret. The exception to this is validation which does not run a command set by default and uses the secret's credentials. If you modify validation to use a command set you will need to change the default authentication for validation if the command set uses sudo.

Here is a typical authentication for **SSH Key Rotation Privileged Account** (except validation, which is identical to the authentication block used by **SSH Key Rotation**):

Username: \${1}\$USERNAME

Password: \${1}\$PASSWORD

Key: \${1}\$PRIVATE KEY

Passphrase: \${1}\$PRIVATE KEY PASSPHRASE

## Command Sets

### Overview

To handle cleanup and error-handling for key rotation two command set types were added: **Post Successful Change** and **Post Fail Change**. A password change using one of the two new password types will execute as follows:

1. Connect to the box using the specified credentials (secret credentials or an alternate secret's credentials).

2. Run the Password Change command set. This will add the new public key to the authorized\_keys file. It does not change the password yet nor does it remove the old public key.
3. Verify using the new public key and old password. This verifies that the new key was added correctly.
4. If the verify check is successful, run the Post Success Change command set. This changes the password and, if successful, removes the old public key from authorized\_keys if present.
5. If the verify check is unsuccessful, run the Post Failure Change command set. This removes the new public key from authorized\_keys and does not change the password.
6. Return the success or failure of the overall process.

**Post Successful Change** and **Post Failure Change** are advanced command sets that are hidden by default. To see them, scroll to the bottom of the page and click the **Advanced Post Change Commands** link.

#### **Password Change Command Set**

In other password types the Password Change command set is only responsible for changing the password. For the two key rotation password changers, the default Password Change command set checks for the existing public key on the secret, and if found, will append a new public key to authorized\_keys (the old key is then removed in the Post-Reset Command Set). The password change is done in the Post Successful Change command set only after the key change has been validated.

#### **Verify Password Changed (Heartbeat) Command Set**

Following this Reset Command Set, a Verify Password Changed is performed by attempting to connect to the host using the credentials on a secret to validate the new public key that was added to authorized\_keys. If a command set is present, those commands are then run after connecting and the validation is a success only if both the connection and the command set are successful. (The command set is normally used when a secret uses alternate secrets as credentials in which case the alternate credentials are specified for authentication and command set does the actual validation of the secret.)

In the case of SSH key rotation, this validation heartbeat is run immediately after the reset command set using the current username, current password, new private key and new passphrase to connect for validation. If connection is successful, the validation is considered successful and Post Successful Change command set is run next to remove the old public key (if current private/public keys exist on the secret) from authorized\_keys). If validation is not successful, the Post Fail Change command set is run to remove the new public key added during the reset.

#### **Post Successful Change Command Set**

If the Password Change command set and Verify Password Changed are both successful, the Post Successful Change command set is run. This command set finalizes the key rotation by changing the password on the account and removing the old public key from authorized\_keys.

#### **Post Fail Change Command Set**

If the Password Change command set is successful but the Verify Password Changed fails, the Post Fail Change command set is run. This command set rolls back the changes made in the Password Change command set by removing the new public key from authorized\_keys.

For more information about customizing SSH command sets, see [How to Create a Custom SSH Password Changer](#).

#### **Notes**

SSH Key Rotation scripts will typically be more complex than password change command sets that do not do key rotation. These scripts will often include tokens representing values from the secret and associated secrets as well as commands to verify success or failure of

previous commands using `$$CHECKFOR` and `$$CHECKCONTAINS`. For more information about these features see the **Editing a Custom Command** topic in the [Secret Server TDP](#).

The default command sets for **SSH Key Rotation Privileged Account** use `sudo` to execute several commands. These command sets assume that the `sudo` command will not prompt for a password. If your environment prompts for a password when using `sudo` the command sets will need to be modified to supply the password. If your environment caches the `sudo` credentials, the easiest way to handle this is to add the following two lines at the top of each command set on the SSH key rotation Privileged Account password changer:

```
sudo -i echo
```

```
${1}$PASSWORD
```

This will pass the credentials from the first associated secret when prompted by `sudo` and cache the credentials for the rest of the script.

## Troubleshooting

- The SSH Password Changers are targeted to OpenSSH. If using a different SSH library or if the user keys are not in the users `/.ssh/authorized_keys` file you can check the commands used and modify them as appropriate under **Admin > Remote Password Changing** and clicking **Configure Password Changers**. The password changers used are **SSH Key Rotation** and **SSH Key Rotation Privileged Account**.
- Errors are logged to **Admin > Remote Password Changing**. Additional logs can be found in the Secret Server directory in the log subfolder. For example: `C:\inetpub\wwwroot\secretserver\log`.
- A change was made to how SSH script variables are named in order to differentiate them from tokens when testing command sets on the Configure Password Changers page. Non-token script variables should begin with an underscore. Anything in the script beginning with a dollar sign not followed by an underscore will be treated as a token and displayed as a field in the test dialog. For example:
  - `$USERNAME` – References the username from the Secret.
  - `${1}$USERNAME` – References the username from the first linked Secret.
  - `$_USERNAME` – References a bash variable defined in the script.

## SSL Certificates

Secret Server can be configured to run using Secure Sockets Layer (SSL) certificates. We strongly recommend that Secret Server installations run using SSL. Not using SSL significantly reduces the security of the contents of Secret Server since browsers viewing the site are not using an encrypted connection.

**Important:** This feature is part of the early release of Secret Server 10.11. The general release is not till April 13, 2021 for the on-premises version and between April 3rd and May 15th 2021, depending on region, for the cloud version.

## Overview

Secret Server can now export and import Secret Server settings as a JavaScript Object Notation (JSON) file. With this, you can more easily move settings from an existing Secret Server environment to another.

## Prerequisites

### Required General Permissions

There are the permissions required to access and perform the process. These are:

To view the Export/Import page or menu link:

- Administer Export or View Export
- Administer Import

To view audits (at least one is required):

- Administer Users
- Own User
- View Users

Exporting to a JSON file:

- Administer Configuration
- Administer Export

Importing from a JSON file:

- Administer Configuration
- Advanced Import

### Required Additional Permissions

Some of the settings require additional permissions to export or import:

**Table:** Required Additional Permissions

I Setting | Permission | I--I--I | OpenID Log on | Administer Delinea One | I SAML | Administer Configuration SAML | I Security | Administer Configuration Security | I Session Recording | Administer Configuration Session Recording | I SSH Commands | Administer SSH Menus | I Delinea One Log on | Administer Delinea One | I Two Factor Log on | Administer Configuration Two Factor | [Unexpected Link Text](#)

### Required Licenses

Additional licenses may be required to import or export some settings.

#### Advanced Auditing License

This license is required for these settings in the Application Settings category:



- SyslogCefLogSite
- SyslogCefPort
- SyslogCefProtocol
- SyslogCefServer
- SyslogCefTimeZone

## Enterprise Edition

**Note:** this settings are also available with the Professional Edition and Approval Workflow Add-on licenses.

The Enterprise Edition license is required for these settings in the Launcher Settings category:

- CheckInSecretOnLastLauncherClose
- CloseLauncherOnCheckInSecret

It is required for these settings in the Permission Options category:

- EnableApprovalFromEmail
- ForceSecretApproval

It is required for the TicketSystems category.

## Pro Edition

The Pro Edition license is required for these setting categories:

- SAML
- Session Recording

## Platinum Edition

The Platinum Edition license (or Pro Edition and Unix SUPM licenses) is required for the SSH Commands setting category.


## Procedures


### Exporting Settings


To export Secret Server settings:

1. Go to **Admin > All**. The Admin page appears:

What are you looking for?


Search for an admin option 

Simple View 




## Actions

Secret Server features that perform important jobs




## Setup & System Maintenance

Setup your Secret Server system and keep it running with Licensing, Backups, Imports, Networking options, and more




## Users, Roles, Access

These features help you organize users & permission settings within Secret Server



## Diagnostics, Logs, Security

Reference options for diagnostics, logs, and security features



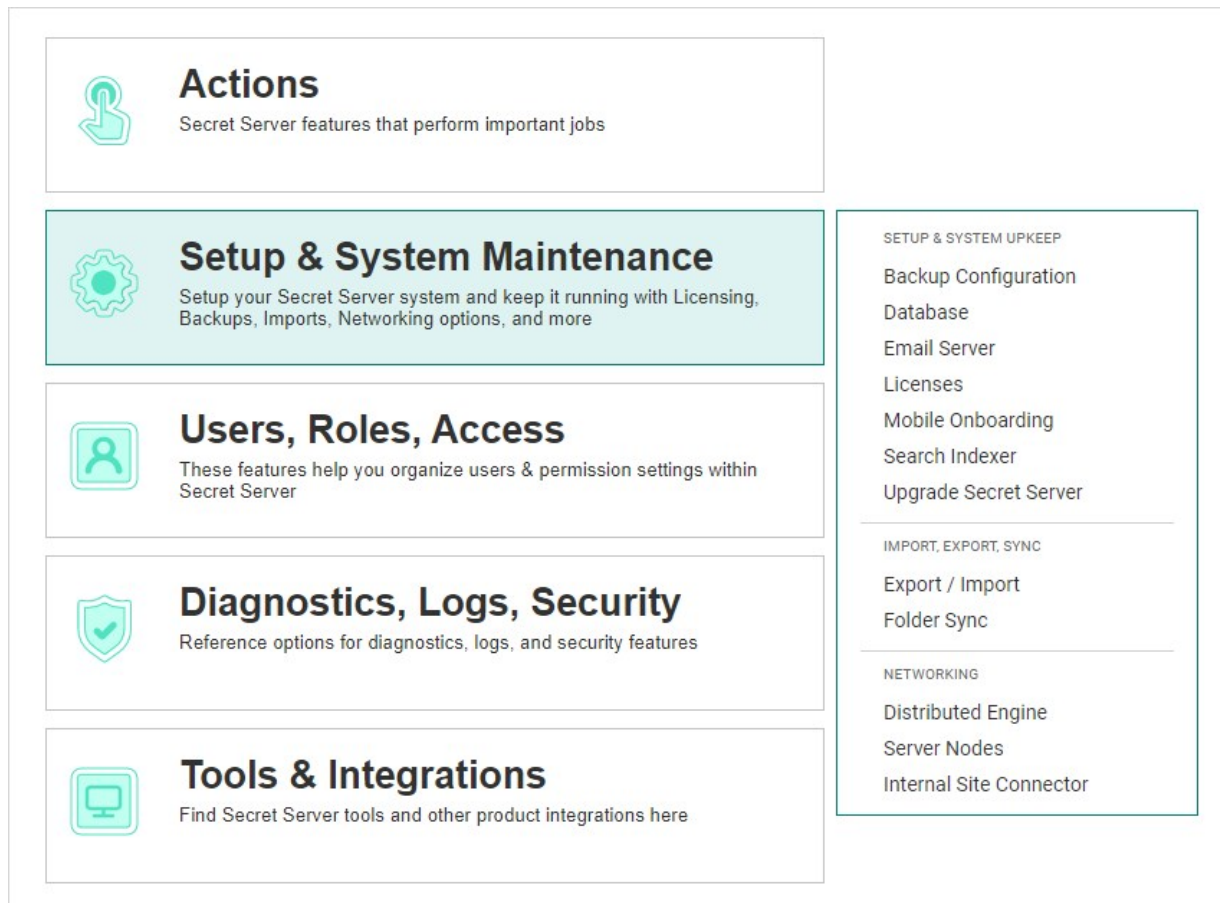
## Tools & Integrations

Find Secret Server tools and other product integrations here

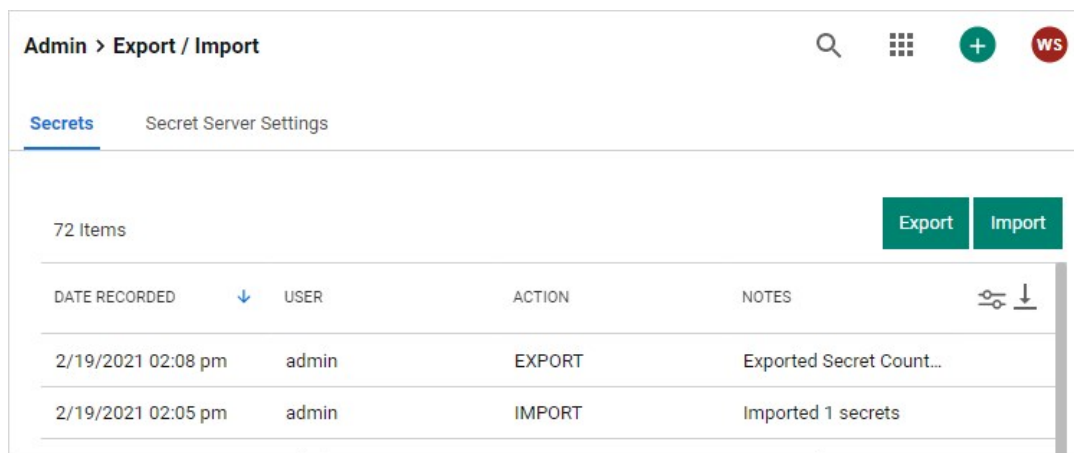
TOOLS & INTEGRATIONS

- Launcher Tools
- Connection Manager
- SDK Client Management
- Privilege Manager
- Privileged Behavior Analytics
- DevOps Secrets Vault
- Slack Integration

2. Click the **Setup & System Maintenance** button. A menu appears alongside the button:



3. Click the **Export / Import** menu item. The Secrets tab of the Export / Import page appears:



4. Click the **Secret Server Settings** tab:

Admin > Export / Import

Secrets Secret Server Settings

2 Items

Export Import

DATE RECORDED	USER	ACTION	NOTES
2/24/2021 10:08 am	[REDACTED]	SECRET SERVER S...	Application Settings
2/24/2021 10:07 am	[REDACTED]	SECRET SERVER S...	Application Setting...

5. Click the **Export** button. The Settings Export page appears:

Admin > Export / Import > Settings Export

### Settings Export

This feature allows you to export pre-selected settings, which can be imported to other Secret Server environments for streamlined setup.

To achieve this, select which setting categories you wish to export.  
[KB Link](#)

**Setting Categories \***

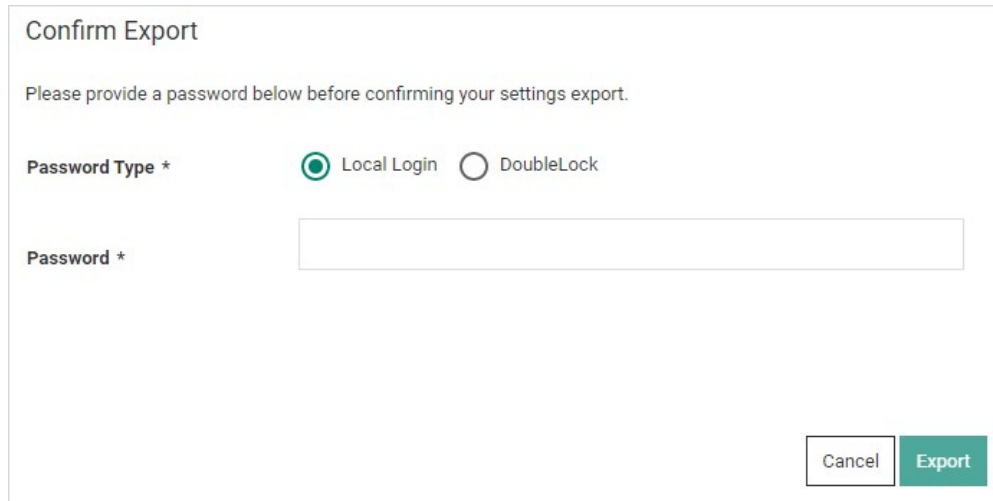
- ☐ Configuration
  - ☐ Application Settings
  - ☐ Launcher Settings (Runtime)
  - ☐ Protocol Handler Settings (Install-Time)
  - ☐ Permission Options
  - ☐ User Experience
  - ☐ User Interface
  - ☐ Advanced Settings
  - ☐ Login
  - ☐ Folder Settings
  - ☐ Local User Passwords
  - ☐ Security
  - ☐ Email
  - ☐ Ticket System
  - ☐ Session Recording
  - ☐ SAML
  - ☐ SSH Commands
  - ☐ Licenses

Cancel Export Settings

- Click to select the check boxes for the settings categories you wish to include. Clicking the **Configuration** check box selects all available categories.

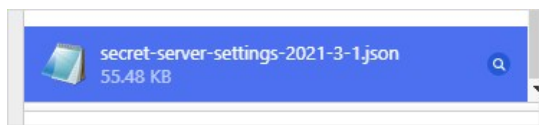
**Note:** See the [Setting Category Reference](#) section for details on the settings in each category.

- Click the **Export** Settings button. A Confirm Export popup appears:



The image shows a 'Confirm Export' dialog box. At the top, it says 'Please provide a password below before confirming your settings export.' Below this, there is a 'Password Type \*' section with two radio buttons: 'Local Login' (which is selected) and 'DoubleLock'. Underneath, there is a 'Password \*' label followed by an empty text input field. At the bottom right, there are two buttons: 'Cancel' and 'Export'.

- Click the **Password** selection button to choose **Local Login** or **DoubleLock** if that applies.
- Type your password in the **Password** text box.
- Click the **Export** button. The JSON file appears in your browser's downloads:




**Note:** This example is for the Vivaldi Chrome browser—yours will likely look different.


## Importing Settings


To Import Secret Server settings:

- Go to **Admin > All**. The Admin page appears:

What are you looking for?




Simple View 




## Actions

Secret Server features that perform important jobs




## Setup & System Maintenance

Setup your Secret Server system and keep it running with Licensing, Backups, Imports, Networking options, and more




## Users, Roles, Access

These features help you organize users & permission settings within Secret Server



## Diagnostics, Logs, Security

Reference options for diagnostics, logs, and security features



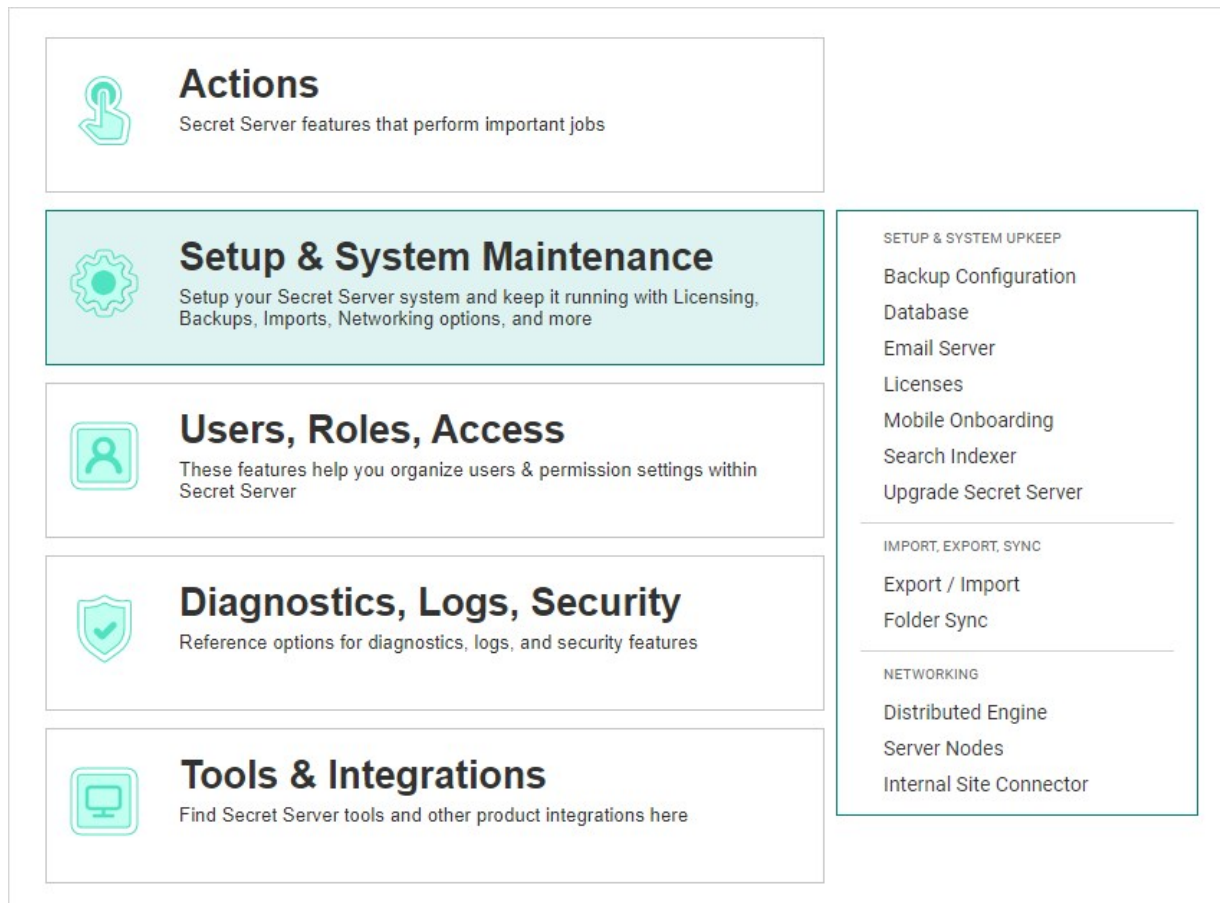
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Find Secret Server tools and other product integrations here

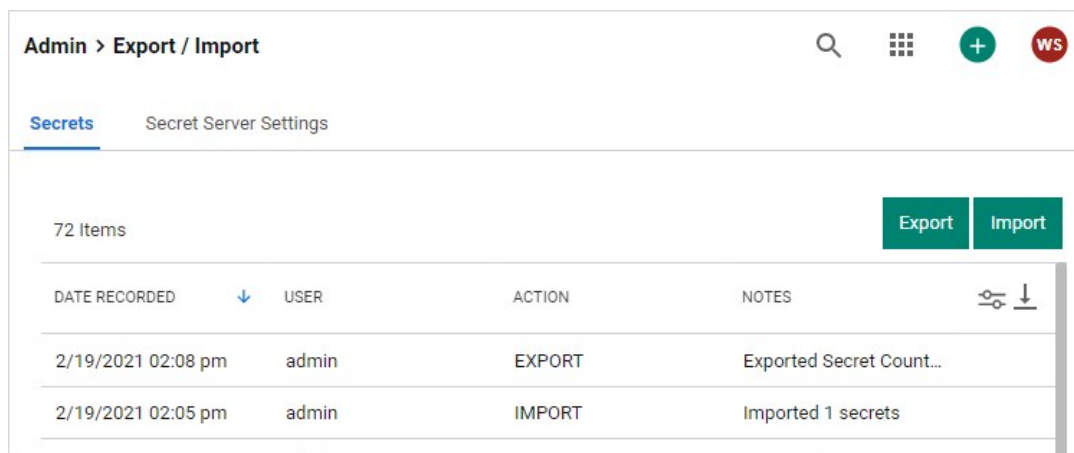
TOOLS & INTEGRATIONS

- Launcher Tools
- Connection Manager
- SDK Client Management
- Privilege Manager
- Privileged Behavior Analytics
- DevOps Secrets Vault
- Slack Integration

- Click the **Setup & System Maintenance** button. A menu appears alongside the button:



3. Click the **Export / Import** menu item. The Secrets tab of the Export / Import page appears:



4. Click the **Secret Server Settings** tab:

Admin > Export / Import

+

WS

Secrets

Secret Server Settings

2 Items

ExportImport

DATE RECORDED	USER	ACTION	NOTES	
2/24/2021 10:08 am		SECRET SERVER S...	Application Settings	
2/24/2021 10:07 am		SECRET SERVER S...	Application Setting...	

- Click the **Import** button. The Settings Import page appears:



Admin > Export / Import > Settings Import

### Settings Import

This feature allows you to import settings from an existing Secret Server environment to aid in gaining congruently configured environments.

To achieve this, select for import a JSON file that was exported from the desired Secret Server environment configuration. Executing this import will override existing setting configurations of this environment.  
[KB Link](#)

Import File \*
[Change](#)

---

Setting Categories \*

☐ Configuration
☐ Application Settings
☐ Launcher Settings (Runtime)
☐ Protocol Handler Settings (Install-Time)
☐ Permission Options
☐ User Experience
☐ User Interface
☐ Advanced Settings
☐ Login
☐ Folder Settings
☐ Local User Passwords
☐ Security
☐ Email
☐ Ticket System
☐ Session Recording
☐ SAML
☐ SSH Commands
☐ Licenses

Cancel

Import Settings

- Click the **Change** link, and navigate to and select the JSON file you want to import. The name of the file you chose appears above the Change link:

secret-server-settings-2021-3-1.json (55.48 KB)  
[Change](#)[Clear](#)

---

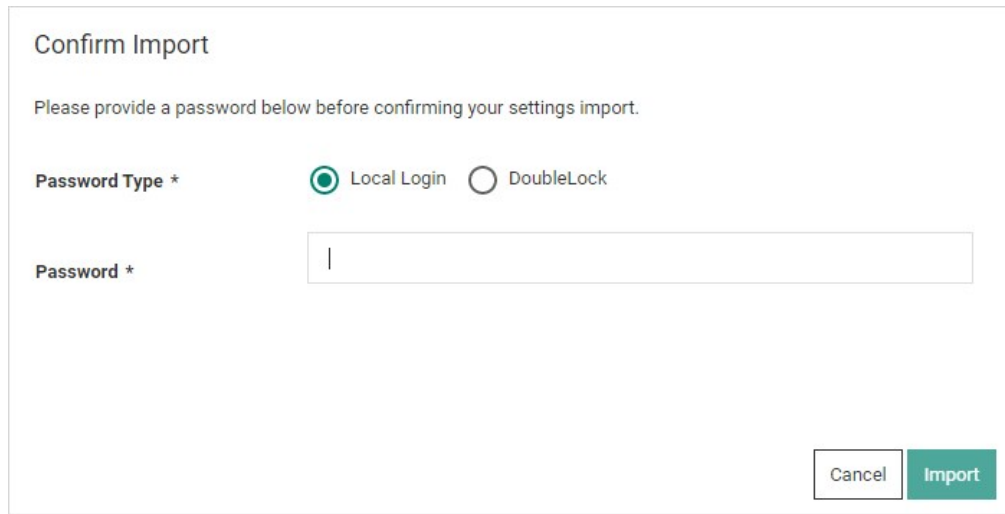
☐ Configuration

- Click to select the check boxes for the settings categories you wish to include. Clicking the **Configuration** check box selects all available categories.

**Note:** Some settings may not allow you to select them, based on your permissions and licenses. Another possibility is the category was not included in the original export. Hover the mouse pointer over any of these settings to view a hint of what is

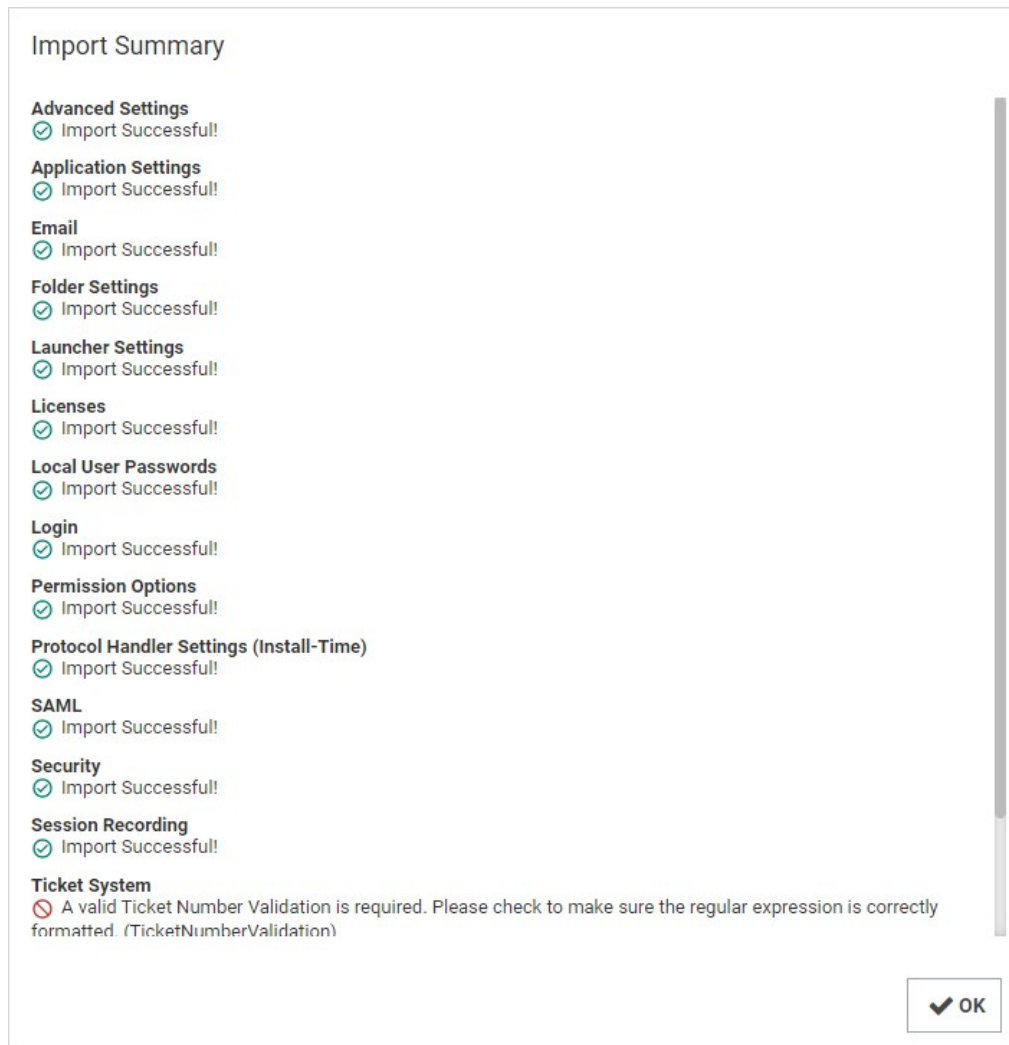
likely causing it. **Note:** See the [Setting Category Reference](#) section for details on the settings in each category.

8. Click the **Import Settings** button. A Confirm Import popup appears:



The image shows a 'Confirm Import' dialog box. At the top, it says 'Confirm Import'. Below that, a message reads: 'Please provide a password below before confirming your settings import.' There are two radio button options for 'Password Type \*': 'Local Login' (which is selected with a green dot) and 'DoubleLock'. Below these is a text input field for 'Password \*' with a single vertical line inside. At the bottom right, there are two buttons: 'Cancel' and 'Import'.

9. Click the **Password** selection button to choose **Local Login** or **DoubleLock** if that applies.
10. Type your password in the **Password** text box.
11. Click the **Import** button. An Import Summary popup appears:



12. Click the **OK** button. The importation appears in the log that you saw earlier on the Export / Import page.

## Setting Category Reference

This section details what settings are contained in the following settings categories:

Note: Some settings are unavailable in certain environments or if requiring a license or permission.

### Application Settings

These settings correspond to the Application Settings section on the Configuration General page.

This setting is unavailable in an on-premise environment:

- DisplayDowntimeMessageToAdminsOnly

These settings are unavailable in a cloud environment:

- AllowSoftwareUpdateChecks
- CustomURL

- EnableKeepAliveThread
- TmsRootUrl
- WriteSyslogToEventLog

This setting is unavailable in an IBM environment:

- AllowSendTelemetry

## Advanced Settings

These settings correspond to the Advanced Settings section on the Configuration Advanced page.

## Launcher Settings (Runtime)

These settings correspond to the Launcher Settings (Runtime) section on the Configuration General page.

Launcher Deployment Type setting can be one of the following:

- 0: Click Once
- 1: Protocol Handler

This setting is unavailable in a cloud environment:

- LauncherDeploymentType

## Email

These settings correspond to the Email tab on the Configuration Email page.

These settings are unavailable in a cloud environment:

- SmtDomain
- SmtPassword
- SmtPort
- SmtServer
- SmtUseCredentials
- SmtUseImplicitSSL
- SmtUserName
- SmtUseSSL

## Folder Settings

These settings correspond to the Folders tab on the Configuration Folders page.

## Licenses

These settings correspond to the licenses listed on the Licenses page.

## Local User Passwords

These settings correspond to the Local User Passwords tab on the Configuration Local User Passwords page.

## Login

These settings correspond to the Login tab on the Configuration Login page.

These settings unavailable in a cloud environment:

- CacheAdCredentials
- TwoFactor.Radius.ClientPortRange

## Permission Options

These settings correspond to the Permission Options section on the Configuration General page.

The Default Secret Permissions setting can be one of the following:

- 0: Secrets inherit permissions from folder
- 1: New Secrets copy permissions from folder
- 2: Only creator has permissions to new Secrets

## Protocol Handler Settings (Install-Time)

These settings correspond to the Launcher Settings (Runtime) section on the Configuration General page.

## SAML

These settings correspond to the SAML tab on the Configuration SAML page. To insert a new identity provider, in the same instance the export file came from, the IdentityProviderId setting must be set to 0. Otherwise, it will treat it as an update (see External Instance Id). The identity provider name cannot match another already in the database.

## Security

These settings correspond to the Security tab on the Configuration Security page.

These settings are unavailable in a cloud environment:

- DatabaseIntegrityMonitoringSymmetricKey
- EnableDatabaseIntegrityMonitoring
- EnableHSTS
- FipsEnabled
- ForceHttps
- HSTSMaxAge

## Session Recording

These settings correspond to the Session Recording tab on the Configuration Session Record page. The launcher must be enabled, and a valid license for Session Monitoring is required to export and import this feature.

These settings are unavailable in a cloud environment:

- ArchiveLocationBySite
- ArchivePath
- DaysUntilArchive
- EnableArchive
- EnableHardwareAcceleration
- StoreInDatabase
- VideoCodeId

To update SSHProxyRecordVideo or SSHProxyRecordKeyStrokes, SSH Proxy must be enabled.

To update RDPPProxyRecordVideo or RDPPProxyRecordKeyStrokes, RDP Proxy must be enabled.

## SSH Commands

These settings correspond to the SSH command restrictions, the SSH commands, allowed command menus, and blocked command lists.

## Ticket System

These settings correspond to the Ticket System tab on the Configuration Ticket System page. To insert a new ticket system in the same instance the export file came from, TicketSystemId must be set to 0. Otherwise, it will treat it as an update (see External Instance Id). The ticket system name cannot match another already in the database.

## User Experience

These settings correspond to the User Experience section on the Configuration General page.

- Application Language
- Default Date Formats can be found in the tbDateOptions table.
- Default Time Formats can be found in the tbTimeOptions table.
- Default New User Roles can be found in the tbRoles table
- Server Time Zones can be found in the server registry: Computer\HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Time Zones

## User Interface

These settings correspond to the User Interface section on the Configuration General page.

These settings are unavailable in an IBM environment:

- AllowUserToSelectTheme
- CustomLogoCollapsed
- CustomLogoFullSize

## JSON Export File

In addition to the setting categories, here are a few components of the JSON export file that you should be aware of.

### External Instance ID

```
"externalInstanceId": "95931fb9-02b0-47a5-a59d-69d6543a192d",
```

The external instance ID is an identifier for the Secret Server instance the settings were exported from. If you change this ID, Secret Server will assume the export came from another database and will insert new records for the ticket system (TicketSystemId) or SAML (Identity Providers—IdentityProviderId) categories. To add a new record in the same instance, set the ID to 0 and it will be treated as a new item.

### Configuration Version

```
"configurationVersion": "1.0.0",
```

This is the configuration version the settings were exported from. In the future when other settings are added, it will help Secret Server determine which settings are available and which are not in the database.

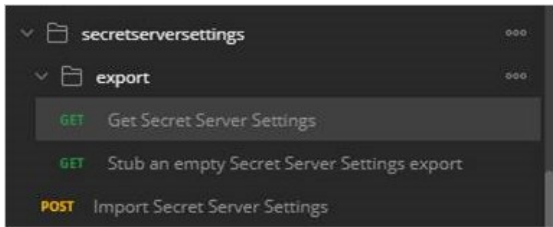
## JSON Import File

In the UI, the exported JSON file can be easily modified and used as the import JSON file. For the API, the exported JSON must be added to the

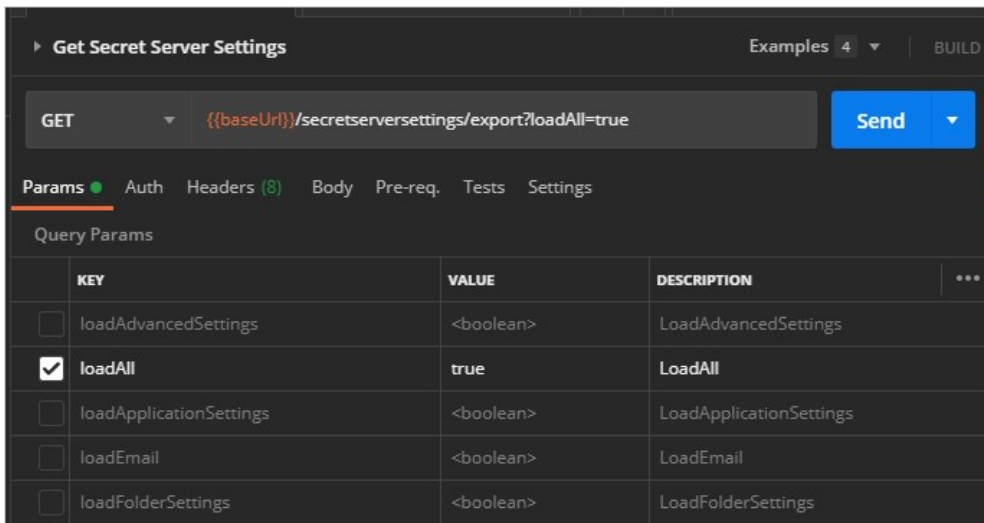
data object. Then manually update the desired filter category load to true to import.

## API Calls Filter

Secret Server has settings import/export endpoints for the API to manipulate. Opening Postman and going to **secretserversettings > export > GET Get Secret Server Settings**, you would see:



Looking at the query parameters for that endpoint, we see:



The keys are equivalent to those on the user interface or those in the JSON file.

The **loadAll** key tells Secret Server to update all the available settings. These include application settings, launcher settings, protocol handler settings, permission options, user experience settings, and user interface settings.

If you click the **Body** tab below, you can see what JSON code represents the key you chose for the export:

Get Secret Server Settings Examples 4 BUILD

GET `{{baseUrl}}/secretserversettings/export?loadAll=true` Send

Params Auth Headers (8) Body Pre-req. Tests Settings

Param	Value	Type	Load
loadAdvancedSettings		<boolean>	LoadAdvancedSettings
loadAll	true		LoadAll

Body Cookies Headers (14) Test Results 200 OK 3.96 s 59.27 KB Save

Pretty Raw Preview Visualize JSON

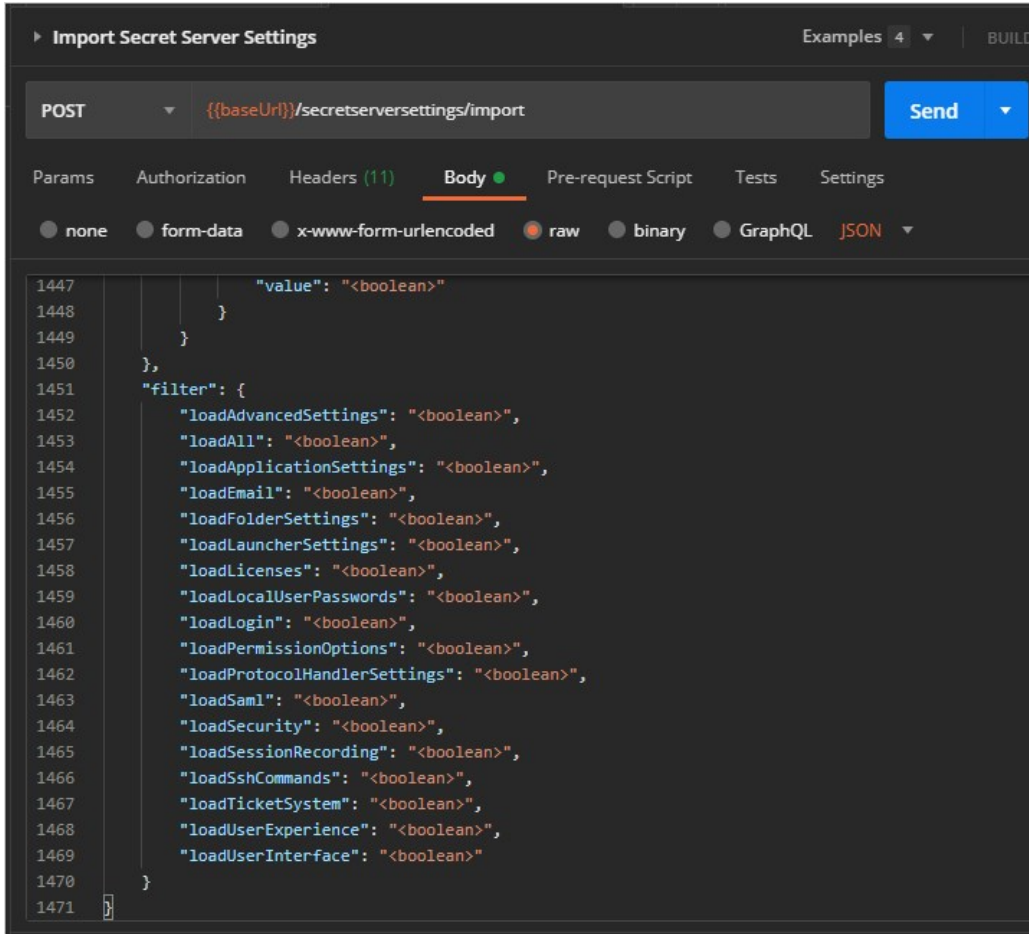
```

1
2  "externalInstanceId": "bf05836e-e992-41ce-85f9-0699fc643661",
3  "configurationVersion": "1.0.0",
4  "applicationSettings": {
5    "allowSoftwareUpdateChecks": false,
6    "configurationEarlyAdopterEnabled": false,
7    "allowSendTelemetry": true,
8    "enableWebServices": true,
9    "mobileMaxOfflineDays": 30,
10   "mobileMaxOfflineHours": 0,
11   "apiSessionTimeoutUnlimited": false,
12   "apiSessionTimeoutDays": 0,
13   "apiSessionTimeoutHours": 0,
14   "apiSessionTimeoutMinutes": 20,
15   "apiRefreshTokensEnabled": true,
16   "maximumTokenRefreshesAllowed": 3,
17   "preventApplicationFromSleeping": true,
18   "enableSyslogCefLogging": true,
19   "syslogCefServer": "127.0.0.1",
20   "syslogCefPort": 514,
21   "syslogCefProtocol": 1,
22   "syslogCefTimeZone": 2,
23   "syslogCefLogSite": 1,
24   "writeSyslogToEventLog": false,
25   "winRmEndpointUrl": "http://THY-01-0079-LT.testparent.thycotic.com:5985/wsman",
26   "enableCredSsp": false,
27   "maxSecretLogLength": 100000,
28   "customUrl": "",
29   "tmsInstallationPath": null,

```

When using the POST Import Secret Server Settings command, you will see a filter object at the bottom of the code stipulating what to update:

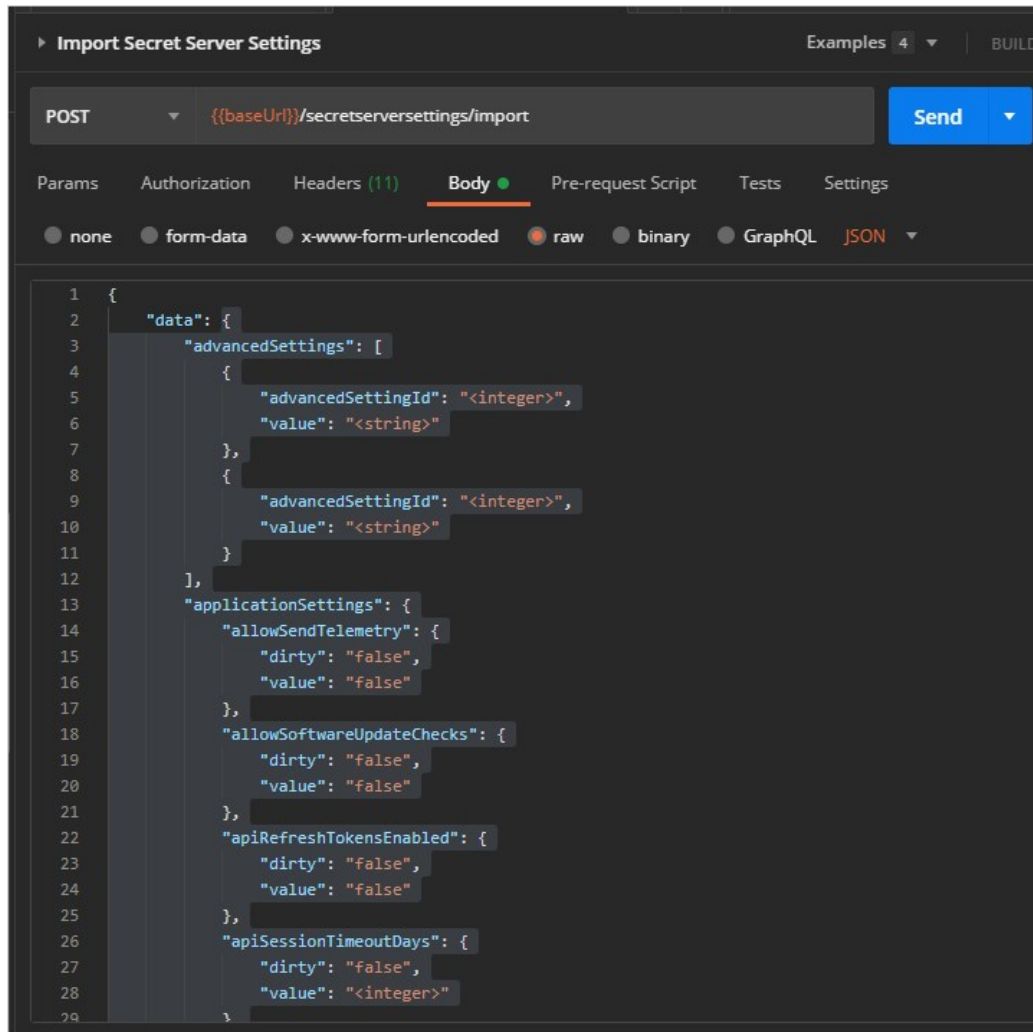




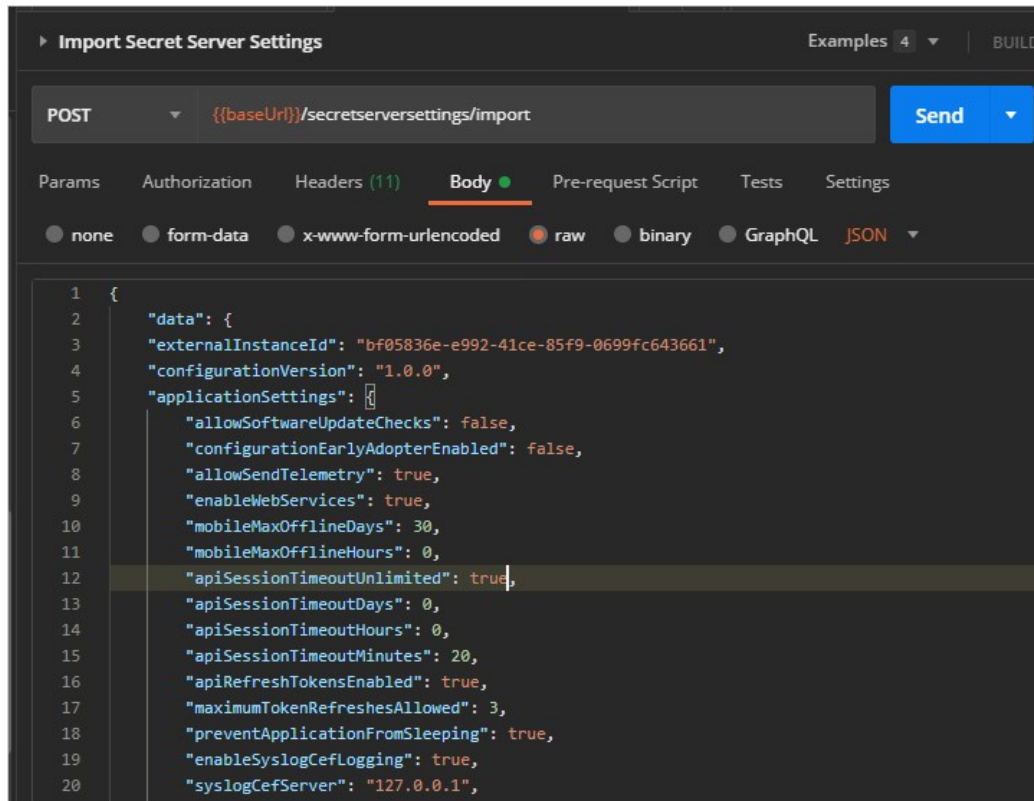
For example, if you set `loadApplicationSettings` to `true`, only the application settings are updated, assuming the objects stipulated were sent with the request. Similarly, included objects that are disallowed by the filter are ignored.

To make a GET call to update a single setting:

1. Import the category it belongs to. For example, if you want to update `apiSessionTimeoutUnlimited` to `true`, you would copy the entire `applicationSettings` result (the category and all of its settings).
2. For the POST Import Secret Server Settings call, remove the settings in the data section, leaving the filter section as is:



3. Paste the settings you copied earlier in its place.
4. Change the `apiSessionTimeoutUnlimited` setting to `true`:



5. Scroll down to the filter section and remove the filters you do not want to update. Alternatively, you can replace all the `<boolean>` settings with `false` for the filters you do not want.

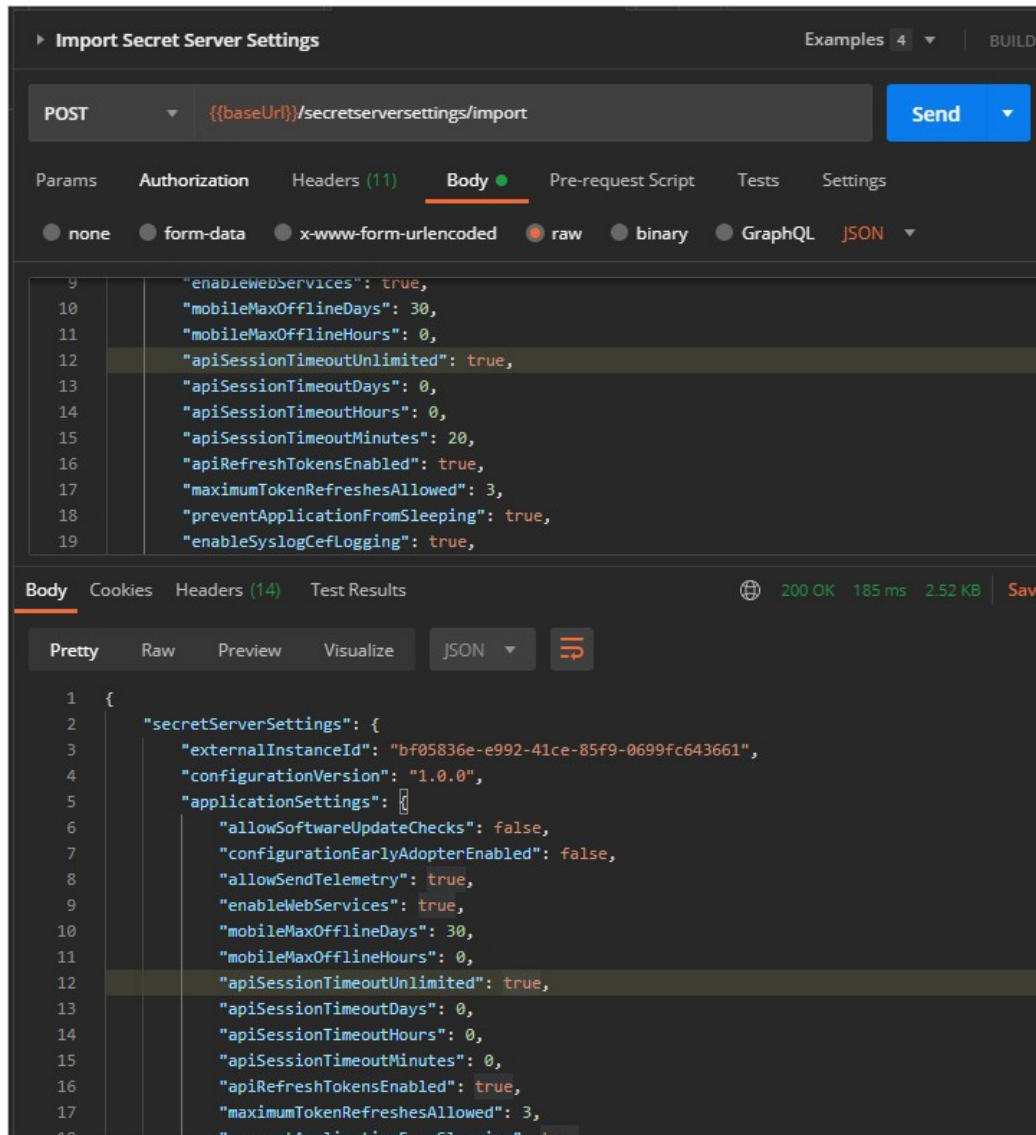
6. If you want to set a nullable field back to null, set the dirty flag and the value to null. For example:

```

"siteId": {
  "dirty": "true",
  "value": null
}

```

7. Click the **Send** button. If all goes well, Postman will return the updated category object:



**Note:** In this example, we copied the whole data object, but you do not have to. For a quick update, you can Import with just the settings you want to update. Anything not sent is ignored. This is the reason a nullable setting has to be explicitly set to null, along with setting the dirty flag—everything set to null is ignored, the same as if you did not send the setting at all.

8. If something went wrong, you will see an error section at the bottom of the results:



## Audits

An audit is recorded for each setting category that was exported or imported by user. The individual setting audits can be viewed on the Configuration Audit page.

**Figure:** Audits on the Export / Import page:

Admin > Export / Import				
Secrets <a href="#">Secret Server Settings</a>				
36 Items <span>Export</span> <span>Import</span>				
DATE RECORDED	USER	ACTION	NOTES	
02/18/2021 9:51 am	admin	SECRET SERVER SETTINGS IMPORT	Ticket System - Completed with errors. Please check the System Log for details.	
02/18/2021 9:41 am	admin	SECRET SERVER SETTINGS EXPORT	Advanced Settings, Application Settings, Permission Options, Launcher Settings, Protocol Handl...	
02/18/2021 9:13 am	user	SECRET SERVER SETTINGS IMPORT	Application Settings, SAML, Ticket System - Completed with errors. Please check the System Lo...	
02/18/2021 9:11 am	user	SECRET SERVER SETTINGS IMPORT	Ticket System - Completed with errors. Please check the System Log for details.	

If there are errors, a system log entry will also be saved with details:

- Email
- Login
- Security
- Ticket System
- SAML - Completed with errors

## Events

When Secret Server settings are exported or imported, an SECRETSERVERSETTINGS event is logged.

## Logs

When Secret Server settings are exported or imported or validation errors occur, a new log entry will appear in the ss.log file.

**Note:** <USERNAME> and <USERID> are replaced with your values. The items in the parentheses are the errant category settings.

## System Logs or CEF Example

<USERNAME> (<USERID>) - Secret Server Settings Import - Failed to import SAML for the following reason(s): TicketSystem=Only one ticket system can be default. (IsDefault);SAML=Identity Provider Id was not found in the database. Check that it was not modified after export. (IdentityProviderId) Secret Server.

## SS.log Examples

- ERROR Delinea.Logging.ILogWriter - <USERNAME> (<USERID>) - Secret Server Settings Import - Failed to import SAML for the following reason(s): TicketSystem=Only one ticket system can be default. (IsDefault);SAML=Identity Provider Id was not found in the database. Check that it was not modified after export. (IdentityProviderId) Secret Server.
- ERROR Thycotic.Logging.ILogWriter - <USERNAME> (<USERID>) - Secret Server Settings Import - Failed to import some settings due to the following reason(s): Security=Access Denied;Login=Insufficient permissions to edit Radius settings. (Radius),Insufficient permissions to edit Delinea One or OpenId settings. (OpenIdConnect),Insufficient permissions to edit Duo settings. (Duo);TicketSystem=Only one ticket system can be default. (IsDefault);SAML=Access Denied

## Errors and Resolutions

SAML=Access Denied	Need Administer Configuration SAML permission to update SAML settings.
SAML=Identity Provider Id was not found in the database. Check that it was not modified after export. (IdentityProviderId)	For SAML, the IdentityProviderId provided in the import file was not found in the database. If intending to add a new one, set this to 0.
TicketSystem=Only one ticket system can be default. (IsDefault)	For TicketSystem, IsDefault is set to true when there is already one set to true in the database. If intending to set it to true, set the other one to false.
Insufficient permissions to edit Radius settings. (Radius) Insufficient permissions to edit Duo settings. (Duo)	Need Administer Configuration Two Factor permission to update Radius or Duo settings.
Insufficient permissions to edit Delinea One or OpenId settings. (OpenIdConnect)	Need Administer OpenID Connect permission to update Open ID Connect settings.

## Overview

You can configure a multipurpose global banner for all users and use it for maintenance, security, or policy notifications. You can set the banner style, text, a hyperlink, and an in-theme color, which is determined by the style. The styles include:

- Caution
- Error
- Failure
- Information
- Status
- Success
- Warning

The settings are available in the configuration preview.

## Configuration

1. Navigate to **Admin > Configuration** in Secret Server.
2. Click **Configuration Preview** in the top right hand corner.
3. Select **Enable**.
4. Go to **Administration > Configuration > User Interface**.

## Configuration

Search configuration section names, labels, and actual configuration values.

### User Interface

Define new or classic UI, logos, and whether or not users can select a classic theme.

[Edit](#)

Disable Legacy UI	Yes
This option is available only for this minor release, and will be removed in future releases. If you need to enable the legacy UI, please prepare for it to be removed in the 11.4 release.	
Enable New User Interface as Default for New Users	Yes
Allow Users to Select Classic Theme	Yes
Default Classic Theme	Secret Server Classic - Blue
Custom Logo Light Mode (Full Size)	
Custom Logo Light Mode (Collapsed)	
Custom Logo Dark Mode (Full Size)	
Custom Logo Dark Mode (Collapsed)	
Custom Login Logo (light mode)	

- Click the **Edit** button. The page becomes editable:



## Configuration

### User Interface

Define new or classic UI, logos, and whether or not users can select a classic theme.

Disable Legacy UI	<input checked="" type="checkbox"/> <p>This option is available only for this minor release, and will be removed in future releases. If you need to enable the legacy UI, please prepare for it to be removed in the 11.4 release.</p>
Enable New User Interface as Default for New Users	<input checked="" type="checkbox"/>
Allow Users to Select Classic Theme	<input checked="" type="checkbox"/>
Default Classic Theme	<div>Secret Server Classic - Blue</div>
Custom Logo Light Mode (Full Size)	<a href="#">Change</a>
Custom Logo Light Mode (Collapsed)	<a href="#">Change</a>
Custom Logo Dark Mode (Full Size)	<a href="#">Change</a>
Custom Logo Dark Mode (Collapsed)	<a href="#">Change</a>
Custom Login Logo (light mode)	<a href="#">Change</a>
Custom Login Logo (dark mode)	<a href="#">Change</a>
Show Custom Banner	<input type="checkbox"/>

Cancel

Save

6. Click to select the **Show Custom Banner** check box. New controls appear:

Show Custom Banner	<input checked="" type="checkbox"/>
Banner Text	<div></div>
Banner View Link	<div></div>
Banner Style	<div>Search or pick one</div>
<div>Cancel</div> <div>Save</div>	

7. Type or paste the desired text in the **Banner Text** text box.
8. Type or paste the desired URL, if any, in the **Banner View Link** text box.
9. Click the **Banner Style** dropdown list to select one of the following:
  - o Caution
  - o Error
  - o Failure
  - o Information
  - o Status
  - o Success
  - o Warning
10. Click the **Save** button. Your entries will look similar to this:

Show Custom Banner	Yes
Banner Text	Attend the online security seminar!
Banner View Link	<a href="https://www.acmesecurityseminar/register">https://www.acmesecurityseminar/register</a>
Banner Style	Information

11. Click the **Preview Banner** button to see your new banner:

*i*
INFORMATION

Attend the online security seminar!

View Dismiss

**Note:** The Preview button is primarily for when you have previously dismissed the banner. The first time you save a new banner, it automatically appears at the top of every page, including the one you are on.

12. Click the **View** button to go to the URL you entered.
13. Click the **Dismiss** button to remove the banner from all pages for that session.

## **What is Maintenance Mode?**

Maintenance mode prevents users from changing secrets or secret-related data such as dependencies, secret templates, and password requirements.

## **Why do we need Maintenance Mode?**

When secret key rotation takes place, or the HSM configuration is changed, Secret Server needs to ensure that no data corruption occurs. To mitigate this, these operations turn on maintenance mode, which puts Secret Server into read-only mode. We also recommend manually enabling maintenance mode before performing upgrades.

## **Can I still access my Secrets when Maintenance Mode is turned on?**

Yes. Secrets will be read-only, but you can still view them, including secrets that are double-locked or protected by "require approval for access." You are unable to change the checkout status of a secret during maintenance mode. This means if the secret is currently checked-in, you will be unable to check it out. If the secret is currently checked out, it cannot be checked in until the system leaves maintenance mode.

## **How long does Maintenance Mode last?**

Maintenance mode lasts until the operation triggering it is completed. The time required will vary based on the operation and the number of secrets in the system. Typically, maintenance mode lasts less than 30 minutes.

## **How do you enable and disable Maintenance Mode?**

To enable and disable Maintenance Mode, see [Enabling and Disabling Maintenance Mode](#).

## Overview

Object metadata allows you to store extended information on several Secret Server objects including users, groups, folders, dates, or secrets via the user interface or REST API. You can store most data types, including strings, Boolean values, numbers, dates, and users. You can combine this metadata into sections containing named fields of your defined types.

Unlike preexisting object fields, this metadata is flexible and dynamic. No coding, structural changes, or database schema changes are required. The only constraint is a role permission that controls who can add metadata fields or sections, which is granular down to the sections level on a given entity. For example, users that can view a user might be allowed to edit the values in the "public" metadata section and users that can edit a user might be allowed to edit all the sections for that user.

## Features

Secret Server object metadata features:

- You can store user-defined metadata sections and field values on users, groups, folders, or secrets.
- Sections and fields are defined once and can be used across any applicable object. This allows for a common description across all objects. For example, all the objects could have metadata fields for business owner, source system, and corporate department name.
- Metadata fields are grouped or organized into sections.
- When viewing metadata, only populated fields appear. Field names with blank values are never present.
- You can define who can edit which sections via a role permission and by view or edit permissions the object.
- Each object maintains an audit history for all metadata fields, including previous values and who defined them.
- Audit history is viewable as a basic line chart for metadata fields stored as numbers. This provides a historical value table, as opposed to an audit log.

## Example Use Cases

There are many ways to use Secret Server object metadata. You could:

- Define common attributes from a corporate directory that are not available on a standard user, such as manager, hire date, or department.
- Allow defined users to add data to an object without allowing that user to edit the object itself. For example, the user could not edit a secret but can add notations on the secret that are useful to others accessing the object.
- Store external system link identifiers for integrations. For example, the employee ID from the HR system could be stored in the metadata for users. Integration jobs could then query this ID from metadata and use it for synchronization.
- Add a "department owner" field on a folder to store which department owns it. For instance, the folder contains secrets for marketing as defined by the metadata field.
- Avoid users putting numerous items into the notes field on a secret, resulting in a disorganized mess. With metadata, those items could be stored in properly named fields. This organizes the notes and allows them to be easily searched without having to parse a block of text.

## Adding Object Metadata

**Note:** This instruction is on a user object. The process for folders, groups, and secrets is very similar.

1. Go to **Admin > Users**. The User Management page appears:

Admin > User Management

Groups

Users

Audit

There are currently 101 enabled user(s) out of a total licensed 101 user(s).

Migrate to AD

Create User

☐


103 Items

All Domains

Include Disabled

USERNAME	NAME	EMAIL	ENABLED	DOMAIN	LAST LOGIN	
admin	admin	<div></div>	Yes		3 hours, 52 ...	
<div></div>	<div></div>	<div></div>	Yes	gamma.thy...		
<div></div>	<div></div>	<div></div>	Yes	gamma.thy...	5 months, ...	
<div></div>	<div></div>	<div></div>	Yes	gamma.thy...	5 months, ...	
<div></div>	<div></div>		Yes	gamma.thy...	1 year, 6 m...	
<div></div>	<div></div>		Yes	gamma.thy...		

2. Click on the desired user. The user's page appears:

Admin > User Management > Users > 

General

Groups

Roles

Teams

Metadata

Audit


Options ▾

User Details [Edit](#)


Specific login and user detail information for a single user.

[KB Link](#)

Username




Display Name \*



Domain

Local

Email



Application Account

No

Multifactor Authentication

< None >

Enabled

Yes

Locked Out

No

Restricted By Team

No

- Click the **Metadata** tab.
- Click the **Add Metadata** button. The Add Metadata popup appears:

Add Metadata

Section Name \*

Search or pick one

Cancel

Save

- Click the **Section Name** dropdown list and select **Add New Section**. Additional controls appear:

Add Metadata

Section Name \*

Add New Section

New Section Name \*

Section Description

Metadata Field \*

Search or pick one

Cancel

Save

- Type the section name in the **New Section Name** text box.
- (Optional) Type a description of the field in the **Section Description** text box.
- Click the **Metadata Field** dropdown list and select **Add New Field**. Still more controls appear:



### Add Metadata

Section Name \*

Brains

Metadata Field \*

Add New Field

Metadata Field Name \*

Field Type \*

Search or pick one

Cancel

Save

9. Type the field's name in the **Metadata Field Name** text box.
10. Click the **Field Type** dropdown list and select the desired data type. We chose Boolean.
11. (Optional) Click to select the **Value** check box if you want the field to be prepopulated to true. This only applies to the Boolean data type.

**Note:** Boolean fields always appear later because they always have a value.

12. Click the **Save** button. The new section and metadata field appears:

Brains

Edit

Big Brain

false

Edit

Add Metadata

The section appears in the top-left (*Brains*), and the field appears in the bottom right (*Big Brain*). We now have true or false field denoting if the user has a big brain.

13. Click the **Add Metadata** button again to add another field to the section. The Add Metadata popup returns.
14. This time, click the **Section Name** dropdown list and select the section that you just created.
15. Click the **Metadata Field** dropdown list box and select **Add New Field**. More controls appear:
16. Type the name of the new field in the **Metadata Field Name** text box. We chose *Brain Last Used*.
17. Click the **Field Type** dropdown list to select Date / Time. Date and time text boxes appear.
18. Add a date and time. You must add a value—otherwise there is no point in adding the field—blank fields are invisible.
19. Click the **Save** button. The new field appears on the Metadata tab:

Brain Last Used	3/4/2021 12:00 am	<a href="#">Edit</a>
-----------------	-------------------	----------------------

20. Add additional fields as desired.

21. The **Brains** section, **Big Brain** Boolean value, and **Brain Last Used** date / time fields are now available for use across all Secret Server users.

## Best Practices

How your organization uses object metadata requires some forethought, including:

- Will you allow anyone to add metadata or only a specific set of individuals? This is controlled by applying the above mentioned role.
- How do you want to standardize the naming of sections and fields? One user might call the same field *business owner* and another might call it *subject expert* if you do not establish the field nomenclature up front.
- Do you want to create a "public" field section that is available to all users to edit, even those with read only permission on the object?

## Overview

Secret Server can push its secrets to DevOps Secret Vault by creating a secret based on the "DevOps Secret Vault Client Credentials" template, which holds the client credentials for a DevOps Secret Vault tenant. Using the REST API, you can then register a DevOps Secret Vault tenant in Secret Server. That tenant references that secret to push secrets to DevOps Secret Vault at a set sync interval.

## Behavior Test

You can manually push secrets to the DSV tenant, in addition to Secret Server checking for secrets to push to tenants on a timer. Secret Server will check for if a tenant needs updating every 30 minutes on the cloud or 10 minutes for an on-premises installation. Users are prevented from setting a tenant's sync interval to less than Secret Server's timed iteration because there would be no benefit to doing so. When Secret Server checks for secrets to be pushed to DSV, it only pushes secrets that have been changed since the last time they were updated in DSV. When a secret is pushed to DSV, its sync time is updated.

## Fields

All secret fields are copied to DSV except for fields that are marked as "Hide On View." The notes field of a secret maps to the secret description in DSV. Files are Base64 Encoded, then sent to DSV. They are stored as encoded, and need decoding for use.

## Setup in Secret Server

To configure pushing secrets to DSV:

1. Create a client in DSV. Save the client ID and secret that are generated when you created it. A DSV client is a container for a password.

**Note:** Please see the DSV documentation for details.

2. Create a secret to connect to DSV:

1. [Create a new secret](#) based on the DevOps Secrets Vault Client Credentials template:

## Create New Secret

This folder is for work related Secrets only. Do not store personal non-work Secrets, such as your Online Banking password, in this folder.

Secret Template

DevOps Secrets Vault Client Credentials [Change](#)

Folder

Personal Folders
Clear

Secret Name \*

Client ID \*

Client Secret \*

Show

Generate

Tenant \*

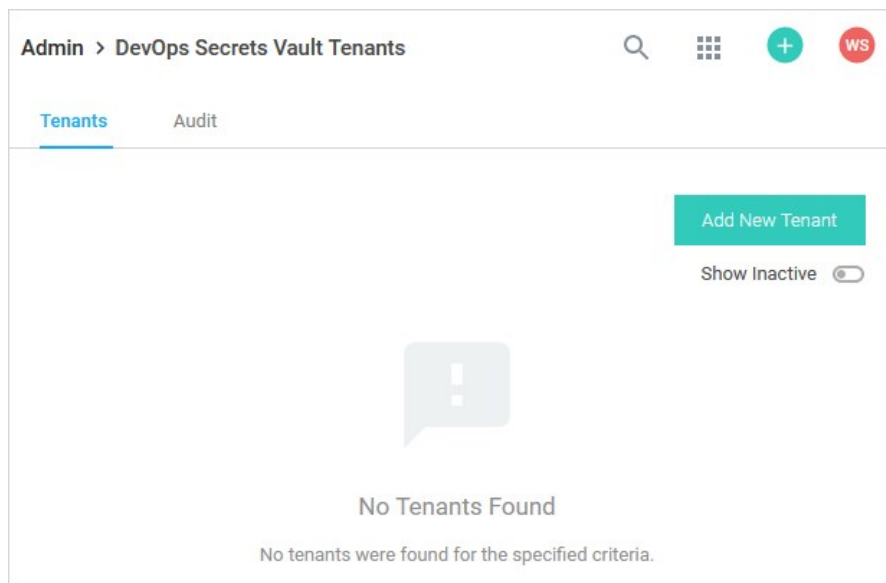
Notes

Cancel

Create Secret

- Type the name for the new secret in the **Secret Name** text box.
- Type the DSV client ID in the **Client ID** text box.
- Type the DSV password for authentication in the **Client Secret** text box. If you do not have one, you can create a new here by clicking the **Generate** button. Then, create or configure a client in DSV using the password.
- Type the DSV tenant to connect to in the **Tenant** text box. A DSV tenant is your DSV cloud account and the rights to access it. Use the format: `https://<tenantname>.secretsvaultcloud.<region>` with the region being one of the following:
  - U.S. region: `com`
  - E.U. region: `eu`
  - APAC region: `au`
- Click the **Site** dropdown list to select your Secret Server site.
- Click the **Create Secret** button.

3. Go to **Admin > See All**. The Admin Menu page appears.
4. Click the **DevOps Secrets Vault** link. The DevOps Secrets Vault Tenants page appears:



5. Click the **Add New Tenant** button. The Add New Tenant popup appears:

### Add New Tenant

Tenant Name \*

Client Secret \*

No Secret Selected

Sync Interval (minutes) \*

Cancel

Save

6. Type a descriptive name for the tenant in the **Tenant Name** text box. This can be anything you wish.
7. Click the **Client Secret** link to select the secret you created earlier in this instruction.
8. Click the **Sync Interval** list box to select how often you want Secret Server to push secrets to DSV for this tenant.
9. Click the **Save** button.

## API Examples

### Creating a DevOps Secret Vault Tenant

Use a POST to `/api/v1/devops-secrets-vault/tenant` using the body below to create a tenant in Secret Server.

```
{
  "Data": {
    "secretId": { "value": 79, "dirty": true },
    "tenantName": { "value": "LJDevTenant", "dirty": true },
    "syncInterval": { "value": 60, "dirty": true },
    "active": { "value": true, "dirty": true }
  }
}
```

The secret ID is the client ID for the secret based on the DSV Client Credentials template. The Sync Interval is how often Secret Server checks if secrets needs to be pushed to DSV. Only secrets associated with active tenants are pushed to DSV. You are returned the tenant ID if the POST is successful.

## Creating a Sync Map

Use a POST to `/api/v1/devops-secrets-vault/add-sync` using this body to map a secret to a DSV tenant:

```
{
  "data": {
    "secretId": {
      "dirty": true,
      "value": 60
    },
    "dsvTenantId": {
      "dirty": true,
      "value": 1
    },
    "active": {
      "dirty": true,
      "value": true
    },
    "fieldNamesPath": {
      "dirty": true,
      "value": [
        "Demo", "\\$domain", "qagreentest"
      ]
    }
  }
}
```

When the secret is mapped to a tenant, an initial sync immediately occurs. Following the initial sync, the secret is checked to determine if updates have been made when the sync Interval expires (making it "dirty") for the mapped tenant. If no changes have been made to the secret, then the secret is not pushed to DSV. You can reference fields from the secret to create the path in DSV. Secret Server will look for a \$, then search for the following string as the [field slug names](#) for the secret's template. The path in DSV follows this format:

`/secrets/<DSV_secret_name>.`

## Manually Syncing a Secret

Use a POST to `/api/v1/devops-secrets-vault/sync` to manually trigger a push to DSV for existing sync maps. The list of integers contains the SyncMapIds of the secret to tenant mapping, so you can control which secret is pushed to which tenant.

```
{
  "data": [
    3, 4, 5
  ]
}
```

## Listing DevOps Secret Vault Tenants

List DSV tenants registered to Secret Server by running a GET to `/api/v1/devops-secrets-vault/tenant`. Query parameters accepted:

- filter.nameSearch=
- filter.includeInactive=

## Getting a DevOps Secret Vault Tenant's Details

View the details of a single tenant by specifying a tenant ID in a GET to `/api/v1/devops-secrets-vault/tenant/{tenantId}`.

## Getting the Status of a Secret's Synchronization

View a secret's sync status by running a GET to `/api/v1/devops-secrets-vault/sync/status/{syncMapId}`.

## Getting a List of Secret Synchronization Statuses

View a list of secret sync statuses by running a GET to `/api/v1/devops-secrets-vault/sync/status`. Query parameters accepted:

- filter.secretId=
- filter.includeInactive=
- filter.tenantId=

## APIs and Scripting

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

**Note:** This section contains general material on API access and scripting. APIs, scripts and techniques may appear elsewhere in the documentation for specific aspects of Secret Server. For example, Automatic Secret Export REST API is in the Secret Import and Export section.



## Overview

Secret Server relies on [Windows Remote Management](#) (WinRM) components to run PowerShell scripts. This requires configuration on the Secret Server Web server and any distributed engines. By default, Secret Server uses `http://localhost:5985/wsman` as the WinRM endpoint. The endpoint URI can be seen under **Admin > Configuration** or **Admin > Distributed Engine > Manage Sites > Local** if using distributed engines. At the moment, we only support running PowerShell scripts on localhost. If you are new to PowerShell Remoting please review [PowerShell Remoting Security Considerations](#).

## Configuration (Domain Joined)

Run PowerShell as an Administrator and execute:

Enable-PSRemoting

See [Enable-PSRemoting](#) for more information.

This command performs the following steps:

- Runs the [Set-WSManQuickConfig](#) cmdlet, which performs the following tasks:
  - Starts the WinRM service
  - Sets the startup type on the WinRM service to Automatic
  - Creates a listener to accept requests on any IP address
  - Enables a firewall exception for WS-Management communications
  - Registers the Microsoft.PowerShell and Microsoft.PowerShell.Workflow session configurations, if it they are not already registered
  - Registers the Microsoft.PowerShell32 session configuration on 64-bit computers, if it is not already registered
  - Enables all session configurations
  - Changes the security descriptor of all session configurations to allow remote access.
- Restarts the WinRM service to make the preceding changes effective.

## Verifying Listeners

Confirm the listener:

```
Get-WSManInstance -ResourceURI winrm/config/listener -SelectorSet @{Address="*";Transport="http"}
```

The output should reflect the newly configured listener with **Enabled : true**

## Additional Considerations

- By default two BUILTIN groups are allowed to use PowerShell Remoting as of v4.0: Administrators and Remote Management Users. (`Get-PSSessionConfiguration -Name Microsoft.PowerShell).Permission`)
- Sessions are launched by Secret Server under the user's context, which means all the same security controls and policies apply within the session.
- See [Investigating PowerShell Attacks](#) by FireEye for additional security considerations.
- Your environment may already be configured for WinRM. If your server is already configured for WinRM but it is not using the default configuration, you can change the URI to use a custom port or URLPrefix.

## Configuration (Standalone)

By default WinRM uses Kerberos for authentication. Since Kerberos is not available on machines that are not joined to the domain, HTTPS is

required for secured transport of the password. Only use this method if you are going to run scripts from a Secret Server Web server or distributed engine that is **not** joined to the domain.

**Note:** WinRM HTTPS requires a local computer "Server Authentication" certificate with a CN matching the hostname that is not expired, revoked, or self-signed. A certificate would need to be installed on each endpoint Secret Server or the engine manages.

Create the new listener:

```
New-WSManInstance - ResourceURI winrm/config/Listener -SelectorSet @{Transport=HTTPS} -ValueSet @{{Hostname="HOST";CertificateThumbprint="XXXXXXXXXX"}}
```

## Overview

You can use PowerShell scripts in Secret Server to automate specific tasks. These scripts are useful in several places in Secret Server, such as in creating custom remote password changers, custom dependency changers, discovery scanners, and custom ticket system integration.

## Creating a PowerShell Script

1. Develop your script. See:

- [REST API PowerShell Script Examples](#)
- [Using Secret Fields in Scripts](#)
- [Dependency Token List](#)


**Important:** Do not edit the script with Windows Notepad. Instead, use Notepad++, Visual Studio Code, or Atom. Windows Notepad can add invisible characters that can cause issues.

**Note:** Using PowerShell in Secret Server involves passing a parameter string to the script. This string can contain literal values as well as tokens that represent values on the object in Secret Server that the script is attached to. For example, when creating a custom password changer, you pass in values such as the user name, old password, and new password using tokens that represent these values for whichever secret is running the password change script. Similarly, dependencies have a set of tokens that represent values on the dependency and its associated secret.

2. Go to **Admin > Scripts**.

















































## Scripts

PowerShell
SQL
SSH



Script testing will execute from the Web Server you are connected to but scripts may run on other nodes outside of testing

+ Create New
[Information on PowerShell Scripts](#)

NAME	DESCRIPTION	CATEGORY	ACTIVE	USAGE COUNT	
Create OU Placeholder	Discovery	Discovery Scanner	Yes	0	   
Find Users in AD	Users	Discovery Scanner	Yes	0	   
Find Host Ranges	HostRange	Discovery Scanner	Yes	0	   
Find Machines	Machine	Discovery Scanner	Yes	0	   
Find Local Accounts	local Acc	Discovery Scanner	Yes	0	   
Find Local Accounts - with custom field names	Local Accountn	Discovery Scanner	Yes	0	   
Script to find AD Users who have administrator rights on a computer	AD useras	Discovery Scanner	Yes	0	   
Find Dependencies	Depen	Discovery Scanner	Yes	0	   
Create a Domain Controller in a OU	Control Domain	Discovery Scanner	Yes	0	   
Find Users in OU	OU	Discovery Scanner	Yes	1	   
Service Account Dummy Code	Service Account Dummy Code	Discovery Scanner	Yes	0	   
Task Account Dummy	Task Account Dummy	Discovery Scanner	Yes	0	   

☐ Show Inactive
Filter by category:

Back

View Audit

Script Usage Report

Test PowerShell with WinRM

**Note:** In some older versions of Secret Server, you can find the **Scripts** option under **Remote Password Changing** on the **Administration** menu bar.

- On the **PowerShell** tab, click **+Create New**. The New PowerShell Script popup appears:

**New PowerShell Script**

Name

Description

Category Untyped

Script

1

4. Type the script name in the **Name** text box.
5. Type a description in the **Description** text box.
6. Click the **Category** dropdown list to select the type of script. This will determine where the script resides in Secret Server and more. For instance, the Dependency choice ensures that Remote Password Changing is turned on by enabling it on the Remote Password Changing page.
7. Paste your script into the **Script** text box.
8. Click the **OK** button. The new script appears in the table on the Scripts page.

## Best Practices

### Debugging

Scripts may contain debug lines to help you test the script. Debug statements use the Write-Debug command. For example: Write-Debug "The users name is \$Username"

### Script Arguments

There are input boxes for specifying arguments in places where the PowerShell scripts are used. Argument values are specified on a single line separated by a space. Values containing spaces should be enclosed in quotes. Parameters to PowerShell scripts are referenced through the zero-based `Args` array. It is often beneficial to assign `Args` variables to other more-meaningful named variables. For example:

Arguments: "Welcome back" and "Joe"

Script:

```
$greeting = $Args[0]
```

```
$name = $Args[1]  
Write-Debug "$greeting $name"
```

Output: "Welcome back Joe"

## Exceptions

In situations where the script should fail, given a specific set of conditions, an exception should be explicitly thrown. When an exception is thrown, the script stops running and the failure is logged in the system log. The script is considered to have successfully run if no errors or exceptions occur while processing. For example:

```
if ($meetsCondition -eq $false)  
{  
    throw "Did not meet condition"  
}
```

You can use SQL scripts in Secret Server to automate specific tasks. You can configure a SQL script as a dependency of a secret and run after the password is successfully changed on the secret.

## Creating a SQL Script

1. From the Administration Menu, click **Scripts**.
2. Click the **SQL** tab on the Scripts page.
3. Click the **Create New** button.
4. Type the name, description, and script in the dialog box.
5. Click the **OK** button.
6. Using SQL scripts as dependencies requires that Remote Password Changing is turned on, so ensure that this is enabled on the Remote Password Changing page.

## Using Parameters

Where SQL scripts are used, we provide an arguments text box. It is often beneficial to assign variables to other more meaningful variables.

### Examples

#### SQL

```
UPDATE TABLE cmsuser  
SET password = PWDENCRYPT(@Password) WHERE username = @Username;
```

#### MySQL

```
UPDATE TABLE cmsuser  
SET password = PASSWORD(?) WHERE username = ?;
```

#### PostgreSQL

```
UPDATE TABLE cmsuser  
SET passwd = CRYPT(?, GEN_SALT('sha256')) WHERE username = ?;
```

#### ODBC

```
UPDATE TABLE cmsuser  
SET passwd = $Password WHERE username = $Username;
```

#### Basic Oracle PL/SQL

```
INSERT INTO cmuser values (:username, :password);
```

#### Advanced Oracle PL/SQL

```
EXECUTE IMMEDIATE 'alter user '|| :username ||' identified by '|| :password || ''';
```

## Returning Errors

In situations where the script should fail given specific conditions, the script should explicitly throw an exception. When an exception is thrown, the script stops running and the failure is recorded in the system Log. The script is considered to have successfully run if no errors or exceptions occur while processing.

### Examples

#### SQL

```
RAISERROR(N'ERROR: %s', 14, 1, N'Failure');
```

#### MySQL

```
SIGNAL SQLSTATE '45000'  
SET MESSAGE_TEXT = 'ERROR: Failure';
```

#### PostgreSQL

```
DO language plpgsql $$  
BEGIN  
RAISE EXCEPTION 'ERROR (14)';  
END  
$$;
```

#### ODBC

```
RAISERROR(N'ERROR: %s', 14, 1, N'Failure');
```

## SQL Example

An issue that occurs in SQL Server database environments is when a linked database is set up with a credential and that credential's password changes. To counter this, you can set up a SQL script to run as a dependency after the password change occurs to drop and recreate the link. Note that you may need to edit the option depending on the desired linked server configuration.

### Example

#### SQL

```
EXEC master.dbo.sp_dropserver @server=@MACHINE, @droplogins='droplogins'  
EXEC master.dbo.sp_addlinkedserver @server = @MACHINE, @srvproduct=N'SQL Server'  
EXEC master.dbo.sp_addlinkedsrvlogin @rmtsrvname=@MACHINE, @useself=N'True', @locallogin=NULL, @rmtuser=NULL, @rmtpassword=NULL  
EXEC master.dbo.sp_addlinkedsrvlogin  
@rmtsrvname=@MACHINE, @useself=N'False', @locallogin=@LOCALUSERNAME, @rmtuser=@REMOTEUSERNAME, @rmtpassword=@PASSWORD
```

### Parameters

- @MACHINE The machine or instance of the server where the linked database exists. For instance, SERVER\SQL2014.
- @LOCALUSERNAME The local login on the server where the linked database is configured.



- `@REMOTEUSERNAME` The username that is set in the linked database's security info for connecting to the linked database. This should be the username of the secret that the dependency is on.
- `@PASSWORD` This will be the new password after the SQL account's password is changed.

SSH scripts can be used in Secret Server to automate specific tasks. An SSH script can be configured as a dependency of a secret and run after the password is successfully changed on the secret.

## Creating an SSH Script

1. From the **Admin** menu, click **Scripts**.
2. Click the **SSH** tab on the Scripts page.
3. Click the **Create New** button.
4. Type the name and description in their text boxes.
5. Paste the script in the text box.
6. Click the **OK** button.

Using SSH scripts as dependencies requires that Remote Password Changing is turned on, so ensure that this is enabled on the Remote Password Changing page.

Scripts return all output results, which allows you to debug your script using the echo command (or any command that will write to standard output).

For example:

```
echo The users name is $USERNAME
```

An input box for specifying arguments will exist in places where the SSH scripts are used. Argument values are specified next to their associated argument name. Parameters to SSH scripts are referenced through named variables. It is often beneficial to assign parameter variables to other more meaningful variables.

Another example:

```
$GREETING = Welcome back
```

```
$NAME = Joe
```

```
echo $GREETING $NAME
```

Output: Welcome back, Joe

In situations where the script should fail given a specific set of conditions, exit the script with a non-zero status code. When scripts exit with a non-zero status, the failure is logged in the System Log. The script is considered to have successfully run if it does not exit with a non-zero status code.

Example:

```
if [ ! $MEETS_CONDITION -eq 0 ]; then
```

```
echo Failure
```

```
exit 1;
```

```
fi
```

```
echo Success
```

## Use Case

Update a user's password in the Apache user configuration file when it is changed in Secret Server:

```
cd $FILEPATH;

rm -f tomcat-users.xml.bak;

sed -i.bak 's/username="$USERNAME".*password="[^"]*/username="$USERNAME" password="$NEWPASSWORD"/' tomcat-users.xml;

if grep -q $NEWPASSWORD "tomcat-users.xml"; then
exit 0;
fi
exit 5;
```

## Adding an SSH Script as a Dependency

1. Navigate to **Admin > Scripts**.
2. Select the **SSH** tab.
3. Click **Create New** to create a script.
4. Fill out the required fields **Name**, **Description**, and **Script**.
5. (Optional) Change the setting for the environmental line ending in case your environment experiences issues with line termination.
6. (Optional) Specify the port that the script will connect to.

When filling out the script there is some important information to remember. If you would like to use one of the Secret Server variables such as \$USERNAME, \$NEWPASSWORD, or \$CURRENTPASSWORD, you need to specify that they are parameters. For example, take the following script from our use case:

**Edit SSH Script**

Name: Update Tomcat Config \*

Description: Updates the user's password in Tomcat. \*

Script:

```
1 cd $FILEPATH;
2
3 rm -f tomcat-users.xml.bak;
4 sed -i.bak 's/username="$USERNAME".*password="[^"]*/username="$USERNAME" password=
5
6 if grep -q $NEWPASSWORD "tomcat-users.xml"; then
7   exit 0;
8 fi
9 exit 5;
```

Settings: New Line (\n) Port

Params:

USERNAME	Literal	
NEWPASSWORD	Literal	
Add New...	Interpreted	+

OK Cancel

Within the script, parameters are specified with the dollar sign prefixed to the name. In the list of parameters, you simply specify their name without the dollar sign. This is so you can fill their values in later when implementing the script as a secret dependency.

When adding the SSH Script as a dependency to a secret, specify the built-in Secret Server variables with the dollar-sign prefix. For example, using our use case:

New Dependency

[Explain](#)

TypeSSH Script

ScriptUpdate Tomcat Config

NameChange Tomcat Password

Server Namecentos.example.org

Port22 (default)

Server Key Digest

Description

Wait (s)0

Enabled☒

Privileged AccountNo Secret Selected

SSH Key SecretNo Secret Selected

Parameters

USERNAME\$USERNAME

NEWPASSWORD\$PASSWORD

✓ OK

✕ Cancel

If a parameter in the script is not specified in the list of parameters, then they will use environmental variables on the remote host.

## Overview

A list of all valid tokens that can be used in PowerShell, SSH, and SQL dependency script arguments.

PowerShell, SSH, and SQL dependencies can have script arguments that derive their values from values on the dependency, the secret it belongs to, or any other secrets associated for remote password changing. Starting with Secret Server 10.0, tokens can also be used in ODBC connection string arguments. Script arguments are defined on dependency changers in Secret Server 10.0 and above and on the dependency in earlier versions of Secret Server. The following table lists the tokens available to dependency scripts.

## Best Practices

### Wrap Fields in Quotation Marks

When specifying PowerShell arguments, the `$fieldname` argument is replaced with the information in the field, and *then* the whole string is passed to PowerShell. Thus, if the string returned has spaces, PowerShell parses the spaces as separate arguments, which causes errors.

Therefore, we recommend you wrap your fields in two quotation marks. For example: `"$fieldname"`, which is then parsed by PowerShell as one string.

### Avoid Using Spaces in Field Names

We recommend not using spaces within your field names. In many cases, that would not cause a problem, but if the first word in the field name is also a reserved word, it will cause an error because the reserved word is parsed separately from the rest of the field name.

For example, a field named:

`$machine name`

Because `$machine` is a reserved word, the parser would separate the reserved `$machine` value, followed by `name` as a separate argument.

**Note:** Surrounding the field name in quotation marks would *not* fix this—Secret Server makes the substitution prior to PowerShell parsing the string.

## Token List

**Table:** Dependency Tokens

<code>\([x]\)</code>	pre-10.0	The value of the field with the same name on the xth secret on the RPC tab for use in custom password changing commands and scripts.
<code>\$(x)\$PASSWORD</code>	pre-10.0	The password on the xth secret on the RPC tab for use in custom password changing commands and scripts.
<code>\$(x)\$USERNAME</code>	pre-10.0	The username on the xth secret on the RPC tab for use in custom password changing commands and scripts. Example: <code>\$(1)\$USERNAME</code> is the username of the first associated secret.
<code>\$</code>	pre-10.0	The value of the field on the secret with the same name. Examples: <code>\$DOMAIN</code> matches the secret's "Domain" field, and <code>\$NOTES</code> matches the "Notes" field.

\$	10.0	The name of any scan item field (defined on the scan item template) that is visible in the dependency edit dialog. If a scan item field is derived from a parent field, you may also use the parent field name as a parameter that translates to this field's value.
\$CURRENTPASSWORD	pre-10.0	The password currently on the secret (context-sensitive to whether script is run before or after password change).
\$CURRENTPUBLICKEY	10.2	The public key currently on the secret (context-sensitive to whether script is run before or after key rotation).
\$DATABASE	pre-10.0	The value of the Database field from the dependency. Only valid for SQL dependencies unless added as a field by the scan item template (see below).
\$DEPENDENCYPRIVILEGEDPASSPHRASE	10.3	The private key passphrase on the privileged account assigned to the dependency.
\$DEPENDENCYPRIVILEGEDPASSWORD	10.3	The password on the privileged account assigned to the dependency.
\$DEPENDENCYPRIVILEGEDPRIVATEKEY	10.3	The private key on the privileged account assigned to the dependency.
\$DEPENDENCYPRIVILEGEDUSERNAME	10.3	The user name on the privileged account assigned to the dependency.
\$DEPENDENCYSSHKEY	10.3	The new SSH key to set on the dependency.
\$DEPENDENCYSSHKEYPASSPHRASE	10.3	The new passphrase of the SSH key to be set on the dependency.
\$MACHINE	10.0	The value of the Machine Name field on the dependency. This is always the second part of the dependency title (<service name> on <machine>).
\$NEWPASSWORD	10.2	This is not available to the dependency at the time of the password change. It will no longer be set as the NewPassword gets set to the Password.
\$NEWPUBLICKEY	10.2	The new public key that is being set on the secret.
\$PASSPHRASE	10.2	The passphrase used to encrypt the private key in a public/private key pair on this secret.
\$PASSWORD	pre-10.0	The password on the secret.
\$PORT	pre-10.0	The value of the Port field from the dependency. Only valid for SQL and SSH dependencies unless added as a field by the scan item template (see below).
\$PRIORPASSPHRASE	10.2	The passphrase that was set on the secret before the current passphrase rotation.
\$PRIORPASSWORD	10.2	In the context of a password change, this is the password at the beginning of the password change. The password that was set on the secret before the current password change. In the context of run dependency from the Dependency tab, this is the prior value of the password before the last password change.

\$PRIORPUBLICKEY	10.2	The public key that was set on the secret before the current key rotation.
\$PUBLICKEY	10.2	The public key on the secret.
\$SERVICENAME	10.0	The value of the Service Name field on the dependency. Service Name may have a different name based on the dependency type, but it is always the first part of the dependency title (<service name> on <machine>).
\$USERNAME	pre-10.0	The username on the secret.

**Note:** The mappings of these parameters come from the remote password changer, so you can check the mapping by editing the secret template and selecting configure password changing.

**Note:** Some of these tokens, such as \$PASSWORD, \$CURRENTPASSWORD, \$NEWPASSWORD, and \$PRIORPASSWORD, may seem to duplicate each other, but they have distinctions based on the context as described above.

**Note:** In some cases, whether or not the dependency is being changed locally or through a distributed engine may have an impact on what these tokens return. This is due to the asynchronous nature of distributed engines. The newer tokens, such as \$NEWPASSWORD and \$PRIORPASSWORD, were created to address this issue. If you are using older tokens, such as \$PASSWORD and \$CURRENTPASSWORD, and seeing unexpected results, try using \$PRIORPASSWORD and \$NEWPASSWORD.

## Overview

The Secret Server SDK replaces and improves upon the existing functionality of the Java API and .NET/Application API. Users can leverage this SDK to tokenize credentials in scripts and configuration files for .NET web applications. The SDK can also call for a REST Web services authentication token for added functionality. Finally, the SDK has a local encrypted cache for every location it is installed in to allow for quicker transit times and resiliency in case communication with Secret Server is lost.

To download the SDK command line tool, choose a version and OS platform below.

See the [Secret Server Software Development Kit for DevOps](#) topic for how to use the SDK.

## SDK Client version 1.5.3

### Release Notes

Added a "multi" option to the CLI. You can now select one field from multiple secrets in a single call by passing in a comma-separated list of multiple Secret IDs and a field name.

### Downloads

- [Windows x64](#)
- [MacOS x64](#)
- [Linux x64](#) (including RHEL 7 to 8—RHEL 9 uses OpenSSL v3, which the SDK does not support)
- [Red Hat Enterprise Linux 6 x64](#)

### Download File Hashes

#### Windows x64

- File: secretserver-sdk-1.5.3-win-x64.zip
- SHA256: 231F88106CC03434AC7E107579BB1B7686B10011F208068913F5F3762A4A5B64

#### MacOS x64

- File: secretserver-sdk-1.5.3-osx-x64.zip
- SHA256: E13657A9E80235F2404F398254E537185619DCF921546C03D28BDF17C75E1694

#### Linux x64

- File: secretserver-sdk-1.5.3-linux-x64.zip
- SHA256: 8AFAB562C35EDC4AFD5EB6B6275635A06C319FD0275318B5DE6ED61D8678FCC4

#### Red Hat Enterprise Linux 6 x64

- File: secretserver-sdk-1.5.3-rhel.6-x64.zip
- SHA256: E4E83E632FFA640A47C70A880E53DBDE38F12F2CAF6FE4441D18ECEB7D716904

## Legacy Releases

### SDK Client version 1.5.0



## Release Notes

- Cache improvements
- Stability improvements

## Downloads

- [Windows x64](#)
- [MacOS x64](#)
- [Linux x64](#) (including RHEL 7 to 8—RHEL 9 uses OpenSSL v3, which the SDK does not support)
- [Red Hat Enterprise Linux 6 x64](#)

## Download File Hashes

### Windows x64

- File: secretserver-sdk-1.5.0-win-x64.zip
- SHA256: 4B3246470E4EA87190CE3B511151E93E04E7363EADBD145BA0EE8AA63BC1378B

### MacOS x64

- File: secretserver-sdk-1.5.0-osx-x64.zip
- SHA256: 492D177CF86554EC22B947957328D833471E2DECFA7AE95FC0D2B3FFB1B24E37

### Linux x64

- File: secretserver-sdk-1.5.0-linux-x64.zip
- SHA256: 94672CA26C438301A070C020FFAEE2932250F3358C91B30BC4F9B8F0E0A1210B

### Red Hat Enterprise Linux 6 x64

- File: secretserver-sdk-1.5.0-rhel.6-x64.zip
- SHA256: BF0BA52C7BA0838E56C4C0C44FC29794223B04336458D342F14872FE3914E30B

## SDK Client version 1.4.1

## Release Notes

- New option to specify a configuration and cache directory other than the default
- SDK CLI (tss) now has a --configure-directory option.
- Nuget SDK packages now check for a SecretServerSdkKeyDirectory AppSetting.
- Updated the Nuget SDK packages to support customizing the key storage directory. They now check for a SecretServerSdkKeyDirectory AppSetting.
- Updated the Nuget SDK packages to have a SecretServerClient GetAccessToken() and GetAccessTokenAsync() method, to get a REST or SOAP API token. This is equivalent to the existing SDK CLI command token.

## Downloads

- [Windows x64](#)
- [MacOS x64](#)
- [Linux x64](#) (including RHEL 7 to 8—RHEL 9 uses OpenSSL v3, which the SDK does not support)
- [Red Hat Enterprise Linux 6 x64](#)

## SDK Client version 1.3.0

### Release Notes

- Upgrade to .NET Core 2.1 runtime
- Encrypt configuration with DPAPI on Windows by default
- New commands to display connection status and version
- New option to specify a key storage directory other than the default
- Target multiple OS versions with a single build
- New build for Red Hat Enterprise Linux 6

### Downloads

- [Windows x64](#)
- [MacOS x64](#)
- [Linux x64](#) (including RHEL 7 to 8—RHEL 9 uses OpenSSL v3, which the SDK does not support)
- [Red Hat Enterprise Linux 6 x64](#)

## SDK Client version 1.0.0

### Release Notes

Initial release of the SDK command line tool

### Downloads

- [Windows 10 x64](#)
- [CentOS 7 x64](#)
- [Red Hat Enterprise Linux 7 x64](#)
- [Ubuntu 16.10 x64](#)
- [MacOS 10.12 x64](#)

## SDK NuGet Packages (Optional)

To get the SDK NuGet packages, check out the documentation on our [GitHub page](#). This package is not required to use the SDK Client.

**Note:** The SDK Client and SDK NuGet packages are two separate projects with separate versioning. We actively work to maintain feature parity between the two projects, but at times their features may differ.

Secret Server contains an OpenAPI Swagger specification file that describes the REST API endpoints. There are several Swagger-based tools available to generate clients. This document describes using some popular ones to generate clients for different languages including C#, Java, and PowerShell. The generated client facilitates calling the Secret Server REST API and indicates API changes with new Secret Server versions.

**Note:** Please use the article quick links on the right to jump to the section you are interested in.

## Generating Clients

### C# Client Using NSwagStudio

1. Download and install NSwagStudio ( <https://github.com/RicoSuter/NSwag/wiki/NSwagStudio> )
2. Copy and paste the swagger.json file for "Documentation for token authentication." This is located at: {Your SecretServer Base Url}\Documents\restapi\OAuth\swagger.json
3. Suggested settings:
  - Namespace: SecretServerAuthentication
  - Inject HttpClient via constructor
  - Generate default values for properties
4. Generate output.
5. Copy output into a C# file in solution.
6. Copy and paste the swagger.json for "Documentation for REST API using bearer token authentication." It is located at {Your SecretServer Base Url}\Documents\restapi\TokenAuth\swagger.json.
7. Suggested Settings:
  - Namespace: SecretServerRestClient
  - Inject HttpClient via constructor
  - Generate default values for properties
8. Generate output.
9. Copy output into a C# file in solution

See [Authenticating](#) for creating a token to use in the examples below.

```
// Authenticate:
var httpClient = new HttpClient();
var token = "<TOKEN>";

// Set credentials (token):
httpClient.DefaultRequestHeaders.Authorization = new AuthenticationHeaderValue("Bearer", token);

// Call REST API:
var client = new SecretServerRestClient.SecretsServiceClient("https://secretserver.url.local/ss/api/v1", httpClient);
var search = client.SearchAsync(sortBy0_name: "lastHeartBeatStatus", sortBy0_direction: "asc");
var results = search.Result;
```

### C# or .NET Core Client Using OpenAPI Generator

**Note:** These client-generation instructions were written with OpenAPI Generator version 5.1.1, which was the latest version at the time. Future versions may fix issues that necessitated some workarounds. If you are using a newer version, you may need to make adjustments.

**Note:** These instructions assume that you have Java and .NET Core installed on your machine. They should work on all systems, but the syntax will need to be tweaked for other shells.

1. Follow the steps in [Getting OpenAPI Generator](#).
2. Store the path to the relevant swagger.json files as variables. These variables can be either a local file path or a URL.

```
$oauthSwagger = 'OAuth/swagger.json' $tokenAuthSwagger = 'TokenAuth/swagger.json'
```

3. Run the following commands to generate the necessary clients. You can run `java -jar openapi-generator-cli.jar help generate` to see advanced options that you may wish to configure. Options specific to the .NET Core generator are described on [Config Options for csharp-netcore](#) page.

```
java -jar openapi-generator-cli.jar generate -i $oauthSwagger -g csharp-netcore --skip-validate-spec --package-name SecretServerOAuth --remove-operation-id-prefix --additional-properties=netCoreProjectFile=true -o oauth-csharp java -jar openapi-generator-cli.jar generate -i $tokenAuthSwagger -g csharp-netcore --skip-validate-spec --package-name SecretServerTokenAuth --remove-operation-id-prefix --additional-properties=netCoreProjectFile=true -o tokenauth-csharp
```

4. Build the packages in release mode:

```
dotnet build -c Release oauth-csharp/src/SecretServerOAuth dotnet publish -c Release tokenauth-csharp/src/SecretServerTokenAuth
```

5. Add the necessary .dll files to your project. The DLLs are located at the paths below:

```
oauth-csharp/src/SecretServerOAuth/bin/Release/netstandard2.0/SecretServerOAuth.dll tokenauth-csharp/src/SecretServerTokenAuth/bin/Release/netstandard2.0/publish/*.dll
```

6. Test the API. For example:

See [Authenticating](#) for creating a token to use in the examples below.

```
var token = "<TOKEN>";
// Do not use tokenAuthConfig.AccessToken
// This method can be called repeatedly as the access token expires, old values will be overwritten
tokenAuthConfig.AddApiKey("Authorization", $"{token.TokenType} {token.AccessToken}");

var foldersApi = new FoldersApi(tokenAuthConfig);
var folder = await foldersApi.GetAsync(11);

Console.WriteLine(folder);
Console.ReadKey();
```

## Java Client Using OpenAPI Generator

**Note:** These client-generation instructions were written with OpenAPI Generator version 5.1.1, which was the latest version at the time. If you are using a newer version, you may need to make adjustments.

**Note:** These instructions assume that you have Java configured on your machine. JDK 8 or greater is required. These instructions should work on all systems, but the syntax will need to be tweaked for other shells.

1. Follow the steps in [Getting OpenAPI Generator](#).
2. Store the path to the relevant swagger.json files as variables. These variables can be either a local file path or a URL.

```
$oauthSwagger = 'OAuth/swagger.json' $tokenAuthSwagger = 'TokenAuth/swagger.json'
```

3. Run the following commands to generate the necessary clients. You can run `java -jar openapi-generator-cli.jar help generate` to see advanced options that you may wish to configure. Options specific to the Java generator are described on the [Config Options for java](#) page.

```
java -jar openapi-generator-cli.jar generate -i $oauthSwagger -g java --skip-validate-spec --invoker-package secretserver.oauth.client --api-package secretserver.oauth.api --model-package secretserver.oauth.model --group-id secretserver --artifact-id secretserver.oauth --remove-operation-id-prefix -o oauth-java java -jar openapi-generator-cli.jar generate -i $tokenAuthSwagger -g java --skip-validate-spec --invoker-package secretserver.tokenauth.client --api-package
```

```
secretserver.tokenauth.api --model-package secretserver.tokenauth.model --group-id secretserver --artifact-id secretserver.tokenauth --remove-operation-id-prefix -o tokenauth-java
```

- Follow the instructions in `oauth-java/README.md` to include the package in your build process. Alternatively, follow the steps below to generate JAR files and test.

```
cd oauth-java mvn clean install -DskipTests cd ../tokenauth-java mvn clean install -DskipTests
```

- Include the following JARs in your project (replace version numbers as necessary):

```
oauth-java/target/secretserver.oauth-10.9.9.jar tokenauth-java/target/secretserver.tokenauth-10.9.9.jar tokenauth-java/target/lib/*.jar
```

- Test the JAR files:

See [Authenticating](#) for creating a token to use in the examples below.

```
// set to the root of the Secret Server instance with no trailing slash
String basePath = "https://thycotic.com/SecretServer";
```

```
secretserver.oauth.client.ApiClient oauthClient = secretserver.oauth.client.Configuration.getDefaultApiClient();
secretserver.tokenauth.client.ApiClient tokenAuthClient = secretserver.tokenauth.client.Configuration.getDefaultApiClient();
```

```
String token = "<TOKEN>";
```

```
tokenAuthClient.setBasePath(basePath + "/api");
tokenAuthClient.setApiKey(tokenResponse.getTokenType() + " " + token);
FoldersApi foldersApi = new FoldersApi(tokenAuthClient);
FolderModel folderModel = foldersApi.get(11, false, false);
System.out.println(folderModel);
```

## PowerShell Using OpenAPI Generator

**Note:** These client-generation instructions were written with OpenAPI Generator version 5.1.1, which was the latest version at the time. If you are using a newer version, you may need to make adjustments. The PowerShell generator is in beta.

- Follow the steps in [Getting OpenAPI Generator](#).
- Store the path to the relevant `swagger.json` files as variables. These variables can be either a local file path or a URL.

```
$oauthSwagger = 'OAuth/swagger.json' $tokenAuthSwagger = 'TokenAuth/swagger.json'
```

- Run the following commands to generate the necessary clients. You can run `java -jar openapi-generator-cli.jar help generate` to see advanced options that you may wish to configure. Options specific to the PowerShell generator are described on [Config Options for powershell](#) page.

**Note:** These commands set `disallowAdditionalPropertiesIfNotPresent` to `false` to work around [a bug in the generator](#).

```
java -jar openapi-generator-cli.jar generate -i $oauthSwagger -g powershell --skip-validate-spec --package-name SecretServerOAuth --remove-operation-id-prefix -o oauth-ps java -jar openapi-generator-cli.jar generate -i $tokenAuthSwagger -g powershell --skip-validate-spec --package-name SecretServerTokenAuth --remove-operation-id-prefix -o tokenauth-ps
```

- Perform a find/replace to work around a bug in the generator:

```
Get-ChildItem ".\tokenauth-ps\src\SecretServerTokenAuthModel\*.ps1" | Foreach-Object { (Get-Content $_) | Foreach-Object { $_ -replace "$AllProperties = \\\", "$AllProperties = @{}" } | Set-Content $_ }
```

- Run the following commands to build the PowerShell modules. `-Verbose` can be specified if desired.

```
.\oauth-ps\Build.ps1 .\tokenauth-ps\Build.ps1
```

- Import both modules:

```
Import-Module .\oauth-ps\src\SecretServerOAuth Import-Module .\tokenauth-ps\src\SecretServerTokenAuth
```

7. Set the base URL of each module. Only edit the first line below. The value must be the full URL to the root of Secret Server **with no trailing slash**, for example `https://thycotic.com/SecretServer`.

```
$baseUrl = "https://thycotic.com/SecretServer" SecretServerOAuth\Set-Configuration -BaseUrl $baseUrl SecretServerTokenAuth\Set-Configuration -BaseUrl $baseUrl
```

8. Store a token - See [Authenticating](#) for creating a token.

9. Set the TokenAuth module to use the token: `SecretServerTokenAuth\Set-Configuration -DefaultHeaders @{ Authorization = $token.token_type + " " + $token.access_token }`

10. Test the folder service Get endpoint (replace the ID as necessary):

```
Get-FolderDetail -id 11
```

## Postman Workspace

[Postman](#) is a REST client with a GUI to easily test API requests. To automatically generate a workspace with Secret Server API calls, click the **Import** button and choose whether to use a local file or a URL. Ensure the **Generate a Postman Collection** check box is selected. The program appears to be doing nothing while importing, but will inform you of success shortly.

## Insomnia Workspace

[Insomnia](#) is a REST client similar to Postman. To automatically generate a workspace with Secret Server API calls, first click the arrow to open the dropdown, then click **Import/Export**. Click **Import Data**, then **From File** or **From URL** as desired.

## Getting OpenAPI Generator

**Note:** These client-generation instructions were written with OpenAPI Generator version 4.3.0, which was the latest version at the time. Future versions may fix issues that necessitated some workarounds. If you are using a newer version, you may need to make adjustments.

OpenAPI Generator supports several installation methods, described on their [CLI Installation](#) page. You can pick the method most suitable for your environment. The commands in this article use the JAR method for simplicity, but other installation methods use mostly the same command format so only small tweaking should be required.

**Note:** All methods require the Java runtime (version 8+).

## Self-Signed or Other Invalid Certificates

If you use an SSL certificate that is self-signed or otherwise not technically valid, OpenAPI Generator throws an error if you try to use a URL to `swagger.json` instead of a local file (or when using the Java client). To fix this, you need to import the certificate into Java's certificate store. The following example commands are for Windows, but the same concept applies to Mac and Linux as well.

**Note:** The default password for the cacerts keystore is `changeit`.

Java 8 stores the cacerts keystore in `JAVA_HOME` unless it was explicitly changed. `keytool` should also be on your PATH if java itself is.

```
keytool -import -keystore "%JAVA_HOME%\jre\lib\security\cacerts" -file "path\to\cert.pem"
```

Java 11 provides a flag on `keytool` to find the cacerts keystore automatically.

```
keytool -import -cacerts -file "path\to\cert.pem"
```

## Swagger 2.0 Notes

Some features in our REST API are not currently supported in Swagger 2.0. For example, the sort is an array of a complex objects. The actual API will accept multiple sort levels by passing this query string, `paging.sortBy[0].name=secretname&paging.sortBy[1].name=folderid`. The auto-generated

client only allows you to specify the first sort by default. To specify multiple sorts, the serialization needs to be customized. We assumed that multiple sorting levels is probably an advanced feature and or choice will work for most.

Secret Server web services can be called using scripts. This example demonstrates how to authenticate and retrieve a Secret programmatically in Perl. If connecting to an Installed instance, change the URL to match your site and specify the application name if configured.

This example runs using standard Perl modules and Strawberry Perl v5.24.1.1.

You may need to install REST::Client from CPAN which can be done by running:

```
cpanm REST::Client
```

This module makes interacting with REST-ful APIs much easier.

The TSS script below leverages the API created in the TSS with .pm extension file.

The TokenResponse with .pm extension file defines an object that stores the authentication credentials for the session.

The ErrorResponse with .pm extension file defines an object that stores error information should a REST request fail.

The SecretModel with .pm extension file defines an object that stores the Secret information when requesting a particular Secret from the REST API.

TSS.pl:

```
use REST::Client;
use JSON;

use TSS;

# Enter your Secret Server web site here.
my $host = 'http://localhost';

# Enter the application name, should it be defined.
my $applicationPath = '/secretserver';

my $false = 0;
my $true = 1;
my $usingSelfSignedCertificate = $true;

if ($usingSelfSignedCertificate) {
    # Disable hostname validation since this will fail with self-singed certs.
    $ENV{'PERL_LWP_SSL_VERIFY_HOSTNAME'} = $false;
}

# Initialize the TSS Perl API with the connection information provided above.
my $tss = TSS->new(
    secretServerUrl => $host,
    applicationPath => $applicationPath
) ;

print "Username: ";
my $input = <STDIN>;
chomp $input;
my $username = $input;

print "Password: ";
$input = <STDIN>;
chomp $input;
my $password = $input;

# Authenticate to Secret Server
my $response = $tss->getToken($username, $password);
if (ref $response eq 'ErrorResponse') {
    $tss->handleError($response);
    exit();
}

# Persist the API token in our TSS API session.
```



```
$tss->tokenResponse($response);

$password = undef;

print "Secret ID to retrieve: ";
$input = <STDIN>;
chomp $input;
my $secretId = $input;

# Retrieve a Secret from Secret Server by Secret ID.
$response = $tss->getSecret($secretId);
if (ref $response eq 'ErrorResponse') {
    $tss->handleError($response);
    exit();
}

# Read the SecretModel object
print 'Secret ' . $response->id . ' retrieved successfully. Secret name: ' . $response->name . "\r\n";
```

TSS.pm:

```
package TSS;

use REST::Client;
use JSON;

use TokenResponse;
use ErrorResponse;
use SecretModel;

use strict;

sub new {
    my($class, %args) = @_ ;

    my $self = {
        client => REST::Client->new(),
        secretServerUrl => undef,
        applicationPath => undef,
        tokenResponse => undef,
        %args
    };
    bless $self, $class;

    $self->client->setHost($self->secretServerUrl);

    return($self);
}

sub client {
    my $self = shift;
    return $self->{client};
}

sub secretServerUrl {
    my $self = shift;
    return $self->{secretServerUrl};
}

sub applicationPath {
    my $self = shift;
    return $self->{applicationPath};
}

# Getter and setter so that API tokens can be reused through a session.
sub tokenResponse {
    my $self = shift;
    my $tokenResponse = shift;

    if ($tokenResponse ne undef) {
        $self->{tokenResponse} = $tokenResponse;
        return $tokenResponse;
    }
}
```

```

return $self->{tokenResponse};
}

# Crafts a HTTP header for providing authentication to Secret Server.
sub getHeaders {
    my $self = shift;

    my $headers = {
        Accept => 'application/json',
        Authorization => 'Bearer ' . $self->tokenResponse->access_token
    } ;

    return $headers;
}

sub handleError {
    my $self = shift;
    my $errorResponse = shift;

    print 'ERROR!' . $errorResponse->message . ' (Error Code: ' . $errorResponse->errorCode . ') ' . "\r\n";
}

# Authenticates to Secret Server by POST'ing a Form URL Encoded content body containing sensitive credentials.
sub getToken {
    my $self = shift;
    my $username = shift;
    my $password = shift;

    my $postParams = $self->client->buildQuery([
        username => $username,
        password => $password,
        grant_type => "password"
    ] ) ;

    my $response = $self->client->POST($self->applicationPath . '/oauth2/token', substr($postParams, 1), {'Content-Type' => 'application/x-www-form-urlencoded'});

    if ($self->client->responseCode() ne 200) {
        my $errorResponse = ErrorResponse->new(
            errorCode => $self->client->responseCode(),
            message => "Unable to get token."
        );

        return $errorResponse;
    }

    my $responseJson = from_json($response->responseContent);

    if (exists $responseJson->{'errorCode'}) {
        my $errorResponse = ErrorResponse->new(
            errorCode => $responseJson->{'errorCode'},
            message => $responseJson->{'message'}
        ) ;

        return $errorResponse;
    }

    my $tokenResponse = TokenResponse->new(
        access_token => $responseJson->{'access_token'},
        token_type => $responseJson->{'token_type'},
        expires_in => $responseJson->{'expires_in'}
    ) ;

    return $tokenResponse;
}

# Gets a Secret from Secret Server by GET'ing a specified Secret by ID and passing an authentication header containing our API token.
sub getSecret {
    my $self = shift;
    my @params = @_ ;
    my $secretId = $params[0];

    my $headers = $self->getHeaders();

    $self->client->GET($self->applicationPath . '/api/v1/secrets/' . $secretId, $headers);
    my $responseJson = from_json($self->client->responseContent());

```

```

if (exists $responseJson->{'errorCode'}) {
    my $errorMessage = ErrorResponse->new(
        errorCode => $responseJson->{'errorCode'},
        message => $responseJson->{'message'}
    ) ;

    return $errorMessage;
}

my $secretModel = SecretModel->new(
    id => $responseJson->{'id'},
    name => $responseJson->{'name'},
    secretTemplateId => $responseJson->{'secretTemplateId'},
    folderId => $responseJson->{'folderId'},
    active => $responseJson->{'active'},
    items => $responseJson->{'items'},
    launcherConnectAsSecretId => $responseJson->{'launcherConnectAsSecretId'},
    checkOutMinutesRemaining => $responseJson->{'checkOutMinutesRemaining'},
    checkedOut => $responseJson->{'checkedOut'},
    checkOutUserDisplayName => $responseJson->{'checkOutUserDisplayName'},
    checkOutUserId => $responseJson->{'checkOutUserId'},
    isRestricted => $responseJson->{'isRestricted'},
    isOutOfSync => $responseJson->{'isOutOfSync'},
    outOfSyncReason => $responseJson->{'outOfSyncReason'},
    autoChangeEnabled => $responseJson->{'autoChangeEnabled'},
    autoChangeNextPassword => $responseJson->{'autoChangeNextPassword'},
    requiresApprovalForAccess => $responseJson->{'requiresApprovalForAccess'},
    requiresComment => $responseJson->{'requiresComment'},
    checkOutEnabled => $responseJson->{'checkOutEnabled'},
    checkOutIntervalMinutes => $responseJson->{'checkOutIntervalMinutes'},
    checkOutChangePasswordEnabled => $responseJson->{'checkOutChangePasswordEnabled'},
    proxyEnabled => $responseJson->{'proxyEnabled'},
    sessionRecordingEnabled => $responseJson->{'sessionRecordingEnabled'},
    restrictSshCommands => $responseJson->{'restrictSshCommands'},
    allowOwnersUnrestrictedSshCommands => $responseJson->{'allowOwnersUnrestrictedSshCommands'},
    isDoubleLock => $responseJson->{'isDoubleLock'},
    doubleLockId => $responseJson->{'doubleLockId'},
    enableInheritPermissions => $responseJson->{'enableInheritPermissions'},
    passwordTypeWebScriptId => $responseJson->{'passwordTypeWebScriptId'},
    sitId => $responseJson->{'sitId'},
    enableInheritSecretPolicy => $responseJson->{'enableInheritSecretPolicy'},
    secretPolicyId => $responseJson->{'secretPolicyId'},
    lastHeartBeatStatus => $responseJson->{'lastHeartBeatStatus'},
    lastHeartBeatCheck => $responseJson->{'lastHeartBeatCheck'},
    failedPasswordChangeAttempts => $responseJson->{'failedPasswordChangeAttempts'},
    lastPasswordChangeAttempt => $responseJson->{'lastPasswordChangeAttempt'},
    secretTemplateName => $responseJson->{'secretTemplateName'},
    responseCodes => $responseJson->{'responseCodes'}
) ;

return $secretModel;
}

1;

```

TokenResponse.pm:

```

package TokenResponse;

use warnings;
use strict;

sub new {
    my $class = shift;
    my %options = @_;

    my $self = {
        access_token => undef,
        token_type => undef,
        expires_in => undef,
        %options
    } ;
    bless $self, $class;
}

```

```

    return $self;
}

sub access_token {
    my $self = shift;
    return $self->{access_token};
}

sub token_type {
    my $self = shift;
    return $self->{token_type};
}

sub expires_in {
    my $self = shift;
    return $self->{expires_in};
}

1;

```

ErrorResponse.pm:

```

package ErrorResponse;

use warnings;
use strict;

sub new {
    my $class = shift;
    my %options = @_;

    my $self = {
        errorCode => undef,
        message => undef,
        %options
    };
    bless $self, $class;

    return $self;
}

sub errorCode {
    my $self = shift;
    return $self->{errorCode};
}

sub message {
    my $self = shift;
    return $self->{message};
}

1;

```

SecretModel.pm:

```

package SecretModel;

use warnings;
use strict;

sub new {
    my $class = shift;
    my %options = @_;

    my $self = {
        id => undef,
        name => undef,
        secretTemplateId => undef,
        folderId => undef,
        active => undef,
        items => undef,
        launcherConnectAsSecretId => undef,
    };
    bless $self, $class;

    return $self;
}

1;

```

```

checkOutMinutesRemaining => undef,
checkedOut => undef,
checkOutUserDisplayName => undef,
checkOutUserId => undef,
isRestricted => undef,
isOutOfSync => undef,
outOfSyncReason => undef,
autoChangeEnabled => undef,
autoChangeNextPassword => undef,
requiresApprovalForAccess => undef,
requiresComment => undef,
checkOutEnabled => undef,
checkOutIntervalMinutes => undef,
checkOutChangePasswordEnabled => undef,
proxyEnabled => undef,
sessionRecordingEnabled => undef,
restrictSshCommands => undef,
allowOwnersUnrestrictedSshCommands => undef,
isDoubleLock => undef,
doubleLockId => undef,
enableInheritPermissions => undef,
passwordTypeWebScriptId => undef,
siteId => undef,
enableInheritSecretPolicy => undef,
secretPolicyId => undef,
lastHeartBeatStatus => undef,
lastHeartBeatCheck => undef,
failedPasswordChangeAttempts => undef,
lastPasswordChangeAttempt => undef,
secretTemplateName => undef,
responseCodes => undef,
% o p t i o n s
} ;
bless $self, $class;

return $self;
}

sub id {
    my $self = shift;
    return $self->{id};
}

sub name {
    my $self = shift;
    return $self->{name};
}

sub secretTemplateId {
    my $self = shift;
    return $self->{secretTemplateId};
}

sub folderId {
    my $self = shift;
    return $self->{folderId};
}

sub active {
    my $self = shift;
    return $self->{active};
}

sub items {
    my $self = shift;
    return $self->{items};
}

sub launcherConnectAsSecretId {
    my $self = shift;
    return $self->{launcherConnectAsSecretId};
}

sub checkOutMinutesRemaining {
    my $self = shift;
    return $self->{checkOutMinutesRemaining};
}

```

```
}

sub checkedOut {
    my $self = shift;
    return $self->{checkedOut};
}

sub checkOutUserDisplayName {
    my $self = shift;
    return $self->{checkOutUserDisplayName};
}

sub checkOutUserId {
    my $self = shift;
    return $self->{checkOutUserId};
}

sub isRestricted {
    my $self = shift;
    return $self->{isRestricted};
}

sub isOutOfSync {
    my $self = shift;
    return $self->{isOutOfSync};
}

sub outOfSyncReason {
    my $self = shift;
    return $self->{outOfSyncReason};
}

sub autoChangeEnabled {
    my $self = shift;
    return $self->{autoChangeEnabled};
}

sub autoChangeNextPassword {
    my $self = shift;
    return $self->{autoChangeNextPassword};
}

sub requiresApprovalForAccess {
    my $self = shift;
    return $self->{requiresApprovalForAccess};
}

sub requiresComment {
    my $self = shift;
    return $self->{requiresComment};
}

sub checkOutEnabled {
    my $self = shift;
    return $self->{checkOutEnabled};
}

sub checkOutIntervalMinutes {
    my $self = shift;
    return $self->{checkOutIntervalMinutes};
}

sub checkOutChangePasswordEnabled {
    my $self = shift;
    return $self->{checkOutChangePasswordEnabled};
}

sub proxyEnabled {
    my $self = shift;
    return $self->{proxyEnabled};
}

sub sessionRecordingEnabled {
    my $self = shift;
    return $self->{sessionRecordingEnabled};
}
```

```
sub restrictSshCommands {
  my $self = shift;
  return $self->{restrictSshCommands};
}

sub allowOwnersUnrestrictedSshCommands {
  my $self = shift;
  return $self->{allowOwnersUnrestrictedSshCommands};
}

sub isDoubleLock {
  my $self = shift;
  return $self->{isDoubleLock};
}

sub doubleLockId {
  my $self = shift;
  return $self->{doubleLockId};
}

sub enableInheritPermissions {
  my $self = shift;
  return $self->{enableInheritPermissions};
}

sub passwordTypeWebScriptId {
  my $self = shift;
  return $self->{passwordTypeWebScriptId};
}

sub siteId {
  my $self = shift;
  return $self->{siteId};
}

sub enableInheritSecretPolicy {
  my $self = shift;
  return $self->{enableInheritSecretPolicy};
}

sub secretPolicyId {
  my $self = shift;
  return $self->{secretPolicyId};
}

sub lastHeartBeatStatus {
  my $self = shift;
  return $self->{lastHeartBeatStatus};
}

sub lastHeartBeatCheck {
  my $self = shift;
  return $self->{lastHeartBeatCheck};
}

sub failedPasswordChangeAttempts {
  my $self = shift;
  return $self->{failedPasswordChangeAttempts};
}

sub lastPasswordChangeAttempt {
  my $self = shift;
  return $self->{lastPasswordChangeAttempt};
}

sub secretTemplateName {
  my $self = shift;
  return $self->{secretTemplateName};
}

sub responseCodes {
  my $self = shift;
  return $self->{responseCodes};
}

1;
```





**Note:** The REST API is available as of Secret Server 9.1.

**Note:** To use the REST API you first must enable Webservices. To do so, go to Admin > Configuration general tab. Enabling Webservices simply makes the ASP.NET REST Webservices built into Secret Server available.

**Note:** For a full reference of the REST endpoints and parameters, see the [REST API Guide](#).

**Note:** When using the API to search secrets, the account used must have at least "view" permissions on the full folder path to find the secret.

**Note:** Secret Server Cloud exclusively supports TLS 1.2. This version includes fixes for known vulnerabilities in older TLS versions and will eventually be required for PCI compliance. The following will need to be added to the top of your scripts because PowerShell defaults to TLS 1.0: `[Net.ServicePointManager]::SecurityProtocol = [Net.SecurityProtocolType]::Tls12`

**Note:** Secret Server Cloud API users: If Delinea One is enabled, *and* an API user logging on has an email address set in Secret Server, the user *must* use the Delinea One password, instead of the local Secret Server password. Using a local account password will fail. Use one of these workarounds:

- Disable Delinea One, if not needed
- Use the Delinea One password instead
- Use a user account that does not have an email address in Secret Server

## Authentication

See [Authenticating](#) for creating a token to use in the script examples below.

## Searching Secrets

```
try
{
    $api = "https://<Secret Server URL>/api/v1"
    $token = "<TOKEN>"

    $headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
    $headers.Add("Authorization", "Bearer $token")

    $filters = "?filter.HeartbeatStatus=1&filter.includeRestricted=true&filter.searchtext=< mySearchText >"

    Write-Host "-----"
    Write-Host "----- Secret Search Values -----"
    Write-Host "-----"

    #?filter.searchfield=username&filter.searchfield=displayname&filter.searchfield=filter.searchText=mister&filter.includeinactive=true" -Headers $headers

    $result = Invoke-RestMethod "$api/secrets/$filters" -Headers $headers

    Write-Host $result.filter.searchField
    Write-Host $result.total

    foreach($secret1 in $result.records)
    {
        Write-Host $secret1.id - "$secret1.name" - "$secret1.folderId - $secret1.lastHeartBeatStatus"
    }

    Write-Host "-----"
    Write-Host "----- Secret Lookup Values -----"
    Write-Host "-----"

    #?filter.searchfield=username&filter.searchfield=displayname&filter.searchfield=filter.searchText=mister&filter.includeinactive=true" -Headers $headers

    $result = Invoke-RestMethod "$api/secrets/lookup/$filters" -Headers $headers

    Write-Host $result.filter.searchField
```

```

Write-Host $result.total

foreach($secret in $result.records)
{
    Write-Host $secret.id" - "$secret.value
}
Write-Host "-----"
}
catch [System.Net.WebException]
{
    Write-Host "----- Exception -----"
    Write-Host $_.Exception
    Write-Host $_.Exception.Response.StatusCode
    Write-Host $_.Exception.Response.StatusDescription
    $result = $_.Exception.Response.GetResponseStream()
    $reader = New-Object System.IO.StreamReader($result)
    $reader.BaseStream.Position = 0
    $reader.DiscardBufferedData()
    $responseBody = $reader.ReadToEnd() | ConvertFrom-Json
    Write-Host $responseBody.errorCode " - " $responseBody.message
    foreach($ModelState in $responseBody.modelState)
    {
        $ModelState
    }
}
}

```

## Creating a Secret

```

try
{
    $site = "https://<Secret Server URL>"
    $api = "$site/api/v1"

    $token = "<TOKEN>"

    $headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
    $headers.Add("Authorization", "Bearer $token")

    #stub
    $templateId = 6001
    $secret = Invoke-RestMethod $api"/secrets/stub?filter.secrettemplateid=$templateId" -Headers $headers

    #modify
    $timestamp = Get-Date

    $secret.name = "$timestamp"
    $secret.secretTemplateId = $templateId
    $secret.AutoChangeEnabled = $true
    $secret.autoChangeNextPassword = "NextpA$$w0rd"
    $secret.SiteId = 1

    $secret.IsDoubleLock = $true

    foreach($item in $secret.items)
    {
        if($item.fieldName -eq "Domain")
        {
            $item.itemValue = "theDomain"
        }
        if($item.fieldName -eq "Username")
        {
            $item.itemValue = "myaccountname"
        }
        if($item.fieldName -eq "Password")
        {
            $item.itemValue = "!@#ssword1"
        }
        if($item.fieldName -eq "Notes")
        {
            $item.itemValue = "TheNotes"
        }
    }
}

$secretArgs = $secret | ConvertTo-Json

```

```
#create
Write-Host ""
Write-Host "-----Create secret -----"

$secret = Invoke-RestMethod $api"/secrets/" -Method Post -Body $secretArgs -Headers $headers -ContentType "application/json"

$secret1 = $secret | ConvertTo-Json
Write-Host $secret1
Write-Host $secret.id
}
catch [System.Net.WebException]
{
    Write-Host "----- Exception -----"
    Write-Host $_.Exception
    Write-Host $_.Exception.Response.StatusCode
    Write-Host $_.Exception.Response.StatusDescription
    $result = $_.Exception.Response.GetResponseStream()
    $reader = New-Object System.IO.StreamReader($result)
    $reader.BaseStream.Position = 0
    $reader.DiscardBufferedData()
    $responseBody = $reader.ReadToEnd()

    Write-Host $responseBody
}
}
```

## Editing a Secret

```
try
{
    $site = "https://<Secret Server URL>"
    $api = "$site/api/v1"

    $token = "<TOKEN>"

    $headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
    $headers.Add("Authorization", "Bearer $token")

    #get
    $secretId = 45
    $secret = Invoke-RestMethod $api"/secrets/$secretId/" -Headers $headers

    #modify
    $timestamp = Get-Date

    $secret.Active = $true
    $secret.Name = "Updated Secret$timestamp.Ticks"
    $secret.folderId = 1101
    $secret.LauncherConnectAsSecretId = -1
    $secret.AutoChangeEnabled = $false
    $secret.RequiresComment = $false
    $secret.CheckOutEnabled = $false
    $secret.CheckOutIntervalMinutes = 17
    $secret.CheckOutChangePasswordEnabled = $true
    $secret.ProxyEnabled = $true
    $secret.SessionRecordingEnabled = $true
    $secret.PasswordTypeWebScriptId = -1
    $secret.SiteId = 1
    $secret.EnableInheritSecretPolicy = $false
    $secret.SecretPolicyId = -1
    $secret.AutoChangeNextPassword = "pass1232"

    $secretArgs = $secret | ConvertTo-Json

    #update
    Write-Host ""
    Write-Host "-----Update secret -----"

    $secret = Invoke-RestMethod $api"/secrets/$secretId/" -Method Put -Body $secretArgs -Headers $headers -ContentType "application/json"

    $secretUpdate = $secret | ConvertTo-Json
    Write-Host $secretUpdate
}
catch [System.Net.WebException]
{
    Write-Host "----- Exception -----"
}
```

```

Write-Host $_.Exception
Write-Host $_.Exception.Response.StatusCode
Write-Host $_.Exception.Response.StatusDescription
$result = $_.Exception.Response.GetResponseStream()
$reader = New-Object System.IO.StreamReader($result)
$reader.BaseStream.Position = 0
$reader.DiscardBufferedData()
$responseBody = $reader.ReadToEnd()

Write-Host $responseBody
}

```

## Checking in a Secret

```

try
{
    $site = "https://<Secret Server URL>"
    $api = "$site/api/v1"

    $token = "<TOKEN>"

    $headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
    $headers.Add("Authorization", "Bearer $token")

    $secretId = 3803
    #SecretArgs are only required as needed for the REST endpoint. ForceCheckIn may be relevant if the secret has been checked out by another user since you will need to
    force checkin to use the secret. This removes the other user's checkin and rotates the password if the secret is configured to do so.
    $secretArgs = @{
        #DoubleLockPassword
        #TicketNumber
        #TicketSystemId
        #Comment ="Passing a comment"
        #ForceCheckIn = $false
        #ExposeFieldValues
        #IncludeInactive
    } ConvertTo-Json

    $secret = Invoke-RestMethod $api"/secrets/$secretId/check-in" -Method Post -Body $secretArgs -Headers $headers -ContentType "application/json"

    Write-Host $secret
    Write-Host $secret[0].message
    Write-Host $secret[0].code

    Write-Host "Name: " = $secret.name
    Write-Host "Active: " = $secret.active
    Write-Host "Template: " = $secret.secretTemplateName
    Write-Host "Heartbeat Status: " = $secret.lastHeartBeatStatus
    Write-Host "RPC" = $secret.lastPasswordChangeAttempt
    Write-Host "Checkout" = $secret.CheckedOut
    Write-Host "Checkout User" = $secret.CheckOutUserDisplayName
}
catch [System.Net.WebException]
{
    Write-Host "----- Exception -----"
    Write-Host $_.Exception
    Write-Host $_.Exception.Response.StatusCode
    Write-Host $_.Exception.Response.StatusDescription
    $result = $_.Exception.Response.GetResponseStream()
    $reader = New-Object System.IO.StreamReader($result)
    $reader.BaseStream.Position = 0
    $reader.DiscardBufferedData()
    $responseBody = $reader.ReadToEnd()

    Write-Host $responseBody
}
}

```

## Deleting a Secret

```

try
{
    $site = "https://<Secret Server URL>"
    $api = "$site/api/v1"

    $token = "<TOKEN>"

```

```
$headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
$headers.Add("Authorization", "Bearer $token")

$secretId = 11231

Write-Host "----- Delete a Secret -----"

$timestamp = Get-Date

$deletemodel = Invoke-RestMethod "$api/secrets/$secretId" -Headers $headers -Method DELETE -ContentType "application/json"
Write-Host $deletemodel
}
catch [System.Net.WebException]
{
    Write-Host "----- Exception -----"
    Write-Host $_.Exception
    Write-Host $_.Exception.Response.StatusCode
    Write-Host $_.Exception.Response.StatusDescription
    $result = $_.Exception.Response.GetResponseStream()
    $reader = New-Object System.IO.StreamReader($result)
    $reader.BaseStream.Position = 0
    $reader.DiscardBufferedData()
    $responseBody = $reader.ReadToEnd() | ConvertFrom-Json
    Write-Host $responseBody.errorCode " - " $responseBody.message
    foreach($ModelState in $responseBody.modelState)
    {
        $ModelState
    }
}
```

## Creating a User

```
try
{
    $site = "https://<Secret Server URL>"
    $api = "$site/api/v1"

    $token = "<TOKEN>"

    $headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
    $headers.Add("Authorization", "Bearer $token")

    # create user
    Write-Host ""
    Write-Host "----- Create a User -----"

    $timestamp = Get-Date
    $userCreateArgs = @{
        userName = "newuser$timestamp"
        password = "faW1fs@3S@"
        DisplayName = "new user$timestamp"
        enabled = $true
        emailAddress = "newuser$timestamp@v.com"
        twoFactor = $false
        radiusUserName = "aRadiusName"
        radiusTwoFactor = $false
        DomainId = 1
        isApplicationAccount = $true
    } | ConvertTo-Json

    $user = Invoke-RestMethod "$api/users" -Headers $headers -Method Post -ContentType "application/json" -Body $userCreateArgs
    Write-Host "New User ID : " $user.id
}
catch
{
    Write-Debug "----- Exception -----"
    Write-Host $_.Exception.Response.StatusCode
    Write-Host $_.Exception.Response.StatusDescription
    $result = $_.Exception.Response.GetResponseStream()
    $reader = New-Object System.IO.StreamReader($result)
    $reader.BaseStream.Position = 0
    $reader.DiscardBufferedData()
    $responseBody = $reader.ReadToEnd() | ConvertFrom-Json
    Write-Host $responseBody.errorCode " - " $responseBody.message
    foreach($ModelState in $responseBody.modelState)
```

```
{
  $ModelState
}
```

## Field Update, Get, File Upload, and Download

**Note:** This script requires Secret Server 10.1 or later.

```
try
{
  $site = "https://<Secret Server URL>"

  #secret id and field to test against
  $secretId = 283;
  $fieldToUpdate = "machine"

  #secretid and file to upload
  $fileSecretId = 283;
  $fileFieldToUpdate = "private-key"

  $token = "<TOKEN>"

  $headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
  $headers.Add("Authorization", "Bearer $token")

  $endpoint = "$site/api/v1/secrets/$secretId/fields/$fieldToUpdate"

  $body = @{
    value = "newhost"
  } | ConvertTo-Json

  echo $endpoint
  echo -----

  echo -----
  echo "Updating Field $fieldToUpdate"

  $response = $null
  $response = Invoke-RestMethod -Method Put -Uri $endpoint -Headers $headers -ContentType "application/json" -Body $body
  echo $response;

  echo -----
  echo "Getting value from $fieldToUpdate"

  $response = $null
  $response = Invoke-RestMethod -Method Get -Uri $endpoint -Headers $headers
  echo $response;

  echo -----
  echo "Uploading file from $fileFieldToUpdate"

  $endpoint = "$site/api/v1/secrets/$fileSecretId/fields/$fileFieldToUpdate"
  echo $endpoint

  $secretArgs = @{
    fileName = "test.pem"
    fileAttachment = [IO.File]::ReadAllBytes("C:\temp\test.pem")
  } | ConvertTo-Json

  $response = $null
  $response = Invoke-RestMethod -Method Put -Uri $endpoint -Headers $headers -Body $secretArgs -ContentType "application/json"

  echo $response

  echo -----
  echo "Downloading file from $fileFieldToUpdate"
  echo $endpoint

  $response = $null
  $response = Invoke-RestMethod -Method Get -Uri $endpoint -Headers $headers #-OutFile "c:\temp\outfile2.pem"

  Write-Host $response.Length
  Write-Host $response
```

```

echo -----
}
catch [System.Net.WebException]
{
    Write-Host "----- Exception -----"
    Write-Host $_.Exception
    Write-Host $_.Exception.Response.StatusCode
    Write-Host $_.Exception.Response.StatusDescription
    $result = $_.Exception.Response.GetResponseStream()
    $reader = New-Object System.IO.StreamReader($result)
    $reader.BaseStream.Position = 0
    $reader.DiscardBufferedData()
    $responseBody = $reader.ReadToEnd()
    Write-Host $responseBody.errorCode " - " $responseBody.message
    foreach($modelState in $responseBody.modelState)
    {
        $modelState
    }
}
}

```

## Expiring a Token

**Note:** This script requires Secret Server 10.1 or later.

```

try
{
    $site = "https://<Secret Server URL>"
    $api = "$site/api/v1"

    $token = "<TOKEN>"

    $headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
    $headers.Add("Authorization", "Bearer $token")

    foreach($user in $pagedUsers.records)
    {
        Write-Host $user.userName
    }

    # expire token
    Write-Host ""
    Write-Host "----- Expire Token -----"

    $expireToken = Invoke-RestMethod "$site/api/v1/oauth-expiration" -Headers $headers -Method Post

    # This part should fail with a 403 Forbidden
    Write-Host ""
    Write-Host "----- Expect an error -----"

    $secrets = Invoke-RestMethod "$site/api/v1/secrets" -Headers $headers
}
catch [System.Net.WebException]
{
    Write-Host "----- Exception -----"
    Write-Host $_.Exception
    Write-Host $_.Exception.Response.StatusCode
    Write-Host $_.Exception.Response.StatusDescription
    $result = $_.Exception.Response.GetResponseStream()
    $reader = New-Object System.IO.StreamReader($result)
    $reader.BaseStream.Position = 0
    $reader.DiscardBufferedData()
    $responseBody = $reader.ReadToEnd()
    Write-Host $responseBody.errorCode " - " $responseBody.message
    foreach($modelState in $responseBody.modelState)
    {
        $modelState
    }
}
}

```

## Managing Folders (Basic)

**Note:** This script requires Secret Server 10.1 or later.

```

$uri = "https://<Secret Server URL>"
$api = "$uri/api/v1"

$token = "<TOKEN>"

$headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
$headers.Add("Authorization", "Bearer $token")

#Get Folder Stub
$folderStub = Invoke-RestMethod $api"/folders/stub" -Method GET -Headers $headers -ContentType "application/json"

##### Add Folder #####

$timeStamp = Get-Date
$folderStub.folderName = "Rest Folder" + $timeStamp
$folderStub.folderTypeId = 1
$folderStub.inheritPermissions = $false
$folderStub.inheritSecretPolicy = $false

$folderArgs = $folderStub | ConvertTo-Json

$folderAddResult = Invoke-RestMethod $api"/folders" -Method POST -Body $folderArgs -Headers $headers -ContentType "application/json"
$folderId = $folderAddResult.id

if($folderId -gt 1)
{
    echo ""
    echo "-----"
    echo "--Add Folder Successful--"
    echo "-----"
    echo ""
    echo $folderAddResult | ConvertTo-Json
}
else
{
    Write-Error "ERROR: Failed to Add a folder."
    return
}

##### Delete Folder #####

#DeleteFolder is not implemented. Must be done through the UI.
echo ""
echo "-----"
echo "--Delete Folder Not Implemented--"
echo "-----"
echo ""

##### Get Folder #####

$folderGetResult = Invoke-RestMethod $api"/folders/$folderId" -Method GET -Headers $headers -ContentType "application/json"

if($folderGetResult.id -eq $folderId)
{
    echo ""
    echo "-----"
    echo "--Get Folder Successful--"
    echo "-----"
    echo ""
    echo $folderGetResult | ConvertTo-Json
}
else
{
    Write-Error "ERROR: Failed to Get a folder."
    return
}

##### Add Child Folder #####

$timeStamp = Get-Date
$folderStub.folderName = "Rest Child Folder" + $timeStamp
$folderStub.folderTypeId = 1
$folderStub.inheritPermissions = $false
$folderStub.inheritSecretPolicy = $false
$folderStub.parentFolderId = $folderGetResult.id

```



```
$folderArgs = $folderStub | ConvertTo-Json
```

```
$folderChildAddResult = Invoke-RestMethod $api"/folders" -Method POST -Body $folderArgs -Headers $headers -ContentType "application/json"
$childFolderId = $folderChildAddResult.id
```

```
if($childFolderId -gt 1)
{
    echo ""
    echo "-----"
    echo "--Add Child Folder Successful--"
    echo "-----"
    echo ""
    echo $folderChildAddResult | ConvertTo-Json
}
else
{
    Write-Error "ERROR: Failed to Add a Child folder."
    return
}
```

```
##### Update Folder #####
```

```
$childFolderId = $folderChildAddResult.id
$childFolderGetResult = Invoke-RestMethod $api"/folders/$childFolderId" -Method GET -Headers $headers -ContentType "application/json"
```

```
$foldername = "UpdatedFolderNAME"
$childFolderGetResult.folderName = $foldername
$childFolderGetResult.folderTypeId = 1
$childFolderGetResult.inheritPermissions = $true
$childFolderGetResult.inheritSecretPolicy = $false
```

```
$childFolderUpdateArgs = $childFolderGetResult | ConvertTo-Json
```

```
$childFolderUpdateResult = Invoke-RestMethod $api"/folders/$childFolderId" -Method PUT -Body $childFolderUpdateArgs -Headers $headers -ContentType "application/json"
```

```
if($childFolderUpdateResult.folderName -eq $foldername)
{
    echo ""
    echo "-----"
    echo "--Update Folder Successful--"
    echo "-----"
    echo ""
    echo $childFolderUpdateResult | ConvertTo-Json
}
else
{
    Write-Error "ERROR: Failed to Update a folder."
    return
}
```

```
##### Search Folders #####
```

```
$searchFilter = "?filter.searchText=UpdatedFolderNAME"
```

```
$searchResults = Invoke-RestMethod $api"/folders$searchFilter" -Method GET -Headers $headers -ContentType "application/json"
$folder = $searchResults.records[0]
echo $searchResults
echo $folder
```

```
$name = "UpdatedFolderNAME"
if($searchResults.total -gt 0 -and $folder.folderName -eq $name)
{
    echo ""
    echo "-----"
    echo "--Search Folder Successful--"
    echo "-----"
    echo ""
    echo $group
}
else
{
    Write-Error "ERROR: Failed to Search Folders."
    return
}
```

```
##### Lookup Groups #####

$lookupFilter = "?filter.searchText=Updated"

$lookupResults = Invoke-RestMethod $api"/folders/lookup$lookupFilter" -Method GET -Headers $headers -ContentType "application/json"
$folder = $lookupResults.records[0]
echo $lookupResults
echo $folder

if($searchResults.total -gt 0 -and $folder.value -eq $name)
{
    echo ""
    echo "-----"
    echo "--Lookup Folder Successful--"
    echo "-----"
    echo ""
    echo $folder
}
else
{
    Write-Error "ERROR: Failed to Lookup Folders."
    return
}

##### Add Group To Folder #####

$folderPermissionCreateArgs = Invoke-RestMethod $api"/folder-permissions/stub?filter.folderId=$folderId" -Method GET -Headers $headers -ContentType "application/json"
#To give permissions to a group, populate the GroupId variable and leave UserId $null.
#To give permissions to a user, populate the UserId variable and leave GroupId $null.
$folderPermissionCreateArgs.GroupId = 3
$folderPermissionCreateArgs.UserId = $null
$folderPermissionCreateArgs.FolderAccessRoleName = "Owner"
$folderPermissionCreateArgs.SecretAccessRoleName = "View"

$permissionArgs = $folderPermissionCreateArgs | ConvertTo-Json

$permissionResults = Invoke-RestMethod $api"/folder-permissions" -Method POST -Headers $headers -Body $permissionArgs -ContentType "application/json"
if($permissionResults.FolderId -eq $folderId)
{
    echo ""
    echo "-----"
    echo "--Add Folder Permissions Successful--"
    echo "-----"
    echo ""
    echo $permissionResults
}
else
{
    Write-Error "ERROR: Failed to Add Folder Permissions."
    return
}
$folderPermissionId = $permissionResults.id

##### Remove Group From Folder #####

$permissionDeleteResult = Invoke-RestMethod $api"/folder-permissions/$folderPermissionId" -Method DELETE -Headers $headers -ContentType "application/json"
if($permissionDeleteResult.id -eq $folderPermissionId)
{
    echo ""
    echo "-----"
    echo "--Remove Folder Permissions Successful--"
    echo "-----"
    echo ""
}
else
{
    Write-Error "ERROR: Failed to Remove Folder Permissions."
    return
}
}
```

This code sample demonstrates how to use Python 3 to authenticate to Secret Server, retrieve a secret, and update secret fields and items.

This code uses the "requests" module, which makes it simple to communicate via REST. You can install the requests module by running: `pip install requests`

A token is returned from username and password authentication that is used for all subsequent API calls.

```
import http.client
import urllib
import json
import requests

site = '[Your Secret Server Site]' #ex: http://domain.com/SecretServer
authApi = '/oauth2/token'
api = site + '/api/v1'
token = "<TOKEN>"

#REST call to retrieve a secret by ID
def GetSecret(token, secretId):
    headers = {'Authorization': 'Bearer ' + token, 'content-type': 'application/json'}
    resp = requests.get(api + '/secrets/' + str(secretId), headers=headers)

    if resp.status_code not in (200, 304):
        raise Exception("Error retrieving Secret. %s %s" % (resp.status_code, resp))
    return resp.json()

#REST call method to update the secret on the server
def UpdateSecret(token, secret):
    headers = {'Authorization': 'Bearer ' + token, 'content-type': 'application/json'}
    secretId = secret['id']
    resp = requests.put(api + '/secrets/' + str(secretId), json=secret, headers=headers)

    if resp.status_code not in (200, 304):
        raise Exception("Error updating Secret. %s %s" % (resp.status_code, resp))
    return resp.json()

#Retrieves the secret item by its "slug" value
def GetItemBySlug(secretItems, slug):
    for x in secret['items']:
        if x['slug'] == slug:
            return x
    raise Exception("Item not found for slug: %s" % slug)

#Updates the secret item on the secret with the updated secret item
def UpdateSecretItem(secret, updatedItem):
    secretItems = secret['items']
    for x in secretItems:
        if x['itemId'] == updatedItem['itemId']:
            x.update(updatedItem)
            return
    raise Exception("Secret item not found for item id: %s" % str(updatedItem['itemId']))

#Get secret with ID = 1
print("Retrieving Secret with id: 1...")
secret = GetSecret(token, 1)
print("Secret Name: " + secret['name'])
print("Secret ID: " + str(secret['id']))
print("Active: " + str(secret['active']))

#Get the "Notes" secret item
notesItem = GetItemBySlug(secret, 'notes')
print("Notes secret field value: %s" % notesItem['itemValue'])
print()

#Change value of "Notes" secret item
print("Updating secret...")
notesItem.update({'itemValue': 'New Notes Value'})
UpdateSecretItem(secret, notesItem)
print("Secret updated.")
print()
```


```
#Change secret values
updateValues = {'name':'Updated Secret Name' }
secret.update(updateValues)
updatedSecret = UpdateSecret(token, secret)
notesItem = GetItemBySlug(updatedSecret, 'notes')
print("Updated Secret Name: " + updatedSecret['name'])
print("Notes secret field value: %s" % notesItem['itemValue'])
```

## Overview

The Secret Server REST API guides are version specific. In fact, they are automatically generated when a Secret Server version is created. Thus, to ensure you have the correct guides *for* your Secret Server version, it is best (but not required) to access the documentation *from* that version of Secret Server; however there are many reasons why this might not be practical, so we provide download links below.

## Accessing the Guides

To access the guides:

1. For Secret Server versions 10.5.3 and later with the new user interface, click the  icon in the top right of the dashboard and click **Secret Server REST API Guide**. The Secret Server REST API Guide page appears.
2. Accessing Secret Server through the API and scripts can be powerful mechanism but ensure you are following best practices with the account and access for any script connecting to Secret Server. The Secret Server Software Development Kit for DevOps is recommended for all automated or machine-to-machine scripts. If not using the SDK, creating an application account for the script access and limiting the permissions both from Role perspective and on Secret themselves is security best practice.
3. On the Secret Server REST API page of your instance, click the link for one of the three guides:
  - **Documentation for REST API using bearer token authentication:** Hyperlinked documentation for REST API access using token authentication.
  - **Documentation for token authentication:** Instructions for getting an authentication token.
  - **Documentation for REST API using Windows integrated authentication:** Hyperlinked documentation for REST API access using Integrated Windows Authentication (IWA).

## Downloading the Guides

**Note:** Only use the following links if you cannot easily access a guide from a version of Secret Server. There is a possibility the guides below are not the most current versions.

### Current Version

Click the  icon in the top right of the dashboard and click **Secret Server REST API Guide**. The Secret Server REST API Guide page appears.

**Note:** You can also go to **Admin > REST API Guide**.

### Version Archive

- [Secret Server 11.4.000002 REST API Guide](#)
- [Secret Server 11.3.000003 REST API Guide](#)
- [Secret Server 11.1.000007 REST API Guide](#)
- [Secret Server 11.0.000008 REST API Guide](#)
- [Secret Server 11.0.000007 REST API Guide](#)
- [Secret Server 11.0.000006 REST API Guide](#)
- [Secret Server 10.9.000064 REST API Guide](#)
- [Secret Server 10.9.000033 REST API Guide](#)
- [Secret Server 10.8.000000 REST API Guide](#)
- [Secret Server 10.7.000000 REST API Guide](#)
- [Secret Server 10.6.000000 REST API Guide](#)

- [Secret Server 10.5.000000 REST API Guide](#)
- [Secret Server 10.4.000000 REST API Guide](#)
- [Secret Server 10.3.000000 REST API Guide](#)
- [Secret Server 10.2.000000 REST API Guide](#)
- [Secret Server 10.1.000000 REST API Guide](#)

## Overview

Manipulating the Secret Server API via scripts is very handy and powerful but also potentially dangerous, so it is critical to follow best practices to ensure robust security. This topic discusses these best practices. We recommend the Secret Server Software Development Kit for DevOps for all automated or machine-to-machine scripts. If not using the SDK, we strongly recommend creating an application account for script access and limiting permissions via both roles and the secrets themselves.

## Best Practices

For security, it is critical that you:

- Do not use admin accounts.
- Use a least-privilege account, limiting role and secret access permissions.
- Never store passwords or tokens in plain text. Use secure credentials instead—see below for details.
- Use a least-privilege application account. These are restricted from logging in the UI.
- Never use domain admin credentials in an automated script.
- Create a specific service account with only the permissions needed to get the task done.
- Always expire tokens. To expire tokens, navigate to the **Admin > Configuration > Application** and enable **Session Timeout for Webservices**, setting the timeout to a short period, the default is 20 mins.

## Authentication Methods

### Scripts Run by Automated Processes

Recommended methods:

- Secret Server Software Development Kit for DevOps (SDK). The SDK is a great way to limit access to a specific client with encrypted credentials and IP restrictions. See [Secret Server Software Development Kit for DevOps](#) for more information.
- Integrated Windows Authentication (IWA).

### Specific User Use Cases with Script Augmentation

Recommended methods:

- Get credentials with two-factor authentication (2FA). This is a secure way to prompt users for credentials for manually run scripts.
- Prompt with 2FA. This prompts the user for script credentials.
- IWA.

**Not Recommended method:**

- API token from the UI with 2FA.

**Note:** If your account is secured with 2FA, use the `-UseTwoFactor` switch to be prompted for your two-factor OTP code.

## Example Credential-Access Scripts

### Recommended Methods

#### Get-Credential with 2FA

```
$Application = "https://<Secret Server URL>"

function Get-Token
{
[CmdletBinding()]
param (
    $credentials,
    [Switch] $UseTwoFactor
)

$creds = @{
    username = $credentials.UserName
    password = $credentials.GetNetworkCredential().Password
    grant_type = "password"
} ;

$headers = $null
If ($UseTwoFactor) {
    $headers = @{
        "OTP" = (Read-Host -Prompt "Enter your OTP for 2FA: ")
    }
}

try
{
    $response = Invoke-RestMethod "$Application/oauth2/token" -Method Post -Body $creds -Headers $headers;
    $token = $response.access_token;
    return $token;
}
catch
{
    $result = $_.Exception.Response.GetResponseStream();
    $reader = New-Object System.IO.StreamReader($result);
    $reader.BaseStream.Position = 0;
    $reader.DiscardBufferedData();
    $responseBody = $reader.ReadToEnd() | ConvertFrom-Json
    Write-Host "ERROR: $($responseBody.error)"
    return ;
}
}

$token = Get-Token -credentials (Get-Credential) -UseTwoFactor
```

## Prompting for Credentials with 2FA

```
$Application = "https://<Secret Server URL>"

function Get-Token
{
[CmdletBinding()]
param (
    [Switch] $UseTwoFactor
)

$creds = @{
    username = Read-Host -Prompt "Enter your username: "
    password = Read-Host -Prompt "Enter your password: "
    grant_type = "password"
} ;

$headers = $null
If ($UseTwoFactor) {
    $headers = @{
        "OTP" = (Read-Host -Prompt "Enter your OTP for 2FA: ")
    }
}

try
{
    $response = Invoke-RestMethod "$Application/oauth2/token" -Method Post -Body $creds -Headers $headers;
    $token = $response.access_token;
    return $token;
}
catch
{
}
```



```
$result = $_.Exception.Response.GetResponseStream();
$reader = New-Object System.IO.StreamReader($result);
$reader.BaseStream.Position = 0;
$reader.DiscardBufferedData();
$responseBody = $reader.ReadToEnd() | ConvertFrom-Json
Write-Host "ERROR: $($responseBody.error)"
return ;
}
```

\$token = Get-Token -UseTwoFactor

## Integrated Windows Authentication

**Note:** Secret Server Cloud does not support IWA.

```
$api = "https://<Secret Server URL>/winauthwebservice/api/v1"
$endpoint = "$api/secrets/3844"
$secret = Invoke-RestMethod $endpoint -UseDefaultCredentials
```

**Note:** See [Using Webservices with IWA via PowerShell](#) for more information.

## Deprecated Method

### API token from the UI with 2FA

**Note:** The user must first be set up with 2FA.

```
$application = "https://<Secret Server URL>"
$token = "<TOKEN>"
```

```
$headers = @{}
$headers.Add("Authorization", "Bearer $token")
```

1. From the Secret Server REST API page of your instance, select one of the following token authentication methods for user scripts:
  - Bearer token authentication
  - Token authentication
  - Windows integrated Authentication
2. Generate a token from your user preferences in Secret Server. Use this as a bearer token in user scripts.
3. Click the user-initials button on the top right of the page and select **User Preferences**. The User Preferences page appears:

User Preferences

General

Settings

Security

## General Information

This section contains general information about your user account within your organization's framework. The information in this section cannot be edited on this page. To update your display name, username, or email, please contact your administrator.

Display Name	Will Sprunk
Username	wsprunk@gamma.thycotic.com
Email	None
Domain	gamma.thycotic.com
Last Login	15 minutes ago

## API Token

Create an API Token for use in scripts.

[Generate API Token and Copy to Clipboard](#)

## Password Settings

Change your local user password used to log in to Secret Server, or make changes to your user account's DoubleLock password.

[Create DoubleLock Password](#)

4. In the **API Token** section, click on **Generate API Token and Copy to Clipboard**.

5. Paste the token text into the script.

## Downloading Example Scripts

Example Scripts:

- [PowerShell Examples](#)

**Note:** For REST API Client Generation (Advanced), please see [REST API Client Generation with OpenAPI Swagger](#)

## Overview

This Secret Server Software Development Kit (SDK) for DevOps tool, or simply SDK, was created for securing and streamlining DevOps processes with regard to Secret Server. The SDK for DevOps tool allows you to more efficiently engage Secret Server via a Command Line Interface (CLI) without compromising security. It allows you to securely retrieve credentials from and track access to a secure vault.

The SDK uses the [Secret Server REST API](#). The SDK is a .NET library (available via a NuGet package), which you can use in a custom application. The SDK .NET library exposes a limited subset of the REST API.

**Note:** You can download the current and legacy versions of the API on the [Downloads for Secret Server Software Development Kit for DevOps](#) page.

**Note:** The SDK can run on any version of .NET that supports .NET Standard 2.0 apps including .NET Core 2.0 plus, .NET Framework 4.6.1 plus, .NET 5 plus, and .NET 6 plus.

**Note:** See the [Delinea SDK Integration Doc](#) on GitHub for more information.

There is also a .NET Core CLI SDK Client that uses the SDK .NET library. The SDK Client was created to allow customers to write automation scripts to access secrets without having to write code to directly access the REST API.

The .NET SDK library and the .NET Core CLI client both:

- Automatically store the credentials and remote server in an encrypted file used to acquire an OAuth token. The token is then used to make subsequent API calls. OAuth tokens have an expiration time, which is configurable in the UI on the configuration page via the "Session Timeout for Webservices" value.
- Get the contents of a secret.
- Provide client-side caching (SDK client caching)

Secret Server has user and application accounts. Both types can access Secret Server via the REST API. Application accounts are not counted for licensing purposes. Application account can *only* access Secret Server via the REST API. Both account types never expire. Secret Server provides security for automated clients. SDK rules manage permissions. Client IDs are created when `SecretServerClient.Configure()` or `tss init` is called. The client ID is used to reference SDK client instances.

**Note:** Do not give an Application Account the Administrator Role or give it all of the Role permissions. It is recommended to only assign the minimum roles needed to complete the task, that means create a new Role with only the permissions it needs and only share the secrets needed.

**Note:** For REST API Client Generation (Advanced), please see [REST API Client Generation with OpenAPI Swagger](#)

**Note:** We have a [Python SDK](#) that is independent of the SDK .NET library. It allows a Python script to access secrets without requiring REST knowledge. It has access to a small subset of the REST API.

## How It Works

The SDK is a console application written in .NET Core that wires up its own credentials based on the machine it is installed on. Those credentials, called "DevOps Users", do not have any rights in Secret Server but can be assigned to other Secret Server users or application user accounts, mimicking permissions to access secrets.

This removes the widespread DevOps issues with hard coding credentials into scripts and configuration files. Instead, the target system is registered via IP address that is white listed, which provides REST authentication without entering user credentials. You can use the SDK to retrieve a REST user token for our REST API, or you can use the SDK to perform direct queries on Secret Server.

In summary, the SDK establishes secure access points so that power users can employ the Secret Server API directly from the CLI, without

wasting time entering privileged account passwords.

## Configuration Overview

Secret Server exposes a REST API interface that is used by the SDK client. When the SDK sends a REST request, Secret Server determines where the request came from (via IP address) and what permissions it should be granted (via a rule set in Secret Server). Thus, once the client is initialized with the Secret Server and the rule name, that configuration is stored and encrypted on the client, ready for subsequent calls.

Out of the box, the SDK offers:

- token retrieval
- secret retrieval
- secret field retrieval

**Note:** We expect to expand the SDK's capabilities over time to allow even greater access to the REST API.

The SDK requires setup in two areas: Secret Server configuration and SDK installation on the DevOps system.

## Required Roles and Permissions

- **Administer Configuration:** Allows a user to enable SDK functionality in Secret Server, that is, to enable webservice and enable the SDK itself.
- **Administer Users:** Allows a user to use the SDK to retrieve account credentials on client machines. Alternatively, you can be the owner of the application account used by the SDK.
- **Administer Create Users:** Allows a user to access the **Admin > SDK Client Management** page in Secret Server.

## Setup Procedure

### Task 1: Configuring Secret Server

Configure Secret Server for communication with the SDK:

1. Navigate to **Admin > Configuration**.
2. Click the **General** tab.
3. Click the **Edit** button.
4. Click to select the **Enable Webservices** check box in the **Application Settings** section.
5. Click the **Save** button.
6. Select and setup any application accounts that you want for use by SDK clients. Make sure these application accounts have appropriate permissions to access any secrets or execute any operations the client host needs to perform. To create a new account with the needed permissions:
  1. Go to **Admin > Users**.
  2. Click the **Create New** button. The Edit User page appears:

## Edit User

User Name

Display Name

Email Address

Domain

Local

▼

Password

Confirm

Two Factor

< None >

▼

Enabled

☒

Locked Out

☐

[Advanced](#)

Save

Cancel

3. Type the account name in the **User Name** and **Display Name** text boxes.
4. Type a password in the **Password** and **Confirm** text boxes. Record the password for future use.
5. Click the **Advanced** link. The Advance section appears:

[Advanced](#)

Application Account

☐

As an application account, the user will only be able to log in through the Application Account API and will not require a separate user license. (See [KB Article](#))

Managed By

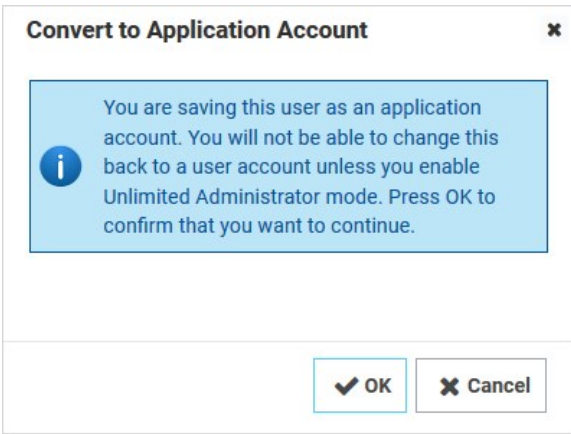
User Administrators

▼

Save

Cancel

6. Click to select the **Application Account** check box.
7. Click the **Save** button. A confirmation popup appears.



8. Click the **OK** button. The View User page appears:

View User

User Name

DevOps1

Display Name

DevOps1

Email Address

Domain

Local

Two Factor

< None >

Enabled

Yes

Locked Out

No

Application Account

Yes

IP Address Restrictions

None

Restricted By Team

No

GROUPS FOR USER

There are no groups for this user.

ROLES FOR USER

Save To File < 1 to 1 of 1 >

ROLE NAME

User

Back

Edit

View Audit

Change IP Restrictions

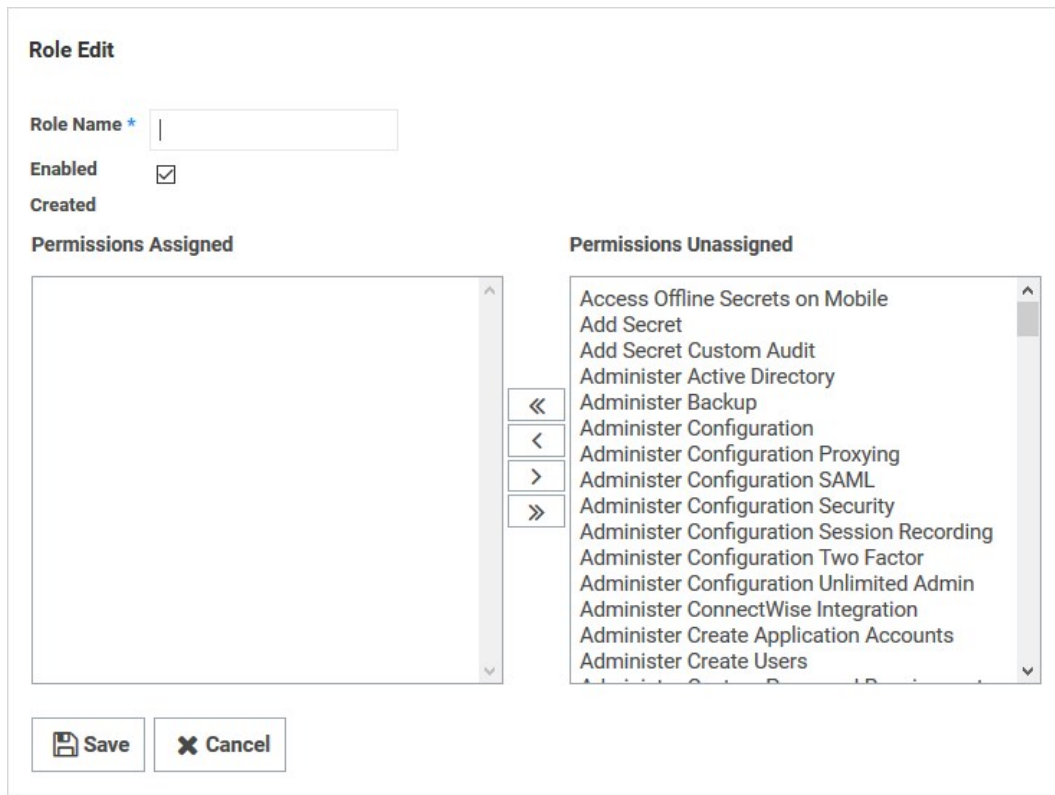
Assign Groups

Assign Roles

Configure Secret Template Permissions

7. Create a new role:

1. Go to **Admin > Roles**.
2. Click the **Create New** button. The Role Edit page appears:



**Role Edit**

**Role Name \***

**Enabled** ☒

**Created**

**Permissions Assigned**

**Permissions Unassigned**

Access Offline Secrets on Mobile  
Add Secret  
Add Secret Custom Audit  
Administer Active Directory  
Administer Backup  
Administer Configuration  
Administer Configuration Proxying  
Administer Configuration SAML  
Administer Configuration Security  
Administer Configuration Session Recording  
Administer Configuration Two Factor  
Administer Configuration Unlimited Admin  
Administer ConnectWise Integration  
Administer Create Application Accounts  
Administer Create Users

3. Type the new role name in the **Role Name** text box.

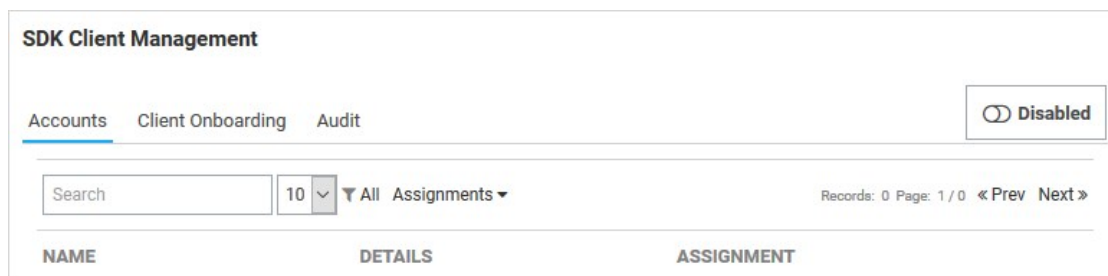
4. Assign the **View Secret** permission to that role. The permission appears in the Permissions Assigned text box. You can add additional permissions later as needed.

5. Click the **Save** button. The new role appears in the Roles table.

8. Enable SDK management:

1. Go **Admin > See All**. The admin panel appears.

2. Type SDK in the **Search** text box and select **SDK Client Management**. The SDK Client Management page appears:



**SDK Client Management**

**Accounts** **Client Onboarding** **Audit**

10

Records: 0 Page: 1 / 0 « Prev Next »

NAME	DETAILS	ASSIGNMENT
------	---------	------------

3. Click the **Disabled** toggle button to change it to **Enabled**.

9. Set up a SDK client rule:

1. Click the **Client Onboarding** tab.



SDK Client Management

Accounts

Client Onboarding

Audit

☒ Enabled

10 ▾

▾ All Assignments ▾

Records: 0 Page: 1 / 0 « Prev Next »

NAME	DETAILS	ASSIGNMENT	REQUIRE THIS GENERATED ONBOARDING KEY
<div>+ Rule</div>			

- Click the **+ Rule** link. A new rule appears:

SDK Client Management

Accounts

Client Onboarding

Audit

☒ Enabled

10 ▾

▾ All Assignments ▾

Records: 0 Page: 1 / 0 « Prev Next »

NAME	DETAILS	ASSIGNMENT	REQUIRE THIS GENERATED ONBOARDING KEY
<input type="text" value="Rule Name"/>	<input type="text" value="IPv4 Address, or CIDR notation"/>	<div>Not Selected ▾</div>	<div> <input type="checkbox"/> Require this generated onboarding key                             </div> <div> <div>Save</div> <div>Cancel</div> </div>

- Type a short, unique name in the **Rule Name** text box. Clients must provide a valid rule name when connecting. For example: ProductionWebApp.
- Type an IPV 4 address or address range (in CIDR notation) in the **Details** text box. Secret Server will only allow clients to use this rule if they connect from a valid IP address. If not provided, Secret Server will not enforce IP address restrictions on this rule. We strongly recommend using this feature.
 

**Note:** There is a 250-character limit, so you can only add a few dozen IP addresses unless you use CIDR notation.
- Click to select the application account you created earlier in the **Assignment** dropdown list. Clients are granted the same permissions as this account within Secret Server. If not provided, an account will be automatically created for clients, but will have no default permissions. You must use an application account (the one you created) for a rule. Application accounts are restricted from logging into the system through the normal user interface and do not count towards your license quota.
- Click to select the **Require this generated onboarding key** check box. Clients must provide a generated additional key string when authenticating. If not provided, Secret Server allow any client to use the rule if its IP address is within the specified range. We strongly recommend using this feature.
- Click the **Save** button. The Show Key link appears.
- Click the **Show Key** link to save the generated onboarding key (something like TFyORLL1teQmD8OAMstqKGWkJGksFRtaelY0b2NnhsM=) for future use. It will not be visible again.

**Note:** If you cannot copy the key text after selecting it, you probably need to add the Secret Server Utilities extension for your

browser. For now, just manually copy it.

## Task 2: Installing the SDK Client

**Note:** This requires Secret Server version 10.4+ or Secret Server Cloud

**Note:** IWA is not supported by the SDK.

**Note:** The SDK can run on any version of .NET that supports .NET Standard 2.0 apps including .NET Core 2.0 plus, .NET Framework 4.6.1 plus, .NET 5 plus, and .NET 6 plus.

1. [Download the SDK](#) for your platform.
2. Unzip the SDK zip file you downloaded.
3. To get the SDK Nuget packages, see our [documentation on GitHub](#).
4. On non-Windows systems, you must make the tss program executable by running `chmod u+x tss`.
5. On Linux systems, you must install libunwind as follows:
  - On Red Hat or Centos, run `sudo yum install libunwind libicu`
  - On Ubuntu, run `sudo apt-get install libunwind-dev`
6. To confirm the SDK client tool is installed and working, run the help:
  - On Windows, run `tss --help`
  - On non-Windows systems, run `./tss --help`

## Task 3: Connecting to Secret Server

Before the client can retrieve data from Secret Server, it must be initialized to connect to the Secret Server instance. This is a one-time operation on the client machine:

Run `tss init --url <url> -r <rule> -k <key>` using the parameters you recorded earlier for your Secret Server instance.

For example, if your parameters are:

- Secret Server is hosted at `https://myserver/SecretServer/`
- You created a rule named `ProductionWebApp`
- Your onboarding key is `CNrQwRBscnq4qAZ6v3EIAcE27vQuLlz6KSpfRJHryyA=`

Then you would run:

```
tss init --url https://myserver/SecretServer/ -r ProductionWebApp -k CNrQwRBscnq4qAZ6v3EIAcE27vQuLlz6KSpfRJHryyA=
```

**Note:** You can also start the SDK client in interactive mode (`tss -i`) and follow the prompts to run the `init` command.

Secret Server will validate that the client-provided information is correct and that the IP address matches the configured restrictions. If successful, the client and server have established the connection, and the client can now be used to retrieve Secret Server data.

## Usage Examples

- Retrieving a secret by ID (returns a JSON structure describing the entire secret record): `tss secret -s 4`
- Retrieving all secret field values for a secret by ID: `tss secret -s 4 -ad`
- Retrieving only the value of a particular secret field by secret ID: `tss secret -s 4 -f password`
- Writing a secret field value to a file: `tss secret -s 4 -f password -o passwordfile.txt`

- Retrieving an access token for use in other REST API requests: `tss token`

The SDK client also includes an interactive mode (`tss -i`) that allows you to input multiple commands into a series of prompts. To exit interactive mode, run the `exit` command.

## SDK Client Management

To view and manage a list of connected SDK clients from within Secret Server:

1. Go **Admin > See All**. The admin panel appears.
2. Type SDK in the **Search** text box and select **SDK Client Management**. The SDK Client Management page appears.
3. Click the **Accounts** tab. A list of connected SDK clients SDK appears. You can remove or rename them. You can use the **Enable/Disable** button at the top of the page to disable and re-enable all SDK client activity.
4. Click the **Client Onboarding** tab to manage the onboarding rules.
5. Click the **Audit** tab. A list of SDK client activity appears.

**Note:** If you remove a connected client, it may be able to reconnect unless you alter or remove the rule that it used. You can use the button above the grid to disable and re-enable all SDK client activity.

6. To remove the Secret Server connection from a client machine, run the `tss remove` command. This deletes the connection, and the client can no longer retrieve Secret Server data without being re-initialized.

## SDK Client Caching

### Overview

To increase performance and reliability, you can configure the SDK client to cache values retrieved from Secret Server on the client machine. Cached values are stored encrypted on disk. You can configure client caching in one of four ways:

- **Never (0):** With this default setting, the client never caches Secret Server data. All data requests result in a query directly against the SSS instance. If the instance is unavailable, the requests fail. Secret Server
- **Server Then Cache (1):** With this setting, the client first attempts to retrieve the value from the server. If the server is unavailable, it checks to see if the same value has been previously fetched within a given period, and if so, it will return the cached value. Use this setting to guard against losing the connection to SS.
- **Cache Then Server (2):** With this setting, the client first checks to see if the same value has been previously fetched within a given period. If so, it returns the value without consulting the server. If not, it fetches, caches, and returns the value from the server. Use this setting for increased performance by reducing requests sent to SS.
- **Cache Then Server Fallback on Expired Cache (3):** This strategy operates similarly to "Cache Then Server," but if the server is unavailable and an expired value exists in the cache, the client returns that value as a last resort. Use this strategy for increased performance and reliability.

All these cache strategies have a configurable age, in minutes, after which the value is considered expired and not used (except in "Cache Then Server Fallback" mode). Cache settings are set using the client application. See the examples below.

### Examples

- Turn off caching: `tss cache --strategy 0`
- Turn on "Cache Then Server" setting with a cache age of five minutes: `tss cache --strategy 2 --age 5`
- Immediately clear all cached values: `tss cache --bust`
- Show the current cache settings: `tss cache --current`

**Important:** Anytime you use a cached value, recent changes made to Secret Server may not be applied, including changes to the value itself, permissions, or other access control settings. Examine your organization's security policies and application requirements to determine the best cache settings to use.

**Note:** Please click the table of contents on the left to see the sub-pages to this one. Click the table of contents on the right to see headings on this page.

## SSH Blocked Command Lists

### Overview

Secret Server supports privilege management and command restrictions for UNIX and other platforms with SSH interfaces. Privilege management is an additional layer of access control that you can apply to secrets with SSH launchers over SSH proxy. With privilege management, you can grant users access to a machine to block specific commands that a user may run as root or any other privileged account.

**Note:** To use command restrictions, Secret Server must have SSH Proxy and Enable Block Listing enabled.

With SSH blocked command lists, you can define disallowed commands when connecting as a privileged account. The blocked command list is defined by a series of regular expressions.

Upon launching a secret with an assigned SSH command blocklist, each command sent to the target is evaluated for a match on the blocklist. If the command is found to match a list entry, that command is blocked from execution. Blocked output is shown to the user at the terminal.

### Requirements

System requirements:

- Secret Server 10.9.000064 or later Secret Server
- Secret Server Platinum Edition license or Secret Server Professional and Unix SUPM license
- SSH proxy must be enabled

### Creating SSH Blocked Command Lists

The format for specifying a blocked command follows a regular expression syntax that is typical to most scripting languages. The blocked commands are surrounded with `\b` word boundary anchors. For example, to block the `sudo` command, you use:

```
\bsudo\b
```

This expression blocks the execution of any command with the `sudo` string in it (as a separate word), for example, these are blocked:

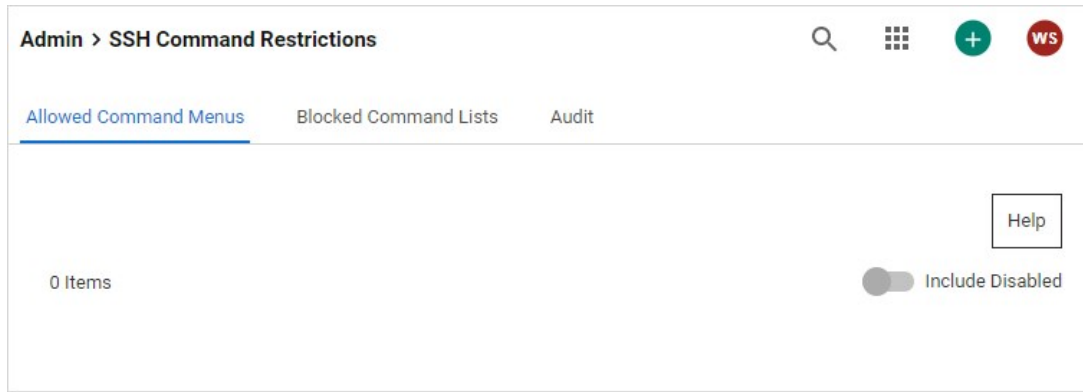
- `sudo`
- `sudo root`
- `sudo ls /usr/local/protected`
- `sudo shutdown -r +15 "quick reboot"`

And these are not:

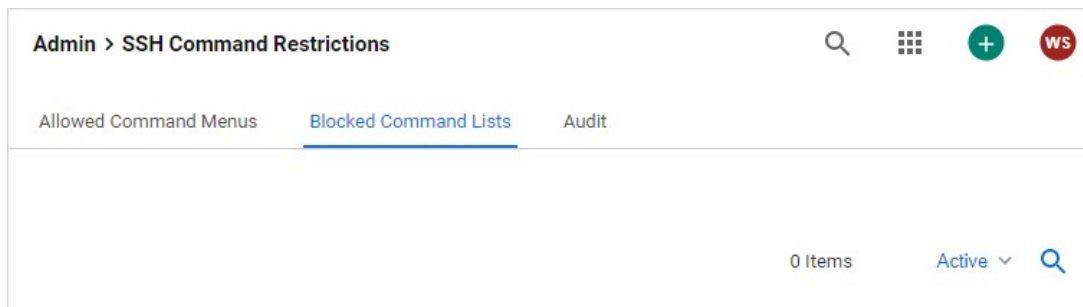
- `cat sudoku`
- `echo "sudo"`

To create a list of blocked commands:

1. Go to **Admin > See All**.
2. Hover the mouse pointer over the **Actions** menu item and select **SSH Command Restrictions**. The SSH Command Restrictions page appears:



3. Click the **Blocked Command List** tab:



4. Click the **Create Blocked Command List** button. The New Blocked Command List page appears:

## New Blocked Command List

Name \*

Prevent superuser commands

Enabled \*

☒

Description

Prevents superuser commands

Blocked Commands \*

Selected Commands (2)

Blocks su commands : \bsu\b

Blocks sudo commands : \bsudo\b

Remove

Remove

Add Commands to Blocked Command List

Search for commands

+ Blocks copy commands : \bcp\b

+ Blocks move commands : \bmv\b

+ Blocks reboot commands : \breboot\b

+ Blocks remove commands : \brm\b

+ Blocks shred commands : \bshred\b

+ Blocks wget commands : \bwget\b

Cancel

Create Blocked Command List

5. Type the list name in the **Name** text box.
6. Ensure the **Enabled** check box is selected.
7. **Either** select a predefined regex from the **Add Commands to Blocked Command List** dropdown list. **Or** add a custom regex of your own:
  1. Scroll to the bottom of the dropdown list.
  2. Click the **Create New Command** link. The Create Command and Add to Blocked Command List popup appears:



**Create Command and add to Blocked Command List**

**Command Name \*** Blocks listing of current directory

1	\\b1s\\b
---	----------

**Command Pattern(regex) \***

Cancel Create and Add

3. Type the name for the command in the **Command Name** text box.
4. Type or paste the regex in the **Command Pattern** text box.
5. Click the **Create and Add** button. The command is added to the dropdown list.
8. Click the **Create Blocked Command List** button.

## Applying SSH Command Blocked Lists in Secret Settings

To enable privilege management for an account:

1. Navigate to a PuTTY secret's **Settings** tab.
2. Go to the **SSH Launcher** section.
3. Click the **Edit** link.
4. Click the **Connect Using** dropdown list and select **Credentials on Another Secret**.
5. Click the **No Secret Selected** link to choose a secret containing your log on credentials, which the launcher uses when logging on the SSH service.
6. Enable command restrictions:
  1. Click the **Security** tab.
  2. Go to the **Other Security** section.
  3. Click the **Edit** link to set **Enable Proxy** to Yes.
  4. Click the **Edit** link for the **Enable SSH Command Restrictions**. The Edit SSH Command Restrictions popup appears:

Edit SSH Command Restrictions

☒ Restrict SSH Commands

☐ Allowed Command Menus

☒ Blocked Command Lists

Owner Permission

Unrestricted

Edit Permission

Admin Command Blocklist

View Permission

User Command Blocklist

Cancel

Save

5. Ensure the Restrict SSH Commands check box is selected.
6. Click to select the Blocked Command Lists selection button.
7. Click the **Owner**, **Edit**, and **View Permission** dropdown lists to map the blocked command lists to users via those permissions. You can also leave them as unrestricted.
8. Click the **Save** button.

SSH Command Restrictions via a Secret Policy

You can apply SSH command restrictions to a secret policy for ease of management. You can apply secret policies to secret folders or directly to a secret itself. To apply command restrictions, set a policy as follows:

**Table:** Secret Policy Security Settings for SSH Command Restrictions

Security Settings	Enable Proxy	Enforced	Checked
Security Settings	Enable SSH Command Restrictions	Enforced	Checked
Security Settings	SSH Command Restriction Type	Enforced	Blocked List
Security Settings	SSH Command Blocklist for Secret Owners	Enforced or Not Set	Desired Block Command List or Not Set
Security Settings	SSH Command Blocklist for Secret Editors	Enforced or Not Set	Desired Block Command List or Not Set
Security Settings	SSH Command Blocklist for Secret Viewers	Enforced or Not Set	Desired Block Command List or Not Set

## SSH Command Menus

Secret Server supports privilege management and command restrictions for UNIX and other platforms with SSH interfaces. Privilege management is an additional layer of access control that can be applied to secrets with SSH Launchers over SSH Proxy. Privilege management gives the ability to grant users access to a machine with specific command restrictions to define the available commands that a user may run as root or another privileged account.

**Note:** To use command restrictions, Secret Server must have SSH Proxy enabled.

With command menus, you can configure predefined commands that users or groups will be able to access when connecting as a privileged account. A command menu is a list of command names mapped to system commands. The format for specifying a command is to separate a name and command with an equals symbol. For example:

```
restart_apache = /usr/sbin/service apache restart
```

You may also use parameters in commands so users can execute more complex commands. For example:

```
move_file = /bin/mv $src $dst
```

You can specify environmental variables by escaping dollar signs in commands. For example:

```
go_home = cd $$HOME
```

Command restrictions currently do not support complex commands, such as multiple commands on one line, piping, or output redirection. To support these functions, you may add a script to the system that has these capabilities and point map the command to that script. We highly recommend that generated scripts have proper user permissions and that the absolute path is used. The absolute path ensures that the correct script is being executed.

Commands may not be named as numbers or one of the following predefined commands:

```
..
up
-help
?
-more
logout
exit
```

To enable privilege management for an account, navigate to a PuTTY Secret's launcher tab and specify the "Connect As" secret that you wish to connect as. When launching this secret, the launcher uses it as credentials to log into the SSH service and then log into the credentials specified on the secret.

To enable command restrictions, navigate to a PuTTY secret's security tab and specify "Enable Proxy" and "Enable SSH Command Restrictions." This gives you the ability to map users and groups to command menus. When the unrestricted command menu is specified for a user, the user is launched into a normal shell environment without command restrictions. Likewise, if the "Allow Owners Unrestricted SSH Commands" option is enabled, the owners of the secret are also launched into a normal shell environment without command restrictions.

When specifying command menus on a secret, at least one command menu must be selected unless "Allow Owners Unrestricted SSH Commands" is enabled.

You can apply command restrictions to a secret policy for ease of management.

Secret Server supports using PowerShell, SSH, and SQL scripts as dependencies on a secret. These scripts can use information on the secret through the field name prepended with a \$. For example, \$DOMAIN, \$PASSWORD, or \$USERNAME. Linked secrets are accessible by \${1}\$FIELDNAME for the first linked secret, \${2}\$FIELDNAME for the second, and so on.

There are two contexts in which script dependencies run:

- As part of the RPC process. See [Password Changing Scripts](#).
- When run manually from the Dependencies tab on the secret.

For a complete list of tokens that are available to script dependencies, see [List of Dependency Tokens](#).

## Overview

You can enable webservices at **Admin > Configuration** on the **General** tab. Checking the **Enable Webservices** check box makes the ASP.NET SOAP and REST webservices built into Secret Server available for use. Additional steps are needed in IIS to ensure proper access.

**Note:** Integrated Windows Authentication (IWA) does **not** work on Secret Server Cloud.

**Note:** This procedure only works if Secret Server on-premises is installed on IIS 7 or greater.

## Procedure

To enable IWA for webservices in IIS:

1. Open IIS Manager (inetmgr).
2. Expand the **Sites** node until you locate your Secret Server application or website
3. Expand the **Secret Server** node to locate the **winauthwebservices** folder.
4. Click on the **winauthwebservices** folder.
5. Click on **authentication** in the **Security** section.
6. Disable **Anonymous Authentication**.
7. Enable **Windows Authentication**.

**Note:** If you are using IIS7 or greater and do not see this option, the option will need to be added through the server roles (webserver). IIS may give an alert about using both challenge and redirect-based authentication, which you can ignore.)

8. Open Windows Explorer.
9. Navigate to the **winauthwebservices** folder.
10. Give **read access** to the **winauthwebservices** folder to the domain users and groups that will be using IWA to access the webservices.

## Access Examples

### SOAP

The SOAP web service URL for IWA is <Secret Server URL>/winauthwebservices/sswinauthwebservice.asmx.

Example script:

```
# Sample Powershell Script
# demonstrating retrieval of a Secret from Secret Server
# via web service protected by IWA

$where = 'http://mysecretserver/winauthwebservices/sswinauthwebservice.asmx';
$secretId = 1
$sws = New-WebServiceProxy -uri $where -UseDefaultCredential
$wsResult = $sws.GetSecret($secretId, $false, $null)
if ($wsResult.Errors.length -gt 0){
    $wsResult.Errors[0]
}
else
{
    $wsResult.Secret
}
```

```
}
```

## REST

REST web service references the same winauthwebservices folder as SOAP when doing IWA, but in code the URL endpoint does not need to change.

Example script:

```
# Sample Powershell Script  
# demonstrating authentication via web service protected by IWA  
  
$api = 'http://mysecretserver/winauthwebservices/api/v1';  
$endpoint = $api/secrets/3844'  
$secret = Invoke-RestMethod $endpoint -UseDefaultCredentials
```

## Overview

You can enable webservices at **Admin > Configuration** on the **General** tab. Checking the **Enable Webservices** check box makes the ASP.NET SOAP and REST webservices built into Secret Server available for use. Additional steps are needed in IIS to ensure proper access.

**Note:** Integrated Windows Authentication (IWA) does **not** work on Secret Server Cloud.

**Note:** This procedure only works if Secret Server on-premises is installed on IIS 7 or greater.

## Procedure

To enable IWA for webservices in IIS:

1. Open IIS Manager (inetmgr).
2. Expand the **Sites** node until you locate your Secret Server application or website
3. Expand the **Secret Server** node to locate the **winauthwebservices** folder.
4. Click on the **winauthwebservices** folder.
5. Click on **authentication** in the **Security** section.
6. Disable **Anonymous Authentication**.
7. Enable **Windows Authentication**.

**Note:** If you are using IIS7 or greater and do not see this option, the option will need to be added through the server roles (webserver). IIS may give an alert about using both challenge and redirect-based authentication, which you can ignore.)

8. Open Windows Explorer.
9. Navigate to the **winauthwebservices** folder.
10. Give **read access** to the **winauthwebservices** folder to the domain users and groups that will be using IWA to access the webservices.

## Example

### Overview

The SOAP web service URL for IWA is <Secret Server URL>/winauthwebservices/sswinauthwebsevice.asmx.

The method below uses the SecretServerGetSecret.ps1 PowerShell script to make the SecretGet WebService call, exposing it through the SecretServer.pm Perl package. The Sample.pl file uses the SecretServer.pm package to retrieve specific fields from the result.

The flow is as follows:

1. Your Perl script (sample.pl) makes a request to the SecretServer.pm package.
2. The SecretServer.pmpackage passes the request on to the SecretServerGetSecret.ps1 PowerShell script.
3. The SecretServerGetSecret.ps1 PowerShell script calls the Secret Server web services and authenticates using the service account that sample.pl is running under.

4. The results are passed back to SecretServer.pm and then on to your Perl script (Sample.pl)
5. Create the following three files:

## SecretServerGetSecret.ps1

```
# Sample Powershell Script
# demonstrating retrieval of a Secret from Secret Server
# via web service protected by Windows Authentication
# returned as Xml

$where = $args[0]
$secretId = $args[1]
$ws = New-WebServiceProxy -uri $where -UseDefaultCredential
$wsResult = $ws.GetSecret($secretId)
$res = convertto-xml $wsResult.Secret -As string -Depth 20
$res
```

## SecretServer.pm

```
package SecretServer;
use strict;

sub usage {
    print "\nUsage: GetSecret [webservice url] [secretid]\n";
}

sub new {
    my($class, %args) = @_;
    my $self = bless({}, $class);
    return($self);
}

sub get_secret {

    my($self, $url, $secretid) = @_;
    my $result = `powershell.exe .\\SecretServerGetSecret.ps1 $url $secretid`;
    return($result);
}

sub get_field_from_result {

    my($self, $result, $field) = @_;
    $result =~ s/<Property Name="Value" Type="System.String">([^\<]+)</Property><?\.s*<Property Name="(?!FieldName)[^\"]+\">+</Property><s*<Property Name="FieldName"([^\<]+)>$field</Property>/gsi;

    return("$1");
}

1;

# this is if you want to execute the Get Secret call manually from the command line
# if (@ARGV != 2)
#{
    # usage(); # Call subroutine usage()
    # exit(); # When usage() has completed execution,
    # # exit the program.
#}

# my $url = $ARGV[0];
# my $secretid = $ARGV[1];
# my $result = `powershell.exe .\\SecretServerGetSecret.ps1 $url $secretid`;

# print $result;
```

## Sample.pl

```
use lib 'C:/Path to the SecretServer.pm file>';
use SecretServer;

my $x = SecretServer->new();

#Change this value to match your URL
```



```
my $url = 'http://<Your Secret Server Url>/winauthwebservices/sswinauthwebservice.asmx';
```

```
#Change this value to match your desired Secret Id
```

```
my $secretid = 17;
```

```
my $result = $x->get_secret($url, $secretid);
```

```
my $username = $x->get_field_from_result($result, 'UserName');
```

```
my $password = $x->get_field_from_result($result, 'Password');
```

```
print "Username : $password";
```

Please run the following as **Administrator**.

```
# This simply generates a self-signed certificate which will import into Secret Server
# Requires .NET 4.5 or above
# Please Run As Administrator
```

```
### User Variables ###
```

```
# Filename of PFX
```

```
$filename = 'PFXNAMEHERE.PFX'
```

```
# Certificate Password for PFX
```

```
$pass = Read-Host -Prompt "Please Enter Password for .pfx file" -AsSecureString
```

```
# DNS name in certificate
```

```
$dnsname = Read-Host -Prompt "Please enter the server's FQDN"
```

```
###--Commands--###
```

```
# NOTE: The provider must be set in order to be compatible with .NET 4.5 newer versions of .NET can import certs from more providers
```

```
try {
```

```
    $cert = New-SelfSignedCertificate -CertStoreLocation cert:\localmachine\my -DnsName $dnsname -HashAlgorithm SHA256 -KeyLength 4096 -Provider "Microsoft  
Enhanced RSA and AES Cryptographic Provider"
```

```
    $path = 'cert:\localmachine\my\' + $cert.thumbprint
```

```
    Export-PfxCertificate -Cert $path -FilePath $filename -Password $pass
```

```
    # remove from cert store
```

```
    Remove-Item $path
```

```
}
```

```
catch { Write-Error $_ }
```

## Secret Server Authentication, Encryption, and Security

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server provides integration options for Windows authentication and SAML to automatically authenticate users to the application when they browse to Secret Server on their workstations. Secret Server also allows you encrypt data at various locations.

## Introduction

In some cases, a PowerShell script may need to access resources outside of a Secret Server machine. This requires that any credentials are delegated to the target machine. Secret Server runs PowerShell scripts using Windows Remote Management (WinRM), which does not allow credential delegation by default. To allow credential delegation, the Secret Server machine must have Credential Security Support Provider (CredSSP) enabled. CredSSP is a security support provider that allows a client to delegate credentials to a target server.

Some scenarios requiring CredSSP:

- The script needs to query or update a value in Active Directory.
- The script needs to query or update a value in a SQL Server instance.
- The script is used as part of extensible discovery for locating accounts or machines on a different domain or non-domain joined environment.

## Enabling CredSSP for WinRM in Secret Server

1. Go to **Administration > Configuration**. The General tab of the Configuration page appears:

APPLICATION SETTINGS	
Allow Automatic Checks for Software Updates	Yes
<a href="#">Anonymized System Metrics Information</a>	
Send Anonymized System Metrics to Thycotic	No <a href="#">View Metric Data</a>
<a href="#">View Webservices</a>	
Enable Webservices	Yes
Maximum Time for Offline Access on Mobile Devices	30 days
Session Timeout for Webservices	20 minutes
Enable Refresh Tokens for Web Services	No
Prevent Application from Sleeping When Idle	Yes
<a href="#">Syslog/CEF Logging Advanced Settings Information</a>	
Enable Syslog/CEF Logging	No
<a href="#">Test PowerShell with WinRM</a>	
WinRM Endpoint URL	http://localhost:5985/wsman
<a href="#">How do I configure CredSSP for WinRM?</a>	
Enable CredSSP Authentication for WinRM	Yes

2. Click **Edit** button at the bottom of the page.
3. Click to select the **Enable CredSSP Authentication for WinRM** checkbox.

4. Click the **Save** button.

**Note:** This is the global CredSSP settings and by default will configure CredSSP and connections to come *from* the Web server. This is used when **not using distributed engines**.

**Note:** If you are using distributed engines and you enable CredSSP at the site-specific level, these settings take precedence over this global CredSSP setting. Secrets will prioritize these site-specific settings. Therefore, if you plan on using CredSSP through a distributed engine, you should consider disabling the global setting seen below and only configure it at the site-specific level.

## Configuring CredSSP for WinRM on the Secret Server Machine

1. Log on to the machine running Secret Server.
2. Run Windows PowerShell as an administrator.
3. Enable client-side CredSSP by running:

```
Enable-WSManCredSSP -Role Client -DelegateComputer <Secret Server fully qualified machine name>
```

For example:

```
Enable-WSManCredSSP -Role Client -DelegateComputer <localhost>
```

**Note:** localhost is the actual string that Secret Server uses to generate the PowerShell run space. Sometimes customers need both localhost and FQDN entries. *In theory*, those entries should be the same, thus not needing a second one.

4. Enable server-side CredSSP by running:

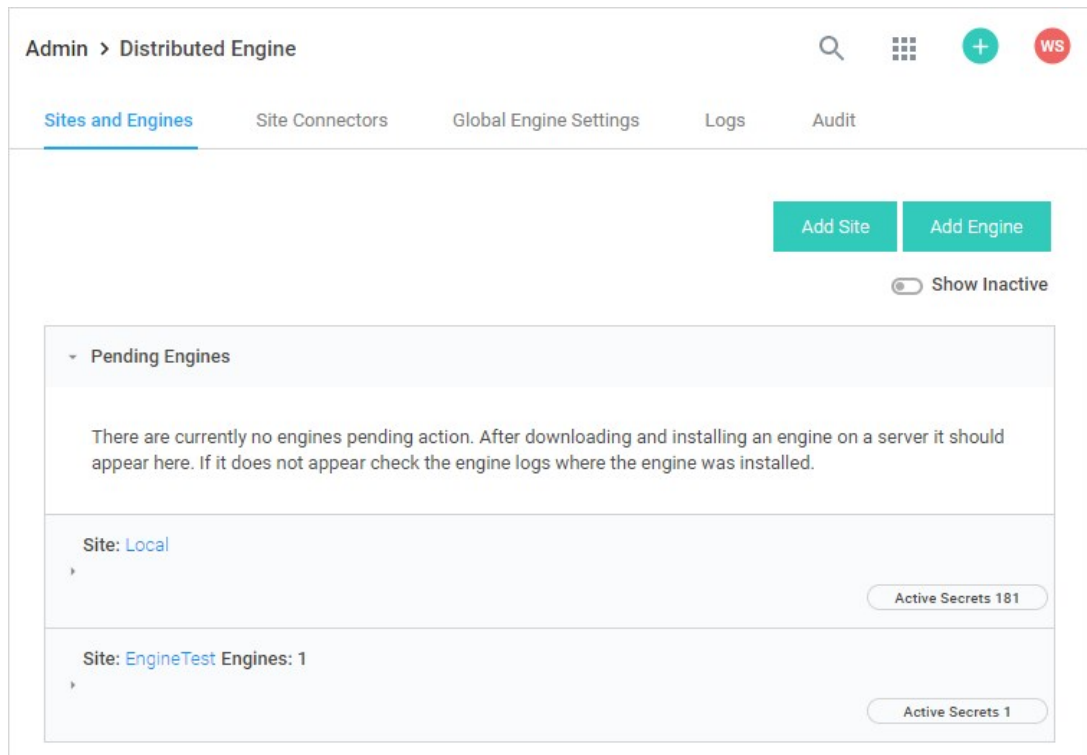
```
Enable-WSManCredSSP -Role Server
```

5. The Web server always uses a specified account to run the PowerShell scripts. Considerations:
  - Ensure that account is added to the "Remote Management Users" local group on each Web server.
  - For RPCs with custom password changers, this would be "Change Password Using," and then select "Privileged Account."
  - For PowerShell password changers in the classic UI, this would be "Run PowerShell Using" and can alternatively be configured as the "Default Privileged Account" at the template level.
  - For custom dependencies using PowerShell scripts, this would be the "Run As" secret.
  - If you use any form of extensible discovery, this account needs to be the first secret that is linked to the scanner. Any additional secrets linked to the scanner are typically associated with authentication to the destination system.

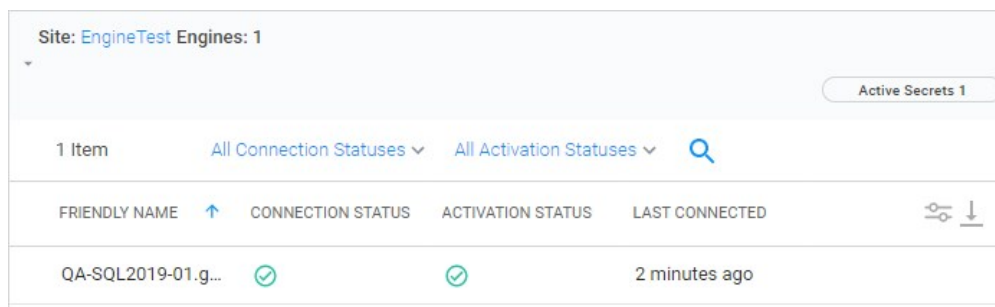
## Configuring CredSSP for WinRM on a Distributed Engine

You can alternatively configure CredSSP and the credential delegation to occur from your distributed engines by changing this setting at the site level:

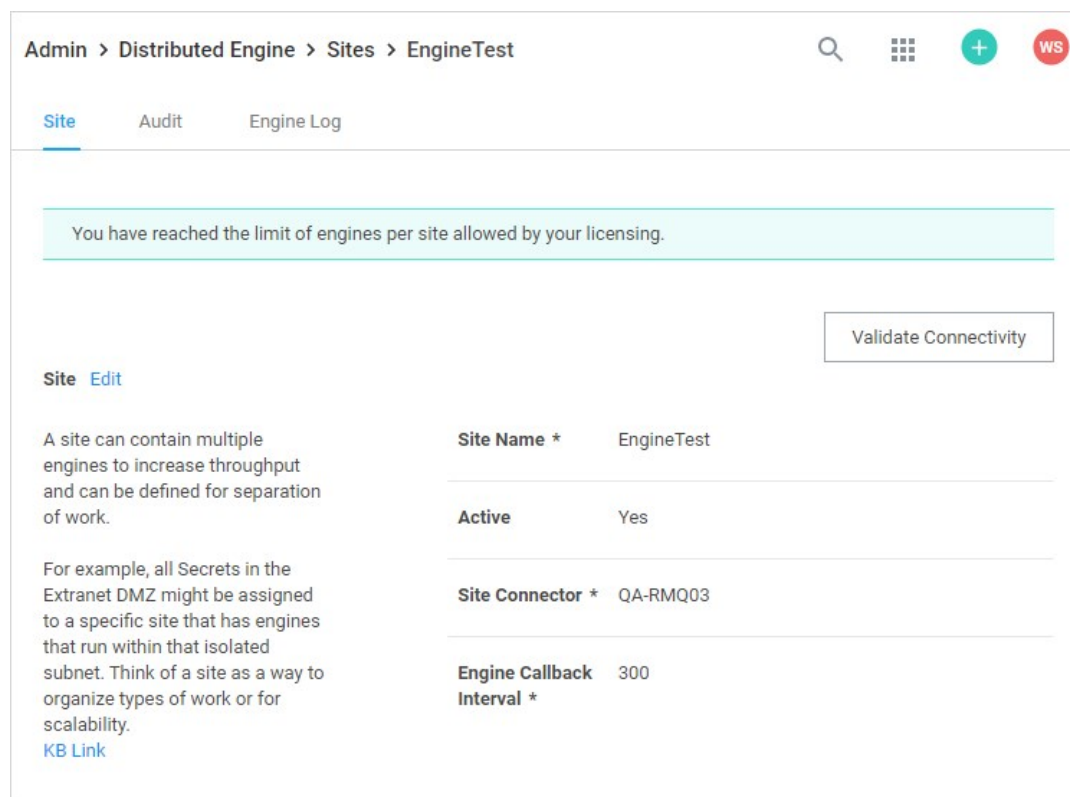
1. Go to **Admin > Distributed Engine**. The Distribute Engine Configuration page appears:



- Click the site panel button for the desired DE. The panel expands, displaying the DEs for that site:



- Click the site name link at the top of the panel. The site's page appears:



4. Scroll down to see the **Enable CredSSP Authentication for WinRM** listing in the **Advanced Site Configuration** section.

5. If it is not enabled, log on to each of your distributed engines where CredSSP is enabled.

6. Run Windows PowerShell as an administrator.

7. Enable client-side CredSSP by running:

```
Enable-WSManCredSSP -Role Client -DelegateComputer <distributed engine fully qualified machine name>
```

```
Enable-WSManCredSSP -Role Client -DelegateComputer <localhost>
```

**Note:** localhost is the actual string that the Distributed Engine is using to generate the run space. Some customers need to have both the localhost and FQDN entry. *In theory*, both entries above should be the same, thus not needing a second entry.

8. Enable server-side CredSSP by running:

```
Enable-WSManCredSSP -Role Server
```

9. The distribute engine will always use a specified account to run the PowerShell scripts. Considerations:

- Ensure that account is added to the "Remote Management Users" local group on each engine where CredSSP is enabled.
- For RPCs with custom password changers, this would be "Change Password Using," and then select "Privileged Account".
- For PowerShell password changers in the classic UI, this would be "Run PowerShell Using" and can alternatively be configured as the "Default Privileged Account" at the template level.
- For custom dependencies using PowerShell scripts, this would be the "Run As" secret.
- If you use any form of extensible discovery, this account needs to be the first secret that is linked to the scanner. Any additional secrets linked to the scanner are typically associated with authentication to the destination system.

10. Ensure that the "Allow Delegating Fresh Credentials" group policy setting is enabled and is not disabled by a domain policy.

1. Open the gpedit.msc file on your Secret Server machine or distributed engine, depending on where CredSSP is enabled
  2. Navigate to **Computer Settings > Administrative Templates > System > Credentials Delegation**.
  3. Edit the "Allow Delegating Fresh Credentials" setting.
  4. Verify that it is Enabled.
  5. Click "Show..."
  6. Verify that the list contains an entry that begins with "wsman/" and ends with the fully qualified machine name of the Secret Server machine or distributed engine.
  7. If destination systems are non-domain joined or on another domain without a trust, it may be required for you to add in an entry for **each** destination system you wish to run the script or do discovery on (as examples). Consider collecting a list of all destination FQDNs for your specific use case and adding them all in one go.
11. Depending on where CredSSP is configured (Web server or distributed engine), run the following commands:
- o View existing entries: `Get-Item WSMan:\localhost\Client\TrustedHosts`
  - o Adding computers if your TrustedHosts list is empty: `Set-Item WSMan:\localhost\Client\TrustedHosts -Value <ComputerName>,[<ComputerName>]`
  - o Adding computers to your existing TrustedHosts list: `$curlList = (Get-Item WSMan:\localhost\Client\TrustedHosts).value Set-Item WSMan:\localhost\Client\TrustedHosts -Value "$curlList, Server01"`
12. On the destination system, if it is on a separate domain without a trust or non-domain joined, add the reverse WSman entries so the destination system trusts either Secret Server or your engines. Run one of the following commands:
- Web server:
- ```
Set-Item WSMan:\localhost\Client\TrustedHosts -Value <Web Server 1 FQDN>,[<Web Server 2 FQDN>]
```
- Engine:
- ```
Set-Item WSMan:\localhost\Client\TrustedHosts -Value <Distributed Engine 1 FQDN>, [<Distributed Engine 2 FQDN>]
```
13. Restart either Secret Server or the engine you just trusted.

## Enabling CredSSP on Secret Server Agents for PowerShell Script Dependencies

**Note:** Remote agents were upgraded to distributed engines in Secret Server version 8.9. This section only applies to Secret Server versions 8.8.000020 and earlier.

**Note:** Remote Agents are only needed for networks that are not directly connected to the network that Secret Server is installed on. If you are not using remote agents, disregard this section.

By default, Secret Server agents inherit the "Enable CredSSP Authentication for WinRM" setting from Secret Server; however, you can override this in the agent configuration file as follows:

1. On the machine running the agent, locate the the agent program files. By default, they are at C:\Program Files (x86)\Thycotic Software Ltd\Secret Server Agent.
  2. Edit the SecretServerAgentService.exe.Config file in a text editor.
  3. Locate the "UnencryptedSettings" section.
  4. Add a new key to that section for EnableCredSSPForWinRM and set it to true. For example:
- ```
<add key="EnableCredSSPForWinRM" value="true" />
```

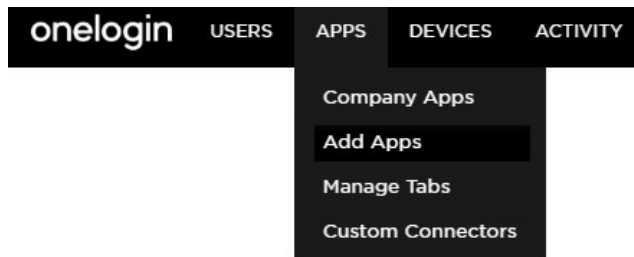


5. Restart the "Secret Server Agent" service to apply the setting.

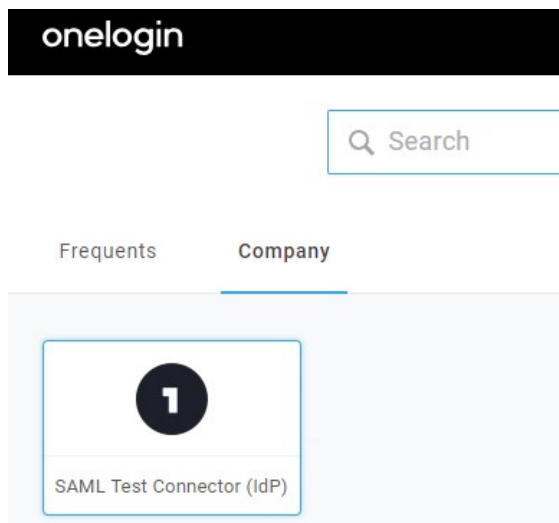
To access Secret Server using OneLogin for SAML, follow the steps below for OneLogin, then follow the steps for Secret Server.

## Step One: OneLogin

1. Navigate to your OneLogin instance and log in as an administrator.
2. Select **Administration > Apps > Add Apps**.



3. Search for **SAML Test Connector (IdP)** and select it, then click **Save**.



4. Click on the **Configuration** tab and fill out the details as described below:

Configuration	Parameters	Rules	SSO	Access
<p>RelayState</p> <input type="text"/>				
<p>Audience</p> <input type="text" value="SecretServerServiceProvider"/>				
<p>Recipient</p> <input type="text"/>				
<p>ACS (Consumer) URL Validator*</p> <input type="text" value="^https://instance.example.com/saml/"/> <p>*Required. Regular expression - Validates the ACS URL when in</p>				
<p>ACS (Consumer) URL*</p> <input type="text" value="https://instance.example.com/saml/assertionconsumerservice.aspx"/> <p>*Required</p>				
<p>Single Logout URL</p> <input type="text" value="https://instance.example.com/saml/sloconsumerservice.aspx"/>				

- **RelayState** can be left blank.
- **Audience** is the name of the Service Provider configured in Secret Server (for instance "SecretServerServiceProvider").
- **Recipient** can be left blank.
- **ACS (Consumer) URL Validator** a required field that needs to be a valid RegEx of the ACS (Consumer) URL.

Modify the text in the example below according to the URL string of your Secret Server instance:

`https://instance.example.com/saml/assertionconsumerservice.aspx$`

- **ACS (Consumer) URL** like the step above, but no longer in RegEx format.

Modify the text in the example below according to the URL of your Secret Server:

`https://instance.example.com/saml/assertionconsumerservice.aspx`

- **Single Logout URL** the Secret Server URL for SLO (Single Logout):

`https://instance.example.com/saml/sloconsumerservice.aspx`

5. Click **Save** when done.

6. Click **More Actions** and **SAML Metadata** to download the metadata for OneLogin.

MORE ACTIONS

Vendor Homepage
SAML Metadata

## Step Two: Secret Server

1. Log into your Secret Server instance, then go to **Admin > Configuration > SAML** tab and click **Create New Identity Provider**.

General
Login
SAML
Folders
Local User Passwords
Security
Ticket System

IDENTITY PROVIDERS

+ Create New Identity Provider

DISPLAY NAME NAME DESCRIPTION CERTIFICATE THUMBPRINT ACTIVE ADVANCED

View Log View Audit

2. Click **Import IDP from XML Metadata** and select the OneLogin metadata you saved previously. If you don't see the file, you may need to change the metadata filetype to .xml

Enter IDP Information
Fill out the fields to configure a new IDP by hand.

Import IDP from XML Metadata
Import a XML file containing the IDP's configuration metadata.

3. To add users to OneLogin, navigate to OneLogin and log in as an administrator once more, then click **Administration > Users > New User**.

User Info
Authentication
Applications
Activity

Active
☒

First Name \*
Last Name \*

Email
Username

Phone Number
Manager

Company
Department

Title

- Fill out the required information and click **Save** when finished.

**Note:** If you are using a Secret Server local account or Secret Server Cloud, the username will be in email format and it must be identical on OneLogin and Secret Server. For an Active Directory account, it should be the samAccountName.

- Click on the **Applications** tab, then click the plus sign (+).

User Info
Authentication
Applications
Activity

Applications
+

- Select **SAML Test Connector (IdP)**, then click **Continue**.

Assign New Login To Test Monster

This login will override any apps assigned via roles.

Select Application
SAML Test Connector (IdP)

- Enter the user's Secret Server username (email format) then click **Save**.

## Edit SAML Test Connector (IdP) Login For Test Monster

Enabled ☒ Allow users to sign in

NameID (fka Email)

NameID Format: Email

8. Mouse over **More Actions** and click **Change Password** to give the user a login password.

**MORE ACTIONS** ▼

- Assume User
- Change Password
- Force Logout
- Send Invitation
- Show User Details
- Reapply Mappings
- Delete
- Unlicense
- Download PKI cert
- Create New User
- Create New Sub User

9. In another browser or in incognito mode, log into your OneLogin instance as the user you just created. If prompted to add OneLogin to your browser, click **Skip**.
10. You should see the **SAML Test Connector (IdP)**. Click on it to authenticate into Secret Server using the SAML workflow.

**onelogin**

Search

Frequents Company

1

SAML Test Connector (IdP)

**Important:** This topic is for Secret Server v10.5 and later and assumes you have a running Identity Service Provider (IDP) with a signed certificate.

**Note:** Secret Server does not support using SAML when Integrated Windows Authentication (IWA) is enabled.

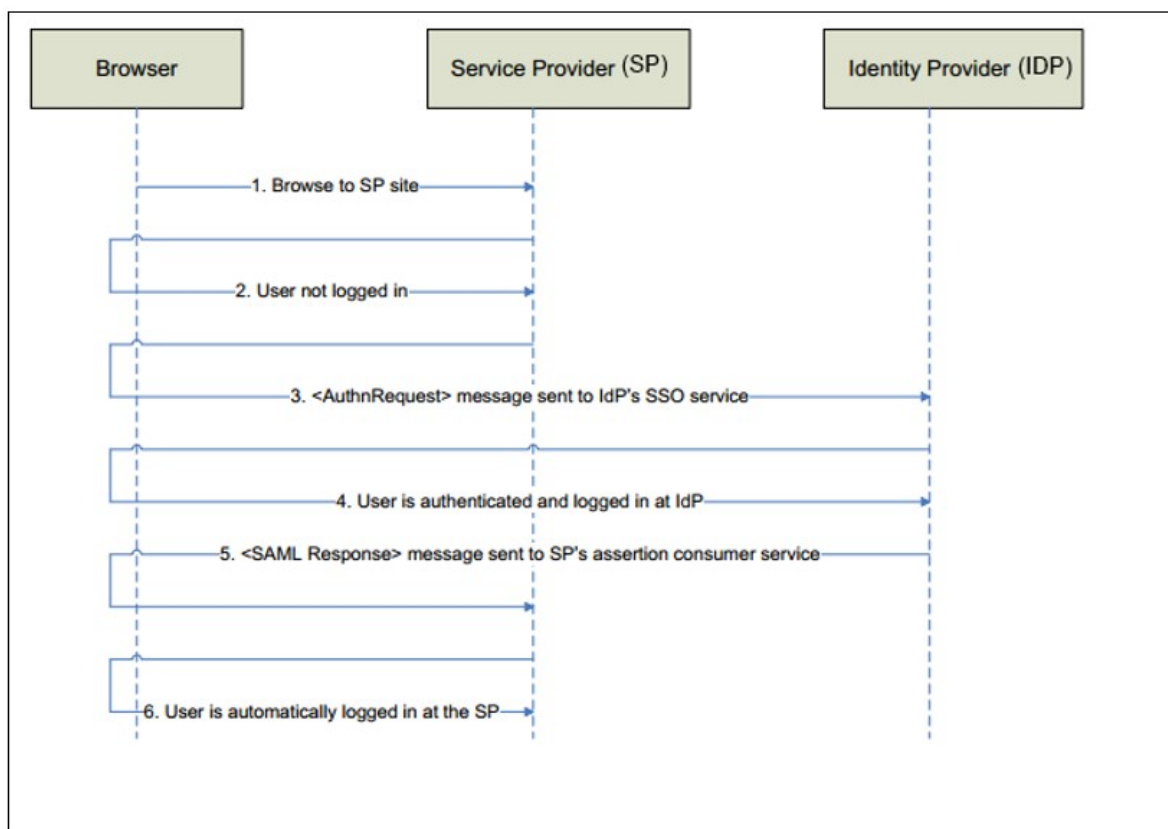
**Note:** This topic applies to Secret Server 10.5 and later.

## SAML Overview

Secret Server allows the use of SAML Identity Provider (IDP) authentication instead of the normal authentication process for single sign-on (SSO). To do this, Secret Server acts as a SAML Service Provider (SP) that can communicate with any configured SAML IDP.

In the diagram below, Secret Server acts as the service provider. Any configured SAML IDP can be used for this process and there are several well tested providers, including OKTA, OneLogin, Azure ADFS, and Microsoft ADFS.

**Figure:** Secret Server as a SAML Identity Provider



## Prerequisites

### Licensing and Version

Secret Server Professional Edition or higher, upgraded to version 10.5 or later. To install a new SAML license, go to **Admin > Licenses > Install New License**.

## .NET Framework 4.6.2+

To use SAML 2.0, you must install .NET Framework 4.6.2 or higher on your Web server. This allows Secret Server to use Microsoft's "next generation" CryptoNG API for signing SAML requests, instead of being limited to the much older CryptoAPI. This is often necessary to use modern SSL certificates and is strongly recommended as a security best practice.

To download and install the latest version of .NET Framework: See [Microsoft .NET Framework 4.8 offline Installer for Windows](#) for the latest version as of when this topic was written. If you have already installed Secret Server on the same Web server, you have already done this.

### Administer Configuration SAML Role Permission

The "Administer Configuration SAML" role permission is required to use SAML to access Secret Server. To grant a user this permission from an administrator account:

1. Go to **Admin > Roles**. The Roles page appears.
2. Click the **Create New** button. The Role Edit page appears:

**Role Edit**

Role Name \*

Enabled ☒

Created

**Permissions Assigned**

**Permissions Unassigned**

- Access Offline Secrets on Mobile
- Add Secret
- Add Secret Custom Audit
- Administer Active Directory
- Administer Backup
- Administer Configuration
- Administer Configuration Proxying
- Administer Configuration SAML
- Administer Configuration Security
- Administer Configuration Session Recording
- Administer Configuration Two Factor
- Administer Configuration Unlimited Admin
- Administer ConnectWise Integration
- Administer Create Application Accounts
- Administer Create Users

« « > » »

**Save** **Cancel**

3. Type the name, such as SAML, in the **Role Name** text box.
4. Click to select the **Enabled** check box.
5. Click **Administer Configuration SAML** in the right side **Permissions Unassigned** list box.
6. Click the **<** button to move the permission to the other side.
7. Click the **Save** button. The Roles page returns.



8. Click the Assign Roles link of the newly created role. The View Role Assignment page appears:

### View Role Assignment

[By Role](#)
[By User Or Group](#)

**Role**

Save To File < 1 to 15 of 15 >

NAME	TYPE	CREATED
admin	User	5/15/2019
gamma.thycotic.com\	User	3/30/2020
gamma.thycotic.com\	User	3/26/2020
Developers	Group	8/9/2019
gamma.thycotic.com\	User	4/9/2020
gamma.thycotic.com\	User	8/9/2019
gamma.thycotic.com\	User	8/9/2019

9. Click the **Role** dropdown list to select the role you just created.

### View Role Assignment

[By Role](#)
[By User Or Group](#)

**Role**

There are no Groups or Users.

Back

Edit

10. Click the **Edit** button. The Role Assignment page appears:

### Role Assignment

Please note that changing role assignment could remove your access to Role Administration.

By Role

By User Or Group

Role

SAML

Assigned

Unassigned

<<

<

>

>>

admin

appaccount1

DevOps1

Duo Approvers

Everyone

gamma.thycotic.com\Access Control Assistance Operators

gamma.thycotic.com\Account Operators

gamma.thycotic.com\Administrators

gamma.thycotic.com\...

gamma.thycotic.com\...

gamma.thycotic.com\... Password Replication Group

gamma.thycotic.com\...

gamma.thycotic.com\...ors

gamma.thycotic.com\...

Back


11. Move the desired users to the **Assigned** list using the same method as before.
12. Click the **Save Changes** button.

## Setting up Secret Server

1. Navigate to **Admin > Configuration**.
2. Click the **SAML** tab:


## SAML Configuration

[General](#)
[Login](#)
[SAML](#)
[Folders](#)
[Local User Passwords](#)
[Security](#)
[Ticket System](#)
[Email](#)
[Session Recording](#)
[HSM](#)


SAML instructs Secret Server to trust a separate server as its Identity Provider. When SAML is enabled, the Identity Provider is responsible for asking the user for their username or password, but Secret Server will still ask the user for any configured 2-factor.


### SAML GENERAL SETTINGS


SAML Enabled	No
Use Legacy SAML	No


Edit


### SAML SERVICE PROVIDER SETTINGS

**Name** SecretServerServiceProvider  
**Certificate**



Edit



Download Service Provider Metadata (XML)

### IDENTITY PROVIDERS

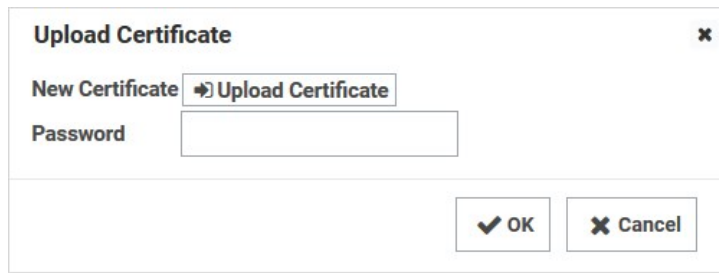

Create New Identity Provider

DISPLAY NAME	NAME	DESCRIPTION	CERTIFICATE THUMBPRINT	ACTIVE	ADVANCED
--------------	------	-------------	------------------------	--------	----------


View Log


View Audit

- Click the **Edit** button in the **SAML General Settings** section.
- Click to select the **SAML Enabled** check box.
- Click the **Save** button.
- Once you have SAML setup on our identity provider, then under **General Settings**, click **Edit**, then check the **SAML Enabled** checkbox. **Save** changes.
- Click the **Edit** button in the **SAML Service Providers** section.
- Type a name for your Secret Server service provider, such as SecretServerServiceProvider, in the **Name** text box.
- Click the **Select Certificate** link. The Upload Certificate popup appears:



10. Click the **Upload Certificate** button to upload the certificate used for Secret Server's HTTPS configuration.

What type of certificate can be used?

- The uploaded SAML certificate requires a .pfx file format.
- For on-premises instances: The uploaded certificate should match the one used for Secret Server's HTTPS configuration, **or** it can be created as a self-signed certificate using [this PowerShell script](#).
- For Secret Server Cloud users: Generate your own certificate using the same PowerShell script.

**Note:** Run the referenced PowerShell script as an administrator on a machine with .NET 4.5 or above and replace the variables in the script as directed. Your certificate is created in the directory from which you run the script. The subject name on the certificate is irrelevant, though for on-premises instances it typically matches the URL of the instance.

11. Locate your certificate .pfx file and select it.
12. Click the **Open** button. The new certificate appears.
13. Type the access password for the private key of the certificate in the **Password** text box.
14. Click the **OK** button. The certificate is uploaded and tested, and the popup disappears. The certificate now appears in the SAML Service Provider Settings section.

**Note:** If you have an outdated version .NET Framework (earlier than 4.6.2), you may see an error recommending you upgrade to fix the error. Reload the certificate after you do so.

15. Click the **Save** button.
16. Click on **Download Service Provider Metadata (XML)** to download the SecretServerSAMLMetadata.xml file. This file is needed when setting up SAML on your Identity Provider.
17. Set up your Identity Provider using the SecretServerSAMLMetadata.xml file from the previous step.
18. Click the **Create New Identity Provider** link. An Identity Provider popup appears.
19. Click the **Import IDP from XML Metadata** button.
20. Navigate to your SecretServerSAMLMetadata.xml file and select it. This is used for uploading into your IDP, which varies by provider. Follow instructions in the following section..
21. Click the **Open** button.

## Setting up IDPs

IDP setup varies by provider. Go to the [IDP Integration site](#) for instructions for your provider.

**Note:** The username returned from the IDP to Secret Server within the SAML Response/Assertion's subject statement must match the desired format. The format of the username passed depends upon how the user was created within Secret Server.

**Note:** If AD Sync was used to create Secret Server users, the username returned from the IDP must match this format: SecretServerUsername@ADsyncDomain Or ADsyncDomain\SecretServerUsername. If using SLO, ensure that the NameID is set correctly in the IDP as an outgoing claim for the Secret Server Service Provider. If a user has different sAMAccountName and userPrincipalName in Active Directory, custom rules in the IDP can be created.

## Lockout Workaround

Locked Out? Here's how you get around SSO. If during the configuration process for SAML you lock yourself (as an administrator or a user) out of Secret Server, you can log on Secret Server without using the SSO workflow by using this URL string:

[YourSecretServerInstanceName]/login.aspx?preventautologin=true

The role permission needed for this is "Bypass SAML Login," which admins have by default.

## Overview

Delinea One is the single-sign-on provider for Delinea applications. With Delinea One, one user account can be granted access to multiple Delinea products, such as Secret Server, Privilege Manager, DevOps Secrets Vault, and Account Lifecycle Manager. Delinea One enables login integration using the OpenID Connect protocol, an industry standard single-sign-on method.

This article describes the Delinea One configuration options available in Secret Server.

## Cloud versus On-Premise

For Secret Server Cloud, Delinea One is the default identity provider. When you set up the cloud instance, it will already be configured and ready to use Delinea One. The initial admin user will log in with their Delinea One account, and optionally, all newly created Secret Server accounts can be synchronized with Delinea One, so they can log in that way as well.

For the on-premise version of #, Thycotic One integration is off by default, but it is supported. You can turn on Delinea One integration and configure it. For example you might want to share an identity provider between your on-premise instance, and one or more other cloud products.

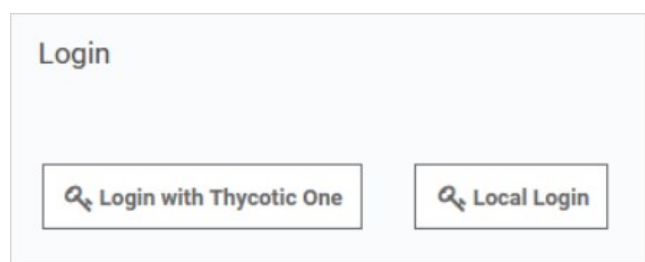
## Procedures

### Logging in with Delinea One

When Delinea One integration is turned on, all Secret Server users can log in either with their local passwords or with Delinea One. All Secret Server permissions and configuration will apply to that user regardless of how they logged in.

However, the local username and password and the Delinea One username and password are not necessarily the same thing. In Delinea One, you'll log in with your email address rather than your username, and the password you use may very well be different from the Secret Server password.

You'll see this on the login screen:



Clicking **Local Login** will bypass Delinea One and allow the user to log in with their local Secret Server password. Clicking **Login with Delinea One** will redirect the user to Delinea One to authenticate. Once that is successfully done, the user will be redirected back to Secret Server.

After clicking **Login with Delinea One**, users will type their email address and password:

Sign In

Email address

Next

[Create New Account](#)[Reset My Password](#)

And then be redirected back to their dashboard in Secret Server.

### Configuring Thycotic One

Thycotic One integration is configured on the **Admin > Configuration** page, under the **Login** tab. You can view the configuration there:

Enable Thycotic One Integration	Yes	<a href="#">Sync Now</a>
Thycotic One Server URL	<a href="https://login.thycotic.com/">https://login.thycotic.com/</a>	
Add New Users to Thycotic One	Yes	
Use Thycotic One authentication as the default	Yes	

The **Sync Now** button provides a way for you to trigger a synchronization of your Secret Server accounts with Delinea One. In most cases, you will not need to use this, as synchronization will happen on a schedule or whenever a relevant event happens, such as enabling a user or performing an Active Directory synchronization. Only active user accounts with email addresses will be synchronized.

Click **Edit** at the bottom of the page to change the configuration. The available options are slightly different between the cloud and on-premise versions of Secret Server.

### Secret Server Cloud

When editing the options in Secret Server Cloud, you'll see something like this:

Enable Thycotic One Integration	<input checked="" type="checkbox"/>
Secret Server Redirect URI	https://yourcloudinstance.secretservercloud.com/signin-oidc
Thycotic One Server URL	https://login.thycotic.com/
Client Id	d9f43331-09d3-41b1-82ca-326c9c6dd419
Client Secret	< Saved >
Add New Users to Thycotic One	<input checked="" type="checkbox"/>
Use Thycotic One authentication as the default	<input checked="" type="checkbox"/>

Here are the available options:

- **Enable Delinea One Integration:** Turn on to enable Delinea One functionality. Turn off to completely disable Delinea One logins and synchronization. Make sure you have an admin account with a working local password.
- **Secret Server Redirect URI:** For informational purposes, this shows the page address to which you are redirected after you have logged in with Delinea One.
- **Thycotic One Server URL:** The Delinea One server you have connected to. There is one separate Delinea One instance in each Secret Server Cloud region.
- **Client ID:** The client ID portion of the Delinea One server credentials.
- **Client Secret:** Not shown, the client password portion of the credentials.
- **Add New Users to Delinea One:** When checked, Secret Server accounts will be synchronized with Delinea One. Adding a user will send them a welcome email, where they can set up their Delinea One account password and log into Secret Server. When unchecked, users will not be synchronized and no email will be sent. New users will not be able to log in with Delinea One, unless you click **Sync Now** on the **Admin > Configuration > Login** page, which will synchronize all active users.
- **Use Delinea One authentication as the default:** When checked, Delinea One authentication is used for the REST and SOAP APIs and mobile apps. Users who have logged in with Delinea One use their Delinea One account passwords for those activities, rather than their local Secret Server account passwords. When unchecked, they will use their local Secret Server account passwords for those activities.

In Cloud, the server URL, client ID, and client secret cannot be edited—they are set up for you when the instance is provisioned and cannot be changed.

## Secret Server On-Premise

When editing the options in Secret Server on-premise, you'll see something like this:



Enable Thycotic One Integration	<input checked="" type="checkbox"/>
Secret Server Redirect URI	<a href="https://mysecretserverinstance.example.com/SecretServer/signin-oidc">https://mysecretserverinstance.example.com/SecretServer/signin-oidc</a>
Thycotic One Server URL	<input type="text"/>
Client Id	<input type="text"/>
Client Secret	<input type="text"/>
Add New Users to Thycotic One	<input type="checkbox"/>
Use Thycotic One authentication as the default	<input type="checkbox"/>

Unlike in Cloud, the server URL, client ID, and client secret can be edited in an on-premise instance. You can generate Delinea One credentials using Delinea's cloud management portal, Cloud Manager. Otherwise, the configuration options behave the same as in Cloud.

## Generating a Delinea One Credential

To generate a credential for use in an on-premise Secret Server instance, follow the steps below:

1. From Cloud Manager, choose a Delinea One region under Other Login Options.
2. Log into Delinea One as a user that will be managing your organization's credentials. Create an account if you have not yet done so.
3. Go to Cloud Manager at <https://portal.thycotic.com/>.
4. Click **Sign In**. You are redirected to our tech support portal login.
5. Click the button for the Delinea One region you chose. Since you are already logged in to Delinea One, this will redirect you back to Cloud Manager.
6. Next, choose a team: In the menu, go to **Manage > Teams**. You may already have one if you have an existing cloud product. If not, create one. Each team can handle multiple Delinea One credentials.
7. Having selected your team, go to **Organizations**. Again, if you already have an organization, you can use it; if not, you can create one. An organization provides a way to manage the global login policies for all users.
8. Go to **Credentials**. Click **Add**. An Organization Credential dialog box appears:

Organization Credential

Name

My Secret Server Instance

Post-Login Redirect URIs

+

https://mysecretserverinstance.example.com/SecretServer/signin-oidc

Post-Logout Redirect URIs

+

Credentials

These credentials must be added to your application (for example, Secret Server) to connect to Thycotic One.

Endpoint

https://login.thycotic.com/

Client Id

c36b17ca-3e20-438c-bfa4-f0903ea54fcf

Client Secret

806f0ddc33d46994313b857468c97318d6e1fadf73efaa00b4dc05dec31c48cc

Make a note of this value, as it cannot be retrieved once it is saved.

Save

Cancel

9. The available fields are as follows:

- **Name:** A description of the application using this credential, for informational purposes.
- **Post-Login Redirect URIs:** A list of valid URIs that will be allowed to authenticate with this credential. The value of "Secret Server Redirect URI" from your on-premise instance should go here. If users access your instance with more than one URI, you may want to add all of them here by clicking the + button to create additional fields. Unless an application supplies a URI that is an exact match to one of these, Delinea One will not complete the authentication.
- **Post-Logout Redirect URIs:** Secret Server does not support this feature, so this may be left blank.
- **Credentials:** The fields in this area contain the values you need to put into the Delinea One configuration in SS. Copy and paste them into the corresponding fields.

10. Once you capture all the values, click **Save**, and then save the configuration in Secret Server as well. Your instance is now fully integrated with Delinea One. If you selected the synchronization option, Secret Server will immediately sync your active users with

Delinea One, and they'll receive welcome emails describing how to continue the process.

## Overview

The Federal Information Processing Standard 140-1 (FIPS 140-1) and its successor FIPS 140-2 are United States Government standards that provide a benchmark for implementing cryptographic software. Secret Server was tested and operates correctly in FIPS-compliant environments.

**Note:** The Microsoft .NET implementations of AES and SHA are not FIPS certified so Secret Server uses the Windows API versions for encryption functionality which *are* FIPS certified.

See [FIPS 140-2 Validation](#) for the FIPS certificate numbers for the Windows operating systems, including the algorithm implementations that we use. Supported operating systems include Windows Server 2008 R2 and above.

## Site-Specific FIPS Configuration

Individual sites are configurable for FIPS compatibility. The setting is available on the **Administration > Distributed Engine > Site Configuration page**, in the Engine Default Settings dialog box. All engines on a site will use this setting, overriding the global setting, which is configured at **Administration > Configuration > Security**.

## Procedure

To enable FIPS compliance:

### Task 1: Enable FIPS in Secret Server

1. Ensure Secret Server is already installed.

**Important:** Secret Server is unavailable and may give errors (such as "Parser Error Message: This implementation is not part of the Windows Platform FIPS validated cryptographic algorithms") until all the steps are completed.

**Important:** During Secret Server installation, if FIPS compliance for Windows has already been enabled 'InvalidOperationException' error messages may result. To resolve the issue, please contact support for assistance.

**Important:** If FIPS is enabled as part of a domain group policy, it must be disabled before the option can be enabled in Secret Server, otherwise an error may occur. It can be re-enabled using group policy once the feature has been enabled in the application.

2. In Secret Server, go to **Admin > Configuration**.
3. Click the **Security** tab.
4. Click the **Edit** button at the bottom of the page.
5. Click to enable the **Enable FIPS Compliance** check box in the **FIPS Compliance** section.
6. Click the **Save** button.

### Task 2: Enable FIPS in Windows

1. At the Windows command prompt, run `secpol.msc`. The Local Security Policy application appears.
2. In the left pane, drill down to **Security Settings > Local Policies > Security Options**.
3. In the right pane double-click the **System Cryptography: Use FIPS Compliant algorithms for encryption, hashing, and**

**signing** policy. Its properties appear.

4. Click to enable the **Enabled** selection button on the **Local Security Setting** tab.
5. Click the **OK** button.
6. Close the **Local Security Policy** application.

### Task 3: Reset the IIS Server

Run `iisreset` from the Windows command prompt. IIS resets.

**Note:** When using FIPS compliance mode in Secret Server, we use the NIST-certified encryption algorithms within the Windows Operating System.

**Note:** There should be no need to enable FIPS on the database server operating system because the encryption applies between the application and the database, not between the operating systems. Data is encrypted before it reaches the database.

### Related Information

- [NIST Cryptographic Module Validation Program Information](#)
- [FIPS information for Windows](#)

## Overview

Many modern secure applications use access tokens to ensure that users have access to the resources appropriate for them. Access tokens typically have a limited lifetime to ensure that information they contain or reference doesn't become stale, and to limit the time available for an attacker to use a stolen token.

When an access token expires or becomes invalid but the application still needs to access a protected resource, the application must use a new access token. To provide a new access token without requiring the user to grant permission a second time, OAuth 2.0 introduced an artifact called a *refresh token*.

Note the following:

- You cannot use a refresh token more than once.
- You cannot use a refresh token if your API Session Timeout is set to unlimited.
- In Secret Server, the refresh token "Time to live" equals the APISessionTimeout plus 15 minutes.
- Access tokens retrieved from REST can also be used for SOAP.

## How to Enable Refresh Tokens in Secret Server

### Procedure

You will receive a refresh token only if the option is enabled in **Admin > Configuration** as described below.

1. Click **Admin > Configuration** > then click the **General** tab.

The **Enable Web Services** field is visible but not editable.

## Configuration

[General](#)
[Login](#)
[SAML](#)
[Folders](#)
[Local User Passwords](#)
[Security](#)
[Ticket System](#)

### APPLICATION SETTINGS

Allow Automatic Checks for Software Updates Yes

Early Adopter No

#### Anonymized System Metrics Information

Send Anonymized System Metrics to Thycotic No [View Metric Data](#)

#### View Webservices

Enable Webservices No

Prevent Application from Sleeping When Idle Yes

#### Syslog/CEF Logging Advanced Settings Information

Enable Syslog/CEF Log Output No

#### Test PowerShell with WinRM

WinRM Endpoint URL http://localhost:5985/wsman

#### How do I configure CredSSP for WinRM?

Enable CredSSP Authentication for WinRM Yes

Secret Server Custom URL https://qa-cust-01.gamma.thy

Privilege Manager Installation URL ~/../TMS

2. Scroll to the bottom of the window, click the **Edit** button, and scroll back up. The window title changes from **Configuration** to **Edit Configuration** and the **Enable Web Services** field is now editable.

## Edit Configuration

[General](#)
[Login](#)
[SAML](#)
[Folders](#)
[Local User Passwords](#)
[Security](#)
[Ticket System](#)

### APPLICATION SETTINGS

Allow Automatic Checks for Software Updates



Early Adopter



[Anonymized System Metrics Information](#)

Send Anonymized System Metrics to Thycotic



[View Metric Data](#)

[View Webservices](#)

Enable Webservices



Prevent Application from Sleeping When Idle



[Syslog/CEF Logging Advanced Settings Information](#)

Enable Syslog/CEF Log Output



[Windows Remote Management Explanation](#)

WinRM Endpoint URL

http://localhost:5985/ws

[How do I configure CredSSP for WinRM?](#)

Enable CredSSP Authentication for WinRM



Secret View Interval Minutes

5

- Check the box next to **Enable Web Services**. The menu expands and the **Enable Refresh Tokens for Web Services** field is now visible.



[View Webservices](#)

**Enable Webservices** ☒

---

[Maximum Time Offline Explanation](#)

**Maximum Time for Offline Access on Mobile Devices**

Days

Hours

---

**Session Timeout for Webservices**

☐ Unlimited

Days

Hours

Minutes

---

**Enable Refresh Tokens for Web Services** ☐

---

**Prevent Application from Sleeping When Idle** ☒

- Click to enable the check box next to **Enable Refresh Tokens for Web Services**. The menu expands and the **Maximum Token Refreshes Allowed** field is now visible.

[View Webservices](#)

**Enable Webservices** ☒

---

[Maximum Time Offline Explanation](#)

**Maximum Time for Offline Access on Mobile Devices**

Days

Hours

---

**Session Timeout for Webservices**

☐ Unlimited

Days

Hours

Minutes

---

**Enable Refresh Tokens for Web Services** ☒

---

**Maximum Token Refreshes Allowed**

- Enter a numeral in the box next to **Maximum Token Refreshes Allowed**.
- Scroll to the bottom of the page and click **Save**.
- Authenticate with REST. You should receive both an access\_token and a refresh\_token.
- Use the access token until it expires.

- When the access token expires, POST to the same endpoint for authentication ("oauth2/token") with the body containing the following:

```
grant_type = "refresh_token"
```

```
Set refresh_token = <YOUR REFRESH TOKEN>
```

- You should receive a refresh\_token and a new access\_token.

## Example

```
[Net.ServicePointManager]::SecurityProtocol = [Net.SecurityProtocolType]::Tls12
$uri = "https:// < yoursecretserverinstance >"
$api = "$uri/api/v1"

function Authenticate {
    $args= @{
        username = "username"
        password = "password"
        grant_type = "password"
    }

    echo "-----"
    echo "--Authenticate--"
    echo "-----"
    $response = Invoke-RestMethod "$uri/oauth2/token" -Method Post -Body $args -ContentType "application/json"
    $global:token = $response.access_token
    $global:refreshToken = $response.refresh_token

    $global:headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
    $global:headers.Add("Authorization", "Bearer $token")
}

function Refresh {
    $args= @{
        grant_type = "refresh_token"
        refresh_token = $refreshToken
    }

    echo "-----"
    echo "----Refresh----"
    echo "-----"
    echo "--Sending Refresh Token"
    echo $refreshToken

    $response = Invoke-RestMethod "$uri/oauth2/token" -Method Post -Body $args -ContentType "application/json"

    if($response.access_token){
        $global:token = $response.access_token
        $global:refreshToken = $response.refresh_token
        $global:headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
        $global:headers.Add("Authorization", "Bearer $token")
    }
}
```

## Overview

An SSL (Secure Sockets Layer) certificate greatly enhances the security between the user's browser and the server your Secret Server is installed on. It encrypts all data between the server and the client's browser so if an attacker were to look at the data being transmitted between the two, they would not be able to decipher it.

**Note:** SSL is required when using Integrated Windows Authentication.

## Obtaining an SSL Certificate

You can get a certificate from various companies such as [Thawte](#) or [VeriSign](#). If you already obtained a certificate from one of them, please follow their instructions for installing their certificates.

**Note:** Delinea does **not** provide certificates.

## Installing a Self-Signed Certificate

You can create your own certificate for trial or sandbox environments:

**Note:** This requires IIS 7 or later.

### Task One: Generate an IIS Self-Signed Certificate

1. Open IIS manager (**inetmgr**) on your Web server.
2. Click on the server node (one of the root nodes) in the left panel.
3. Double-click the **Server certificates** icon.
4. Click the **Create Self-Signed Certificate** link in the **Actions** panel. The Specify Friendly Name dialog box appears.
5. Type any name you desire in the **Specify a Friendly name for the certificate** text box.
6. Click the **OK** button. You now have an IIS self-signed certificate that is valid for one year. It appears under the Server Certificates panel. The certificate common name (Issued To column) is the host name of the machine running the site.

### Task Two: Bind the Self-Signed Certificate to the IIS Site

1. In IIS Manager, click the server you want to bind to on the **Connections** panel tree.
2. Drill down to **Sites > Default Web Site**.
3. Click the **Bindings...** link in the **Actions** panel. The Site Bindings dialog box appears.
4. Click the **Add...** button. The Edit Site Binding dialog box appears.
5. Click the **Type** dropdown list and select **https**.
6. Click the **SSL certificate** dropdown list to select the certificate you just created.
7. Click the **OK** button. You return to the Site Bindings dialog box, where the HTTPS binding now appears.
8. Click the **Close** button. The dialog box closes.

## Task Three: Test the Self-Signed Certificate

1. In a browser, go to the Website using the certificate. You should see a warning that there is an issue with the site's security certificate—specifically, the security certificate was issued for a different website's address. This occurs because IIS uses the server's name as the common name when using a self-signed certificate, which usually does not match the hostname to access the site in your browser.
2. To access the website, click the "continue to the website" link or button. You will have to do this each time you access the site. Because this is a test environment, this should not be an issue.

**Note:** It is possible to remove the warning by adding the self-signed certificate to the trusted root certificate authorities, but that is beyond the scope of this instruction.

**Note:** This applies to Secret Server Version 10.7 SP2+.

## Introduction

### OpenID Connect

OpenID Connect is an industry-standard single-sign-on (SSO) protocol. An identity provider implementing OpenID Connect can be used as an identity source for Secret Server, allowing users to log in with external credentials.

### OpenID Connect Support in Secret Server

#### Secret Server

Secret Server implements OpenID Connect authorization code flow, allowing any standards-compliant provider to be used as an identity source. To use OpenID Connect, a Secret Server administrator must configure the login integration. Additionally, user accounts must be created in Secret Server that correspond to the external accounts.

## Prerequisites

### General

- Secret Server version 10.7 SP2+
- An OpenID-Connect-compatible identity provider, such as Delinea One, Azure AD, Auth0, or Okta.

### Permissions

- To configure the login integration, a Secret Server user must have Administer OpenID Connect permissions. Secret Server
- To add user accounts that can be used with OpenID Connect, a Secret Server user must have administer user permissions.

### Task One: Acquire and Configure an OpenID Connect Provider

1. Follow your OpenID Connect provider's setup instructions for configuring a new identity client.
2. Gather the configuration data from the provider. To configure an OpenID Connect login provider, the provider must supply these:
  - **Provider URL:** An HTTPS URL, acting as an authentication endpoint. Secret Server expects the provider URL to be the "issuer" URL of the provider. For example, if the OpenID Connect configuration for the provider is accessible at  
`https://example.com/.well-known/openid-configuration,`  
then the URL used in the Secret Server configuration should be  
`https://example.com.`
  - **Client ID:** The ID portion of the credentials used to interact with the provider.
  - **Client Secret:** The password portion of the credentials used to interact with the provider.

The process for determining this information varies by provider and you can usually find it by following the provider-specific documentation for configuring an OpenID Connect client.

- Configure the provider with the Secret Server Redirect URI, as shown below, when configuring OpenID Connect integration in Secret Server. It is usually `https://YourWebServer/SecretServer/signin-oidc`. The Secret Server Redirect URI value must be added to the provider's configuration, so that the Secret Server instance can perform the authentication handshake. This process varies by provider, but it is usually known as a post-login redirect URI or callback URI.

## Task Two: Configure Secret Server

- Locate the Secret Server OpenID Connect configuration at **Admin > Configuration > Login**:

<b>Enable OpenID Connect Integration</b>	<input checked="" type="checkbox"/>
<b>Secret Server Redirect URI</b>	<code>https://yourservername/SecretServer/signin-oidc</code>
<b>OpenID Connect Server URL</b>	<input type="text" value="https://provider.example.com"/>
<b>Client Id</b>	<input type="text" value="provider-client-id"/>
<b>Client Secret</b>	<input type="password" value="....."/>
<b>Add New Users to Thycotic One</b>	<input checked="" type="checkbox"/>
<b>Use Thycotic One authentication as the default</b>	<input checked="" type="checkbox"/>
<input type="button" value="Save"/> <input type="button" value="Cancel"/>	

- Click to select the **Enable OpenID Connect Integration** check box.
- Fill in the other values using the what you gathered earlier.

**Note:** The two Delinea One options are not relevant unless you use Delinea One as your OpenID Connect provider. They have no effect for other providers.

- Click the **Save** button.

## Task Three: Matching External Accounts to Secret Server Users

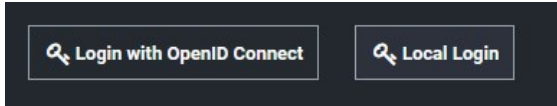
Ensure a matching user already exists in Secret Server, which is required when logging on an OpenID Connect account. OpenID provides for no user list synchronization or on-the-fly account creation. Users are matched according to the claims provided in their authentication ticket. Matching occurs using the following criteria:

- If the name identifier value matches an active user that has already logged in with OpenID Connect, then this user will be logged on.
- If not, then if the email or UPN values match an existing, unique, active Secret Server user, then this user will be logged on.

Otherwise, the login attempt will fail, and information about the failure will be added to the system log.

## Task Four: Logging on with OpenID Connect

Finally, confirm the configuration by logging on with OpenID Connect. Once Open ID Connect has been configured, the Secret Server login page will have a new **Login with OpenID Connect** button:



Clicking this button initiates the OpenID Connect log on process with the external provider. Depending on provider settings, you may be asked to approve the login request or grant access to specific profile info. Once you have approved the request and logged in to the external provider, you will be redirected back to Secret Server and logged in as the corresponding local user.

Secret Server provides the option to integrate your SAML implementation to automatically authenticate users to the application:

- To configure SAML for versions 10.5+, see the [SAML 2.0 Configuration Guide](#).
- To configure SAML for versions 10.2-10.4, see the [SAML Configuration Guide for Secret Server 10.2-10.4](#).



Host SSH key verification is supported for use with heartbeat, proxied launchers, password changers, and discovery. Host SSH key verification can be used to ensure that the machine you are connecting to is a trusted host. Host SSH key verification will not pass credentials to the target machine unless the public key digest matches the SHA1 digest that Secret Server has on file. This helps prevent man-in-the middle attacks.

## How to Map a Server SHA1 Digest to a Secret

To configure host SSH key verification:

1. go to Secret Templates and add a field for the host's SSH key digest.
2. Click **Configure Extended Mappings**.
3. Add a "Server SSH Key" mapping to your newly created SSH key digest field.
4. On your secrets, add the SSH Key digest of the hosts to your digest field. Verification takes effect the next time you connect to the host.

## Heartbeat

If no "Server SSH Key" mapping exists for the secret or if the mapped digest field is blank, the digest will not be checked. If a digest is mapped and present and it does not match, then heartbeat will fail with a "UnableToValidateServerPublicKey" error. The heartbeat log will show the expected and actual values for the SHA1 digest.

## Password Changing

If no "Server SSH Key" mapping exists for the secret or if the mapped digest field is blank, the digest will not be checked. If a digest is mapped and present and it does not match, then the password change will fail. The Remote Password Changing log will show the expected and actual values for the SHA1 digest.

## Non-Proxied Launcher

When launching PuTTY, it displays a message if the server's public key digest is not yet trusted.

## Proxied Launcher

If no "Server SSH Key" mapping exists for the secret or if the mapped digest field is blank, the digest will not be checked. If a digest is mapped and present and it does not match, then a message will be written to PuTTY displaying the expected and actual values for the SHA1 digest. The credentials from the secret will not be passed to the target machine.

## SSH Script Dependencies

SSH Script dependencies now have a "Server Key Digest" field. When this field is blank, the server's digest will not be checked. When it is filled in, if it does not match, an error is returned indicating the expected and actual values from that server. No credentials are passed to the target machine unless the digest matches.

## Unix Account Discovery

To validate SHA1 server digests for Unix account discovery, create a file named `KeyDigests.txt` in the root of the Secret Server website. Each line should contain an IP address or other computer identifier, a comma, and then the SHA1 digest (see example below). When the file exists and has data, all machines to be scanned must match one of the SHA1 hashes in the file. Any computers that do not match will still show up on the Discovery Network View page, but authenticated scanning will not take place (no credentials will be passed to the machine, and

accounts will not be retrieved from the machine).

Sample KeyDigests.txt:

```
192.168.1.5:7E:24:0D:E7:4F:B1:ED:08:FA:08:D3:80:63:F6:A6:A9:14:62:A8:15  
apollo,7A:25:AB:38:3C:DD:32:D1:EA:86:6E:1C:A8:C8:37:8C:A6:48:F9:7B
```

Be sure that your digest value which you input into KeyDigests.txt is not an MD5 value. MD5 values are 32 bytes, whereas a SHA1 is 40. So the above is correct whereas if you obtain a digest of your public key file and the result has 32 bytes, this is likely an MD5. One command which could be used to obtain the SHA1 digest of the public key file for use in KeyDigests.txt is:

```
awk '{$print $2}' id_XXX.pub | openssl base64 -d -A | openssl sha1
```

After which, you should add : to every two characters to the output such that it matches the above. We will try to connect to the keys which we have the strongest preference for first in the event of multiple keys and it is legal to have multiple digests for the same IP address or hostname in the file. In the event of multiple keys on your system, it is usually correct to get the digest from /etc/ssh/ssh\_host\_rsa\_key.pub and put it into KeyDigests.txt if this public key exists.

Since Secret Server uses IIS to run the web application, we use the IIS function for smart card authentication:

<https://technet.microsoft.com/en-us/library/cc732116.aspx>

We recommend enabling Integrated Windows Authentication in Secret Server (Under **Administration > Active Directory**) if the users are AD users. That way Secret Server will not prompt for credentials if the user is authenticated to AD. IIS will authenticate the users based on the smart card certificate, and Secret Server will pass the user through since they are logged in as an AD user.

To do this, there are two parts:

Configure Client Certificate Authentication in IIS -

<http://www.iis.net/configreference/system.webserver/security/authentication/clientcertificatemappingauthentication>

Configure Windows Authentication in IIS and Secret Server - [Configuring Integrated Windows Authentication](#)

1. Install the **Client Certificate Mapping Authentication** and **IIS Client Certificate Mapping Authentication** role services for IIS.
2. Reboot.
3. In IIS manager, highlight the server and click **Authentication**. Enable **Active Directory Client Certificate Authentication**.
4. In IIS manager, highlight the virtual folder for SecretServer and click **SSL Settings**. Check **Require SSL** and select Accept under **Client Certificates**.
5. Edit the file:

```
%windir%\system32\inetsrv\config\applicationhost.config
```

and add

```
<clientCertificateMappingAuthentication enabled="true" />" under the" <windowsAuthentication enabled="false" />
```

6. Enable Integrated Windows Authentication in SecretServer. When the user goes to the website they get prompted for smart card credentials if there is one inserted. Otherwise it takes them to the login screen.

If you experience a performance issue with the first login, it may be related to the SSLAlwaysNegoClientCert property. More on this can be read here: [Changing IIS to Not Stop Worker Process in IIS 7.0 and Later](#)

That could affect performance, which makes sense when doing the initial load of the home screen (which is probably one of the bigger screens in Secret Server in terms of size).

Starting with version 10.4, Secret Server allows you to define a policy for validating X509 Certificates. This applies to all Active Directory domains using LDAPS. It also applies to any connections to syslog servers over TLS. Certificates that do not meet the policies specified in Secret Server are rejected, denying connections to the server. All certificate validation failures are logged in the security audit log, which is available by going to **Admin > See All** and then **Security Audit Log**.

## Setting the Certificate Verification Policy

To set a verification policy:

1. Go to **Admin > Configuration**.
  2. Click the **Security** tab.
  3. Click the **Edit** button
  4. Click to select the **Apply TLS Certificate Chain Policy and Error Auditing** check box. The TLS Auditing options appear:
-

TLS AUDITING

Apply TLS Certificate Chain Policy and Error Auditing
☒

Ignore Certificate Revocation Failures
☐

Additional Certificate Chain Policy Options
What are X509 Certificate Chain Policy Options?

X509RevocationMode.NoCheck

Enable TLS Debugging and Connection Tracking
☐

Advanced (not required)

Secret Server's IIS AppPool must be granted permission to use the Client Certificate, using the Windows HTTP Services Certificate Configuration Tool (WinHttpCertCfg.exe). Example usage:  
winhttpcertcfg.exe -g -c LOCAL\_MACHINE\MY -s "Certificate Subject" -a "HOSTNAME\IIS APPPOOL\SecretServer"  
Download WinHttpCertCfg - Official WinHttpCertCfg documentation

Client Certificate Thumbprint(s)

- To change the policy, type a semi-colon delimited list of policy options in the **Additional Certificate Chain Policy Options** text box. To use a policy, enter the <full\_enumeration\_name>.<enumeration\_item>. For example, to validate the entire certificate chain, add X509RevocationFlag.EntireChain to the semi-colon delimited list of options. See [Certificate Validation Options](#) for details.
- If you wish to ignore certificate revocation warnings and allow revoked certificates, click to select the **Ignore Certificate Revocation Failures** check box.

## Certificate Validation Options

The following Microsoft enumerations are the available certificate chain policy options. For detailed descriptions of each option, see the linked documentation.

### X509RevocationMode

Specifies the mode used to check for X.509 certificate revocation.

NoCheck	0	No revocation check is performed on the certificate.
Offline	2	A revocation check is made using a cached certificate revocation list (CRL).
Online	1	A revocation check is made using an online certificate revocation list (CRL).

[Unexpected Link Text](#)

See [X509RevocationMode Enum](#) for details.

#### **X509RevocationFlag**

Specifies which X.509 certificates in the chain should be checked for revocation.

EndCertificateOnly	0	Only the end certificate is checked for revocation.
EntireChain	1	The entire chain of certificates is checked for revocation.
ExcludeRoot	2	The entire chain, except the root certificate, is checked for revocation.

[Unexpected Link Text](#)

See [X509RevocationFlag Enum](#) for details.

#### **X509VerificationFlags**

Specifies conditions under which verification of certificates in the X.509 chain should be conducted. These values can be bitwise combined to indicate multiple flags.

AllFlags	4095	All flags pertaining to verification are included.
AllowUnknownCertificateAuthority	16	Ignore that the chain cannot be verified due to an unknown certificate authority (CA).
IgnoreCertificateAuthorityRevocationUnknown	1024	Ignore that the certificate authority revocation is unknown when determining certificate verification.
IgnoreCtlNotTimeValid	2	Ignore that the certificate trust list (CTL) is not valid, for reasons such as the CTL has expired, when determining certificate verification.
IgnoreCtlSignerRevocationUnknown	512	Ignore that the certificate trust list (CTL) signer revocation is unknown when determining certificate verification.
IgnoreEndRevocationUnknown	256	Ignore that the end certificate (the user certificate) revocation is unknown when determining certificate verification.

IgnoreInvalidBasicConstraints	8	Ignore that the basic constraints are not valid when determining certificate verification.
IgnoreInvalidName	64	Ignore that the certificate has an invalid name when determining certificate verification.
IgnoreInvalidPolicy	128	Ignore that the certificate has invalid policy when determining certificate verification.
IgnoreNotTimeNested	4	Ignore that the CA (certificate authority) certificate and the issued certificate have validity periods that are not nested when verifying the certificate. For example, the CA cert can be valid from January 1 to December 1 and the issued certificate from January 2 to December 2, which would mean the validity periods are not nested.
IgnoreNotTimeValid	1	Ignore certificates in the chain that are not valid either because they have expired or they are not yet in effect when determining certificate validity.
IgnoreRootRevocationUnknown	2048	Ignore that the root revocation is unknown when determining certificate verification.
IgnoreWrongUsage	32	Ignore that the certificate was not issued for the current use when determining certificate verification.
NoFlag	0	No flags pertaining to verification are included.

[Unexpected Link Text](#)

See [X509VerificationFlags Enum](#) for details.

## Troubleshooting

If you enable certificate policy validation and logging, you may have server connections rejected due to certificates that violate the set policies. These errors are recorded in the security audit log. If the information logged there is not enough to determine why a certificate was rejected, you can get additional log details by enabling TLS Debugging. This adds detailed information to the logs about each certificate checked.

Due to the possibility of exposing sensitive information in the logs, TLS debugging requires two steps to enable:

1. Click to select the **Enable TLS Debugging and Connection Tracking** check box.
2. Change the global logging level to DEBUG. To do this, edit the `web-log4net.config` file in the root folder of your Web application. Follow the comments in the file to comment out the current log level line (the default is INFO), and uncomment the line that sets the value to DEBUG.

**Important:** Only enable TLS debugging when you are actively troubleshooting a certificate validation issue. Disable this option when you are not to prevent logging of certificate details.

**Note:** Please click the table of contents on the left to see any sub-pages to this one.

Windows integrated authentication allows Active Directory users that are synced with Secret Server to log into workstations and be automatically authenticated to the application. A user's Active Directory credentials are automatically passed through to IIS, logging them into the site.



## Configuring Integrated Windows Authentication

**Note:** This article applies to Secret Server On-Premises only.

### Introduction

Integrated Windows Authentication (IWA) allows users to log into Secret Server automatically if they are logged into a workstation with their Active Directory credentials.

**Note:** To ensure users can access the Health Status page see [Checking Secret Server Site Status](#) without logging in, be sure to enable Form and Anonymous authentication in IIS.

**Note:** [Secure LDAP](#) only works with Integrated Windows Authentication in Server 2008 R2 and later.

### Setting Up Windows Authentication

#### Task 1: Configuring Secret Server

1. Log into Secret Server as a user with Active Directory administration privileges.
2. Navigate to and click **Administration > Directory Services** (In the General section). The Directory Services page appears, opened to the Domains tab.
3. Click the **Add Domain** button and select **Active Directory Domain** or **Azure Active Directory Domain**. An Active Directory popup appears.
4. If you chose Active Directory Domain:
  1. Type your FQDN in the **Fully Qualified Domain Name** text box.
  2. Type the name for people to read in the **Friendly Name** text box.
  3. Click to select the **Active** check box.
  4. If you wish to use secure LDAP, click to select the **Use LDAPS** check box.
  5. Click the **Create New Secret** link under **Synchronization Secret**. A popup appears.
  6. Click **Active Directory** Account in the Choose a Secret Template dropdown list. A Create New Secret popup appears.
  7. Fill in the popup with your desired parameters for your AD secret.
  8. Click the **Create Secret** button. The popup disappears and the secret name appears on the previous popup.
  9. Click the **Site** dropdown list to select your desired site.
  10. Click the **Multifactor Authentication** dropdown list to select your desired type of MFA, if any.
  11. Click the **Validate & Save** button to commit your choices. The popup disappears and your directory service appears in the table on the Directory Services page.
5. If you chose Azure Active Directory Domain:
  1. Type your name for people to read in the **Domain Name** text box.
  2. Click to select the **Active** check box.
  3. Type your tenant ID in the **Tenant ID** text box.
  4. Type your client ID in the **Client ID** text box.
  5. Type your client password in the **Client Secret** text box.
  6. Click the **Multifactor Authentication** dropdown list to select your desired type of MFA, if any.
  7. Click the **Validate & Save** button to commit your choices. The popup disappears and your directory service appears in the table on the Directory Services page.
6. Click the **Configuration** tab.
7. Click the **Edit** button in the **Directory Services** section. The section becomes editable.

8. If necessary, click to select the following check boxes:
  - **Enable Directory Services**
  - **Enable Integrated Windows Authentication.**
9. Click the **Save** button.
10. Click the **Edit** button in the **User Synchronization** section. The section becomes editable.
11. Ensure the **Enable User Synchronization** check box is selected.
12. Type the in the **Days**, **Hours**, and **Minutes** text boxes to choose a synchronization interval, which is how often Secret Server pulls in users from AD.
13. Select your desired option from the **User Account Options** dropdown list.
14. Select how to handle inactive users in the **Automatic User Management** dropdown list.
15. Type your desired number of days in the **Days to Keep Operational Log** text box.
16. Click the **Save** button. The Active Directory Configuration page returns to being read only.
17. Click the **Domains** tab.
18. Click the **Synchronize Now** button. This pulls all the users of the specified groups into Secret Server.

## Task 2: Configuring IIS

1. Start the Internet Information Services (IIS) Manager.
2. Navigate to and select your Secret Server website in the **Connections** tree:
3. Double-click the **Authentication** icon in the **IIS** section to open the **Authentication** pane.
4. Enable the **Windows Authentication** parameter by right-clicking it and selecting **Enable**. For now, ignore the alert if it appears in the Alert section.

**Note:** If Windows Authentication is not visible, ensure that the Windows Authentication Role service is enabled in Windows. This is different than earlier versions.
5. Disable the **Anonymous Authentication**.
6. Disable the **Forms Authentication**. The alert in the Alert section should disappear.
7. When finished, the Authentication settings should only have Windows Authentication enabled.
8. Restart your IIS server with an `iisreset` command.
9. On the Secret Server folder, ensure users have read or higher permission, and ensure the security settings are set to be inherited by child objects. Because Secret Server impersonates those users, they require access to Secret Server files.
10. Log in to the Secret Server site from an authenticated workstation.

## Task 3: Configuring Secret Server Launchers

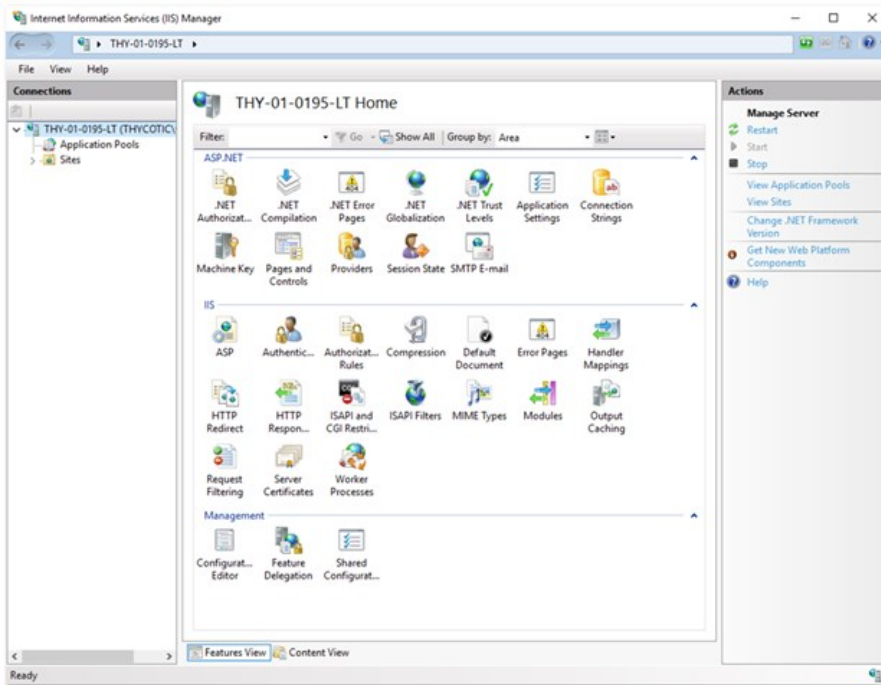
By default, a launcher will not work when using IWA, resulting in an HTTP 401: Unauthorized error. If this is an issue, ensure Secret Server is on Windows Server 2008 or later and complete the following steps:

1. Open IIS and browse to your Secret Server application.
2. Click the ► to see the application's folders.
3. Click to select the **launchers** folder. The launchers Home panel appears.
4. Double-click the **Authentication** icon in the **IIS** section to open the **Authentication** pane.
5. Ensure the **Anonymous Authentication** is set to **Enabled**.
6. Ensure the **Windows Authentication** is set to **Disabled**.
7. Ensure all others are disabled. When you are finished, the settings should have Anonymous Authentication enabled.
8. Click the **webservices** folder.
9. Double-click the **Authentication** icon in the **IIS** section to open the **Authentication** pane.
10. Ensure the **Anonymous Authentication** is set to **Enabled**.
11. Ensure the **Windows Authentication** is set to **Disabled**.
12. Ensure all others are disabled. When you are finished, the settings should have Anonymous Authentication enabled.
13. Click the **rdp** folder.
14. Double-click the **Authentication** icon in the **IIS** section to open the **Authentication** pane.
15. Ensure the **Anonymous Authentication** is set to **Enabled**.
16. Ensure the **Windows Authentication** is set to **Disabled**.
17. Ensure all others are disabled.

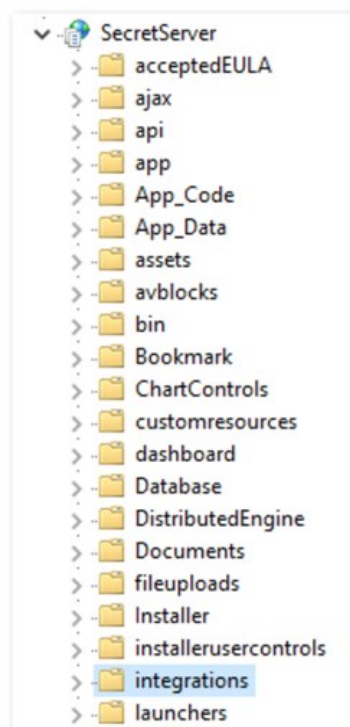
## **Markdig.Syntax.Inlines.EmphasisInline**

Similarly, Secret Server with distributed engines will not work with IWA by default. If this is an issue, complete the following:

1. In Windows Explorer, navigate to the ...\\SecretServer\\ folder. This folder is mapped to your SecretServer folder in your webserver.
2. Create a subfolder named ...\\SecretServer\\integrations.
3. Create a subfolder called ...\\SecretServer\\api in the same location.
4. In your ...\\SecretServer\\api folder, create a subfolder named ...\\SecretServer\\api\\DistributedEngine.
5. Start IIS Manager:



6. Navigate the **Connections** tree back to **integrations** folder in the **SecretServer** node:



7. Double-click the **Authentication** icon in the **IIS** section to open the **Authentication** pane.

8. Ensure the **Anonymous Authentication** is set to **Enabled**.

9. Ensure the **Windows Authentication** is set to **Enabled**.
10. Ensure all others are disabled.
11. Navigate to the ...\\SecretServer\\api\\DistributedEngine folder.
12. Double-click the **Authentication** icon in the **IIS** section to open the **Authentication** pane.
13. Ensure the **Anonymous Authentication** is set to **Enabled**.
14. Ensure the **Windows Authentication** is set to **Disabled**.
15. Ensure all others are disabled.

## Task 5: Configuring Client Certificates

If you are using client certificates, configure the following in IIS for launchers to work:

1. Click to select the **launchers** folder. The launchers Home panel appears.
2. Double-click the **SSL Settings** icon. The settings panel appears.
3. Click to set the **Client Certificates** selection button to **Accept**.
4. A dialogue box requiring a **yes** response pops up.
5. Click **Yes**.
6. Click to select the **Webservices** folder.
7. Once again, double-click the **SSL Settings** icon.
8. This time, set the **Client Certificates** selection button to **Ignore**.

**Note:** If you are not automatically logged in to Secret Server after setting up IWA, IIS may not be handling the credentials correctly. To fix this, recreate the web site in IIS.

**Note:** When testing IWA, keep in mind the requirements at [Your Browser May Prompt You for a Password](#).

**Note:** You may not be able to log in using IWA on the server running Secret Server for Server 2008 or later because of security settings.

## Troubleshooting

### AD User Prompted for Credentials Even Though IWA Is Active

A user is logged onto their machine with the same Active Directory credentials they can log into Secret Server with, but the browser still prompts them for their credentials to reach the site. Ensure your Secret Server site is included in a security zone that allows for automatic logon:

1. In your browser, go to Internet **Options > Security**.
2. Click the **Trusted Sites** security zone.
3. Click the **Custom Level** button. The Security Settings – Trusted Sites Zone dialog box appears.
4. Scroll down to **User Authentication**.

5. Click to select the **Automatic logon with current user name and password** selection button.
6. Click the **OK** button.

## Logging in as a Local Account Is Not Available

In Secret Server 10.0 and later, Secret Server requires Integrated Mode in IIS. The Integrated Mode can only support either Window Authentication or Forms Authentication (used for local account authentication), not both. Because of this limitation, Forms Authentication must be disabled for the site when using Integrated Windows Authentication. Thus, logging in as Secret Server local account is not available when IWA is enabled.

## Installing Windows Authentication in Windows Server 2012 Manager

1. In Server Manager, click the **Manage** menu and select **Add Roles and Features**. The Add Roles and Features wizard appears.
2. Click the **Next** button. The Select installation type window appears.
3. Select the installation type.
4. Click the **Next** button. The Server selection window appears.
5. Select the destination server.
6. Click the **Next** button. The Server roles window appears.
7. Click to expand **Web Server (IIS) > Web Server > Security**.
8. Click to select **Windows Authentication**.
9. Click the **Next** button. The Select features window appears.
10. Click the **Next** button. The Confirmation window appears.
11. Click the **Install** button. The Results window appears.
12. Click the **Close** button.

## Overview

You can specify a secret to provide the default credentials for running all PowerShell scripts on a site. This allows sites in different data centers to have different default credentials. This applies to remote password changing, checkout hooks, and account discovery PowerShell scripts.

**Note:** If you want a specific secret checkout hook, secret password changer, or account discovery scanner to use different credentials you can still provide credentials in those areas, which will take precedence over the one set on the site.

## RunAs Secret Precedence

### Remote Password Changing

The precedence order for which RunAs secret to use for remote password changing is:

1. Privileged account on the secret RPC tab
2. Secret site's RunAs secret
3. Secret

### Secret Dependencies

The precedence order for which RunAs secret to use for PowerShell Secret dependencies is:

1. Privileged account on the dependency
2. Run As secret on the dependency group's site
3. Secret site's RunAs secret
4. Secret

### Checkout Hooks

The precedence order for which RunAs secret to use for checkout hooks is:

1. Privileged account on the hook
2. Secret site's RunAs secret
3. Secret

## Procedures

### Setting the Default PowerShell Credential for a Site

To set a default PowerShell credential for a site:

1. Go to **Admin > Distributed Engines > Manage Sites**.
2. Select the desired site.
3. Click **Edit**.

4. Click the secret picker link on the **Default PowerShell RunAs Secret** field.
5. Click **Save**.

## Using the Site PowerShell Credentials for Discovery

To use the site PowerShell credentials on a discovery scanner:

1. Add a PowerShell scanner to a discovery source or edit an existing scanner.
2. In the **Edit** dialog for the scanner, click to select the **Use Site RunAs Secret** checkbox.
3. Click **Save**.

**Note:** If no RunAs secret is set on the site, you will get an error message when you try to save.



For public websites, only SSL certificates issued by trusted authorities are recognized as valid. Self-signed certificates used only within a company or domain might generate security warnings but these can be ignored. The same is true of self-signed certificates installed on a server for the Secret Server website. However, these security warnings can also interfere with the use of the Secret Server Launcher and Web Password Filler. To resolve these issues, install the certificate on the client machine, either through your browser or Certificates snap-in.

To enable trust in the Secret Server self signed certificates, following these steps:

## Step 1: Compare Host Names

Make sure that the host to which the certificate is issued is the same as the host name for your Secret Server website:

1. Open your browser and navigate to Secret Server.
2. Click **Continue to this website** if you are prompted.
3. Click the **Certificate Error** icon next to the navigation bar.
4. Click the **View certificate** button. The value next to **Issued to** should match the host name for your website. For example, if your website is `https://www.mydomain.local/SecretServer`, it should say **Issued to:** `www.mydomain.local`. If these fields do not match, the client will not be able to fully trust the certificate.

## Step 2: Transfer a copy from your server to the client computer

Obtain a copy of the certificate file and transfer it to the client computer:

1. On the server where Secret Server is installed, find **Run** from the start menu or screen and type in `mmc`, then click the **Enter** button.
2. From the **File** menu, select **Add/Remove Snap-in**.
3. Select the **Certificates** snap-in, then click the right arrow button to add it.
4. In the window that appears, select **Computer Account**.
5. Select **Local Computer**.
6. Click **Finish**. You should now see the **Certificates (Local Computer)** node.
7. Expand the **Personal** folder and then the **Certificates** folder under it.
8. Right-click the certificate that Secret Server uses.
9. Click **All tasks**.
10. Select **Export**.
11. Keep clicking the **Next** button to accept defaults in the wizard.
12. Type in a filename.
13. Click the **Finish** button. The certificate has now been exported.

**Note:** If you have Firefox, the certificate can be saved to your client computer by viewing and exporting it after navigating to the website.

## Step 3: Install the certificate on the client computer

1. On the client computer, find **Run** from the start menu or screen and type in `mmc`, then hit the **Enter** button.
2. From the **File** menu, select **Add/Remove Snap-in**.
3. Select the **Certificates** snap-in, then click the right arrow button to add it.
4. In the window that appears, select **My user account**.
5. Click the **Finish** button.
6. Expand the **Trusted Root Certification Authorities** folder.
7. Right-click the **Certificates** folder and select **All Tasks > Import**.

8. Click **Next** and **Yes** to accept default settings for all steps of the wizard.
9. When prompted for the certificate file, select the file you saved in the previous Step 2.

**Note:** You may need to re-open your browser and browse to Secret Server once more to see the change reflected on the client machine.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server supports a second layer of authentication, called multi-factor authentication (MFA) or two-factor authentication (2FA), for added security. This section discusses several options.

## Duo Security Authentication

**Note:** Using this method of two-factor authentication requires that you have an active account for Duo Security.

**Note:** Secret Server supports using Duo Security as a second factor of authentication. See below for setup instructions.

Note: For more information on Duo and Secret Server, see the [Delinea Secret Server and Duo](#) page.

### Task 1: Create a Duo Application Representing Your Secret Server (Admin)

1. Sign up for a new Duo account, or log in to an existing one at [Duo Security](#).
2. Under **Applications**, create a new application of the **Delinea Secret Server** type. Name the application as you wish.
3. Record the API hostname, integration key, and secret key from the new Duo application you just created.

### Task 2: Configure Secret Server to Use Duo (Admin)

**Note:** Because Duo is a service, the Secret Server instance must have outbound access (TCP port 443) to reach the API host to work. If there is a firewall rule preventing access to Duo's servers, two factor authentication will not work.

1. Open Secret Server.
2. From the **Admin** menu, select **Configuration**.
3. Click the **Login** tab, and then click **Edit**.
4. Select the **Enable Duo Integration** check box.
5. Enter the **API Hostname**, **Integration Key**, and **Secret Key** values.
6. Click the **Save** button.
7. Go to **Admin > Users** to create a test user. The Users page appears.
8. Click the **Create New** button. The **Edit User** page appears:

## Edit User

User Name

Display Name

Email Address

Domain

Local

▼

Password

Confirm

Two Factor

< None >

▼

Enabled

☒

Locked Out

☐

[Advanced](#)

Save

Cancel

9. Click the **Two Factor** dropdown list and select **Duo**.
10. Type or select the other parameters for the new user. See [Users](#).
11. Log on as the test user. If there are multiple two-factor devices available, you will be prompted to select one. If you are un-enrolled you will be given a link to perform self-enrollment. You are contacted via the Duo app, SMS, or a phone call for the second factor.
12. Add or configure actual users one at a time or by using bulk operations.

### Task 3: Setting up Duo (User)

1. Log on to Secret Server.
2. After successful authentication, a new screen appears with the option to select a method to authenticate with.
3. Select one of the options (**Duo Push**, **Send SMS**, or **Phone**), depending on your setup with Duo) and complete the selected authentication process to log in.

## Applications for Soft Token Two-Factor Authentication

The name of the Secret Server soft token two-factor setting for Time-based One Time Password (TOTP) is "TOTP Authenticator." Any TOTP application that uses the TOTP RFC6238 algorithm, such as such as Microsoft [Authenticator](#), will work with the Secret Server TOTP Authenticator. Details on the TOTP RFC6238 standard can be found at [TOTP: Time-Based One-Time Password Algorithm](#).

**Note:** Google Authenticator support started in Secret Server version 8.6.

## Email Two-Factor Authentication

Secret Server requires that a connection to a SMTP server be properly configured to send out confirmation code emails. Enter the SMTP server information and an email address that is used to send notifications:

1. Click **Admin > Configuration**.
2. Click the **Email** tab.
3. Verify SMTP server availability with telnet using the command `telnet <your server name> 25`.

**Note:** If virus protection is running, you may need to add a firewall rule to allow aspnet\_wp.exe to send e-mails.

## FIDO2 (YubiKey) Two-Factor Authentication Configuration

### Overview

#### FIDO2

FIDO2 (Fast Identity Online, second edition) is an open authentication standard that uses physical devices for authentication. Delinea uses it for two factor authentication (2FA) with FIDO2 providing the second authentication after a normal password entry—any FIDO2-enabled user attempting access to a Secret Server account **must** have a FIDO2 device in hand. The device eliminates many password-related issues, such as phishing and man-in-the-middle attacks. It also speeds up the long on process over callback or texting 2FA.

#### YubiKey

YubiKey is a FIDO2-compliant product series from Yubico, a commercial company. We recommend two of their devices--YubiKey 5 Series and Security Key by Yubico.

### Configuration

FIDO2 configuration follows these steps, which we cover in detail in this section:

1. Enable FIDO2 in your Secret Server.
2. Set up the user's credentials.
3. Distribute the FIDO2 device to the user.
4. User registers his or her device.

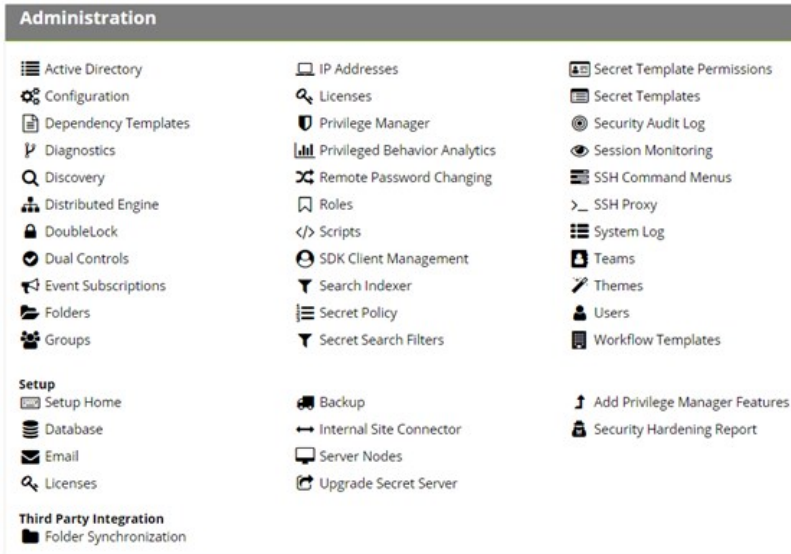
#### Prerequisites

- One FIDO2 device. We recommend the YubiKey series.
- A Secret Server Vault license or greater.
- Administer Users or User Owner permissions in SS.
- A Firefox or Chrome browser.

#### Enabling FIDO2 for a Single User

1. In Secret Server, click the **Admin** menu item. The Administration page appears:





2. Click the **Users** button. The Users page appears:

Users						
You are currently licensed for 101 user(s). You currently have 30 enabled user(s).						
<input type="text"/>						
	User Name	Display Name	Email Address	Enabled	Domain	Two Factor
<input type="checkbox"/>	will@will.com	Will	will@will.com	Yes	Local	< None >
<input type="checkbox"/>	will	Will	will@will.com	Yes	Local	< None >
<input type="checkbox"/>	will	Will	will@will.com	Yes	Local	< None >
<input type="checkbox"/>	will@will.com	Will	will@will.com	Yes	Local	< None >

3. Click the link in the **User Name** column for the user you want to configure. The View User page appears:

### View User

User Name

Will

Display Name

Will

Email Address

will@will.com

Domain

Local

Two Factor

< None >

Enabled

Yes

Locked Out

No

Application Account

No

IP Address Restrictions

None

Restricted By Team

No

4. Scroll down and click the **Edit** button. The Edit User page appears:

Edit User

User Name

bart.simpson

Display Name

Bart Simpson

Email Address

Domain

testparent.thycotic.com

Two Factor

< None >

Enabled

☒

Locked Out

☐

Advanced

Save

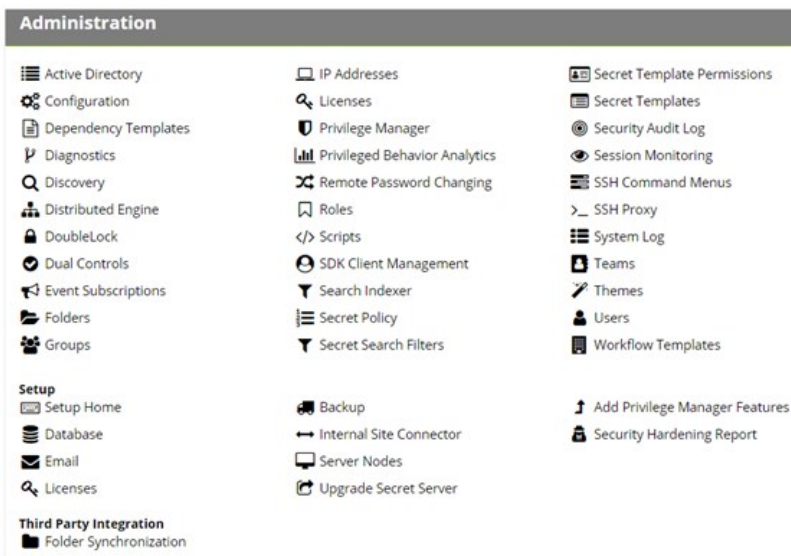
Cancel

5. Click the **Two Factor** list and select **FIDO2**.

6. Click the **Save** button.

## Enabling FIDO2 for Multiple Users

1. In Secret Server, click the **Admin** menu item. The Administration page appears:



2. Click the **Users** button. The Users page appears:

Users						
You are currently licensed for 101 user(s). You currently have 30 enabled user(s).						
<input type="text"/>						
	User Name	Display Name	Email Address	Enabled	Domain	Two Factor
<input type="checkbox"/>	admin@p...	Admin	admin@p...	Yes	Local	< None >
<input type="checkbox"/>	ad...	Ad...	ad...@p...	Yes	Local	< None >
<input type="checkbox"/>	test...	Test...	test...@p...	Yes	Local	< None >
<input type="checkbox"/>	testparent...	Test Parent		Yes	testparent.thycotic...	< None >

3. Click to select the unlabeled check box next to each user you wish to include.

4. Click the **Select Bulk Operation** list below the table and select **Enable FIDO2 Two Factor**. A warning popup page appears:

**Bulk Operation: Enable FIDO2 Two Factor**

Are you sure you want to perform this action on the selected users?

5. Click the **OK** button. A confirmation popup page appears:

**Bulk Operation: Enable FIDO2 Two Factor**

Bulk operation completed.

There were no errors.

6. Click the **Close** button.

## Disabling FIDO2 for Users

Disabling FIDO2 for users, for both single and multiple, is almost the same as enabling them. There are two differences:

- For a single user, select **<None>** for the Two Factor list on the **Edit User** page.
- For multiple users, select **Disable FIDO2 Two Factor** in the **Select Bulk Operation** list on the **Users** page.

**Note:** Disabling FIDO2 2FA does **not** remove device registration information from Secret Server. If FIDO2 is re-enabled, the user can use the FIDO2 device without re-registering it.

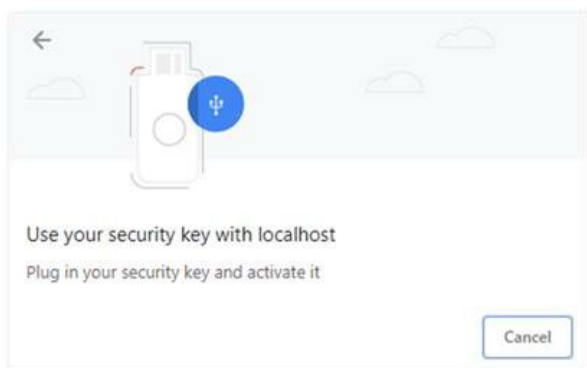
## Unregistering Users from FIDO2

Resetting FIDO2 serves to unregister existing users. There is no way to reverse it—users will have re-register a FIDO2 device, even the same one.

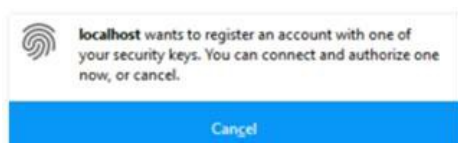
Resetting FIDO2 for both single and multiple users is very similar to enabling FIDO2 for multiple users. The only difference is you select **Reset FIDO2 Two Factor** in the **Select Bulk Operation** list on the **Users** page. That is right, for single users—you do a bulk operation.

## Registering FIDO2 Devices (End User Operation)

1. After an admin registers the user in Secret Server the user is prompted upon his or her next log on. For example, in Chrome:



Or in Firefox:



**Note:** Legacy Microsoft Edge is not supported. Edge Chromium, version 79 or higher, is required for FIDO2 support.

2. The user inserts his or her FIDO2 device into a USB port on the computer.
3. The user activates it by touching the sensor on the device.
4. After successful registration, the user is **again** prompted with the same screen, which is authenticating the current session against the credentials that were just registered.
5. From then on, the user is prompted for his or her security after a successful username-password login. Once the key is authenticated, the Secret Server Dashboard appears.

**Note:** Only one FIDO2 device per user can be registered at any given time; however, the 2FA settings can be temporarily disabled or reset in the case of a lost or forgotten FIDO2 device.

## Auditing and Security

- Upon registration, a user's FIDO2 Credential, the FIDO2 Public Key JSON string, and the FIDO2 Counter is stored in the User's audit log.
- Upon each successful FIDO2 authentication, the FIDO2 counter value is updated and noted in the User's audit log.

## Troubleshooting and Issues

- If the user encounters an error or does not fulfill the authentication before the process times out, the user is redirected back to the username and password log on screen where the process can be reattempted.
- Authentication activities are logged in the user's audit log.
- System errors are logged in the Secret Server.log file in Secret Server's log directory.

## RADIUS User Authentication

Secret Server allows the use of *Remote Authentication Dial-In User Service* (RADIUS) two-factor authentication on top of the normal authentication process for additional security needs. Secret Server acts as a RADIUS client that can communicate with any server implementing the RADIUS protocol.

### Configuring RADIUS

Set up RADIUS on the **Login** tab of the **Configuration** page. This requires enabling RADIUS Integration, specifying the server address, the ports, and the RADIUS shared secret. The shared secret is a specific term for RADIUS clients and is not a reference to secrets in Secret Server.

You can customize the RADIUS "Login Explanation" to give users detailed instructions for entering their RADIUS information.

Once enabled, the **Test RADIUS Login** button appears on the **Login** tab for testing the communication with the RADIUS Server. If you have a failover RADIUS Server, you can specify it by clicking the **Enable RADIUS Failover** checkbox and entering the required information. If the primary RADIUS server cannot be accessed, the failover server is be used.

### Enabling RADIUS for a User

After enabling RADIUS on your Secret Server, you must enable RADIUS two-factor authentication for each user on a per-user basis. On the **User Edit** page, type the **RADIUS User Name** for this user to match the RADIUS server. RADIUS can be enabled for new users by domain.

## Enabling RADIUS Two-Factor Authentication

### Procedure

Secret Server allows the use of RADIUS two-factor authentication on top of the normal authentication process for additional security.

See the full [RADIUS Integration Guide](#) for additional information.

To configure RADIUS for the Secret Server instance:

1. Log on Secret Server with an account with "Administer Configuration" and "Administer RADIUS" permissions.
2. Navigate to **Administration menu > Configuration > Login**.
3. Click the **Edit** button.
4. Type the following:

- **RADIUS Server IP** (IP address to your RADIUS Server). See [RADIUS IP Addresses](#).
- **RADIUS Client Port** (default 1812)

**Note:** If your RADIUS server runs on the same machine as Secret Server, the client and server ports must be different.

- **RADIUS Server Port** (default 1812 for RSA and 1812 for AuthAnvil).
- **RADIUS Shared Secret**, which must match chosen RADIUS shared secret on your RADIUS Server. (Shared Secret is a RADIUS term and not related to any Secret Server secret.)
- **RADIUS Login Explanation** (custom message or instruction). Defaults to "Please enter your RADIUS passcode."

5. Click the **Save** button.

To test RADIUS settings:

1. Click the **Test RADIUS Login** button. A popup appears.
2. Type the RADIUS username and password.
3. Click the **OK** button.
4. After enabling RADIUS on Secret Server, you must enable RADIUS two-factor authentication for each user:
  1. Sign into an account with "Administer Configuration" and "Administer RADIUS" permissions.
  2. Navigate to **Administration > Users**. The Users page appears.
  3. Select the desired user.
  4. Click the **Edit** button.
  5. Click to select the **RADIUS Two Factor Authentication** check box.
  6. Type the username in the **RADIUS Username** text box.

**NOTE:** Secret Server defaults this value to its username. If you wish to use this default name, it must match the username on the RADIUS server.

7. Review the settings and click **Save**.
8. Repeat these steps for each user that needs to use RADIUS.

## RADIUS IP Addresses

Inbound allowlisting is necessary if RADIUS authentication is configured. IP addresses:

### **secretservercloud.com**

- 20.65.118.12 (Primary)
- 23.102.107.104 (Primary)
- 23.102.107.220 (Primary)
- 23.102.106.185 (Primary)
- 23.102.108.55 (Primary)
- 52.224.253.7 (Primary)
- 52.224.253.4 (Primary)
- 52.151.206.73 (Primary)
- 52.151.206.77 (Primary)
- 52.151.206.35 (Primary)
- 52.160.67.39 (DR)
- 52.160.67.38 (DR)
- 104.40.25.170 (DR)
- 138.91.163.99 (DR)
- 137.135.51.234 (DR)

### **secretservercloud.co.uk**

- 20.0.46.111 (Primary)
- 51.142.243.172 (Primary)
- 20.0.46.112 (Primary)
- 20.0.46.123 (Primary)
- 20.0.46.124 (Primary)
- 51.104.62.220 (Secondary)
- 51.104.62.213 (Secondary)
- 51.104.63.38 (Secondary)
- 51.104.62.185 (Secondary)
- 51.104.62.252 (Secondary)

### **secretservercloud.ca**

- 52.228.117.246 (Primary)
- 52.228.113.119 (Primary)
- 52.139.7.40 (Primary)
- 52.139.7.137 (Primary)
- 52.139.7.197 (Primary)
- 52.229.119.193 (DR)
- 52.229.119.89 (DR)
- 52.235.39.79 (DR)
- 52.235.39.125 (DR)
- 52.235.39.5 (DR)

### **secretservercloud.eu**

- 20.79.64.213 (Primary)
- 20.79.65.3 (Primary)



- 20.79.226.78 (Primary)
- 20.79.226.180 (Primary)
- 20.79.226.116 (Primary)
- 20.50.180.242 (DR)
- 20.50.180.187 (DR)
- 20.50.154.28 (DR)
- 20.50.176.86 (DR)
- 20.50.156.219 (DR)

## **secretservercloud.com.sg**

- 20.195.97.220 (Primary)
- 20.195.98.154 (Primary)
- 20.212.128.73 (Primary)
- 20.212.128.75 (Primary)
- 20.212.128.74 (Primary)
- 65.52.165.108 (DR)
- 65.52.160.251 (DR)
- 52.184.100.188 (DR)
- 52.184.101.189 (DR)
- 52.184.101.213 (DR)

## **secretservercloud.com.au**

- 20.37.251.37 (Primary)
- 20.37.251.120 (Primary)
- 20.37.5.233 (Primary)
- 20.37.5.227 (Primary)
- 20.37.5.48 (Primary)
- 20.53.142.34 (DR)
- 20.53.142.37 (DR)
- 20.53.80.77 (DR)
- 20.53.81.216 (DR)
- 20.53.82.77 (DR)

## TOTP

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server supports using any type of soft token or mobile application authentication using the *Time-Based One-Time Password* (TOTP) RFC6238 algorithm. TOTP's are typically generated and authenticated by a mobile application using an algorithm that incorporates the current time to ensure that each one-time password (OTP) is unique. TOTP applications include Authy, Google Authenticator, and Microsoft Authenticator.

Secret Server can also serve as an OTP generator, providing TOTP authentication for RPC and launchers. The soft token two-factor function in Secret Server is the "TOTP Authenticator" and you can use any application that uses the TOTP RFC6238 standard (details on the standard can be found at the [IETF Tools website](#)). An example of a TOTP application that works with Secret Server soft token two-factor authentication is Microsoft Authenticator.

## Disabling TOTP for Users

To disable soft token two-factor authentication, follow almost the same process as enabling soft token two-factor authentication for a user, select **Disable TOTP Auth Two Factor** from the bulk operation drop-down menu instead of **Enable TOTP Auth Two Factor**.

## Enabling TOTP for Secret Server Users

1. From the **Admin** menu, select **Users**.
2. Select the check box beside each user to enable two-factor authentication for.
3. From the **< Select Bulk Operation >** drop-down menu, select **Enable TOTP Auth Two Factor**.
4. Click **OK** in the dialog that appears, confirming the operation.
5. The user(s) are now required to complete the soft token setup with a mobile device the next time they log into Secret Server. See [Onboarding the Mobile App](#) for details on the account and mobile app setup that follow.

## Enabling TOTP for Launchers

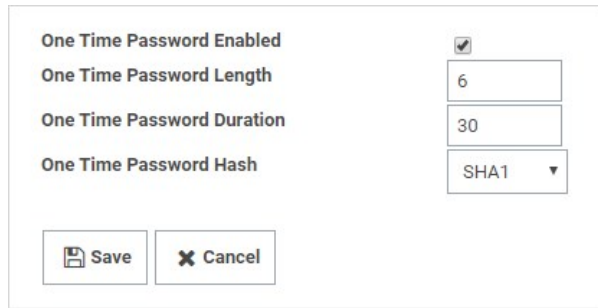
Most commonly, time-sensitive one-time passwords (TOTPs) are generated by a mobile application, such as Google Authenticator or Microsoft Authenticator. Additionally, Secret Server can be used as the TOTP generator for RPC or launchers (for web password secrets only at this time). Both the secret and the secret template require configuration for this use.

### Secret Template Setup

To enable TOTP on a Secret Server template:

1. Go to **Admin > Secret Template**.
2. Select the desired template, and click the **Edit** button. The Secret Template Designer appears.
3. Navigate to the **Settings** section of the page, and click **Edit**.
4. Click to select the **One Time Password Enabled** check box. This enables the option with default settings:

Length: 6 Duration: 30 Hash: SHA1



The screenshot shows a configuration window for a secret template. It contains four settings: 'One Time Password Enabled' with a checked checkbox, 'One Time Password Length' with a text input field containing '6', 'One Time Password Duration' with a text input field containing '30', and 'One Time Password Hash' with a dropdown menu showing 'SHA1'. At the bottom, there are two buttons: 'Save' with a floppy disk icon and 'Cancel' with an 'X' icon.

**Note:** These are the values that most one-time password instances, such as Google and Microsoft Authenticator, use today. If you use these settings with another OTP provider and are unable to successfully use generated codes to authenticate, please review their documentation and adjust these settings as required.

5. Save the secret template. Any web password secret based upon this template can now use TOTP.

### TOTP Secret Setup

Once a secret template is set up for TOTP, each secret based on that template also needs to be set up:

1. Click the **Secrets** menu item in the dashboard.
2. Open the desired secret.
3. Click the **Settings** tab:

Thycotic Web Password ☆

General
Security
Audit
RPC
Dependencies
Sharing
Settings

EMAIL NOTIFICATIONS - PERSONALIZED USER SETTINGS

Send Email When Viewed

No

Send Email When Changed

No

Send Email When Heartbeat Fails

No

TIME-BASED ONE-TIME PASSWORD (TOTP)

Generate One-Time Passwords

☐

Cancel
Save

- Click to select the **Generate One-Time Passwords** check box in the **TOTP** section. This exposes two text boxes:

Generate One-Time Passwords

☒

TOTP Key \*

.....

Show

TOTP Backup Codes

.....

Show

Cancel
Save

- Type the TOTP key in the **TOTP Key** text box. The TOTP Key is generated by the OTP-protected asset when you set up your account to use TOTP. Usually, you are prompted with a QR bar code that you can scan with a mobile device, or you can expose the key that the QR code represents. This text string is the value that is placed into the TOTP Key field.

**Important:** Treat the TOTP key and backup codes like you would any other password! If anyone obtains the key, it can be used to set up a valid TOTP generator for that account on any device, allowing that person to bypass the protection. Similarly, the backup codes allow users to temporarily bypass protection.

**Note:** If you have an account that has been TOTP protected and you did not save the TOTP key upon creation, you must

deactivate TOTP on that account and then reactivate it to retrieve the TOTP key to set up Secret Server.

6. Type the TOTP backup codes in the **TOTP Backup Codes** text box. The TOTP Backup Codes are often presented to a user while initially setting up an account for TOTP. These backup codes are single-use codes for use if a TOTP generator is not available or working. Again, these codes will be valid and allow the holder to get past the two-factor authorization to access an account, so protect them as you would a password!

## Resetting TOTP for Secret Server Users

1. From the **Admin** menu, select **Users**.
2. Select the check box beside the user to reset two-factor authentication for.
3. Click select **Reset TOTP Auth Two Factor** on the **< Select Bulk Operation >** drop-down menu.
4. Click **OK** in the dialog that appears, confirming the operation.
5. The user is now required to complete the soft token setup with a mobile device the next time they log into Secret Server. See **User Setup of Soft Token Two-Factor Authentication** for further details on the account and mobile app setup that follow.



## Viewing a TOTP for a Web Secret

To view or copy the TOTP generated for an account:

1. Navigate to and open the desired secret.
2. Click the **General** tab:

Thycotic Web Password ☆

General
Security
Audit
RPC
Dependencies
Sharing
Settings

Secret Name \*

Thycotic Web Password

Edit

Template

Web Password

Edit

URL \*

http://www.thycotic.com

Edit

UserName \*

myUserName


Edit

Password \*

\*\*\*\*\* Show

Edit


One Time Password


Generate One Time Password

Notes

Edit


Launchers


Web Password Filler

Show Advanced
Edit all fields

3. Click the **Generate One Time Password** link next to the **One Time Password** setting.
4. A dialog box appears with an OTP:

One Time Password for Thycotic Web Password

754 544


Click the One Time Password to copy to clipboard

Close

1. Click the OTP to copy it to the clipboard.
2. Click the **Close** button.

**Note:** The "Generate One Time Password" link also appears on the preview pane when you click a secret on the All Secrets page.

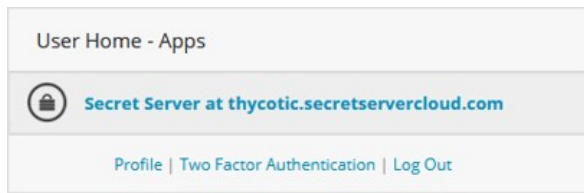
## Enabling Two-Factor Authentication in Delinea One

When two-factor authentication is enabled, Delinea One presents a two-factor challenge to the user logging in. The Delinea One two-factor authentication supplements and does not replace any other two-factor authentication methods used by a client application such as Secret Server. Delinea One supports two-factor authentication using TOTP or SMS. You can have only one two-factor authentication method active at any time. We recommend using TOTP over SMS whenever possible for better security.

### TOTP Two-Factor Authentication

To use TOTP two-factor authentication with Delinea One, you must first have a mobile device with an installed TOTP application such as Google Authenticator, Authy, or Microsoft Authenticator. When you have the app installed, follow the steps below.

1. Log into Delinea One and on the account homepage in the **User Home - Apps** dialog, click **Two-Factor Authentication**.

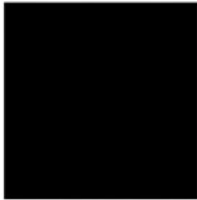


2. Choose **TOTP** and click **Enroll**.

Two Factor Authentication			
Type	Enrolled	Enabled	Actions
Totp	✗		<a href="#">Enroll</a>
Sms	✗		<a href="#">Enroll</a>

Delinea One displays a barcode (redacted in the example shown).

Verification Code
[Home](#)



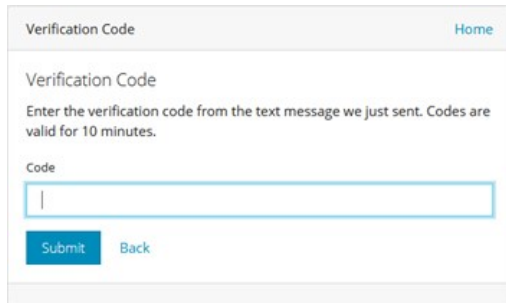
Scan the barcode in your authenticator app (Google Authenticator, Microsoft Authenticator, Authy, or similar).

After scanning, enter the six-digit code from your authenticator app below.

Verification Code

[Submit](#) [Back](#)

3. Using the TOTP app on your mobile device, scan the barcode. You will receive multiple six-digit codes.
4. In the Verification Code field, enter one of the six-digit codes (a new code is generated every 30 seconds).



Verification Code [Home](#)

Verification Code

Enter the verification code from the text message we just sent. Codes are valid for 10 minutes.

Code

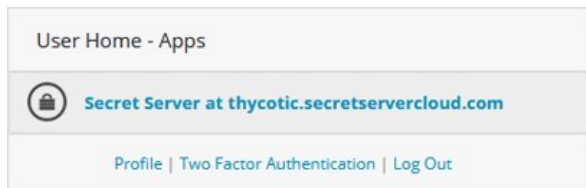
[Submit](#) [Back](#)

When you have correctly entered and submitted a six-digit code, the setup of TOTP two-factor authentication is complete. From this point forward, each time you attempt to log in you will receive a text message on your mobile device with a code that you must enter to complete the login process.


## SMS Two-Factor Authentication

To use SMS two-factor authentication with Delinea One, you must first provide and verify a mobile phone number. Delinea

1. To provide a mobile phone number, log into Delinea One, and on the account homepage in the **User Home - Apps** dialog, click **Profile**.

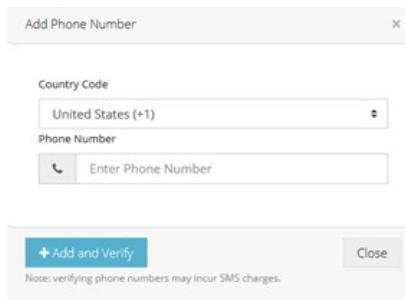


User Home - Apps

 **Secret Server at thycotic.secretservercloud.com**

[Profile](#) | [Two Factor Authentication](#) | [Log Out](#)

2. Click **Add Phone** and enter the country code and phone number of a mobile phone that accepts text messages.




Add Phone Number [×](#)

Country Code

United States (+1) [⌵](#)

Phone Number

 Enter Phone Number

[+ Add and Verify](#) [Close](#)

Note: verifying phone numbers may incur SMS charges.

3. Click **+Add** and **Verify**.

Delinea One sends a text message to the phone number, with a code.

4. Enter the code and click **Submit** in the Verification Code dialog.

Verification Code
[Home](#)

To start using SMS two-factor authentication, click the button below to send a text message to your primary phone number: [REDACTED]

Send Text Message

When you receive the text message, enter the six-digit code below.


Verification Code

Submit
[Back](#)

The phone number now appears as Verified on your profile page.

1. On the Delinea One account homepage in the **User Home - Apps** dialog, click **Two-Factor Authentication**.

User Home - Apps


**Secret Server at thycotic.secretservercloud.com**

[Profile](#) | [Two Factor Authentication](#) | [Log Out](#)

1. Choose **SMS** and click **Enroll**.

Type	Enrolled	Enabled	Actions
Totp	✗		<a href="#">Enroll</a>
Sms	✗		<a href="#">Enroll</a>

Delinea One sends a text message to your phone with a six-digit code.

2. Enter the six-digit code into the box provided.

Verification Code
[Home](#)

Verification Code

Enter the verification code from the text message we just sent. Codes are valid for 10 minutes.

Code

Submit
[Back](#)

When you have correctly entered and submitted the six-digit code, the setup of SMS two-factor authentication is complete. From this point forward, each time you attempt to log in you will receive a text message on your mobile device with a code that you must enter to complete the login process.

## Backup and Disaster Recovery

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server supports manual and scheduled database and IIS directory backups. The database access settings support SQL mirror and automatic failover. As an additional disaster recovery measure, administrators can export secrets to a CSV spreadsheet.

Secret Server can be configured to backup to a network share instead of a local folder on the server. For example, you may want to do this such as when the Secret Server database (SQL) is located on a different server than the web application server (IIS).

To back up:

1. Ensure the Secret Server IIS Application Pool is running as a service account if it is not already. See Secret Server [Running the IIS Application Pool As a Service Account](#).
2. Grant access to the network share (using Windows ACLs) to the account running the Secret Server IIS Application Pool (so that Secret Server can backup the application folder and zip it to the network share).
3. Grant access to the network share (using Windows ACLs) to the account running Microsoft SQL Server service. (so that Microsoft SQL Server can backup the Secret Server database to the network share). You can change the service account running Microsoft SQL Server by going to SQL Server Configuration Manager.
4. Go to **Admin > Backup**. This may require you to go to **Admin > All** and search for **Backup**.

### Backup Configuration

**i** The AppPool running Secret Server must be configured to not shutdown. See the following KB Article.  
Secret Server is currently running as "GAMMA\ss\_iis\_svc", you will need to grant Full Control to the backup folder specified for this user.

**i** To backup to a network share, see the following KB Article.

Enable Web Application Backup	Yes
Backup File Path	c:\backup
Enable Database Backup	Yes
Backup Database File Path	c:\backup
Database Backup SQL Timeout (Minutes)	30
Enable Copy-Only Database Backups	No
Keep Number of Backups	10
Notify Administrators on backup failure	No
Enable Scheduled Backup	Yes
Backup Start Time	5/15/2019 10:18 AM
Backup Every	1 days 0 hours 0 minutes
Next Scheduled Backup	5/28/2020 10:18 AM
Enable TMS Backup	No
TMS Installation Path	

Back
Edit
View Audit
Backup Now

5. Note that the two file paths are from two different perspectives—Backup File Path is from the ASP.NET application server and Backup Database Path is from the Microsoft SQL Server (these may be on the same box in your environment, or they might not be depending on how you have configured Secret Server).
6. Click the **Edit** button.
7. Type the Secret Server backup path, such as \\server01\backup\secretserver\, in the **Backup File Path** text box.
8. Type the database backup path in the **Backup Database Path** text box.
9. Click the **Save** button.



From the Backup Administration page, specify the correct directory paths for the IIS Secret Server file directory and the database backups to be stored. The backup path must be local to the server where the Secret Server database or file directory exists. The directories must also have the proper permissions to allow Secret Server to automatically store backups at those locations. The account that requires permission is displayed as an alert on the Backup page.

## Overview

The following configuration options are available on the **Tools > Backup** page of Secret Server:

- **Backup Database File Path:** This folder must be accessible by the SQL server and stores the database.bak file. See [File Path Settings](#).
- **Backup File Path:** This directory must exist on the Web server and stores the zip file of the application directory. See [File Path Settings](#).
- **Database Backup SQL Timeout (Minutes):** Number of minutes that Secret Server waits for the database backup to complete successfully before timing out.
- **Enable Scheduled Backup:** Enables automatic backups on a set schedule.
- **Keep Number of Backups:** Number of previous backups to keep.
- **Notify Administrators on Backup Failure:** Users with the Administer Backup role permission are notified if the backup fails.
- **Days to Keep Operational Logs:** Sets the period to keep backup-related logs that might contain PII. Secret Server automatically deletes logs older than that (in days).

## File Path Settings

There are two file path settings on the **Admin > Backup** page (ConfigurationBackup.aspx). The "Backup File Path" setting corresponds to the application backup. The "Backup Database Path" setting corresponds to the SQL server backup.

Generally, the "Backup File Path" setting can be set to a path local to the application server for backing up of application files. If Secret Server is running under an account that does not have permission to write to a local path, then a network share can be used. If the SQL server is located on the same server as the Web application server, the "Backup Database File Path" setting can be set to a local path.

If the SQL server is not located on the same server as the Web application server then a network share should be used. The account under which SQL server service is running either must have modify rights to that path or must be a member of a group with modify rights to that path. You must use UNC (Universal Naming Convention) notation to write to a network path. For example: \\TESTVM0\\c\$\\backupDirectory.

If you get an error stating "Cannot open backup device... Operating system error 3," this is often due to an invalid path value.

**Note:** For Secret Server to delete old database backups, the backup database path must also be accessible by the Secret Server Application Pool account.

## **Cannot open backup device... Operating system error 3**

This is often due to an invalid path value for the "Backup Database File Path" setting. For more information on the proper values for this setting, see [File Path Settings](#).

## **Timeout expired. The timeout period elapsed prior to completion of the operation or the server is not responding.**

This is often due to an overly-large database. The Secret Server database likely contains too many log entries. To clear these, within Secret Server, select System Log from the Administration menu. Click the "Clear" button below the data grid that contains the log entries. If the timeout occurs with the clear as well, an upgrade to the latest version should resolve this. If the timeout issue persists with the backup, additional SQL database clean-up may be necessary. Contact [Delinea Support](#) for instructions on shrinking the reserve database size.

## **The process cannot access the file... because it is being used by another process**

The cause of this message is typically multiple backup threads running simultaneously with all attempting to write to the same file. To fix this, open IIS Manager and ensure the "Maximum Worker Processes" setting for Secret Server's application pool is set to 1. If it is not, set the value to 1 and then either recycle the application pool or perform an `iisreset`.

## **Unable to complete backup. The following exception occurred: System.Threading.ThreadAbortException: Thread was being aborted**

If this error message appears in combination with the application backup files not completed or the size of the file is unusually small, the backup process may have been interrupted by anti-virus software. Disabling scanning of the backup folder should resolve the issue.

Also see: [Backing up Secret Server to a network share](#) (KBA)

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Overview

**Note:** The DR features are also referred to as *resilient secrets*.

The Disaster Recovery (DR) feature is a tool for emergency access to critical systems in the event of an emergency, such as a network outage. DR generates updates at regular intervals from one Secret Server instance (the data source) to another, or many other, instances (the Replicas). A select set of folders and the secrets they contain will have any changes sent securely to the configured replicas so that, in the event the data source becomes inaccessible, the replicas can be quickly used for emergency access to vital systems

## Setup

### Secret Server Database Preparation

#### Overview

We provide several SQL scripts to help you identify any data duplication you may have that could cause issues with DR. We recommend that you run all of them.

**Note:** These searches will be built into future DR installations. We provide these as an interim measure till that happens.

They are:

- Secret Template Names: Searches for duplicates
- Secret Field Slug Names: Searches for duplicates
- Character Set Names: Searches for duplicates
- Password Requirements Names: Searches for duplicates
- Domain Names: Searches for duplicates of formal domain names (those in URLs)
- Domain Friendly Names: Searches for duplicates of human-readable domain name equivalents
- Folder Paths: Searches for duplicates of secret folders
- Group Names: Searches for duplicates of user group names
- Role Names: Searches for duplicates of user role names

#### Procedure

Copy and paste each query into a [custom report](#) and run it. Alternatively, database admins can run the scripts directly on the Secret Server On-Premises database. After running the queries, if you receive any results, that indicates duplicates to address before enabling the DR feature. Most issues can be resolved by simply renaming or removing the duplicate items.

#### SQL Scripts

##### Secret Template Names

```
-- Secret Template Names
SELECT
    SecretTemplateName
FROM
    tbSecretType
GROUP BY
    SecretTemplateName
HAVING
    COUNT(*) > 1
```

## Secret Field Slug Names

```
-- Secret Field Slug Names
SELECT
    st.SecretTypeName,
    t.FieldSlugName
FROM
(
    SELECT
        sf.SecretTypeId,
        sf.FieldSlugName
    FROM
        tbSecretField AS sf
    JOIN
        tbSecretType AS st2
    ON
        st2.SecretTypeID = sf.SecretTypeID
    GROUP BY
        sf.FieldSlugName, sf.SecretTypeId
    HAVING
        COUNT(*) > 1
) AS t
JOIN
    tbSecretType AS st
ON
    st.SecretTypeID = t.SecretTypeID
```

## Character Set Names

```
-- Character Set Names
SELECT
    cs.Name
FROM
    tbCharacterSet AS cs
GROUP BY
    cs.Name
HAVING
    COUNT(*) > 1
```

## Password Requirement Names

```
-- Password Requirement Names
SELECT
    pr.Name
FROM
    tbPasswordRequirement AS pr
GROUP BY
    pr.Name
HAVING
    COUNT(*) > 1
```

## Domain Names

```
-- Domain Names
SELECT
    Domain
FROM
    tbDomain
GROUP BY
    Domain
HAVING
    COUNT(*) > 1
```

## Domain Friendly Names

```
-- Domain Friendly Names
SELECT
    FriendlyName
FROM
    tbDomain
```

```
GROUP BY
    FriendlyName
HAVING
    COUNT(*) > 1
```

## Folder Paths

```
-- Folder Paths
SELECT
    FolderPath
FROM
    tbFolder
WHERE
    UserID IS NULL
GROUP BY
    FolderPath
HAVING
    COUNT(*) > 1
```

## Group Names

```
-- Group Names
SELECT
    GroupName
FROM
    tbGroup
WHERE
    IsPersonal = 0
    AND IsPlatform = 0
    AND SystemGroup = 0
    AND DomainId IS NULL
GROUP BY
    GroupName, DomainId
HAVING
    COUNT(*) > 1
```

## Role Names

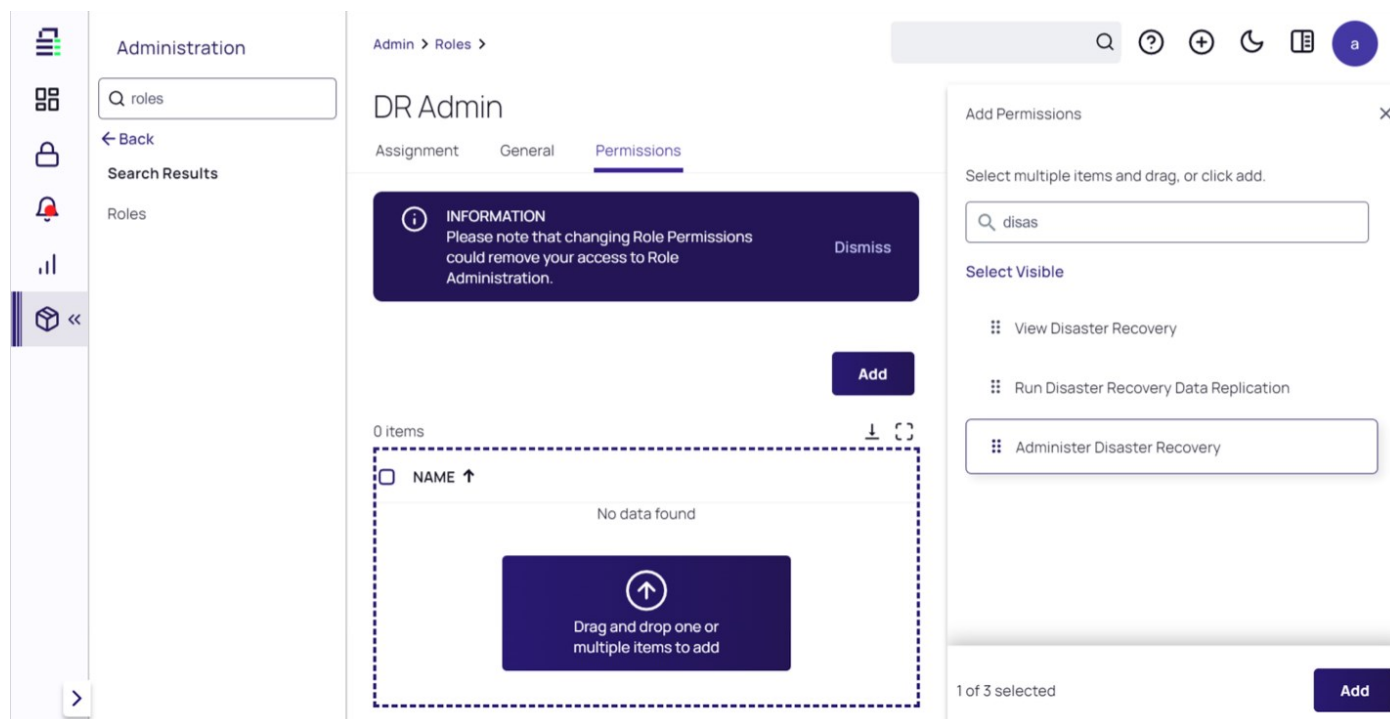
```
-- Role Names
SELECT
    r.Name
FROM
    tbRole AS r
WHERE
    r.RoleType = 1
    AND r.IsSystem = 0
GROUP BY
    r.Name
HAVING
    COUNT(*) > 1
```

## Role Assignment

Assign the "administer disaster recovery" role permission:

**Note:** Do this on both the data source and replica instances.

1. Click **Administration** in the main menu. The Secrets Administration page appears.
  2. Click the **Roles** link in the **Users, Roles, Access Management** section. The Roles page appears.
  3. Select or create the role you want to configure this feature with.
  4. Click the **Permissions** tab.
-



5. Click the **Add** or **Edit** button.
6. If you do not see the role in the **Add Permissions** list, type Administer Disaster Recovery in the search box.
7. Drag the **Administer Disaster Recovery** role from the **Add Permissions** list and drop it in the unlabeled permissions box. The role now has the permission.

## Data Source DR configuration

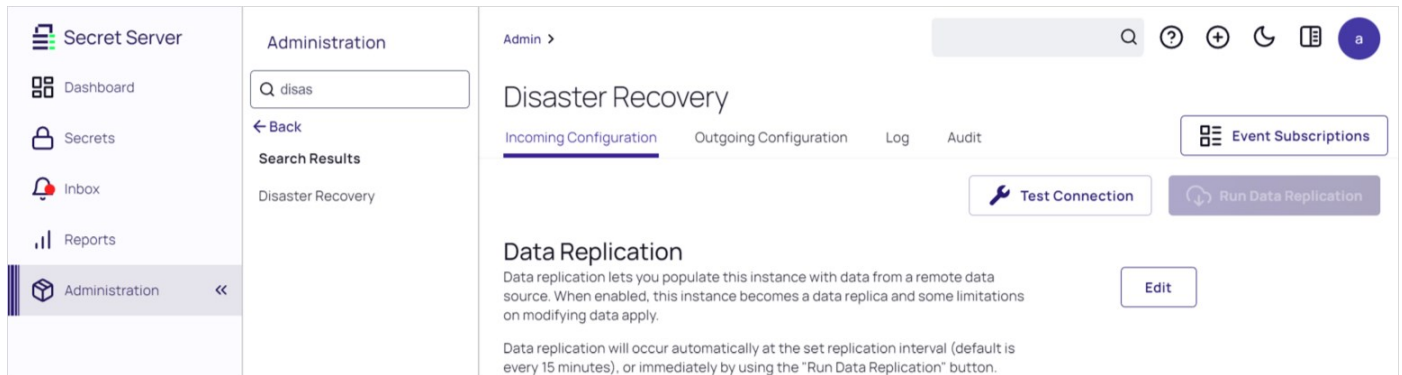
Configure the data source DR configuration:

1. Click **Administration** in the main menu. The Secrets Administration page appears.
2. Search for and click **Disaster Recovery**. The Disaster Recovery page appears.
3. Click the **Outgoing Configuration** tab.
4. Click the **Outgoing Setup Steps** button. A popup appears.
5. Copy the URL from the **Data Source URL** and save it where you can easily access it.
6. Click the **Copy Data Source Key** button to copy the key to the clipboard. The popup disappears.
7. Copy the key and save it to the same location you used for the URL. It should look something like this:

```
https://mydomain.com/Playground
BgIAAAckAABSU0ExABAAAAEAAQAPeEYJLZ3u1F26EF+bBiRwokrGusSAICUpRXIILJFdm2/lo3Ad7dpTEI7j3rvG9+T+j8DKTsmi6Xfjc/J0hkoX00b6LOq4feo6mvnf6Lp
8agopN2XWjLy4KU7ICG2iAoL4wglDpgWVCHdZUcHHVhe6RSkahRDOC4ctpRxb/KOI8Bbk6ftporjwZAfEfCvEOotnnm4Z8qjI0XKKbhLI2eTH2IDTJk53dt8z7g/Aj4nz7aYU
MJX1vDOKKARpd3GiVfu5fcb0hplqw64pjOs8trqOVxuyoyfSLwYPC9rtK4/JZ7Xodq93p9IIEJfSY7cup9kChHfzU8d3RNgWj5pKKVLsPOVUreXV6vceGmRA3OeKY/a8/I6
aEAkmkWjJAP5bmMosYVbcRR2PxI0bXGUSKbMdKdC2Akgm3PWjWqezONsv0QFmJPYEGrLxeJc2/9X+TUnx5ON/Cgeb2bHSf5CLXizjxIB67gzDZpH3q0mmJzm0a
SDmqIc20UxFYk2YZeEzICl5lnAVPiAbaCoKuhQdhaxxaD+wdMQDCCeooKiyhWYo3NFY79k6scJh2+sn62xZNPdpxi0m6rP/F+mpELKMyElwJdFxFm+I14ksaKhIA6b
DnxRLJf/SMdxfmIcTqxLr/r9k6RAiJo8DiBoWMkj4VUCFIL4rYpUIJb/aKmx9npg==
```

## Replica DR Configuration

1. Click **Administration** in the main menu. The Secrets Administration page appears.
2. Search for and click **Disaster Recovery**. The Disaster Recovery page appears.
3. If necessary, click the **Incoming Configuration** tab.



4. Click the **Edit** button. The page becomes editable.



Enabled	<input type="checkbox"/>
Data Replica Name	(not set)
Data Source URL *	<input type="text"/>
Replication Active	No
Replication Interval	<input type="text" value="15"/> minutes
Last Replicated	Never
Replicated User Status *	<input type="text" value="User status mirrors source (Automatic)"/>
Data Source Pinning Key Hash	<input type="text" value="SHA-256 Hash"/>
Data Source Key *	<div>The Data Source URL protocol must be HTTPS for this to take effect. <input type="text"/></div>
<div>CancelSave</div>	

5. Click to select the **Enabled** checkbox.
6. Type or paste the data source URL you saved before.
7. Type or paste the data source key you saved before.

Enabled	<input checked="" type="checkbox"/>
Data Replica Name	(not set)
Data Source URL *	<input type="text" value="http://localhost/Version_11_4_30_src"/>
Replication Active	No
Replication Interval	<input type="text" value="15"/> minutes
Last Replicated	Never
Replicated User Status *	<input type="text" value="User status mirrors source (Automatic)"/>
Data Source Pinning Key Hash	<input type="text" value="SHA-256 Hash"/>
Data Source Key *	<p>The Data Source URL protocol must be HTTPS for this to take effect.</p> <pre>ehOdg6kL2ggvVa+EW4sAHf2RKOWCrLmxHaHy5C4qlmHaF1CD3Ci IkLwU9UEmpKiryspePZ/Uewc75gbmqjkmvKF5mBXQQV+rpqVUPN ONAyALCmmeY6vDaRvHTgDvloA4oY0V7A5by2PV1mQbC+T6X5oa BepJjgdkly4IWTC2nkMmEcERA+/rgdKHPeidQhyG29BnekWlAr58 Zxq9dH3pNS/B4SwVPxAu6r9ao6OfmYEK7XqY/d3z0qmpa7UZFlaF YKlISUJvxn5Cbm2rRa5P+LH4TD7Sq54K7Og29qLUSfZ/mVQ8EDdN 9AeyK33HcVbw8nrj/DZeLq1jr3hska6Kz+FFM+AWb1GT3YInetEEON KbMPQXTkvT65n0JwkTRKs+yph4RLrx2BQB+Cc36dlSe0TjfGJMB5 /pqw1MeMPVQ5ZnO5b/flFAJ0ObOvCocexA==</pre>
<div> <span>Cancel</span> <span>Save</span> </div>	

8. Click the **Save** button.

9. Refresh the **Disaster Recovery** page showing the **Outgoing Configuration** tab. A new block appears for the new replica connection:

Admin >
? + 🌙 📅 a

## Disaster Recovery

Incoming Configuration
Outgoing Configuration
Log
Audit

Event Subscriptions

1 item

✓
Data Storage Path  
C:\DR\Version\_11\_4\_30

Outgoing Setup Steps

Data Replica

? localhost/Version\_11\_4\_30\_rep

- Click the **v** on the block to expand it.

### Data Replica ^

localhost/Version\_11\_4\_30\_rep

Status

Pending

Location

http://localhost/Version\_11\_4\_30\_rep

Last Replicated

Never

Error

No Errors

Folders

Manage

Delete

Approve

- Click the **Approve** button.
- Returning to the **Outgoing Configuration** tab, click the **Test Connection** button to verify everything is configured correctly.

## Finishing up

- Once configuration is complete, return to and refresh the **Outgoing Configuration** tab.
- We recommend expanding the block and clicking the **Manage** button for folders.

Folders

Folders in the list, and their subfolders, will be the only ones replicated.

Allow List

2 items

---

Replicated Secrets

More Replicated Secrets

This enables you to select which folders, subfolders, and secrets get replicated. This reduces the scope of the replicated data, enabling

faster replication and a smaller duplicated data footprint.

**Note:** This will enable the regular interval synchronization

## Replication

By design, the first time a replication from the data source to the replica occurs, all data is replicated. This is likely the slowest DR operates and can take up to 20 minutes to replicate a data source containing 100,000 secrets.

All subsequent replications are significantly smaller. Only information that has been changed since the previous replication is replicated again.

### Replication Scope

The items that DR replicates:

- Character Sets: all Character Sets (add context) are replicated.
- Configuration: selected global configuration settings for application hardening and Active Directory are replicated.
- File Attachments: all File Attachments for replicated Secrets are replicated.
- Folders: Configure this on the data source (under Admin > See All > Disaster Recovery > Data Replicas > Select a Replica > Manage) to limit what folders are replicated. By default, all folders are replicated.
- Groups: All Groups are replicated.
- Launchers: All Launchers and associated mappings are replicated.
- Password Requirements: all Password Requirements are replicated.
- Permissions: all Permissions are replicated.
- Roles: All roles are replicated.
- Secret Templates: All secret templates are replicated.
- Secrets: All secrets within the replicated folders are also replicated.
- Users: all Users are replicated.

### Replica Mode

When you configure a Secret Server instance as a replica, it is automatically placed in replica mode. While in replica mode, the following features are disabled

- ConnectWise synchronization
- Discovery
- DoubleLock
- Heartbeat
- Pipeline and bulk operations on secrets
- Remote password changing
- Secret import
- Secret policy changes to secrets

### Replicated User Status

The "replicated user status" setting determines how the "enabled" status for users is handled during replication. The setting is used primarily when the source and replica user counts do not match—that is, new users are on the source that are not on the replica. Delinea strongly recommends both source and replica user counts match so all users and their access is replicated to the DR instance.

**Note:** When these settings are changed, they impact any new users from that point forward. Existing user statuses do not change.

The possible settings are:

- User status mirrors source (automatic): This is the default setting. Any new users in the source are replicated as enabled.
- New users from source are disabled by default (manual): This setting is for admin special cases and must be manually set. New users are replicated as disabled.

## Recommendations

We recommend placing a Secret Server replica into read-only mode. This further reduces the possibility of data changes to the instance.

Files uploaded to secrets can be backed up using the standard Secret Server backup function. Upon backup completion, they retain their encrypted status and are inside the application backup file (the .zip file).

**Important:** Geo replication requires a Secret Server geo-replication license. Upgrading Secret Server with Geo Replication Enabled will not succeed and may cause data loss. Please see the below information on [Secret Server Upgrade Scenario](#) to see how upgrades should be performed. Geo Replication upgrades are outside the scope of technical support and can be scheduled through Professional Services. Due to improvements in AlwaysOn technology, we recommend using it instead for most use cases.

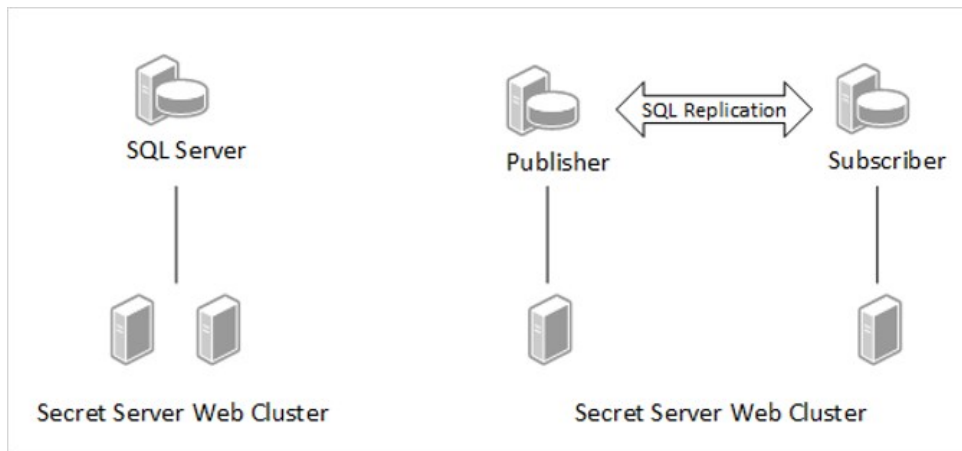
## Overview

Secret Server geo replication is SQL Server replication using a set of technologies for copying and distributing data and database objects from one database to another and then synchronizing between databases to maintain consistency across geographically distributed data centers.

**Note:** Secret Server uses merge replication. The only version validated is pull-based merge replication. Push based replication has not been validated.

## SQL Server Replication

**Figure:** SQL Server Replication



## Benefits of Replication

Enabling SQL Server replication allows a database and application to be hosted closer together and this allows for the mitigation of network latency and outages.

- Decrease application server to database network latency
- Resolve issues with unreliable network connectivity
- Allows for distribution of workload in a scale out fashion
- Works across large distances

In a typical web-clustered version of Secret Server, all application servers access a centralized database. In the event of a network outage, any users on affected application servers are not be able to use Secret Server until network access was restored. In addition, poorly performing networks can introduce latency that may decrease the responsiveness of Secret Server. This technology provides additional options when designing the network topology behind Secret Server that can help alleviate these issues.

## High Availability

SQL Server replication is *not* an option for high availability, but it can be coupled with other technologies like SQL Server AlwaysOn

Availability Groups to provide high availability. Any architecture should be reviewed and designed with your database group.

## Architecture

The SQL Server Replication technologies do all the work of ensuring data consistency between each database, and Secret Server is designed to work well with this technology. When SQL Server replication is enabled on a specified database several system tables, views, stored procedures, and SQL Server jobs are added to the database schema. These tables store information about the data replication, and the procedures contain most of the code needed to perform the synchronization between databases.

## Data Synchronization

This is the process through which SQL Server replication integrates changes from each database node. These changes include data changes as well as schema changes. Each subscribing database node has a synchronization interval that defines when it will synchronize any changes between the main publication node and itself. Secret Server has been tested using pull-based subscriptions where a scheduled job on each SQL Server subscriber runs at a specified interval to trigger the synchronization.

## Data Conflicts

Enabling SQL Server replication introduces the possibility of data conflicts occurring in the Secret Server environment. This can happen when two people in different regions attempt to update the same set of data. Due to the disconnected nature of the technology, the system is unaware of this conflict until a data synchronization occurs. During synchronization, SQL Server attempts to resolve any conflicts based on a defined set of parameters. Secret Server provides a setup script to help define optimal parameters for each article (table, view, and stored procedure) in the Secret Server database.

## SQL Server Replication Monitor and Conflict Viewer

SQL Server provides tools within SQL Server Management Studio that allow viewing of synchronization status, data conflicts, and publications. If a data conflict is not automatically resolved, use the Conflict Viewer tool to resolve the conflict and pick which set of data should be kept. It is possible that manual intervention could be required to resolve the conflict in the base tables on one of the nodes; otherwise, the conflict may still occur after the next synchronization.

For more information:

- [Replication Monitor](#)
- [Conflict Viewer and Interactive Resolver](#)

## Tracking level

SQL Server replication tracks changes to each node by either row or column:

- Row-Level Tracking: Conflicts can occur when any change to any column is made on the same row even if it is not the same column.
- Column-Level Tracking: Conflicts only occur when the same columns are updated on a row.

For more information on row- and column-level tracking, see [Row-Level Security](#)

## Conflict Resolvers

SQL Server replication uses resolvers to determine the outcome of data conflicts between two database nodes. For example, the same row or column was updated on different nodes. These can be as simple as the publisher database always wins, last change by date wins, and many others.

Switch Secret Server nodes over to subscriber databases. Any nodes that are configured to run background, engine, or session recording roles must remain on the publisher database.



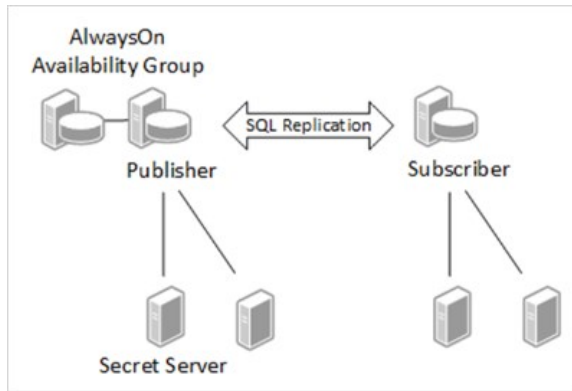
For more information see:

- [Advanced Merge Replication Conflict Detection and Resolution](#)
- [Specify Merge Replication Properties](#)

## Secret Server and SQL Replication

There are many architectures for how SQL Replication can be setup. Determining the correct configuration requires proper planning with a good understanding of how SQL Replication works and the intended goals of using this technology. Here are a few examples.

**Figure:** Secret Server Web Cluster with SQL Server Replication

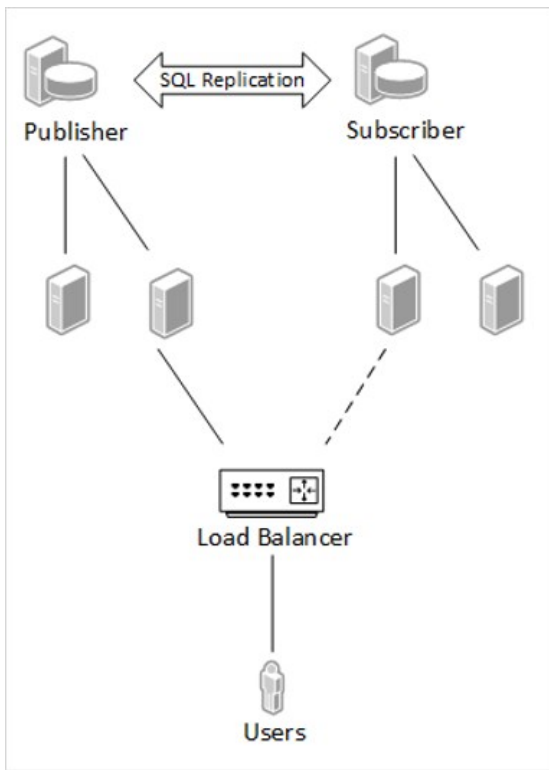


Some key points about designing the right architecture:

- Multiple web application servers can connect to the same database server.
- Secret Server allows you to configure various roles (background, engine, session recording) that perform various services, such as heartbeat and password changing. These roles can only function on a node that has a connection to the publisher database and will not run on other nodes even if configured to do so. If no suitable node is available that has roles enabled and is connected to the publisher database, then certain activities such as secret heartbeat and remote password changing will be offline until such a node becomes available.
- Secret Server Engines are an effective means to distribute workload to different networks or sites. Each engine must call back to a Web application node that connects to a publisher database.
- The diagram shows the publisher in an AlwaysOn availability group, but this is just an example. Depending on the needs of the organization, AlwaysOn could run on both the publisher and the subscribers or on neither. Many other high availability options could be leveraged alongside SQL Replication.

## Using a Subscriber When the Publisher Is Offline

**Figure:** Using a Subscriber When the Publisher Is Offline



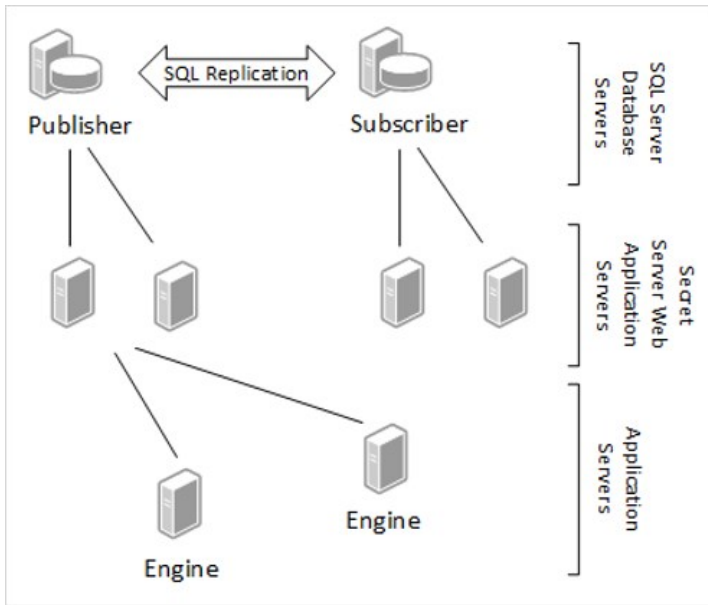
It is important to note that there is a delay in data synchronization between database nodes. This is based on how frequently SQL replication is configured to synchronize. One way to mitigate this data latency is to have every user access a node connected to the publisher. This means that every user would be accessing the same database.

In the event of a network outage, a load balancer could be configured to fail over to the subscriber nodes. The data on the subscriber would be as up to date as the last synchronization, and when network connectivity is restored all data activity will be synchronized again. Obviously, if the issues of network latency or disconnects occur too frequently, this may not be a workable solution.

## Secret Server Distributed Engine

You can add Secret Server distributed engines to different network segments, but you must still be able to call back to a Secret Server Web application server that is connected to a publisher database node. This helps to ensure that heartbeats and password changes occur with the most up to date dataset.

**Figure:** SQL Replication and Secret Server Distributed Engines



## Secret Server Replication Settings

Keep in mind that this is a disconnected technology, so there are required decisions when setting it up:

- How often should synchronization occur?
- Should any resolvers override the provided defaults?
- Are there any operational considerations based on the type of secret data?

## Publications

We recommend setting up two publications for Secret Server:

- **Events:** These are things that need to occur on a timely schedule, such as updating secrets. The events publication should be set to synchronize every minute. This means that if a secret were created in one region, it would not appear in another region for one minute. By default, this publication is called *SSPubEvents*.
- **Logs:** Information from each audit log is available on its server. We do not recommend setting log synchronization to less than hour. If this happens too frequently, the database could create deadlocks by constantly updating large sets of data. Once the logs merge, the events will appear in the order in which they occur and show on the server on which they took place. By default, this publication is called *SSPubLogs*.

## Tracking Level and Resolvers

Using the default Secret Server implementation, most conflicts are resolved by taking the change made on the publication server as the winner (using the "publisher wins" resolver). It is assumed that the publication server is most likely the main server in an environment and therefore, most likely, the decider in a case of a conflict. Thus, we recommend doing functions, such as configuration changes or secret template definition changes, on the publication node. This is only an issue if two people update the same data on two different servers before a synchronization occurs.

There are some exceptions to the "publisher always wins" rule:

Secret Fields	Last Update Wins	If two people change a password on a secret to a new password, then the last person to make the change will win.
Secret Access Request Approval	Last Update Wins	If two people are in a group that is requested to approve access, then the last person to approve or disapprove access would set that approval.
File Attachment	Last Update Wins	
tbConfiguration	Column Level	Configuration changes are resolved by table column, not the default row-level where the entire row is resolved. This allows different configuration options to be set on different servers and not conflict with each other, but changing the same option would create a conflict.

Always remember that the conflict is only resolved when synchronization occurs. If there is a synchronization window of 24 hours, there could be very different data on different servers for that entire 24-hour period. The risk of data conflicts increases with larger synchronization windows. The default recommended synchronization is every minute for most items and every hour for system logs.

For a complete listing of recommended settings navigate to the **SQL Replication Administration** page in an installed version of Secret Server at **ADMIN > Nodes > SQL Server Replication > Show Articles**.

## Conflict Auditing

When conflicts occur during synchronization, Secret Server writes an event to the system log on the server that it has detected these conflicts. Depending on the type of conflict, more-specific information may be written to the audit log for a specific data entity, such as a secret or folder. Notification of the conflict is written to the system, secret audit, folder audit, and other logs. To view complete details of the conflict, the SQL Conflict Viewer tool needs to be used to review the conflict by right clicking on the publication and choosing to View Conflicts.

As an example, if the same field changed on two different servers, resulting in a conflict, then the Secret Server audit log will indicate the field was changed twice and then denote that there was a data conflict.

## Operational Latency

Give consideration to how your Secret Server data is setup and managed. This is most easily described by an example where a manager uses a Secret Server node in Europe and their employee works on a node in Australia. Due to network latency, the organization has changed the default event log synchronization interval from every minute to every five minutes. The employee requests access to a secret in Australia, but due to the synchronization window, the manager is not alerted until five minutes later because the manager is using the server in Europe. You can mitigate this issue by having operational groups work on data for their region or decreasing the synchronization window.

Options to manage data latency if data conflicts occur regularly:

- Distribution of duties: Only update secret templates on the main node.
- Distribution of data: Only edit secret data by region. For example, create a folder for Europe and one for Australia to segment the data. Only edit items in each folder when in the appropriate region.

## Article Settings

When setting up the SQL Replication Publication certain articles need settings other than the default settings. The recommended settings can be found within Secret Server by accessing the SQL Server Replication page located at **Admin > Nodes > SQL Server Replication > Show Articles**. This page can also be used to generate a setup script for both the Publication and Subscribers that uses these default settings. A Distributor will need to be created before running these scripts. For more information, see [Configuring Distribution](#).

## Compensate for Errors

When conflicts occur, an article that has the `compensate_for_errors` attribute set to true will automatically try to resolve the conflict. When false, a SQL Server administrator can use the SQL Server Conflict Viewer to review and resolve conflicts.

## Identity Range

SQL Server replication manages table identities by assigning ranges to the publisher and subscribers. Certain tables (logging or auditing) require larger assigned identity ranges. New ranges are only assigned when a data synchronization occurs. For more information, see [Replicate Identity Columns](#).

## Variations

How SQL Server replication is setup can vary greatly and there may be reasons to not use the standard setup. Consult with your database group for approaches that may work well in your environment. The architecture diagrams contained within this document are just high-level examples.

## Installing and Configuring SQL Server Replication

### Installation

There are a multitude of configuration options for SQL Server replication. At a high level, these are the steps to setup Secret Server in a SQL Server replicated environment:

1. Install Secret Server
2. Enable Secret Server Clustering. For more information, see the [Secret Server: Server Clustering Administration Guide](#).
3. Setup a SQL Server replication distributor:

**Note:** This can run on the same database as the publication database or on a separate one on another server.

1. This can be done from the SQL Server Management Studio by right clicking on the **Replication** node.
2. Review what settings are appropriate for the distributor setup with your on-premise database group or with a database consultant.
3. Download the SQL publication script.
  1. In Secret Server select **ADMIN > Nodes > SQL Server Replication > Get SQL Publication Script**.
  2. Review this script and update the variables according to your environment.

**Note:** Advanced users can use the article list on that same page to configure SQL replication differently than this script to suit your environment.

1. Run this script on the Secret Server Database. A DBA with administrative privileges is needed to run this. Please consult with your on-premise database group or review your configuration with a database consultant.
2. Create snapshots for each publication:
  1. Open SQL Server Management Studio
  2. Right click on each publication under **Replication > Local Publications**
  3. Select **View Snapshot Agent Status**.
  4. Click **Start**

### 3. Download the SQL subscriber script:

1. In Secret Server select **ADMIN > Nodes > SQL Server Replication > Get SQL Subscriber Script**.
2. Review this script and update the variables to match your environment
4. Create a new database on the database server you intend to be your subscriber. Ensure the script uses this database and machine name. Set up permissions for the user or network account that Secret Server uses to connect to this database.
5. Run the subscriber script on the publication database first and then on the subscriber database. If your variables are set properly, it will execute the appropriate part of the script.
6. Expand the **SQL Server Jobs** on the subscriber, and you should see two jobs named for each publication.
7. Right click these jobs to start them. After they complete, your subscriber database should have replicated the schema objects from the publication.
8. Switch Secret Server nodes over to subscriber databases. The primary node *must* remain on the Publisher database, as must any node that an engine calls back to, but all other nodes can be reconfigured to use subscriber databases. Which nodes to switch depends on your specific needs as described in the previous sections. To switch an existing node to a subscriber database, log into that node and go the DbConnectionReset.aspx page by entering that page name in the URL field of your browser ([http\[s\]://<your\\_secret\\_server\\_name>/DbConnectionReset.aspx](http[s]://<your_secret_server_name>/DbConnectionReset.aspx)). Step through the wizard, entering the name of the new server and database when prompted. After completing this step, recycle the node's application pool.

## Troubleshooting the Installation

### Replication Setup Scripts Fail

Make sure that the SQL Server replication feature is enabled before running the script. Check the error messages in the script output. Make sure you set all of the variables in the top of the script correctly (such as publisher server, database names, and subscriber server).

### SQL Replication Job Fails

To see the error message, it is easiest to right click on the job and choose to view history. This error message can indicate the actual problem.

## Removing SQL Server Replication

Certain operations such as upgrading Secret Server, adding or removing DoubleLocks from secrets, and enabling or disabling HSM cannot be performed while SQL Server replication is enabled. In order to perform these operations you must remove SQL Server replication. When you are done with the action that required you to remove replication you can install and configure it again by repeating the previous instructions.

You only need to remove replication from the Publisher and all Subscribers. The Replication Distributer does not need to be removed. These are the steps to remove SQL Server replication from your publisher and subscriber databases.

### On Each Subscriber

1. Stop the websites of all nodes using the subscriber database.

**Note:** You can see what database each node is using from **Admin > Server Nodes**.

1. In SQL Server Management Studio, go to **Replication**, right-click **Local Subscriptions** and choose **Generate Scripts...**
2. In the **Generate SQL Script** dialog, click to select "Subscriptions in the following data sources" and select the Secret Server subscription databases.

3. Select "To drop or disable the components."
4. Click **Generate Script > Open in new query window**.
5. Click **Close** to close the dialog once the script is created.
6. The script contains sections to be run on both the subscriber and the publisher. Run the sections on the subscriber by uncommenting them and commenting those for the publisher.
7. Copy the script to a query window on the publisher server.
8. The script contains sections to be run on both the subscriber and the publisher. Run the sections on the publisher by uncommenting them and commenting those for the subscriber.
9. Perform any maintenance actions needed on the subscriber database and nodes.

## On the Publisher

1. Stop the websites of all nodes using the publisher database.
2. On the publisher, go to **Replication**, right-click **Local Publications** and choose **Generate Scripts...**
3. In the **Generate SQL Script** dialog **check Publications in the following data sources** and select the Secret Server database.
4. Click to deselect the **Distributor Properties** check box.
5. Select **To drop or disable the components**.
6. Click **Generate Script > Open in new query window**.
7. Click **Close** to close the dialog once the script is created.
8. Run the script.
9. Perform any maintenance actions needed on the subscriber database and nodes.
10. After all maintenance tasks are done, restore replication as described in [Installing and Configuring SQL Server Replication](#).

## Managing SQL Server Replication

Once replication is setup and working certain considerations should be given to managing it along with conflicts that can occur. The recommended settings for the publication have been tested to limit conflicts, but they can still occur. Here are some scenarios you might encounter:

Conflict automatically resolved	SQL Server was able to determine how to resolve the conflict. Secret Server will log and audit this conflict. To see the specific details for the conflict, use the <b>SQL Server Conflict Viewer</b> in SQL Server Management Studio.
Conflict unable to be automatically resolved	A user with SQL Server access needs to open the conflict in SQL Server Management Studio. Access these by right-clicking on the publication and choosing to view conflicts.
Some data stops replicating	A table could become blocked if there are conflicts. Other data may continue to synchronize. If data in one region or database node is different than another after a synchronization, there could be conflicts that need to be reviewed and resolved.

SQL Replication Synchronization Times	The status of each publication and subscribing server along with the last time of synchronization can be located in Secret Server by selecting <b>ADMIN &gt; Nodes &gt; SQL Server Replication</b> .
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## Web Server Nodes

The **Web Server Nodes** page now includes a column that lists the database server name and database name. This column also indicates whether the database is the publisher or a subscriber. To see the page:

1. Open Secret Server.
2. Click the **Admin** menu item and select **All**.
3. Click the **Server Nodes** button. The Server Nodes page appears (not shown).
4. If you click the **SQL Server Replication** button, you can see more information about your SQL Server replication. The page pulls from the replication data and shows the:
  - Publication name
  - SQL server
  - Database
  - Subscription type (push or pull)
  - Status of the last sync
  - Last time that subscription was synced
  - Status of the last sync
  - Date of the last sync

**Note:** The same information is available within SQL Server Management Studio, but this page gathers all of the subscription information together in one place.

As mentioned earlier, the **Get SQL Publication Script** and **Get SQL Subscriber Script** buttons will download replication script templates that you can use to set up replication for Secret Server. You can fill in the variables at the top of each script to match your environment and run them as-is or modify them further if you need to customize the default scripts.

The **Show Articles** button lists each article in Secret Server that should be included in replication along with the recommended settings for SQL Server replication. These are *recommended settings* and do not show the current state of replication on the publisher.

## Upgrade Scenario

New versions of Secret Server may issue schema changes including indexes, column changes, and views. In some cases, SQL merge replication will not automatically replicate these schema changes. For this reason, we recommend removing any publications and subscriptions targeting the Secret Server database, redirecting users to the web server at the primary site before performing any upgrade, and recreating the publication and subscriptions from new versions of the replication scripts.

In the following scenario, there are Secret Server web servers installed at a site in Australia, the U.S., and the U.K. The U.K. is the publisher node and Australia and U.S. nodes are the subscribers.

1. Redirect all users to the U.K. Secret Server URL.
2. Stop IIS at the Australia and U.S. sites.
3. Manually force a synchronization between the Australia subscriber and the U.K.:



1. Open SQL Server Management Studio and connect to the Australia subscriber database server.
2. Go to **Replication > Local Subscriptions**.
3. Right-click on one of the Secret Server subscriptions (if you used the scripts provided by Secret Server, they are called *SSPubLogs* and *SSPubEvents*) and select **View Synchronization Status**.
4. Click the **Start** button to force a synchronization.
4. Repeat sub-steps 3 and 4 for all Secret Server subscriptions.
5. Repeat sub-step 3 for the U.S. subscriber database.
6. Resolve any replication conflicts:
  1. Open SQL Server Management Studio and connect to the UK publisher database server.
  2. Go to **Replication > Local Publications**.
  3. Right-click on one of the Secret Server publications (if you used the scripts provided by Secret Server they are called *SSPubLogs* and *SSPubEvents*) and select **View Conflicts**.
  4. Examine and resolve any unresolved conflicts.
7. Generate the script to remove replication on the subscriber databases as specified above.
8. Run it to remove replication.
9. Generate the script to remove replication on the publisher database as specified above.
10. Run it to remove replication.
11. Restart IIS on the Secret Server web server in the U.K.
12. Run the Secret Server web upgrade wizard.
13. Copy the website application directory to the web servers in Australia and the U.S.
14. Use the scripts generated from the Secret Server UI to recreate replication on the publisher.
15. Push a snapshot to the Australia and U.S. subscriber databases.
16. Recreate replication at the subscribers.
17. Restart the jobs on the subscriber databases as described above.
18. Start IIS on the Australia and U.S. web servers.
19. Change redirection rules for Australia and U.S. users so they access the local Web server as normal.

## Other Information about SQL Server Replication

- [Upgrading Secret Server with SQL Replication](#)
- [SQL Server Replication \(MS Books Online\)](#)
- [Snapshot Replication](#)

To back up your Secret Server installation:

**Note:** Your Secret Server instance may be running during this procedure.

1. Navigate to the directory where Secret Server is installed.
2. Copy the folder (holding the application) to your back up location.
3. Open your SQL Server Management Studio.
4. Right click the database your Secret Server is running on, and select **Tasks > Backup**.
5. Click the **Add** button. You will be prompted to enter a file path.
6. Make sure SQL Server has permissions for this location.
7. Copy the resulting database backup file to your backup location.

**Note:** You can also automate steps 2-4 using the command: `osql -S myserver\SQLEXPRESS -E - Q "BACKUP DATABASE SECRETSERVER TO DISK = 'c:\backup\ss.bak' .`

To restore your Secret Server from a backup:

## Restoring the Application

1. Extract your backup zip file of the Secret Server application directory, or copy the files from your other backup location to the physical file path that your virtual directory is pointing to.
2. If you have configured encryption of your `encryption.config` using EFS or DPAPI, you will need to replace the file from the backup with the unencrypted one.
3. Check that FIPS mode is not enabled on the server to avoid an error during the process.

## Restoring the SQL Server Database

Choose one of the following scenarios:

### Scenario One: Database and Secret Server Are in the Same Location

1. Open SQL Server Management Studio and connect.
2. Right click **Databases** and click the **Restore Database** button.
3. In the **To database** text box, type the database name or select it from the drop down list.
4. Click to select the **Device** radio button.
5. Browse to your database backup file.
6. In the **Restore Database** window Options section, ensure the **Force Restore over Existing Database** check box is checked.
7. Click the **Ok** button.
8. If you get an error saying that Management Studio was unable to get exclusive access to the database:
  1. Right click on the Secret Server database and go to **Properties**.
  2. At the very bottom, change the **Restrict Access** property to "SINGLE\_USER". This closes all other connections to the Secret Server database.
  3. Re-attempt the restore.
9. Disable **Force SSL** if there is no certificate installed on the server you are restoring to.
10. In SQL Server Management Studio, expand the databases and select the database for Secret Server.
11. Select **New Query** at on the menu bar to open a query pane.
12. Copy the following command: `UPDATE [dbo].[tbConfiguration] SET ForceHttps = 0` into the query pane
13. Click **Execute** on the menu bar.
14. After the query executes successfully, restart Internet Information Server (IIS) by running `iisreset` from the command line.

**Note:** If you are prompted for database credentials when accessing Secret Server and are unable to re-connect, you may need to remap the user.
15. Expand the **Security > Users** folder under the Secret Server database.

16. Remove the user that Secret Server will use to access the database.
17. Expand the **Security > Logins** folder under the SQL Server root.
18. Right click on the log on corresponding to Secret Server and select **User Mappings**.
19. Re-map the log on to the Secret Server database.
20. If necessary, activate your licenses by going to the **Licenses** page.

## Scenario Two: The Database and Secret Server Are in Different Locations

1. Delete the database.config file from the Secret Server folder.
2. Restart Internet Information Server (IIS) by running iisreset from the command line.
3. Use your Web browser to navigate to the new instance of Secret Server. This redirects you to the Web installer because the database.config file is missing and it thinks you have not installed yet.
4. Open SQL Server Management Studio and connect.
5. Right click **Databases** and click the **Restore Database** button.
6. In the **To database** text box, type the database name.
7. Click to select the **Device** radio button.
8. Browse to your database backup file.
9. In the Restore Database window options make sure the Force Restore over Existing Database Check box is checked.
10. Click **Ok**.
11. If you get an error saying that Management Studio was unable to get exclusive access to the database:
  1. Right click on the Secret Server database and go to **Properties**.
  2. At the very bottom, change the **Restrict Access** property to "SINGLE\_USER". This closes all other connections to the Secret Server database.
  3. Re-attempt the restore.
12. Disable **Force SSL** if there is no certificate installed on the server you are restoring to.
13. Copy the following command: UPDATE [dbo].[tbConfiguration] SET ForceHttps = 0 into the query pane
14. Click **Execute** on the menu bar.
15. Navigate through the Web installer to Step 3.
16. Type the new database credentials (new server location, username, and password).
17. If you are unable to re-connect you may need to remap the user.

**Note:** If you are prompted for database credentials when accessing Secret Server and are unable to re-connect, you may need to remap the user.
18. Expand the **Security > Users** folder under the Secret Server database.

19. Remove the user that Secret Server will use to access the database.
20. Expand the **Security > Logins** folder under the SQL Server root.
21. Right click on the log on corresponding to Secret Server and select **User Mappings**.
22. Re-map the log on to the Secret Server database.
23. Once past Step 3, you are finished. Go to the `home.aspx` page (click the Secret Server logo). There is no need to go any further with the install because the `database.config` has been recreated with the new information.
24. If necessary, activate your licenses by going to the **Licenses** page.

There are numerous options to consider when backing up Secret Server. Backups can be scheduled to run on a specific time interval. To prevent the directory from growing too large, the number of backups to keep can be defined as well. Depending on size constraints or preferences of the DBA, the database backup can either truncate the transaction log or keep it intact. The additional schedule settings are available when "Enable Schedule Backup" is enabled, and the view page indicates the time and date of the next scheduled backup.

Secret Server can run with multiple front-end Web servers. For a critical instance, clustering offers a redundant system to limit potential down time from a single point of failure. Clustering also allows users to load balance for better performance. For instructions on enabling clustering in Secret Server, see [Setting up Clustering](#).

This topic describes the process of configuring Secret Server and SQL Server for a high-availability environment using Mirroring. The contents of this paper include:

- Configuring SQL Server 2016 for database mirroring with a failover partner and a witness
- The encryption used between the primary database and the mirror database
- Configuring Secret Server to use mirroring to achieve high availability

**Note:** This topic uses SQL Server 2016, but it is very similar to earlier versions.

## Introduction

Three different SQL Server instances are required to implement this scenario:

- **Primary database:** The main application database
- **Mirror database:** Replicates all of the data on the primary database in a transactional manner
- **Witness database:** Monitors the health of the primary and mirror databases and initiates failover if necessary

In the setup described here, mirroring operates in synchronous mode, which means that a transaction does not commit on the primary database until it has committed on the mirror.

**Note:** See [Prerequisites, Restrictions, and Recommendations for Database Mirroring](#) for more on synchronous mirroring:

## Procedures

### Setting up Databases for Mirroring

To initiate database mirroring, the databases on the primary and secondary machines must have the same name. We recommend doing this before installation. To initially set up mirroring, in Microsoft SQL Server Management Studio, take a full backup of the database on the primary and then restore it onto the database on the secondary. When restoring the database, the "RESTORE WITH NORECOVERY" option must be selected.

### SQL Server Configuration

The three SQL Server instances should all be running under the same domain account. It is possible to run under different accounts but the configuration is more complex and not supported by Delinea technical support. Each SQL Server instance should be configured to listen on TCP.

### Configuring Mirroring

To configure mirroring:

1. In Microsoft SQL Server Management Studio, drill down to the primary database in the Object Explorer.
2. Right click the primary database and select **Properties**. The Database Properties window appears.
3. Select the **Mirror** page.
4. Click on the **Configure Security** button. The Configure Database Mirroring Security Wizard appears on the introduction page.
5. Click the **Next** button. The Include Witness Server page appears.
6. Click to select the **Yes** selection button.
7. Click the **Next** button. The Choose Server to Configure page appears.



8. Click to select all three interface check boxes (principal, mirror, and witness servers).
9. Click the **Next** button. The Principal Server Instance page appears.
10. Click the **Principal server instance** dropdown list to select the current (primary) server.
11. Type a port number for connecting to the other servers in the **Listener port** text box. The port must be open for TCP communication on the machine's firewall and on any network devices that restrict access to this machine.
12. Click to select the **Encrypt data sent through this endpoint** check box. This enables RC4 encryption on data sent through this endpoint.
13. Type *Mirroring* in the **Endpoint name** text box. The endpoint name is for referencing the endpoint later.
14. Click the **Next** button. The Mirror Server Instance page appears.
15. Repeat the exact same configuration you set for the primary server instance with only the server instance name different (choose the mirror instance).
16. Click the **Next** button. The Witness Server Instance page appears.
17. Repeat the exact same configuration you set for the primary server instance with only the server instance name different (choose the witness instance).
18. Click the **Next** button. The Service Accounts page appears.
19. Type the domain user that SQL Server runs under for each instance's Service Accounts text box. For example `mydomain\sql_svc`.
20. Click the **Finish > >** button. Logins are created for each account and are given CONNECT permission on each endpoint, if needed. The Complete the Wizard page appears.
21. Click the **Finish** button

## Configuring Secret Server for Mirroring

**Note:** The credentials used to access the primary database must also be valid on the mirror database for failover to work.

1. Go to **Admin > See All**. The admin panel appears.
2. Type **Database** in the **Search** text box and select **Database**. The Database Configuration page appears:

## Help

Secret Server supports Microsoft SQL Server versions 2012, 2014, 2016, 2017, and Express.

View [Collation Requirements](#). Need help installing or configuring SQL Server? View [Installing and Configuring SQL KB Article](#).

### Database Configuration

#### SQL SERVER LOCATION

Server Name	QA-CUST-SQL-01
Database	SS_Playground

#### SQL AUTHENTICATION

- ☒ Windows Authentication using Application Identity (GAMMA\ss\_iis\_svc) - **Recommended**  
*(Advanced Setting. Windows Authentication requires a Service Account and advanced IIS setup. Detailed in [Windows Authentication KB](#).)*
- ☐ SQL Server Authentication *(SQL Authentication requires Mixed Mode. See setup in [SQL Authentication KB](#).)*

#### [+] ADVANCED (NOT REQUIRED)



Edit



View Audit

- Click the **Edit** button.
- Click the **Advanced (Not Required)** link. A new section appears:

[-] ADVANCED (NOT REQUIRED)

SSL Encryption ?

☐ Enable

Trust Server Certificate

☐ Enable

Failover Partner ?

(Requires SQL Server Configuration change)

Multi-Subnet Failover

☐ Enable

Connection Timeout (in seconds)

(Enabling Multi-Subnet Failover for AlwaysOn Availability Groups requires SQL Server 2012 and higher with AlwaysOn enabled)

Save Database Connection Settings

Cancel

- Click the select the **SSL Encryption** check box.
- Type the mirror server name in the **Failover Partner** text box.
- Click the **Save Database Connection Settings** button.

## Testing Mirroring

This procedure is necessary to verify that failover will function correctly in the event that the primary server is unavailable or inoperable:

- Open SQL Server Enterprise Manager.
- Right click the primary database and select **Properties**.
- Click the **Mirroring** tab.
- Click the **Failover Now** button. This causes the database on primary to switch roles and become the mirror database. The mirror database becomes the primary. Clients using the application should be able to continue as before.

**Note:** One request may fail before Secret Server begins making requests to the new primary database.

## Database SSL Configuration

**Note:** See [Enable encrypted connections to the Database Engine](#) for instruction on configuring SSL for SQL Server.

The certificate authority used for the SSL certificates must be trusted on all of the machines that are a part of Secret Server's installation. The SQL Server service account must be granted access to the certificate.

Procedure:

- Open Microsoft Management Console by running `mmc` on the Windows command prompt.
- Drill down to **Console Root > Certificates > Personal > Certificates** in the navigation tree.
- Right click the certificate and select **All Tasks > Manage Private Keys**.

4. Grant the user account that SQL Server uses read permission.
5. Ensure SSL is enabled for both the primary and mirror database server. See [Configuring Secret Server for Mirroring](#). It is not necessary to configure SSL on the witness server.

*Unlimited administration mode* is a feature designed to allow an administrator access to all secrets and folders in their Secret Server instance without explicit permission. This can be used in the instance a company has an emergency where access to a secret is needed when no users who have permission are available. Alternately, it can be used when company policies require administrators to have access to all information in the system.

**Note:** An alert visible to all users displays at the top of the Secret View page when unlimited administration mode is enabled.

For a user to be an unlimited administrator they must be assigned a role with the Unlimited Administrator permission and Unlimited Administration Mode must be enabled in Configuration settings.

To navigate to the **Unlimited Administration** section, select **Configuration** from the **Administration** menu, and then click **Change Administration Mode**. We recommend administrators have specific permissions to folders and secrets and this mode is only used temporarily to assign the correct permissions.

**Note:** Changes to the administration mode are logged in an audit grid. The grid shows the user, time of the change, and any notes made by the user.

## Best Practices

### Overview

This document was written after helping many customers successfully deploy Secret Server in their organizations. It covers the issues that most customers tackle as they consider which data to store, who needs access, what permissions to apply, and how to organize all their sensitive data. This document is not meant to cover everything

Think of Secret Server as a platform for your organization to store all of its passwords and sensitive data. This means that it can be configured to work in many different ways depending on your industry, compliance requirements, and ultimate end goals. The trick is to know your objectives and then match the capabilities and best practices to your situation.

### Terminology

Throughout this topic, certain terms are used to refer to specific features or concepts within Secret Server. Some of these terms corresponds to explicit roles defined within Secret Server that may be referenced, while others are broader terms that system administrators should be familiar with.

#### Administrator

Access to all the features within Secret Server can be granted to users by creating and assigning different roles. *Administrator* is one of the default roles that comes installed with Secret Server. By default, this role contains all role permissions, but it can be customized as well. In this guide, when it is used in the context of a Secret Server user, it is referring to the users who generally have most permissions and manage the system. Administrators have control over the global security and configuration settings.

**Note:** Administrators in Secret Server do **not** automatically have access to all data stored in the system—access to data is still controlled by explicit permissions on that data.

#### Basic User Role

The basic user role is a default role that comes installed with Secret Server. This role is a slimmed down version of the user role and primarily focuses on creating and modifying secrets, as well as limited "view" permissions. Users that have this role assigned to them also have their own personal folder.

#### Folder

A folder in Secret Server provides a hierarchical structure for organizing secrets. Some folders contain no secrets at all and may be used only to set permissions or policies on subfolders. Other folders may simply be a way to organize sub-folders that contain secrets. Folders are organized based on a "root" level folder structure, where "/" is the root level folder and any new folder created will be placed under that folder. Personal folders are unique and are created for each user, providing them the "personal folders" permission. Personal folders can contain sub-folders for the owner to organize their secrets.

#### Role Based Access Control (RBAC)

Secret Server role based access control (RBAC) is a mechanism that restricts system access to authorized users and defines what type of access a user has within the system. Often these roles correspond to features within the product and those features may give users greater privileges to make changes within the system. RBAC is a core Secret Server feature.

#### Secret

A secret is any sensitive piece of information (typically a password) that you would like to manage within Secret Server. Typical secrets

include (but are not limited to) privileged passwords on routers, servers, applications, and devices. Files can also be stored in secrets allowing for storage of private key files, SSL certificates, license keys, network documentation, or even a Microsoft Word or Excel document.

## Site

A site is a logical work container that can tell Secret Server which distributed engines should manage work associated with specific tasks. Sites are critical to ensuring that Secret Server can manage remote network segments, alternate locations, or even DMZs. By default, Secret Server comes with the "local" site. That site is unique as it is the only site that can be configured for "web processing" or "engine processing." When the local site is configured for Web processing, the Web servers themselves act as distributed engines and are responsible for all engine work processing, in addition to the Web Server role specific work that they may be configured for. Any additional sites that are user created may only be configured for Engine processing. The "Local" site comes with two free engines under any licensing model that may be used. Any additional sites and engines must be licensed separately and will incur additional licensing costs.

## User

This is the default role for new users that are added to Secret Server. By default, this role contains several permissions that enable new users to interact with Secret Server. Many of these permissions are centered around creating and modifying secrets, as well as several "view" permissions to access audit information. Additionally, access to advanced secret options, assigning secret policies, and a few other advanced permissions are assigned to this role. It also gives each user their own personal folder that is accessible only by each individual user added to the system. Besides the owner, only the "unlimited administrator" role can access these folders.

## Know Your Edition

As you read through this guide, some features may be referenced that are only available in certain editions of Secret Server. To get an idea of what's available, you can reference the [main sales page](#) online.

## Installation

Before installing Secret Server, be sure to look at the [system requirements](#). The process for installing Secret Server is outlined in the [installation guides](#) matching the version of Windows Server you are using. If you have an active trial or have purchased Secret Server licenses, you can find your licenses by logging into your account at [Delinea.com](#).

## Basic Configuration

Once Secret Server is installed, see the [End User Guide](#) to begin setting up Secret Server right away. This covers:

- Adding your licenses
- Basic security settings
- Configuring automatic backups
- Basic security settings
- Heartbeat
- Basic security settings
- Setting up access for local and AD users

## Advanced Configuration

Secret Server's Advanced Configuration page is intentionally hidden from casual access. You have to enter a URL—the page is not accessible by clicking a link. The URL format is:

`https://<server>.<subdomain>.<domain>/<ss install>/ConfigurationAdvanced.aspx`

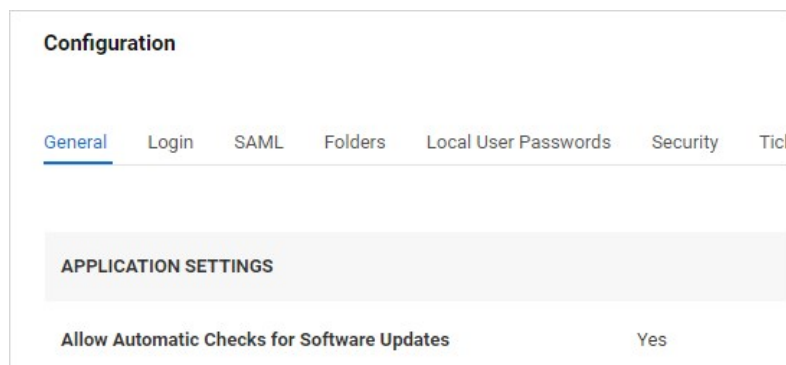
For example:

<https://qa-test.acme-east.acmewidgets.com/acmesecretserver/ConfigurationAdvanced.aspx>

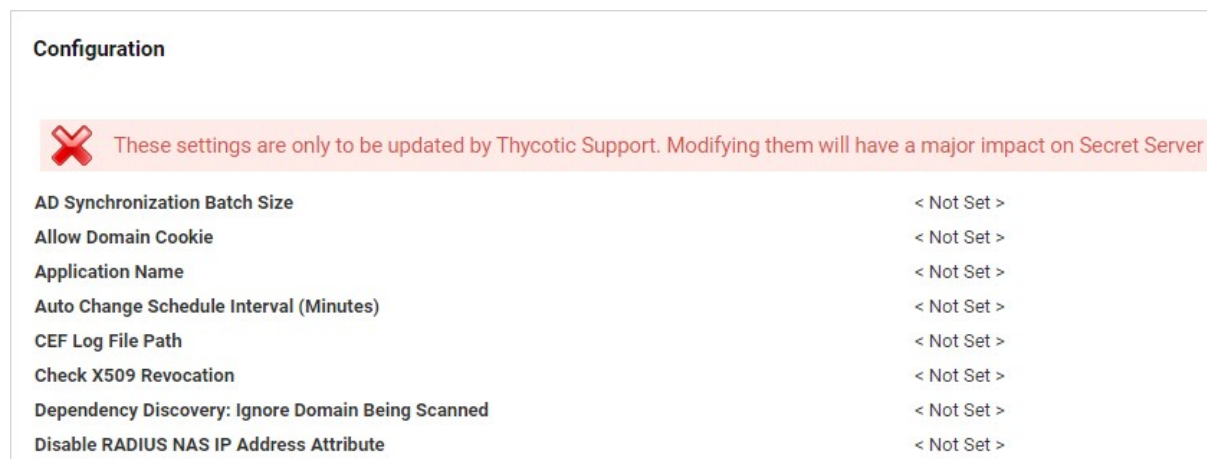
The easiest way to get to the page is:

1. Open your Secret Server instance.
2. Navigate to **Admin > Configuration**. The (regular) Configuration page appears:

**Note:** Administrators in Secret Server do **not** automatically have access to all data stored in the system—access to data is still controlled by explicit permissions on that data.



1. Look at the URL for the page. The file name is ConfigurationGeneral.aspx.
2. Change the name to ConfigurationAdvance.aspx, leaving the rest of the URL as is.
3. Press **<Enter>** the (advanced) Configuration page appears:



4. Note the warning at the top of the page. It is serious, but it is also not *completely* correct. There are a few settings that may be important to your initial deployment. **Do not change any settings not directly discussed here without contacting Delinea Customer Service first.**
5. The following settings might need adjustment:
  - **IP Address Header:** If you are using a load balancer and multiple Secret Server Web server nodes, it is important to set this to X-Forwarded-For. That way, user audits reflect individual user IP addresses and not your load balancer IP address.
  - **Secret Computer Matcher Once Per Discovery:** We mention this setting in the [Discovery Best Practices](#) topic, where we recommend setting it to `true` for for large environment discovery. Otherwise, the matcher runs every five hours, regardless of how



often discovery is configured to run.

You can view [reference architectures](#) for Secret Server. These reference architectures are, at minimum, refreshed every year and are created by our Professional Services Solutions Architect team. For this section, we provide some high-level architecture and design considerations that may help you design a more successful Secret Server or SSC installation.

**Note:** The following recommendations are primarily for Secret Server on-premises. For SSC customers, many of the recommendations are still relevant, even though you only have control over increasing distributed engines—the only Secret Server infrastructure you physically control when using SSC.

Consider some key questions about your SLA requirements for the application:

- What are the RPOs and RTOs for the application?
- Is high availability or disaster recovery required?
- Are you going to purchase Secret Server or SSC?

Answering these helps determine what initial infrastructure is needed for your environment. You can then look at the reference architectures to help select a variation of the reference architecture that works best for your requirements.

**Note:** Many customers take a posted variation and alter it to meet their own needs.

When the Professional Services team works with our customers, we gather both architectural and stakeholder requirements to come up with a design that is sized correctly to meet all business needs. If you are planning to design Secret Server's architecture yourself, we suggest planning additional infrastructure based on feature utilization needs in the following order:

## Session Recording

This is the most process- and memory-intensive feature of the product if it is used heavily. We recommend reviewing [Session Recording Caveats and Recommendations](#) when planning to implement this feature, as it may require additional hardware or Web servers. Below are a few questions to ask yourself:

- Is the organization planning to use session recording and to what capacity?
- How many secrets may have session recording enabled?
- How many session recordings may occur concurrently?

We recommend only enabling session recording on secrets that absolutely need it—such as those with compliance or legal requirements. Otherwise, we recommend enabling session recording only on high value, high impact assets. This includes "global" admin accounts, domain administrator accounts, and other high-level privileged assets within your environment. This should minimize additional infrastructure just for session recording.

## Discovery

This is another feature that can have a large impact on a Secret Server environment. A large enterprise discovering thousands of systems may require additional Web servers or distributed engines. Below are a few questions to ask yourself:

- How many systems do you intend to discover?
- How often should discovery run?
- How quickly does discovery need to complete?

We recommend using out-of-the-box discovery sources where possible. Since discovery cannot be scheduled to run at a specific time, consider enabling discovery for the first time during off-peak hours so it will run around the same time each day or week. If discovering a large number of systems, ensure you have ample Web servers and engines to handle the load. For example, increasing CPU count for each distributed engine can help distributed engines do more work in parallel. Please see [Discovery Best Practices](#) for details.

## API Use Case

Employing multiple integrations with our product may impact a Secret Server environment. Below are a few questions to ask yourself:

- What integrations do you intend to use with Secret Server?
- What is the total number of API calls you anticipate per second, hour, or day?

We recommend that if you require several integrations with Secret Server where a high volume of API calls is anticipated, carefully consider how to configure your Web servers. You may want to have some Web servers dedicated to API use that have all Web roles explicitly disabled. You could place several such Secret Server Web servers in a load balancer configuration.

## Remote Password Changes and Heartbeats

RPC and heartbeats may impact a Secret Server environment if used heavily. Below are a few questions to ask yourself:

- How many secrets RPC?
- How often should passwords be changed?
- How many RPC retries should be attempted?
- How often should we perform heartbeats?

We recommend carefully planning what types of secrets require different password changing schedules based on your company's information security policy. Generally, setting a large number of retry attempts for an RPC is not a good idea. The same goes for heartbeats. Match these settings to the business use case, such as 10 password retry attempts and having heartbeats occur once per day. These small refinements can greatly reduce the load on Secret Server. If you determine you need aggressive RPC and heartbeat schedules, consider having additional Web servers and distributed engines to handle the load.

## Proxying

Heavy proxying can impact Secret Server infrastructure. Below are a few questions to ask yourself:

- How many systems are proxied?
- Are they SSH or RDP connections?
- What is the concurrent need?

We recommend proxy connections go through a distributed engine whenever possible. This offers a security advantage because ports, such as 3390 or 22, are not open inbound directly to your Web servers. You can review [SSH Proxy Configuration](#) to size proxy requests.

## General On-Premise Considerations

The areas mentioned below are often where we spend the most time with customers who have spent professional services time performing architectural health checks. These are the main areas we typically improve:

- Ensure that you have a database maintenance plan in place for Secret Server. It should be implemented or reviewed by your organization's DBAs. Adjusting the data retention settings is not enough and does not substitute for having a maintenance plan.
- Ensure that RabbitMQ clustering configurations have work distribution policies in place. In most engagements, we use the [AutomaticSyncMode](#) policy.
- When designing multi-site, single-instance Secret Server implementations, be cautious when configuring Web servers and enabling roles on all Web server nodes when inter-location latency is high (50 ms or greater).
- When using the "local" site for Web processing when also using sites with distributed engine processing, consider using engine processing for the local site too. In most cases, when using both Web and engine processing, you are using both a built-in message broker (MemoryMQ) with (RabbitMQ).
- Consider having dedicated systems for Secret Server components, as proposed in our mid-range reference architectures. If using RabbitMQ, put it on a dedicated system that is not shared with the distributed engine service. Secret Server
- For large environments where discovery, RPC, and heartbeats will be used simultaneously, carefully consider when to run discovery.

Discovery can compete with RPC requests when both features are using the same site. For large environments, you may want to have a dedicated site and distributed engines for discovery and a separate dedicated site for secrets.

Security is a process—not a product. Take a look at the [Security Hardening Guide](#) to ensure your implementation of Secret Server has optimal security. The guide contains more in-depth recommendations for not only configuring the application in a secure manner but also hardening the server or servers Secret Server is hosted on. That guide complements the information provided here.

One of the most important areas for Secret Server hardening is protecting the `encryption.config` file that is created during installation. After the product is installed, this file exists in the main `\SecretServer\` directory. It is a very important file. This file (unencrypted), along with a backup of your Secret Server database, is all you need to get a Secret Server environment back up and running. Thus, it is imperative that you protect it. There are two ways to protect the `encryption.config` for on-premises Secret Server and two others for Secret Server Cloud.

## Secret Server On-Premises

For an on-premise installation of Secret Server, we recommend protecting your `encryption.config` file with an HSM. When using an HSM, though, there are other things that you should be mindful of:

- Is the HSM highly available?
- Is the HSM capable of handling a high volume of access requests?
- What methods are available for retrieving the key from a backup if my HSM were to crash?

**Important:** If your HSM is down and you do not have backups, there is nothing we can do to help recover your data. Carefully consider the configuration of an HSM for protecting `encryption.config`.

A second, less secure, option for protecting the `encryption.config` file is to use DPAPI combined with EFS. DPAPI is a setting that is enabled on each Web server within your Secret Server cluster. EFS adds an additional password to the `encryption.config` file. It is worth noting that both protection mechanisms can be compromised if an attacker were to log on interactively to Secret Servers Web servers and become a local administrator. Give careful consideration to securing remote access to Secret Server when leveraging DPAPI and EFS.

We recommend storing an unencrypted copy of the `encryption.config` file for disaster recovery scenarios where the Secret Server Web server is irrecoverable. Make a backup of this file immediately after installation (before securing it with a HSM or DPAPI + EFS) and to store the file on one or more media devices such as a hardware encrypted USB drive. The device should then be placed in a secure location, such as a safe. Access to the device should go through a chain of custody process in the event of an emergency where the original file is needed.

## Secret Server Cloud

If you are using Secret Server Cloud, there are two main methods for protecting your `encryption.config` file:

- Delinea owns your `encryption.config` file and is responsible for keeping it secure. We put internal mechanisms in place to ensure that Delinea does not have access to your data without your explicit permission. Delinea
- You configure a connection to AWS KMS to protect the `encryption.config` file. The master key is stored in AWS and under your complete control, inaccessible to Delinea staff

It is important to have a privileged account management (PAM) strategy that helps you determine which types of features to leverage for your various accounts and sensitive data you will be storing. Below are some suggested guidelines for creating a strategic plan. We recommend reading all sections of the guide for a comprehensive look at ways you can secure your Secret Server. However, these guidelines will also link to other parts of the guide so you can choose to jump to a specific section for more detail about a particular topic.

## Identify Data at Risk

Consider all the types of sensitive data your team needs to be securely stored and managed. Where are the biggest risks and pain points in your current password management strategy? Data at risk also often includes more than just passwords.

To get started, think through these key accounts and principles:

- All shared privileged accounts: these are accounts that don't identify an individual (for example: administrator, root, enable, service accounts). All of these should have randomized passwords that are changed frequently.
- Do your users have individual privileged accounts? Maybe each user has—separate AD account for domain admin rights?
- Every password in your organization should be different.
- Do your users have individual privileged accounts? Maybe each user has—separate AD account for domain admin rights?
- What passwords could be needed in an emergency, outside of regular business hours, or when someone is on vacation?

Typical account passwords and sensitive data being stored in Secret Server:

- Active Directory domain administrator accounts
- Active Directory service accounts
- Application passwords (such as SAP and, custom apps)
- Cloud Administrative or Privileged Accounts
- Database accounts (such as MS SQL, Oracle, or MySQL)
- Network equipment passwords (such as router, switches, firewalls, phones, and appliances)
- Sensitive files (such as private key files, SSL certificates, and network documentation info)
- Software license keys, serial numbers, personnel data, and Wi-Fi passwords
- UNIX, Linux, Mac root, and local user accounts
- Website passwords (cloud services, DNS, Amazon AWS, vendors)
- Windows local administrator accounts

## Who Accesses Secret Server?

After determining the data you will store in Secret Server, the next step is to decide [who](#) will use Secret Server to access and manage that data. A common approach is to begin by focusing on one group of users and the passwords they use on a regular basis, later expanding to other teams once a good strategy has been put in place. However, you may find it more beneficial to organize Secret Server for use by all of your users/teams at once so you can design an effective overall folder and policy structure that will work well across all teams.

## What Privilege Levels Are Necessary?

Giving a user access to an account in Secret Server can entail different levels of privilege. Do you want a user to be able to edit the username, machine, or password of a secret, or only view the secret? Should they be able to share the secret with other users? Once you incorporate use of the Launcher into your users' workflow for authenticating to an application, do they really need to know a password, or can you mask it? The [Workflow Security](#) section can help you determine and implement key measures to ensure users have least privilege necessary.

## What are your Password Requirements?

It's unlikely that all your accounts will have the same [password complexity requirements](#) and [rotation schedule](#). In fact, for best security, you should have some variation. You can create sets of password requirements to control password length, characters, and complexity, then apply those to various account types using [secret templates](#). Secret templates also allow you to set a default expiration period, which can translate to how often an account password will be changed automatically.

## Evaluate your Existing Setup

While transitioning to using a new tool for managing your passwords, it is important to take into account how accounts are currently used in your environment. The following questions can help evaluate this:

- Do some of your users have their own, individual AD domain admin accounts, or are there only a few shared domain accounts?
- Do users use local administrator accounts or privileged domain accounts for admin access to systems?

- Are permissions to resources (such as servers and applications) controlled using AD group policy?

## Define Your Core PAM Strategy

There are a few different strategies that typically work best in Secret Server. Other methods of password management may work but require a more significant amount of time and effort to configure and maintain. The most commonly-used strategies are defined below.

### Individual Privileged Domain Accounts

In this scenario, IT team members have their own domain admin accounts that are tied to their identity. They use these accounts to gain elevated privileges to resources such as production servers. Permissions to the various resources they're permitted to access are controlled by AD.

To implement this in Secret Server, each account is stored as its own AD account secret. Only the user tied to that account is granted permissions to the secret. A security setting such as check out (one-time password) or hide launcher password is enabled so the user depends upon Secret Server to use the account. Therefore, all access to that account will be audited. When the IT admin needs elevated privilege to a box, they check out or view the secret and then use the launcher to access the machine.

A benefit of this strategy is that there is not conflict with multiple users trying to use the same account for access to one machine. This strategy provides great accountability—the security team knows the exact user accessing an account and the machine being accessed. The password is not shared among multiple users, and all privileged access is audited by Secret Server.

A pitfall of this strategy can be that there is more management of permissions required in AD. While machines could be access or deny listed to force users to use the Secret Server launcher, thus controlling machine access through Secret Server, this can be tedious.

It is more secure, less work, and simpler to organize permissions for access to domain resources in AD. This strategy works best for organizations that already use AD heavily to control permissions of individual privileged users to domain resources. Ongoing maintenance will rely on updating permissions to resources in AD and ensuring that all new individuals' privileged accounts are being added for management under Secret Server.

### Shared Privileged Domain Accounts

You may choose to have your users use shared privileged accounts to access resources. This strategy involves creating a few service accounts that have permissions to OUs or groups of computers. In Secret Server, these accounts can be limited with the Launcher so they can only be used to Launch to certain computers. This means you can limit the number of domain accounts created and set permissions more broadly (such as at OU level). These passwords could be changed on a schedule or, where possible, used with Check Out to change the password after each use. Using this setup, accounts can be designated for team or function and can have varying Check Out intervals set to ensure that only one person at a time is using each account.

A benefit of this strategy is if individuals do not already have their own privileged domain accounts in AD, then giving them access to shared accounts means less setup in AD while still maintaining accountability for who uses which account, and which machine they access.

A pitfall of this strategy can be that if the team (or function-specific accounts) cover a broad number of machines that can be accessed, it may be a lot of work to set up launcher allow/deny lists to control access through Secret Server. However, if these permissions are set only through AD, it will be difficult to have the visibility into these limitations for an auditor.

### Hybrid of Individual and Shared Accounts

Sometimes, your employees' roles may require longer, more specialized access. For those accounts, you can have individual privileged domain accounts, and for the other regular users you can use a few shared privileged domain accounts. All of these can be stored in Secret Server, but with different settings governing their usage. For example, the shared accounts would still have check out enabled, while the individual privileged accounts will simply have permissions limited to an individual user, possibly with the password hidden using hide launcher password.

## What Is the Highest Risk?

Implementing a comprehensive PAM policy should eventually cover all of your privileged/shared accounts, but this can take some time. When looking at where to start, it is important to consider the areas of risk—where are the areas that need more immediate attention:

- Is it local Windows admin accounts all sharing the same password?
- Pass-the-hash vulnerability?
- Protecting your network equipment passwords?
- Avoiding fines for not meeting compliance mandates?
- Password misuse and auditing employee access to accounts?

Choose a starting point that gives your organization the most value, and then branch out from there.

At minimum, the administrators who manage and use your organization's privileged passwords and data on a regular basis will need to access your Secret Server. Secret Server users can be defined in a few ways:

- Active Directory user accounts.
- Local Secret Server user accounts.
- User accounts from an Azure Active Directory tenant.
- User accounts from another LDAP source (Basic/Kerberos).
- User accounts from SAML integration (often AD accounts). If local accounts are provisioned via SAML, they must correspond and match local user accounts that are within Secret Server. SS also has the concept of groups, which can be local (you create them in SS), AD-synced (security groups from AD), LDAP groups, or AzureAD groups. Groups are a powerful tool for assigning and maintaining permissions to secrets, and therefore should be given careful thought and planning. Below we review the two most common account and group strategies our customers use. These same concepts can apply for other directory service accounts and groups other than Active Directory.

## Local Secret Server Accounts

Local users and groups have to be created and managed manually in Secret Server, as they are not integrated with AD. The first account you create in Secret Server is an example of a local account. Local groups can include local users and AD accounts, and can have a user established as the group owner that is permitted to add or remove users to or from the group.

## Active Directory Accounts

AD accounts can be added for access to Secret Server either manually (one by one) or by AD security group. When adding users by security group, you choose which groups Secret Server will synchronize with AD to update which users' access to Secret Server is enabled or disabled. AD group synchronization happens on a regular, customizable interval to keep group membership changes that happen in AD up-to-date in Secret Server as well.

## Local or Active Directory Accounts?

We recommend using one of these options:

- Only local users and groups (best security)
- Only AD users and groups (most convenient)
- A hybrid of AD users and local groups (balance of security and convenience)

You need to choose an option that provides the levels of security and convenience that are acceptable for your organization. Using the AD accounts option is easy for user maintenance, but it limits the security of Secret Server to the level of security of your AD. This may be fine—just be sure to consider the question of domain admin access to AD in combination with Secret Server permissions.

## Only Local Users and Groups

Creating local users and groups within Secret Server provides a lot of flexibility because you can tailor permission assignment by group to your exact needs. The major benefit of local users and groups is security: users and group membership can be controlled entirely by role-based access control (RBAC) within Secret Server. However, this approach requires more maintenance because creating or deleting users and managing group membership has to be controlled in Secret Server.

## Only AD Users and Groups

If you are considering using AD users and groups for Secret Server access and permissions assignment, review your teams that need access to Secret Server. Compare them to the corresponding groups in your AD. If your AD groups map to ways you want to assign access to secrets, you can synchronize your AD groups with Secret Server and start assigning permissions to secrets (and levels of those permissions—View/Edit/Owner) by group. You can then effectively manage Secret Server access and secret permissions completely from AD by changing AD group membership.

Many customers choose this option because they can maintain control in AD and do not have to worry about any user or group maintenance within Secret Server. If you want to use this option but your AD groups don't match the way you want to assign secret permissions, you will need to create new AD groups to match this, or may want to consider the hybrid approach (below), using local groups instead.

This method, while more convenient, may require additional considerations:

- How are these AD groups being protected?
- Are there controls in place which require elevated or high privilege accounts to modify these AD groups?
- Are there alerts in place for when these groups are modified?
- Is the information security team closely monitoring these groups?

## Hybrid of AD Users and Local Groups

A third option is to create local groups in Secret Server and add AD users to those groups for the purpose of organizing how permissions are assigned to secrets. Many customers who use this setup will create a single AD security group (for example, SecretServerUsers) to use to synchronize their AD users with Secret Server for log on. They then create additional local groups for their users to, which gives them permissions within Secret Server, such as to their teams folder. They may also be added to other Secret Server groups that provide them with other privileges within the environment.

This approach is more secure than using only AD groups and users, but if Active Directory were compromised, intruders may still be able to reset an account password and gain log in access to Secret Server. If secrets are stored in that user's personal folder, those secrets may be compromised which may lead to lateral movement elsewhere within the organization.

## Business Users

A *business user* is a non-IT user, such as sales team members, office managers, data entry clerks, and marketing team members. They are allowed to access and use Secret Server for managing non-privileged accounts, including individual or team application accounts and credentials. Non-privileged accounts include email login, social media password, productivity software credentials, and more.

Business users are not permitted to manage privileged accounts, such as database server credentials, security appliance passwords, and cloud service root keys. Business users are also not permitted to administer Secret Server.

Business users can:

- Access secrets: They can create, update and delete their own secrets within Secret Server. For example, A user signing up for an online service can use the password generator to create a strong password, store that password in Secret Server, and use the Web Password Filler to log in later.
- Request and approve access to secrets: Non-privileged secrets may need approval workflows. Business users can request access to these secrets and can act as approvers. For example, if access to an organization's social media accounts requires authorization from



a member of the marketing team, a business user can request access to the secret, and another business user can approve access.

- Share secrets with other users: Business users can share non-privileged secrets with other users of Secret Server, whether or not they are business users.
- Access secrets using the mobile app: Business users can use the Delinea PAM application to access and manage their secrets.
- Use launchers: Business users accessing secured, but not privileged, systems can use Secret Server launchers. For example, a user in a secure network segment who can only access an application via RDP may use an RDP launcher, as long as the tasks they are performing do not require privileged access.
- View audits of their secrets: Auditing capabilities are included for business users, allowing them to see who has accessed their shared secrets.

Defining your authentication strategy ensures you have standardized authentication practices in line with your Secret Server RBAC scheme. Secret Server offers a wide variety of authentication options that can add flexibility and security to your end user's authentication process.

## Strong Authentication

Protect the tool you are using to secure your privileged accounts by adding a second factor of authentication for users logging into Secret Server. Two-factor authentication can be added whether users are logging in with local or AD accounts. For more information about using two-factor authentication with Secret Server, see the [Security Hardening Guide](#).

## SAML

If your organization is already using SAML for SSO across your organization, it might be a good option for Secret Server authentication too. SAML uses browser-based communication, between the service provider (Secret Server) and the identity provider (SSO providers) to broker authentication. For more information on configuring SAML with Secret Server, please see the [SAML configuration guides](#). The major benefits SAML provides are:

- A consistent MFA strategy across all applications in your environment.
- Simplified authentication communication: The browser handles the process. For SSC, if the authentication strategy is to authenticate against the domain, that communication must flow from SSC to the distribute engine and finally to the domain controller and back for authentication. SAML shortcuts this by having the browser communicate to the service provider and identity providers, reducing authentication latency.
- Easy to configure, manage, and add new users.
- Supports multiple MFA options based on conditional access. For example, a user may only need to verify with one factor for accessing less critical apps, but Secret Server uses two-factor authentication.

## Directory Services

Secret Server provides a multitude of authentication options through directory services. It can sync users into the application from various LDAP sources. It is important to use an outside authentication source to automate user provisioning. The User Account Options setting in the directory services configuration provides these options:

- Users are Enabled By Default (Manual)
- Users are Disabled By Default (Manual)
- User Status Mirrors Active Directory (Automatic)

There are benefits to each strategy, but the last one is usually best. Using a hybrid group structure prevents new users from gaining permissions before they have been reviewed, and if they are disabled in active directory, they are automatically deprovisioned from the system. This provides automatic user management and easier offboarding strategies.

If you decide to use a manual strategy, we suggest using the automatic user management feature to disable users who have been inactive for a defined period of months. This can prevent long-inactive accounts from being compromised and keep your list of active users current.



Roles control which features of Secret Server a user is able to use, view, or administer. Existing roles can be customized, and new roles can be created as needed. Secret Server comes with several roles by default, including administrator, user, and read only. You should review the default roles and decide whether your organization needs further roles for various purposes such as third-party consultants or auditors.

**Note:** Users with the default administrator role (which contains all role permissions available) do **not** automatically have access to all data stored in your Secret Server. secrets are only visible to a user based on the explicit secret permissions assigned to them.

We strongly recommend pulling one or both role permissions pertaining to unlimited administration mode out of the default administrator role. Unlimited administrator mode is a "break-the-glass" feature that allows a user to view all secrets in Secret Server. By splitting the unlimited administration permissions into separate roles, it ensures no one user can both turn on the feature and operate as the unlimited administrator.

Commonly, operational employees are assigned to the "unlimited administrator" role and a CISO or senior manager that is responsible for Secret Server is assigned the "configure unlimited administrator" role.

**Note:** For more information about how unlimited administration mode works and how to effectively control the relevant role permissions, see the [Security Hardening Guide](#).

Other sensitive roles you may want to directly assign to individuals include:

- Administer Role Assignment
- Administer Role Permissions
- Bypass SAML Login
- Create Root Folders
- Delete Secret

For administrator-related roles, we typically recommend having these associated to your planned internal Secret Server subject matter experts. Usually customers have a dedicated group or groups associated with administrator only roles and functions. You can create administrator tiers depending on the size of your organization and the tasks you expect the administrators to perform. This can reduce administrative overhead and provide a path for employees to gain further experience with the product.

We recommend creating AD groups for these administrative roles to ensure that these groups are protected and can only be modified by higher-privilege accounts. Ensure proper monitoring and alerting is in place when creating groups that are intended for high-privilege role access within Secret Server.

## Role Definition and Assignment

Once you have defined your roles, they will seldom need to be changed. Access to modify and assign roles should be tightly controlled.

## Group Assignment

If roles are assigned to groups, then assignment of the groups will also need to be controlled. Often very sensitive role permissions, such as unlimited administrator, are assigned at the user level to limit the risk of granting group assignment permissions. Roles that are individually assigned should be routinely audited at least once a year to ensure users are only assigned the permissions needed for their job.

You have different sets of passwords that should only be viewed by particular administrators. You may also have passwords that should be read-only to some administrators, editable by others, and not even visible to still others. All of these options are possible using the permissions within Secret Server.

Permissions can be allocated at the individual user level but it tends to be easier to manage over time if you allocate your permissions at the

group level. You will need to decide if your existing AD groups could work for these permissions or if you need to create new AD groups or if you want to create and manage local groups in Secret Server.

For more information about what each level of permissions entails, see the [Secret Server Role Permissions List](#).

## Using Folders to Control Access (Inherit Permission)

You can apply permissions (View/Edit/Owner) at the secret level. This allows you to apply very granular permissions on a single secret if needed. Managing permissions on each secret is powerful for situations where you need that flexibility, but it tends to be harder to manage over hundreds or thousands of secrets. Instead, you should consider using folders to control permissions for most secrets. This can be done by creating a folder structure that best represents your organization, teams or data being stored and then applying permissions on the folders, using inheritance across folders where appropriate. Secrets placed in a folder can then inherit the permissions of the folder.

## Deciding on your Folder Structure

The folder structure creates a hierarchy for organization and permissions. This means that folders near the root level need to break out access in high level terms and then get more specific permissions (typically breaking inheritance) as you move down to the "leaf level" sub-folders.

For example:

- Customers
  - Human Resources
  - Information Technology
    - Development Services
      - Programmers
      - Technical Services
        - Database
          - Oracle
          - SQL Server
          - Systems
          - Network Infrastructure
          - Unix
          - Windows
- Vendors

The most typical configuration is to break out the folders based on the teams that need to use those folders with the most restrictive permissions at the deepest subfolders of the tree.

For instance, an Oracle DBA might have the following permissions on the above folders:

- Information Technology (view)
- Database (view)
- Oracle (view/edit/owner)
- SQL Server (view/edit)
- Technical Services (view)

**Note:** If the "require view permission on a specific folder for visibility" setting (Admin > Configuration > Folders) is enabled, a user cannot see the full folder structure unless they have view permissions on all the parent folders of a folder. For example, a user with view on the Oracle folder in our example, would also need view on Database, Technical Services, and Information Technology to see the full folder path.

There are settings under **Admin > Configuration > Folders** to control whether inheritance on folders and secrets should be turned on and also whether users should always see all folders. There are many ways to configure this for your organization.

The most common approach is:

- Use inheritance.
- Do not allow users to see folders unless they explicitly have view permission by enabling the "require view permission on a specific folder for visibility" setting.
- Require all secrets to have a folder.

**Note:** Consider using our [User Teams](#) feature to align your groups within Secret Server to a team. This can help prevent users from sharing secrets with other individuals outside of their own team.

This approach allows different teams or even different departments within your organization to use the same Secret Server instance independently.

If a business need arises to break permission inheritance on a folder or secret, we recommend tracking or auditing those folders because manually applying permissions can increase your administrative overhead.

A *secret policy* is a set of security and remote password changing settings that are normally applied to a secret on the Security or Remote Password Changing tabs. The benefit of using a secret policy is not only that settings can be applied in bulk to secrets (that is, by folder), but that these settings can also be enforced, preventing users from changing them.

Secret policies should be established to apply settings to secrets that are key to the workflow your organization is working toward. For example, if your primary concern is more detailed auditing around service account usage and you also have a requirement that all service account passwords change every 60 days at 2 A.M. on the next Tuesday, you can create a policy that includes these settings and apply it to the folders that will contain all of your service accounts. Whenever new accounts are added to the folder, such as when they are imported via discovery, the settings will automatically be applied and enforced.

Secret policies can also be updated after they have been assigned to folders. Therefore, if your password policy changes and you need your service account passwords to change every 30 days, you can update the policy and it will immediately apply to all secrets the policy is assigned to.

As with permissions, secret policies can be inherited too. Be mindful of where you disable secret policy inheritance to ensure that exceptions to secret policies are tracked. Also, disabling secret policy inheritance may lead to increased administrative overhead.

This section discusses some key best practices around using Secret Server's Discovery feature to find and manage accounts in your environment. See [Further Resources](#) for a link to the comprehensive guide to configuring and using Discovery.

## Discovery Workflow

While it may be tempting to immediately get started using discovery to get your accounts under control, there are a few things you can do ahead of time to make the enforcement of your organization's password policies more streamlined:

- Know which secret template you want to import accounts to. This can effect password changing and Launcher settings that are applied to your imported accounts.
- Have a folder structure established so you have folders appropriated for each type or category of discovered accounts.
- Apply a secret policy to the folders you import to.

Having these settings in place can save you the considerable amount of time it could take to have to re-organize all of your accounts and policies post-import.

## Enterprise Deployment Considerations

We broadly recommend starting small and choosing specific objectives when working with discovery. If you are an organization that has 15 domains, for example, you may choose to first work with discovery within the domain you are most concerned about. Make the objectives even more specific where possible. An example first objective might be to configure discovery for finding all local administrator accounts on all your servers and creating discovery rules for ensuring that new servers have their password changed shortly after being built. Systems with internal elevated risk may also be a good place to start. Other examples are provided below.

### Cloud Accounts

In more recent Secret Server versions, we support discovery of [Google Cloud Platform](#) service accounts, VM instances, and [AWS Instances](#).

### Local Windows Accounts

How many local Windows accounts in your environment use the same password? Are they local admin accounts? Use discovery to quickly mitigate the risk of pass-the-hash attacks by finding all of your local Windows accounts and setting their passwords to unique, strong passwords managed by Secret Server. Where your admins previously had to remember one password to access all machines with local admin rights, they now have to remember zero passwords because they can use Secret Server to find the machine and launch an RDP session using the local admin account without ever knowing, copying, or typing the password.

### Find Backdoor Accounts

Ensuring that users are not creating backdoor administrative accounts on Windows machines is very important as these can compromise general security as well as open the potential for a user to access a machine directly without being audited. By running discovery on a regular interval and having discovery rules alerting you when new accounts are found, you can ensure that users any new local Windows account being created are identified in addition to being either removed or brought into Secret Server.

### Service Accounts

Many organizations do not know where their AD service accounts are being used across the network. By using discovery to scan your network, you can find all of the Windows services, application pools and scheduled tasks that are run by AD service accounts. Once these accounts are found and brought into Secret Server, having discovery run on a regular basis will find any new locations where the account is being used since they were added to Secret Server. With discovery rules, those additional dependencies can be automatically added to the existing secrets. We recommend making sure that the service account discovery has run before using Secret Server to change the service account password.

### Unix Accounts

When scanning for Unix accounts, we recommend using SSH key validation, as discussed in the [Security Hardening Guide](#). This ensures that you are only connecting and trying to authenticate to UNIX servers that have a valid and trusted SSH key.

### ESX/ESXi accounts

Local accounts on ESX/ESXi systems should not change once the server is set up and configured. We recommend creating discovery rules that monitor your ESX/ESXi servers and email the proper teams to inform them of any new account found. These accounts really should not be created, so it is important to monitor them and ensure that no one is creating them maliciously.

Often you will have situations in which you want users to have access to accounts, but only under certain circumstances, such as on a specific day or after the approval of a manager. Maybe your compliance requires that you have the ability to monitor an active RDP, or that you use a one-time password for certain accounts. This section examines best practices around workflow security settings in Secret Server as well as scenarios when these settings are commonly used.

## Hide Launcher Password

Many times, giving an employee access to a resource through Secret Server does not require that he or she have access to the actual password for the account used. As long as the application a user needs can be started by the launcher, there is no reason the user needs to copy/paste or type the password. The hide launcher password setting implements the following:

- Users with access to the secret will see only asterisks (\*\*\*\*) in the password field
- There will be no copy-to-clipboard, field history, or unmask icons next to the field

**Note:** Users with edit permissions to a secret with "hide launcher password" enabled can still view the password when editing the secret. To prevent all possible access to the password, limit users to view permission only.

This can be an important way to reduce exposure of your privileged account passwords. Hiding launcher passwords can be enabled for secrets under the Security tab of a secret or by applying a secret policy. You can also remove the ability for a user to see the password for any secret with a launcher by removing the "view launcher password" permission from their role.

## Require Approval

The "requires approval for access" setting is typically employed in the following cases:

Simple approval workflows:

- When a user should be required to request access to a secret for a certain time period
- When an administrator would like to approve a user's access to a secret in advance for a time in the future (such as a maintenance period outside normal business hours)
- When a group of administrators would not like anyone to access a secret without the approval of another administrator

Advanced approval workflows:

- When requiring a multi-tier approval process that involves having more than one individual approve access to a secret
- When requiring multiple workflow steps, each with different reviewers and a varied number of required approvers
- When selecting "owners" as a review group

This setting can be turned on under the Security tab for an individual secret, but can also be applied via a secret policy. When enabling "requires approval for access," remember that users will still need to have at least view permission to the secret to request access to it. Once access has been granted to the secret, they have whichever level of permission was assigned to them for the secret (view, edit or owner). The approvers of the secret are specified when enabling the setting, and these individuals will be able to modify the time that the requestor originally submitted their access request for or deny the request altogether.

**Note:** Please see our documentation on [Secret Workflows](#) for more advanced workflow use cases. For highly sensitive or privileged accounts, we do recommend implementing multi-tier approval processes where possible.

To require all approvers of a secret to also request access from another approver, be sure to enable the "owners and approvers also require approval" setting.

## Require Comments

Requiring comments to be entered when viewing a secret can be an excellent way to ensure users are accessing a secret for legitimate reasons. You can even view the comments in the audit of the secret to historically track if a secret was accessed for the originally intended purpose. Managers can routinely review these comments and determine where employee training may be required.

A common example would be enabling require comments on a domain administrator account that is stored in Secret Server: A user may enter a comment that indicates he or she needs to use the domain administrator account to "perform adding a user to a group." In many cases, a domain administrator account should not be used for this purpose and often this work can be done with a lesser privileged account

within the environment.

Requiring comments can also be combined with [Ticketing System Integration](#). This is a great way to align secret access with a valid ticket number and a comment. This can help with compliance and track usage of a secret tied to a specific task, which may provide more granular information as to why a secret is needed.

## Check Out

There are times when users need to be able to access a password directly, but you still want to have control over how long they are able to use the account without the need to approve access each time. In this case, hiding the launcher password is not a possibility, but there is also concern about having the user know what the password is after they are done using it. Another concern is often the risk of the hash of the password being stored locally on remote devices after each use and potentially being vulnerable to a pass-the-hash attack.

"Check out" is a security setting that means:

- Only one user at a time has access to a secret
- A user can only access the secret for a predetermined check out interval, such as 30 minutes
- At the end of a check out interval (check in), or when a user manually checks in the account before the time is up, the secret is available for check out by another user
- When enabled, the password can also be changed automatically upon check in

Domain administrator accounts are a great example of a case in which using check out to change the password every time it is used can be extremely beneficial. This ensures that users are not copying the password to Notepad or writing it down for later use and also invalidates the hash that was stored on the remote machine after a remote desktop session.

Check out can be turned on under the Security tab for an individual secret, but can also be applied via a secret policy.

## Session Monitoring

For critical systems and highly privileged accounts, sometimes simply having an audit trail showing when someone viewed the account in Secret Server is not enough. Maybe the auditor also wants to be able to review what was done with the account on a remote session. For these critical secrets, it is recommended to enable session recording for the secret. When session recording is enabled, all launcher sessions can be recorded for later viewing by the auditor or manager in the event they need to investigate the actions performed during a remote session.

What constitutes a "critical system" is subjective. Departments may define this differently, so having them involved in those discussions can be helpful. Some of these systems may be explicitly selected based on risk, compliance, or from the auditing team.

One of the most important things is to not consider all accounts or secrets critical, enabling session recording for them all. That can cause performance issues within your environment—session recording is the single most intensive feature of Secret Server.

Before enabling session recording, you may want to evaluate your users' roles to determine who can monitor real-time sessions and view recordings. The permissions to look for are "administer session monitoring," "view session monitoring," and "view session recording."

Session monitoring can be turned on under the Security tab for an individual secret, but can also be applied via a secret policy.

Secret templates in Secret Server define the types of data (secrets) that can be stored, and the settings for that data. You can store just about any type of sensitive data in Secret Server.

It is important to review the available templates and decide which ones should be available to your users as well as where you would like to make changes to the default templates included.

## Configuring Templates

You can customize existing templates or create new templates if necessary. Many templates are included by default that cover common account types. For example, the AD Account template contains the following settings:

- Domain, username, password, and notes fields
- 30-day expiration period, applying to the password field
- RDP launcher, requiring user input for computer to connect to
- Password changing and heartbeat enabled
- AD password changer, with default password requirements

These settings are typically sufficient for most organizations to use out-of-box. However, you may wish to enable other settings or change settings such as enforcement of a naming convention or more complex password requirements. In this case, you have the flexibility to either modify the existing template, copy the existing template to use as a base for a new template, or create a new template from scratch. The following sections cover some fundamental template settings available for you to customize.

One best practice we often recommend is simply leaving default templates the way they are and duplicating the templates you plan to use. Then customize the newly duplicated templates as needed. Name them something your employees will recognize and readily use.

## File Attachments

Do not forget files. You can have fields on your secret template attaching files. This can be used for storing license key files, private keys, SSL certificates, even Microsoft Word or Excel documents that contain sensitive data.

## Naming Patterns

Secret Server supports enforcement of naming patterns for secret names. Naming patterns allow you to maintain consistency for secret names and can help ease both browsing and grouping secrets by name. Naming patterns use regular expressions and allow you to enter a descriptive error message to describe your naming standard to users. The most common naming standard used is RESOURCE\ACCOUNT (for example, server0001\administrator). You can find this setting by clicking Edit from the template designer page.

## Password History

Secret Server automatically keeps all history on all fields on a secret template. This means that all previous values for machine, username, password and any other fields will be kept. This helps ensure that previous passwords can be found if needed.

## Password Requirements

Password Requirements determine the password compliance rules (for example, 16 characters, one uppercase, one lowercase, one symbol and one number). These can be customized and applied to passwords at the secret template level or per individual secret (under the Security tab). This controls the complexity of passwords generated by Secret Server. Password requirements can also be enforced when users try to edit or create new passwords, and can be viewed for password compliance in reports. This allows you to have different complexity rules for different types of passwords if needed (such as Oracle, SQL, Windows, and UNIX). You can choose to have Secret Server enforce the password requirements on add/edit by turning on validation on the secret template (click Edit from the template designer page).

We have added new password [validation criteria](#) to recent versions of Secret Server, which further helps create unique passwords. We also added [custom password-exclusion dictionaries](#) that can help personalize which words may never be used as part of a password that is generated.

Talk to your security management, auditors and industry experts to find out the best password complexity settings for your environment. Do not hesitate to stipulate complex passwords, such as 100-character random-generated passwords with symbols, alphanumeric uppercase and lowercase)—using a platform like Secret Server makes it easy to work with passwords so complexity and length do not matter (for launchers, copy-to-clipboard, and auto change). In fact, very large passwords can add to security since administrators will be far less likely to remember them or write them down or want to type them.

Another thing to consider when creating password requirements is which character sets should be used. Some systems may not work well with certain characters. For example, underscores can be problematic in certain mainframe environments. You can create your own character sets (Admin > Secret Templates > Character Sets) for use in password requirements. These can then be used when passwords are generated by Secret Server.

## Secret Expiration

Secret Server uses expiration to ensure that passwords are changed on a regular basis. Secrets can be set to expire on an interval such as 30 days (or other intervals as needed). Expiration is often combined with automatic password changing to control how often a password is changed (whenever it expires, Secret Server will queue the secret up for a password change).

You can also control which field is used for expiration. This does not have to be the password field—you could use expiration on a license key and set expiration to when the license is going to expire. When a secret expires, you can then update the expiration field (say license key) and it will no longer be expired. This is a generic way to ensure that a specific field on a secret is changed on a regular basis.

## Session Launcher

The Launcher can be configured on the secret template to allow any tool to be launched using the secret such as Remote Desktop, PuTTY, Web launcher or a custom launcher you configure for a particular executable file, for example, MS SQL Management Studio, SSH clients, FTP tools and more. This can also be used with the "hide launcher password" setting to allow administrators to launch tools without revealing the password.

It is worth spending time in the beginning to get your secret templates the way you want them before users start adding data. Therefore, when a user goes to create a new secret it will be clear which secret template to use instead of selecting the wrong one and attempting to fit account information into an unsuitable template. You can use an option on the secret called "convert template" to later convert a secret to another template, but it is much simpler to plan before your organization begins adding data.

## Basic Configuration

When creating new secret templates, make sure you configure Remote Password Changing, password requirements, secret expiration and the launcher. Ensure your secret template names are descriptive and use terms your users understand. For instance, if you have one template that expires and one that does not, make sure it is clear from the name. If your organization does not use the term AD account, change it to match the organization's language.

## Deactivate Unused or Retired Templates

Secret Server comes with many secret templates preconfigured. You should decide which you want to use and then deactivate the others. You can also retire secret templates if your requirements change over time—secrets remain when a secret template is deactivated but no one will be able to create new secrets for that secret template. Secret Server SS uses soft deletes rather than hard deletes (data is marked as inactive rather than actually deleted), which is essential for auditing. Secrets and secret templates can be inactivated but not deleted.

## Limit Secret Template Administrators

Changing secret templates should be limited to only a small subset of your Secret Server admins. Create a separate role that has the "administer secret templates" role permission and remove it from administrator if you have a lot of administrators. Once you have secret templates configured, it is unlikely they will need to be changed frequently so very few people should need access.

## Override Settings at the Secret

Many of the settings at the secret template can also be overridden at a secret based on that template. For example, if you create a secret for your AD service accounts with a 30-day expiration but need 90 days for a specific AD service account, you can set it to 90 days for that one.



secret. This gives some flexibility for secrets that need to behave differently than other secrets using the same secret template.

Event subscriptions are a great way to send alerts based on various activities. One of the most common event subscriptions we recommend is alerts based on "unlimited administrator" mode being turned on. This can be aligned to alert your CISO or a manager within your information security team, as this should happen only rarely. Other useful event subscriptions to consider:

- Backup Configuration – Backup Failure
- Configuration – Edit
- Encryption – Key Management Disabled
- Role
- Role Permission
- Site – Engine Offline

These alerts can be sent to different people or can even be sent to users that do not have a Secret Server account. For some of the suggestions above, you may have some of these alerts go to a manager of the systems administration team rather than the information security team. Sending alerts to team members that are responsible for different portions of the application allows for flexibility in who may have to respond to these events.

There are many useful built-in reports. For example, a license audit report may be useful to an auditor, while the built-in reports for secret policies may be useful for information security. It is a good idea to meet with various teams to determine what reporting requirements they may have. Please review our [event subscription](#) and [reporting](#) documentation for more information.

The [Audit Data Retention](#) documentation may be helpful for very large environments where there is audit and log retention flexibility. For example, some of these tables within the database are sizeable, so if your environment exceeds 50,000+ secrets, it may be a good idea to make some adjustments. Similarly, you could have a smaller environment, say 25,000+ secrets, but if you are using all Secret Server features heavily, adjustment might be helpful.

Deleting the data within here should not substitute for a database maintenance plan and should be only considered complimentary to one. Lastly, individual audit tables, such as the "secret audit", cannot be managed independently outside of this configuration unless adjusting those tables directly within the database. Thus, we do not recommend doing unless under direct instruction of our support or professional services teams.

APIs and built-in extensibility features are one of the best ways to improve the automation and flexibility of Secret Server and address novel use cases. PAM Maturity relies on the consistent handling of credentials across your organization. Using the API is a great way to enforce consistency, without additional administrative overhead.

Features like event pipelines can help to organize secrets and users, as well as tweak some settings that are not enforced via policy. Additionally, you can discover and manage new device types using extensible discovery or custom password changers. This section covers some high-level best practices for these features and how best to employ them in your environment.

## Running PowerShell with Secret Server

Secret Server's extensible features almost all use PowerShell from the Web servers or distributed engines to execute code. Create a service account for these tasks and store it in a secure location with the other Secret Server service accounts. Documentation for our [API and Scripting](#) components can be found in our Knowledge Base.

### PowerShell Runspaces

Runspace is instances of the PowerShell engine within a process. They define the context a PowerShell runs in and preserve session state using variables and functions that you define, including modules that you load.

For scripts executing on the local or default site, Secret Server generates a runspace to localhost on the Web server (Web site processing) or distributed engine (engine processing or SSC). For scripts running against a specified site, any engine associated to that site may run the script and accomplish the work. This means any dependent configurations need to be made across all Web servers or engines within a site.

This runspace is generated using a specified secret credential in all cases. The credentials used are critical in the operations of PowerShell in Secret Server and a least-permissioned approach should be used.

A domain account, that is, a member of the "remote management users" or "local admin" groups, on the engines or Web servers will have enough permissions to generate the runspace Secret Server needs to execute code. Further restrictions to deny interactive log on can be applied; however, it is important to know what account to use for a least-permissions approach.

You can simplify the assignment of the privileged account in individual locations in Secret Server by specifying a "site run as" secret. This is a default secret for PowerShell running that prevents you from having to manually associate the secret in each place it is used. We highly recommend to configuring this setting on each site under the site's settings.

## **CredSSP**

CredSSP is an authentication mechanism that is designed to delegate credentials across multiple sessions in PowerShell. By default, the runspace uses CredSSP authentication. This is not ideal as there are some security concerns with CredSSP. It is generally better to disable CredSSP authentication under all used sites, and instead implicitly pass credentials into the scripts. CredSSP does have dependent configurations that are required before it can be used.

However, If CredSSP is required, be very explicit with your delegate computer list. Allowlisting this option with an asterisk (\*) may seem easy, but it allows an attacker to scale horizontally across your network.

## **API**

The API is a powerful tool for improving automation and flexibility of your Secret Server deployment. Automation tools can pull dynamic credentials from the vault or leverage the API to create new secrets as part of an automation pipeline.

If your organization does not have script experts to improve your PAM program's flexibility, Delinea Professional Services can help to scope and create custom integrations to address your use cases. Contact your account manager or customer success manager to engage professional services.

### **API Authentication**

Carefully consider your authentication strategy for the API when automating workflows. Authentication strategies that do not require hard coding a password into a configuration or script file are preferred. Secret Server Provides a few mechanisms to accomplish this:

#### **Software Development Kit**

The Secret Server Software Development Kit (SDK) is a mechanism to authenticate machines to a Secret Server instance, without having to pass implicit credentials into the system for each set of calls. To ensure proper RBAC, the SDK is associated to a specific API user in Secret Server. On the local system, once the SDK is initialized, it leverages DPAPI to encrypt the config files, tying it to the user who initialized it. You can use multiple SDK instances on the same machine; however, each instance needs its own directory.

#### **Integrated Windows Authentication**

You can enable Integrated Windows Authentication (IWA) in IIS to use native Windows authentication for API user authentication. This allows the domain to supply authentication between the Web server and Secret Server. This is a great option to remove credentials and automate authentication for automation processes in your environment.

**Note:** IWA is only available for Secret Server On-Premises.

## Event Pipelines

[Event pipelines](#) are a powerful feature that configures tasks that run based on triggers and filters. If scripting is not an option for you, pipelines can be a script-free way to accomplish a lot of what the API provides. You can use event pipelines to build the core automation of a mature PAM deployment.

## Developer Resources

This topic is a one-stop resource for Secret Server developers. It points to TDP topics, as well as legacy knowledgebase articles. See the main TDP [API and Scripting](#) section too.

- [Custom Reports Gallery](#)
  - [Creating Custom Reports](#)
  - [Using Dynamic Parameters in Reports](#)
- 
- [Configure CredSSP for use with PowerShell](#)
  - [Creating and Using PowerShell Scripts](#)
  - [Creating and Using SSH Scripts](#)
  - [Creating and Using SQL Scripts](#)
  - [Password Changing Scripts](#)
  - [Searching Secret Server - PowerShell](#) (KBA)
  - [Using Secret Fields in Scripts](#)
  - [Using Webservices with IWA via PowerShell](#)
- 
- [REST API PowerShell Script Examples](#)
  - [REST Web Services API Reference and Download](#)
- 
- [Change SQL Service Account Passwords without Restarting SQL Service](#)
  - [Dependency Token List](#)
  - [Understanding Dependency Script Errors for SSH, Powershell and SQL](#)
- 
- [Downloads for Secret Server Software Development Kit for DevOps](#)
  - [Secret Server Software Development Kit for DevOps](#)
  - [Delinea Community GitHub Repository](#)
- 
- [SOAP Web Services API Guide](#) (PDF)

## Directory Services

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Directory services are components of network operating systems that map the names of network resources to their network addresses. Their shared information infrastructure locates, manages, and organizes network resources, which can include volumes, folders, files, users, groups, devices, and much more. Active Directory is Secret Server's native directory service.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server can integrate with Active Directory by allowing users to use their Active Directory credentials to log on Secret Server.

**Note:** Before synchronizing or creating users, you need to create a secret to be used as the "sync secret." This secret should contain Domain Admin credentials (or an account with appropriate permissions to search and view the attributes to all your organization's users and groups).

## Active Directory Credential Caching

### Overview

Active Directory credential caching enables users to access Secret Server even when the domain controller is unavailable. When caching is enabled, Active Directory credentials are cached for 30 days in the on-premise editions, and for 90 days in Secret Server Cloud.

With credential caching enabled, whenever a domain user successfully logs into Secret Server, their domain password is hashed using PBKDF2, and stored in the Secret Server database along with the current time stamp.

If a domain user attempts to log in but Secret Server is unable to contact a domain controller, it falls back to the cached credentials to attempt to provide access. If the hash of the entered password matches the hash of the cached credentials and the time has not expired, the authentication will be successful.

### AD Caching Configuration


AD credential caching is disabled by default, but an administrator can enable or disable it at any time using the steps below:

1. Click **Admin > Configuration** and click the **Login** tab.
2. Scroll to the bottom of the window and click the **Edit** button. The tab becomes editable:

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Cache AD Credentials for when Engines are offline ☒

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 Clear Cached AD Credentials

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3. To enable caching, click to select the **Cache AD Credentials for when Engines are offline** check box.
4. To disable caching, click the **Clear Cached AD Credentials** button.

### Auditing

Audit logs are recorded in the system log whenever cached credentials are found to be expired or when a successful login attempt has been made using cached credentials.

## Active Directory Rights for Synchronization Account

Below is a listing of the Active Directory permissions required by the account used for synchronization. See [Configuring Active Directory](#) for more on selecting this account.

### Recommended Permissions

#### Object Tab

This object and all descendant objects:

- List contents
- Read all properties

### Minimum Required Permissions

**Note:** These all require ADSI Edit - Allow (Active Directory Service Interfaces Editor) permission.

#### Object Tab

This object and all descendant objects:

- List contents

#### Properties Tab

This object and all descendant objects:

- Read objectClass

Descendant User objects:

- Read Display Name
- Read Distinguished Name
- Read E-mail-Address
- Read objectGUID
- Read Logon Name
- Read Logon Name (pre-Windows 2000)

Descendant Group objects:

- Read displayName
- Read Distinguished Name
- Read Group name (pre-Windows 2000)
- Read groupAttributes
- Read memberOf
- Read Members
- Read objectGUID



## ADFS Custom Rules for Differing UPN and SAM Account Names

### Overview

In Active Directory, when a user's sAMAccountName and UserPrincipalName (UPN) differ, you must take some steps to accommodate those differences in Secret Server. For example, suppose a user's sAMAccountName is jsmith and the user's UserPrincipalName is john.smith@somedomain.com. When Secret Server syncs with Active Directory, it obtains jsmith as the Secret Server login user name. However, with its standard ADFS rule passing in the UPN, Secret Server will receive john.smith@somedomain.com and it will not find the user.

To rectify this situation you must configure the SAML Username Attribute in Secret Server to be customvalue, and use three custom claim rules described below.

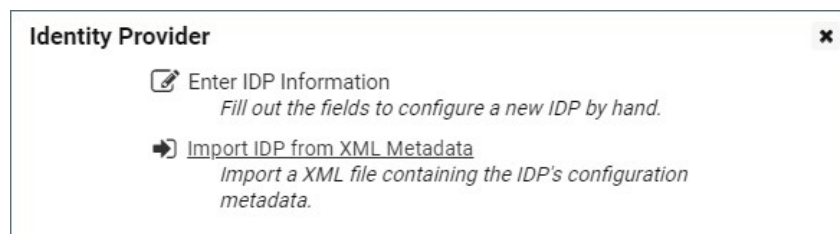
### Change the SAML Username Attribute

To change the SAML Username Attribute in Secret Server, perform the following steps:

1. Click **Admin > Configuration**.
2. Click the **SAML** tab and scroll to the bottom of the window.
3. Click **Create New Identity Provider**.



4. In the Identity Provider dialog, click **Enter IDP Information**.



5. In the next Identity Provider dialog under **User Matching**, type customvalue in the box next to **Username Attribute** and click **OK**.

Identity Provider

REQUIRED SETTINGS

Display Name ?

\*

Name ?

\*

Description ?

Active ?

☒

Public Certificate ?

➔ Upload Certificate

\*

Force Authentication ?

☐

Single SignOn Service Binding ?

HTTPRedirect

▼

Single SignOn Service URL ?

\*

USER MATCHING

Username Attribute ?

customvalue

Domain Attribute ?

SINGLE LOGOUT

Enabled ?

☐

✓ OK

✕ Cancel

## Create Three Rules

To create the three rules you need, open the Active Directory application and follow these steps:

1. In the **Edit Claim Rules** window, select **Add Rule**.
2. Choose **Send Claims Using a Custom Rule** as the rule template.
3. Create each rule using the information below, in the order presented.

**Note:** If you copy code directly from the webpage for pasting, please ensure that you have copied everything you need, or correct the text after pasting it.

### Rule 1: Query AD for UPN and sAMaccountname Attributes

```
c:[Type == http://schemas.microsoft.com/ws/2008/06/identity/claims/windowsaccountname, Issuer == "AD AUTHORITY"]
=> add(store = "Active Directory", types = ("ssupn", "sswindowsaccountname"), query = ";UserPrincipalName,sAMAccountName:{0}", param = c.Value);
```

### Rule 2: Obtain the Domain from the UPN

```
c:[Type == "ssupn"]
=> add(Type = "ssnewupn", Value = RegExReplace(c.Value, "^(.*?)@", ""));
```

### Rule 3: Combine the sAMaccountname with the Domain

```
c1:[Type == "ssnewupn"]  
&& c2:[Type == "sswindowsaccountname"]  
=> issue(Type = "customvalue", Value = c2.Value + "@" + c1.Value);
```

## Configuration Parameters

Active Directory configuration can be enabled by a user with the Administer Active Directory role. To change these settings, select **Directory Services** from the **Administration** menu and then click the **Configuration** tab. Then click **Edit**.

The configuration screen offers several options:

- **Enable Active Directory Integration:** Enable or disable the Active Directory Integration feature.
- **Enable Integrated Windows Authentication:** Enable or disable the Windows integrated authentication feature.
- **Enable Synchronization of Active Directory:** Enable or disable the automatic synchronization of the selected Synchronization Groups from Active Directory. If you have manually added users and will not use the Synchronization group, do not enable this setting or manual users can be locked out.
- **Synchronization Interval for Active Directory:** Set the interval that Secret Server synchronizes its users and groups with the Active Directory.
- User Account Options:
  - **Users are enabled by default (Manual):** Secret Server users are automatically be enabled when they are synced as new users from Active Directory. If they were disabled explicitly in Secret Server, they are not be automatically re-enabled. If creating a new user causes the user count to exceed your license limit, the user is created as disabled. Secret Server
  - **Users are disabled by default (Manual):** Secret Server users are automatically disabled when they are pulled in as new users from Active Directory. If they were enabled explicitly in SS, they are not automatically re-disabled.
  - **User status mirrors Active Directory (Automatic):** When a new user is pulled in from Active Directory, they are automatically enabled if active on the domain. The exception is when this causes you to exceed your license count. For existing users, they are automatically be disabled if they are removed from all synchronization groups, deleted in AD, or disabled in AD. They are automatically re-enabled when they are part of a synchronization group and are active in AD.

## Configuring Active Directory

To allow users to log in with their Active Directory (AD) credentials, you can configure your AD domain settings in Secret Server and then add users either individually or by group.

### Step 1: Enabling Active Directory Integration

1. Select **Admin > Directory Services**. The Directory Services page appears.
2. Click the **Configuration** tab.
3. If **Enable Directory Services** says **No**:
  1. Click the **Edit** link next to **Directory Services**.
  2. Click the **Enable Directory Services** check box.
  3. Click the **Save** button.

### Step 2: Adding a Domain

1. Select **Admin > Directory Services**. The Domains tab of the Directory Services page appears.
2. Click the **Add Domain** button and select **Active Directory Domain**. The Active Directory popup appears.
3. Type the FQDN and friendly name in their text boxes.
4. If you wish to use Secure LDAP, enable the **Use LDAPS** checkbox.
5. If you have an existing sync secret, click the **No Secret Selected** link next to **Synchronization Secret** to select the secret containing the username and password for connection. Otherwise, click the **Create New Secret** link to create one.
6. Click the **Site** dropdown list to select the site for the AD location.
7. Click the **Multifactor Authentication** dropdown list to select the desired MFA, if any.
8. Click the **Validate & Save** button.

Now you are ready to add individual users or groups of users for access to Secret Server with AD credentials. See the relevant section below for instructions.

### Step 3: Setting Up Synchronization Groups

Once you add a domain, add the applicable synchronization groups users from these groups are available for login, subject to synchronization settings. These groups can also be used to assign permissions, roles, and sharing. To add groups:

**Note:** If the specific group does not exist, one can be created by your Active Directory administrator. If you create domain users manually or want to convert local users to domain users, see the corresponding sections below before setting the synchronization group.

1. Click the **Domain Name** link on the **Domains** tab. The page for that domain appears.
2. Click the **Groups** tab.
3. Click the **Edit** link next to **Synchronized Groups**. The top Synchronized Group table and search box represent the available sync groups. The Select Groups list shows all the groups belonging to the domain (those with selected check boxes).
4. Type the name of the desired group in the **Search domain for groups** search text box or scroll down the list to find a group.
5. Click the group. The users belonging to the group appear below in a list to provide a preview to aid selecting groups.

### Step 4: Adding or Removing Groups

1. Click the check box in the **Select Groups** list to add or remove groups from the domain.
2. If you want to remove an entire group instead of not selecting it (leaving it for later use), click the **Remove** link next to the group name in the **Synchronized Groups** table.
3. Click the **Save** button.

**Note:** Enabled users count towards your Secret Server user licensing.

## Step 5: Enabling Active Directory Synchronization

1. Return to the **Directory Services** page.
2. Click the **Configuration** tab.
3. Click to select the **Enable User Synchronization** check box. Additional settings appear.
4. Choose how often you want Secret Server to sync with AD by configuring the **Synchronization Interval**. The default value is one day.
5. Click the **User Account Options** Dropdown list to select a default status for users. See below for a description of each option. We recommend selecting **Users are disabled by default (Manual)** for initial testing. The options are:
  - **Users are enabled by default (Manual)**: Secret Server users are automatically enabled when they are synced as new users from AD. If they were disabled explicitly in Secret Server, they are not automatically re-enabled. If creating a new user will cause the user count to exceed your license limit, the user created disabled. Secret Server
  - **Users are disabled by default (Manual)**: Secret Server users are automatically disabled when they are pulled in as new users from AD. If they were enabled explicitly in SS, they are not automatically re-disabled.
  - **User status mirrors Active Directory (Automatic)**: When new users are pulled in from AD, they are automatically enabled if active on the domain. The exception is when this will cause you to exceed your license count. For existing users, they are automatically be disabled if they are removed from all synchronization groups, deleted in AD, or disabled in AD. They are automatically re-enabled when they are part of a synchronization group and are active in AD. See [Understanding Active Directory Automatic User Management](#).
6. Change the **Days to Keep Operational Logs** text box to set the period to keep AD-related logs that might contain PII. Secret Server automatically deletes logs older than that (in days).
7. Click the **Save** button.

## Step 6: Running Active Directory Synchronization

From the **Directory Services** page, click the **Sync Now** button to run a sync. As the sync progresses, you can click the **Refresh** button to monitor the logs until you see the message **Completed Domain synchronization for all domains**.

## Converting Local Users to Domain Users

Local users can be converted to a domain user in a one-way irreversible process. This feature helps existing customers with extensive groups and permissions setup for a local user that they want to convert to an Active Directory user. The page can be accessed on the **Administration > Users** page by clicking the **Migrate to AD** button. For the conversion to work, the domain user must not exist within Secret Server. The username is changed to match the domain user throughout the system.

## Creating Active Directory Users

Active Directory users can be created manually by a user that has the Administer Users role. You can do this by going to **Administration > Users**, then clicking the **Create New** button. See [Creating a User](#).



## Enabling and Disabling Active Directory Users

If you selected a manual setting for **User Account Options**, you can now enable or disable your AD users' access to Secret Server:

1. Go to **Admin > Users**. The Users page appears.
2. To enable users:
  1. Click to select the **Show Inactive Users** check box.
  2. Click to select the check box next to the users to enable.
  3. Click The **Bulk Operation** dropdown list and select **Enable Users**.
3. To disable users, use the same process, selecting **Disable Users** from the **Bulk Operation** dropdown list.

## Setting up SAML SSO for Active Directory

How to set up Single Sign-On (SSO) for users synced between an Active Directory domain server and a Secret Server user list.

**Note:** The interface and workflows for Active Directory Federation Services (ADFS) Server are subject to change. For more current workflow and interface references, please refer to the [Microsoft ADFS Server documentation](#).

### ADFS Server

1. On your ADFS server, browse to your Secret Server instance and sign in.
2. Download the SecretServerSAMLMetadata.xml file from [YourSecretServerInstance.Name]/samlmetadata.
3. Open **Active Directory Federation Services Management**.
4. Under **Trust Relationships**, click **Add Relying Party Trust** to add your service provider information.
5. In the **Add Relying Party Trust** wizard, click **Start**.
6. Click **Import data about the relying party from a file**.
7. Browse to select the metadata XML file you downloaded earlier and click **Next**.
8. Enter a display name of your choice and click **Next**.
9. Decide whether to configure multi-factor authentication and click **Next**.
10. Choose **Issuance Authorization Rules** and click **Next**.
11. On the **Ready to Add Trust** page, make sure the box next to **Open the Edit Claim Rules dialog** is checked.
12. Click **Next** and then click **Close**. The **Edit Claim Rules for Secret Server** window should open automatically.
13. Click **Add Rule**.
14. Select **Send LDAP Attributes as Claims** as the Claim Rule Template and click **Next**.
15. Fill out the fields below as indicated:
  - **Claim rule name:** Optional Name
  - **Attribute Store:** Active Directory
  - Add an **LDAP Attribute** of User-Principal-Name with an **Outgoing Claim Type** of Name ID.
16. Click **Finish**.
17. Click **Apply** and then click **OK**.
18. Run the following PowerShell command:

```
Set-ADFSRelyingPartyTrust -TargetName name of the relying party trust created in adfs -SamlResponseSignature "MessageAndAssertion"
```
19. Download the metadata for your ADFS IDP from [https://\[YOURSERVERNAME\]/FederationMetadata/2007-06/FederationMetadata.xml](https://[YOURSERVERNAME]/FederationMetadata/2007-06/FederationMetadata.xml).


### Secret Server

1. In Secret Server, click **Admin > Configuration > SAML** tab.

- On the **SAML Configuration** tab, click **Create New Identity Provider**.

## SAML Configuration


General
Login
**SAML**
Folders
Local User Passwords
Security
Ticket System


SAML instructs Secret Server to trust a separate server as its Identity Provider. When SAML is enabled, the Identity Provider is responsible for asking the user for their username or password, but Secret Server will still ask the user for any configured 2-factor.

### SAML GENERAL SETTINGS

SAML Enabled



Use Legacy SAML

 Edit


### SAML SERVICE PROVIDER SETTINGS



Name SecretServerServiceProvider

Certificate

 Edit
 Download Service Provider Metadata (XML)


### IDENTITY PROVIDERS


 Create New Identity Provider

DISPLAY NAME	NAME	DESCRIPTION	CERTIFICATE THUMBPRINT	ACTIVE	ADVANCED
<div>  View Log  View Audit </div>					

- Click **Import IDP from XML Metadata** and select the ADFS metadata you downloaded. If you don't see the file, you might need to change the metadata filetype to xml.

## Identity Provider

 Enter IDP Information  
Fill out the fields to configure a new IDP by hand.

 Import IDP from XML Metadata  
Import a XML file containing the IDP's configuration metadata.

## Adding Users to ADFS

For users to be authenticated by the SSO workflow you are setting up, Secret Server usernames must match domain AD usernames. If you

manually add usernames to Secret Server or AD, you must inspect them carefully to ensure that they match. You can also use Secret Server Discovery to sync Secret Server usernames in bulk with AD usernames.

Once a username matches in both systems, the user can log into their desktop computer using their AD credentials and then browse to Secret Server without being prompted again for authentication.

**Note:** If you have accounts in which the sAMAccountName differs from the UPN name, you can create custom rules to accommodate the differences. See the Directory Services section of the Secret Server documentation.

## Common Errors

If you encounter any of the errors below, check that the **RelyingPartyTrust Rule** on the ADFS server has both the message and assertion signed. By default, only the assertion is signed.

- "Attempt to login via SAML from identity provider had no signed responses or assertions"
- "Attempt to login via SAML with unsigned request"
- "Attempt to login via SAML with unsigned assertion"

If you encounter the error, "SAML Response signature message from IDP failed verification," it means that Secret Server cannot decrypt the assertion message from the IDP (ADFS) because the public certificate thumbprint is incorrect. To fix this issue, follow the steps below.

1. Download the ADFS certificate, upload it to Secret Server (**Admin > Configuration > SAML** tab) and edit the IDP configuration.
2. Check the token-decrypting in ADFS to verify the certificate.
3. Use the [Get-AdfsCertificate](#) cmdlet to retrieve the certificates listed below that ADFS uses, and check that they are appropriately identified as primary (**IsPrimary** is set to **True**):
  - A primary token-signing certificate is used to digitally sign outgoing claims.
  - A primary token-encrypting certificate is published in federation metadata for use by trusted claims providers.
  - Information card signing and service communications certificates are always primary.

## Syncing and Authenticating AD Users via a Distributed Engine

### Local Versus Distributed Engine Sites

Secret Server connects to the domain: from the Web server *or* routed through a distributed engine. If your Web server can reach your domain without issue, then using the local site option is recommended. When a user authenticates or AD synchronization is run, the connection to the domain is from the Web server. If your Web server cannot connect to the target domain, if it is a VM in a cloud environment for example, you can setup an engine on-premises and assign it to the domain. When a user authenticates, Secret Server routes the domain calls through the on-premises engine, eliminating the need for site to site connections or persistent VPNs. Review the Distributed Engine guide for steps on setting up sites and engines.

**Note:** The Active Directory secret is used to synchronize users and groups, it requires permission to search and view the attributes of the users and groups. If you plan on using discovery, the account also needs permissions to scan computers on the network for accounts.

To setup AD to sync from a DE:

1. Create a synced secret. Before synchronizing or creating users, create a secret for use as the sync secret. This secret should contain Domain Admin credentials (or an account with appropriate permissions for read access to all your organization's AD objects).
2. Specify the domain to authenticate against:
  1. Before synchronizing or creating users, you must first specify which domains Secret Server can authenticate against. Secret Server can synchronize with any number of domains.
  2. Go to **Admin > Active Directory**. The Active Directory Configuration page appears.
  3. Click the **Edit Domains** button.
  4. Click the **Create New** button. The Active Directory Domain page appears.
  5. Type the domain information that you want to authenticate to.
  6. Click the **Link a Secret** selection button.
  7. Click the **Sync Secret** list to select the AD secret you created earlier.

**Note:** If you do not have a secret setup yet, click the **Create New Secret** link to create your AD secret.

**Note:** The AD sync secret is used to synchronize users and groups. It requires permission to search and view the attributes of the users and groups. If you plan on using Secret Server discovery, the account will also need permissions to scan computers on the network for accounts.

8. Click the **Save and Validate** button.
3. Set up the synchronization groups:
  1. Once the domain has been added, go to **Admin > Active Directory**. The Active Directory Configuration page appears.
  2. Click the **Edit Synchronization** button. The Synchronization Edit page appears. The Available Groups represent all accessible groups on the specified AD domain. You can preview the user membership with the Group Preview control.
4. Select the desired group from the Available Groups that contains the AD accounts for users you would like to create in Secret Server.
5. Configure AD:

**Note:** See [Active Directory Configuration Parameters](#) for more information.

1. Go to **Admin > Active Directory**. The Active Directory Configuration page appears.
2. Click on the **Edit** button. The Edit Active Directory Configuration page appears.
3. Click to select the **Enable Active Directory Integration** check box.
4. Click to select the **Enable Synchronization of Active Directory** check box.
5. Click the **Save** button.
6. Turn on AD sync.

## Understanding Active Directory Automatic User Management

### Overview

When Active Directory (AD) Sync is run with the "User status mirrors Active Directory (Automatic)" option, it creates groups and users in Secret Server to mirror the organization's configured AD groups and users. A Secret Server user is created or enabled for every enabled AD user in the selected groups.

Thus, every enabled AD user in every synched group consumes a Secret Server license, whether or not they use Secret Server. As a result, an organization can end up paying for far more Secret Server licenses than they need.

AD Automatic User Management addresses this issue by automatically disabling the accounts of users who have not logged in to Secret Server in a specified number of months. This saves unnecessary licensing costs as inactive users do not count against the number of user licenses required by Secret Server.

You can configure the setting on the Edit Active Directory Configuration page. See [Configuring Active Directory](#). There is a checkbox to enable or disable the feature and a textbox to set the number of months before a user is auto-disabled. The default is three, but you can set it from one to 12.

Newly-added users remain enabled until the first synchronization after the configured number of months have passed. When a user whose account has been disabled by this feature attempts to log in they automatically have their account enabled, provided there are licenses available.

### Examples

#### Example One

1. Maria joined the company today.
2. The next AD synchronization creates a Secret Server account for Maria.
3. Maria never logs in to Secret Server because she does not need it for her job.
4. Once the defined number of months have passed, the next AD synchronization disables Maria's Secret Server account.
5. The Secret Server license used by Maria's account becomes available for use.

#### Example Two

**Note:** This only pertains to users who have never logged into Secret Server and their account was disabled (never enabled). It does not apply to previously enabled users who have been disabled due to inactivity.

1. Joe gets added to Secret Server but never logs in.
2. The defined number of months later, Automatic User Management disables his account, freeing his license.
3. Joe gets promoted to a job that requires Secret Server.
4. Joe logs into Secret Server.
5. His account is automatically re-enabled, and he now takes up a license.
6. Joe gets demoted to his old job, which does not require Secret Server.
7. A defined number of months later, Automatic User Management disables his account, and the license is freed up once again.
8. Joe has no idea any of this has happened—the automated process is hidden from him.

## Example Three

1. Rupert logs in to Secret Server several times per month.
2. The defined number of months for Automatic User Management to disable his account is never reached.
3. Rupert's account stays current and his license remains his. The entire process is invisible to Rupert.



**Important:** This integration requires .NET Framework version 4.8 or later.

Use these steps to integrate Secret Server with an Azure Active Directory tenant.

## Configuration Parameters

Azure Active Directory (*Azure AD*) configuration can be enabled by a user with the Administer Active Directory role. To change these settings, navigate to **Admin | Directory Services**, click the **Domain Name** associated with your Azure AD directory, and then click **Edit**.

When creating a new directory, the required configuration screen settings have the following fields:

- **Domain Name:** A friendly display name for the Azure Directory.
- **Active:** Enable or disable the Azure Active Directory domain integration.
- **Tenant ID:** Globally unique identifier (GUID) value assigned to the Azure AD directory.
- **Client ID:** Globally unique identifier (GUID) value assigned to the Client Secret upon creation. Portal will also reference this as the *Application ID* or *App ID*.
- **Client Secret:** Unique, generated string for the Client Secret. *This value can only be retrieved upon creation.*

Optionally you can also configure the following:

- **Multifactor Authentication:** Drop-down selection for the desired MFA.

## Setting up Azure AD for SAML

### Azure AD Configuration Steps

**Note:** For more information on how to setup SAML-based single sign-on for Secret Server in Azure Active Directory, see Microsoft's [Enable single sign-on for an enterprise application](#).

**Note:** You must have SAML already setup in Secret Server with a valid certificate. See the Setting up Secret Server section in [Configuring SAML Single Sign-on](#).

1. Log into your portal.azure.com account.
2. Navigate to **Azure Active Directory**.
3. Navigate to **Enterprise Applications**.
4. Select **New Application**.
5. Select **Non-gallery application**.
6. Give your new IdP application a name and click **Add**.
7. Click **Single sign-on**.
8. In the dropdown, select **SAML-based Sign-on**.
9. If you haven't done so already, download the Secret Server metadata file named SecretServerSAMLMetadata.xml from [YourSecretServerInstance.Name]/samlmetadata:
  1. In Secret Server, navigate to **Administration**.
  2. Type SAML in the combination box. The Section Matches section populates with sections matching what you typed.
  3. Click the **SAML Service Provider Settings** link. The SAML Service Provider Settings page appears.
  4. Click the **Download Service Provider Metadata (XML)** button. The SecretServerSAMLMetadata.xml file downloads to your browser's default location.
- Note:** For more information on setting SAML up in Secret Server, please see See the Setting up Secret Server section in [Configuring SAML Single Sign-on](#)
10. Click **Upload metadata file** and upload the Secret Server Metadata file you previously downloaded.
11. Click **Save**.
12. Scroll down and click **Metadata XML** to download the metadata for this application.
13. Go back to **Azure Active Directory** and click on **App registrations**.
14. Select your Azure Identity Provider (IdP) application.

**Note:** If you don't see the application immediately, you might need to click **View all Applications**.
15. Click **Settings > Properties**, then enter the Logout URL field for your instance. The form for this URL will be:  
`https://[YourSecretServerInstanceName]/saml/SLOService.aspx`.
16. Click **Save**.
17. Return to the **Configuration** search box and type Identity Providers.
18. Click on the **Identity Providers** link that appears in the **Section Matches** section. The SAML Identity Providers page appears.

19. Click the **Create New Identity Provider** button. The Identity Provider popup appears.
20. Click the **New Identity Provider** dropdown list and select **Import IDP from XML Metadata**. An Import File control appears.
21. Click the upload icon and select the XML file you downloaded earlier. If you do not see the file where it should be, ensure the file type is set to XML.
22. Click the **OK** button.

## Adding Users to Single Sign-On in Azure AD

For users to be authenticated by the SSO workflow you are setting up, Secret Server usernames must match Azure AD usernames. If you manually add usernames to Secret Server or Azure AD, you must inspect them carefully to ensure that they match. You can also use Secret Server Discovery to sync Secret Server usernames in bulk with Azure AD usernames.

1. Log into your portal.azure.com account.  
  
Navigate to **Azure Active Directory > Enterprise Applications** and select your IdP from the list
2. Select **Users and groups** and **Add User**.
3. Click **Users and groups/None Selected**.
4. Search for the user you want to add to your SAML workflow. (Note that any users added must also exist in your Secret Server instance. Usernames must match between the systems).
5. Click **Select** at the bottom, then **Assign**.

Once a username matches in both systems, the user should be able to use the Single Sign-On workflow. To test this, log into Azure AD as the user, then browse to your Secret Server instance. The user should be logged into Secret Server automatically without being prompted again for login credentials.

**Note:** If you have accounts in which the sAMAccountName differs from the UPN name, you can create custom rules to accommodate the differences. See [Directory Services](#).

## Advanced Settings

The following Secret Server Identity Provider Advanced Settings can be configured in Azure AD:

- Require Signed SAML Response
- Require Signed Assertion
- Require Signed Assertion Or Signed SAML Response

Below are the steps to configure the settings in Azure Ad:

1. Log in to portal.azure.com.
2. Navigate to **Azure Active Directory > Enterprise Applications**.
3. Select your IdP, then click **Single sign-on**.
4. Scroll down and check the box for **Show advanced certificate signing settings** checkbox.
5. Click the drop-down arrows to reveal options. These advanced options correspond with advanced options in Secret Server.
6. Click **Advanced Settings** next to your identity provider.

- Require Signed SAML Response
- Require Signed Assertion
- Require Signed Assertion Or Signed SAML Response

**Note:** If you apply advanced certificate signing settings to the Secret Server IdP application in Azure AD, return to the Identity Providers page in Secret Server and click the ... button next the provider and select **Advanced Settings** to apply the same settings.

## Create Azure App Registration

The steps provided can be used to create the App Registration required for configuring Azure Active Directory integration.

**Important:** This integration requires .NET Framework version 4.8 or later.

### Azure Portal Method

#### Create the Application Registration

1. Log on the Azure Portal
2. If needed, switch to the intended directory.
3. Navigate to the **Azure Active Directory** blade.
4. Click **App registrations** on the left pane in the **Manage** section.
5. Click the **New registration** button. The App Registrations page appears.
6. Type Thycotic Secret Server in the **Name** text box.
7. Click to select the **Accounts in the organizational directory only** selection button to choose single tenant.
8. In the **Redirect URI (optional)** section, click to select **Web** in the dropdown list.
9. Type `https://<Your Secret Server URL>/signin-oidc` in the text box to the right of the list.
10. Click the **Register** button. Once the app registration is created, the Azure portal opens the blade to this object.
11. In the blade for this app registration, take note of the **Application (client) ID** and **Directory (tenant) ID**. These will be needed for Secret Server configuration.

#### Add Client Secret to the Application Registration

1. Click **Certificates & secrets** on the left panel in the **Manage** section. The Certificates & Secrets page appears.
2. Go to the **Client Secrets** section.
3. Click the **New Client Secret** button. The Add a Client Secret section appears.
4. Type Secret Server in the **Description** text box.
5. Click to select your desired expiration in the **Expires** selection button.

**Note:** If the client secret is set to expire, Secret Server must updated upon or before expiration for this integration to function correctly.

6. Click the **Add** button. The client secret appears in the Client Secrets section.
7. Record the text string in the Value column for that secret.

#### Add API Permissions to the Application Registration

1. Click **API Permissions** on the left panel in the **Manage** section. The API Permissions page appears.
2. If any default permissions appear in the unlabeled configured permissions table, click the ... button and select **Remove Permission**.

3. Click the **Add a Permission** button. The Request API Permissions page appears.
  4. Click the **Microsoft Graph** panel button. A wizard begins.
  5. Click **Application Permissions** when asked **What type of permissions does your application require?** The **Select Permissions** section appears.
  6. In the search text box, type `Group`. A `GroupMember` section appears.
  7. Click to expand the section.
  8. Click to select the **GroupMember.Read.All** check box.
  9. Repeat the process for the following application permissions:
    - `Group.Read.All`
    - `GroupMember.Read.All`
    - `Member.Read.Hidden`
    - `User.Read.All`
- Do the same for the `User.Read` delegated permission.
10. Click the **Add Permissions** button. A prompt appears.
  11. Click the **Yes** button to grant consent to all accounts in the directory. You will receive a notification for "grant consent," and a green check mark appears in the Status column on the Configure Permissions page.

**Note:** This requires a local account with at least one of these roles: "Administer Active Directory," "Unlimited Administrator," or "Administer Configuration Unlimited Admin."

## Script Method

The script below is provided as-is, and future use may require adjustment if Microsoft changes the AzureAD PowerShell module.

At the time of writing, there is no command in the AzureAD module granting admin consent to the app. That step has to be performed via the Azure Portal.

[Download the script](#)

## Configure Azure Active Directory Domain

The steps below are used for adding an Azure Active Directory configuration to Directory Services.

### Add Azure Active Directory Domain

1. Navigate to **Admin | Directory Services**.
2. Click the **Add Domain** button.
3. Click the **Azure Active Directory Domain**.
4. Using the values saved from [Creating Azure App Registration](#), paste or type in:
  - Friendly domain name
  - Tenant ID
  - Client ID
  - Client Secret

**Note:** This requires a local account with at least one of these roles: "Administer Active Directory," "Unlimited Administrator," or "Administer Configuration Unlimited Admin."

1. Ensure the **Active** check box remains checked.
2. (Optional) Click the **Multifactor Authentication** dropdown list to select your desired MFA.
3. Click the **Validate & Save** button. Once validation completes, you will see the Friendly domain name listed.
4. Click the name of the new domain to open the configuration page.
5. Click the **Groups** tab.
6. Click the **Edit** link next to **Synchronized Groups**.
7. Scroll to or search for each desired group containing users you want to sync in the **Select Groups** table.
8. Ensure each group's check box is **checked**.
9. Click the **Save** button to save your changes. You will now see the selected groups in the Synchronized Groups table.
10. Click the **Directory Services** breadcrumb link at the top of the page to navigate back to the Directory Services page.
11. Click the **Sync Now** button to sync the directory groups.



**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

LDAP is an open, industry-standard application protocol for accessing and maintaining distributed directory information services over IP networks.

## Secure LDAP

### Overview

By default, Secret Server uses normal LDAP on port 389 to communicate with Active Directory. Although passwords are still transmitted using Kerberos or NTLM, user and group names are transmitted in clear text. In contrast, secure LDAP (LDAPS) requires that both port 389 and 636 are open.

If you want all information to be encrypted, then you can enable Secure LDAP (LDAPS) in Secret Server via the Advanced link on the Edit Domain page.

When LDAPS is used, Secret Server transmits and receives Active Directory data through port 636 (with port 389 open). A certificate on the domain controller is used to negotiate encryption, and no information is transmitted in clear text.

**Note:** If you want to use Integrated Windows Authentication and Secure LDAP, that is only supported in Windows Server 2008 R2 or greater.

### Troubleshooting LDAPS Connection Issues

Common problems with LDAPS and Secret Server:

- When you turn on LDAPS you will get a "domain name is invalid" error.
- Users are suddenly unable to log on Secret Server.

Both issues are caused by LDAPS to Secret Server communication issues, usually one of the following:

- The certificate is expired (this is the client certificate, not the SSL on the Secret Server website).
- LDAPS is not enabled in your environment.
- A port is blocked that is denying successful communication between the server and AD.

To troubleshoot, use the [free LDP tool](#) to test LDAPS connections from the Secret Server Windows server to your AD server. If you are unable to establish a connection on port 636 (with 389 open too), then we recommend consulting with your AD or security team.

**Note:** Sometimes the Secret Server event viewer has information regarding invalid certificates.

## Syncing with OpenLDAP Directory Service

### Introduction

OpenLDAP is a free, open source version of the Lightweight Directory Access Protocol (LDAP) developed by the OpenLDAP Project. This topic describes syncing OpenLDAP to Secret Server.

**Note:** This feature is only supported by the new interface. The classic interface does not support OpenLDAP Directory Services.

### Unsupported Use Cases

#### Anonymous User Authentication

We do not support anonymous user authentication:

When creating an OpenLDAP directory service, "Anonymous" is a supported authentication method. When this is chosen, Secret Server connects anonymously to the OpenLDAP directory service as configured during the synchronization process and creates any users found on the directory service.

When anonymous is selected, a secondary authentication option, "User Authentication," appears, which is the method used when the synchronized users attempt to authenticate to Secret Server. In short, user authentication cannot be anonymous because Secret Server does not allow anonymous access.

The valid options for user authentication when anonymous is selected for the synchronization process are "Basic," "Kerberos," or "No Authentication." "No Authentication" supports using an OpenLDAP directory service as a user directory while enabling alternative methods of authentication, such as SAML.

#### Duplicate User Attributes

We do not support configurations where using different attributes yield users with the same username, GUID, or user principal name (email address format—not necessarily an actual email address). These must all be unique to each user. If a duplicate exists, it may result in odd, unpredictable behavior from the application.

### Procedure

1. Create a secret in Secret Server of type **OpenLDAP Account**. This sync secret is used to synchronize users and groups. It requires permission to search and view the attributes of the users and groups. If you plan on using Secret Server discovery, the account will also need permissions to scan computers on the network for accounts. Complete these parameters:
  - Domain. Example: ldap.omega.thycotic.com
  - Username. Example: cn=ldap,dc=omegaldap,dc=local
  - Password
2. Go to **Admin > Directory Services**. The Directory Services page appears:

Admin > Directory Services

Domains Configuration Logs Audit

Last Sync Finished: 11 minutes ago

Add Domain Sync Now

1 Item Include Inactive

DOMAIN NAME	FRIENDLY NAME	DOMAIN TYPE	ACTIVE	LAST RUN RESULT
gamma.thycotic...	Gamma Domain	Active Directory	<input checked="" type="checkbox"/>	Group Membershi

3. Click the **Add Domain** dropdown list and select **OpenLDAP Domain**. The OpenLDAP popup appears:

Open Ldap

Fully Qualified Domain Name \*

Friendly Name \*

Active ☒

Distinguished Name \*

Authentication \* Kerberos

Use LDAPS ☐

Synchronization Secret \* No Secret Selected [Create New Secret](#)

Site \* Local

Multifactor Authentication < None >

Cancel Validate & Save

4. Type the domain's FQDN in the **Fully Qualified Domain Name** text box. For example: ldap.omega.thycotic.com.
5. Type any name you desire in the **Friendly Name** text box.
6. Ensure the **Active** check box is selected.

7. Type the distinguished name (node path) in the **Distinguished Name** text box. For example: dc=omegaldap,dc=local
8. Click the **Authentication** dropdown list to select either the **Basic** or **Anonymous** authentication method.
  - Basic authentication requires that valid credentials are assigned as the sync secret. Those credentials are used to authenticate to the OpenLDAP system on each sync.
  - Anonymous authentication does not require valid credentials and removes the Synchronization Secret section. Instead, it exposes a User Authentication field.

**Note:** The Kerberos authentication method probably works but has not been test by Delinea.
9. Basic authentication:
  1. Click the **No Secret Selected** link in the Synchronization Secret section. The Select Secret popup appears.
  2. Navigate to and select the secret you created earlier. The moment you click it, the popup disappears and the secret name appears in the Synchronization Secret section.
10. Anonymous authentication: Click the **User Authentication** list to select **Basic** or **No Authentication**. This sets which authentication method to use when users who are synced anonymously try to authenticate:
  - Basic authentication requires valid OpenLDAP account credentials.
  - No authentication is for when customers want users synced from OpenLDAP but use authentication through another service, such as SAML. We do *not* support anonymous authentication for security reasons.
11. Click to select the **Use LDAPS** check box if you intend to use secure LDAP.
12. Click the **Site** dropdown list to select your site.
13. Click the **Multifactor Authentication** dropdown list to select the desired authentication method.
14. Click the **Validate & Save** button. The information is validated. If there are any connectivity issues, an error message will appear stating what field is the likely cause. If the Active check box is not selected no validation occurs. If you chose anonymous authentication, no secret is needed and no credential validation occurs; however the distinguished name and FQDN are still used. Upon a successful save, a new box appears, prompting the user to select their initial synchronization groups. If groups appear in the search box that also indicates the connection was successful.

## Discovery

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Discovery is the process where Secret Server scans an environment to find accounts and associated resources called *dependencies*. Once accounts are found, they can be used to create new secrets in Secret Server. Users with the "administer discovery" role permission can either manually import accounts or can create an automated process to do so. Using discovery does not stop users from manually creating their own secrets.

Some typical accounts that discovery can find include Windows local admin, Windows domain, and Unix non-daemon. Some typical dependencies discovery can scan for include scheduled tasks running as a domain user, application pools running as a domain user, and services running as a domain user.

**Note:** Account and dependency types not supported out-of-the-box in Secret Server can still be discovered by writing PowerShell scripts that you can run as custom scanners. See [Extensible Discovery](#).

We suggest reading (in order):

- [How Discovery Works](#)
- [Introduction to Discovery Sources, Scanners, and Templates](#)
- [Running and Interpreting Active Directory Discovery](#)

### Quick Initial and Ongoing Importation of Network Credentials

By using discovery, your Secret Server offsets the burden of keeping track of computers and accounts on your network. This can be especially beneficial when getting started for discovering and importing accounts in bulk, as well as having Secret Server find accounts and create secrets whenever a new machine or account is provisioned.

### Protection Against Backdoor Accounts

When Secret Server is configured to discover new accounts, it provides added protection by regularly running discovery on your network to identify those accounts. Secret Server adds the new accounts to its records and resets the accounts password to values that meet your security policy. Consequentially, if someone is setting up backdoor admin accounts on the network, they cannot use those accounts very long before they are imported into Secret Server and their passwords are changed with Remote Password Changing (RPC).

### Active Directory Discovery

Secret Server AD discovery scans for AD machines, AD user accounts, local Windows accounts, and dependencies on an AD domain. First, SS discovers machines from your domain. Next, SS scans each machine for local Windows accounts and dependencies **that depend on domain accounts**. By default, SS scans for local accounts, domain accounts, scheduled tasks, Windows services, and IIS application pools. You can discover additional accounts and dependencies by creating PowerShell scanners. PowerShell scanners are an advanced topic described in the [Extensible Discovery](#) section.

### ESX/ESXi Discovery

Secret Server provides a wizard to help configure ESX/ESXi discovery. You name the discovery Source, define the host ranges of the desired IP addresses, and choose a secret to use as credentials when scanning.

**Note:** Secret Server provides a "Generic Discovery—Only Credentials" secret type that stores a simple username and password pair for Unix or ESX/ESXi discovery. It is intended only for discovery and is incapable of RPC.

## AWS Discovery

Secret Server can scan Amazon Web Services (AWS) for accounts that can access the cloud resource. Two types of secrets can be discovered and managed through Secret Server:

- AWS Access Key: Keys used for programmatic integration with AWS.
- AWS Console Account: User login accounts for AWS.

## Google Cloud Platform Discovery

Secret Server can manage Google Cloud Platform (GCP) service accounts and VM instances. This feature allows users to run discovery to pull and manage VM Instances, as well as import and manage GCP service accounts.

## Unix Discovery

Secret Server provides a wizard to help configure Unix discovery. You name the discovery Source, define the host ranges of the desired IP addresses, and choose a secret to use as credentials when scanning. The default command sets that Secret Server ships with discovers machines and accounts in most Unix environments.

By default, the "Find Non-Daemon Users (Basic Unix)" command set is used first. If a built-in account is discovered, you must modify the discovery source to use the "Find All Users (Basic Unix)" command set. You can create new command sets by clicking the Configure tab on the Discovery Sources page.

## Extensible Discovery

You can customize discovery by changing parts of it to use PowerShell. The information a discovery scanner outputs is defined by its scanner template. For standard templates, the input and output information types are fixed. Extensible discovery allows you to customize or replace the unmanaged account, IP address and OU, account, and dependency discovery steps above. Extensible discovery does still have limitations on what information is passed between discovery scanners. For more information, see [Extensible Discovery](#).

Please see our [Discovery Best Practices Guide](#) to learn about optimizing discovery performance.

## Automated Discovery

The following is a high-level overview of how the most common type of automated discovery works without customization. Discovery is organized into an ordered set of discovery scans that pass information based on input and output templates. This is all configured by default. You cannot alter the out-of-the-box discovery scanners, but you can copy them and then modify the copy.

## Automated Discovery Terms

First, discovery has several terms that need defining:

### Discovery Source

A named object that conducts discovery. There are five broad types: Active Directory, Amazon Web Services, Unix, VMware ESX\ESXi, and Google Cloud Platform.

Configuring discovery is defining the parameters of the discovery source, once the general type is chosen.

### Discovery Scanner

A discovery component that collects information during a discovery. There are four general types, called *scan templates* (in their sequential running order): Find host ranges, Find machine, Find local accounts, and Find dependencies.

A discovery source consists of an ordered sequence of discovery scanners. Each scanner has a defined input and output. A discovery source can have more than one scanner of a given type.

### Discovery Input Template

The defined input type for a discovery scanner. An instance of the template contains the data needed to conduct the scan. The input template is often, but not always, an output template of the preceding scanner in the sequence. Some examples include Active Directory domain, AWS discovery source, organizational unit, and Windows computer.

### Discovery Output Template

The defined output type for a discovery scanner. An instance of the template contains the data produced by the scan. The output template is often, but not always, an input template of the next scanner in the chain. Other times, the output may be used by another non-adjacent scanner in the discovery source. Some examples include: Active Directory account, AWS access key, ESXi local account, host range, organizational unit, and Windows local account.

### Discovery Rule

Discovery rules automatically create credential secrets or send emails when local accounts matching the rule criteria are discovered. Discovery rules are set in the discovery network view page because they are specific to portions of the discovered network and can be as granular as desired. Credential secrets can also be manually created as desired.

## Example Automated Discovery Process

A typical automated discovery process for Active Directory domains, running on an interval, looks like this:

**Note:** The majority of current discovery processes are for AD discovery source type. The others types differ by input and output but follow a similar process.

**Note:** Even though automatic discoveries run on a set interval, you cannot schedule when those occur. The interval is from



whenever the discovery last ran.

1. Discovery matching runs. The discovery matcher creates a link between existing active secrets and any existing secrets in Secret Server based on their machine names, accounts and dependencies. The matcher is automatic. When matches are found, the corresponding existing discovery results appear as "managed" in the discovery network view with a link to the existing secret or dependency.
2. Discovery rules run and attempt to match any unmanaged discovery results to the rule's parameters. If a rule matches the results, discovery automatically imports the results using the settings in the discovery rule. Once finished, discovery begins.
3. The Find Host Ranges scanner (using the Windows Discovery base scanner) runs with an Active Directory Domain input template. The scanner determines which OUs are to be scanned and populates its Organizational Unit output template with a list of those OUs. The output template will be used by the following Find Machine scanner and also by the Find Local Accounts scanner, which does not require machine information.
4. The Find Machine scanner (using the Windows Discovery base scanner) examines OUs from its Organizational Unit input template via LDAP and creates a list of machines with which it populates its Windows Computer output template. This is the list of computers to run a dependency scan on. The Find Dependencies scanner uses this instance of the output template as its input template.
5. The Find Local Accounts scanner (using the File Load Discovery base scanner) examines OUs from its Organizational Unit input template via LDAP and creates a list of all AD admin accounts with which it populates its Active Directory Account output template. This is the list of discovered admin accounts.
6. The Find Dependencies scanner (using the Windows Discovery base scanner) examines a list of machines from its Windows computer input template using various technologies. For example, application pools use Microsoft Web Administration (WMA) or, failing that, Windows Management Instrumentation (WMI). Services use WMI, and scheduled tasks use Windows' task scheduler interfaces. The Find Dependencies scanner can return any number of output templates as desired. These include: Com+ Application, Computer Dependency (Basic), PS Dependency, Remote File, SQL Dependency (Basic), SSH Dependency (Basic), SSH Key Rotation Dependency, Windows Application Pool, Windows Scheduled Task, and Windows Service.

The discovered dependencies for local accounts are displayed at **Admin > Discovery > Discovery Network View > Local Accounts**. Returned accounts for AD users are displayed at **Admin > Discovery > Discovery Network View > Domain > Cloud Accounts**.

**Note:** Any dependencies that were discovered in prior discovery runs that are no longer present are removed from the discovery results, and their secret dependencies are deactivated.

## Manual Discovery

You can also run discovery manually by going to **Admin > Discovery** and clicking the **Run Now** button and selecting **Discovery Scan**. We recommend waiting for any automatic discovery to idle before starting a manual discovery run. A discovery scan runs the first four of the automated steps above. When you click the "Run Now" button on the Scan Computers tab, the last two are run. These steps are the most time intensive steps because many machines may be scanned.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

The sub-topics here discuss discovery for five platforms:

- [Active Directory](#)
- [Amazon Web Services](#)
- [Google Cloud Platform](#)
- [Unix](#)
- [VMware ESX/ESXi](#)

## Active Directory Discovery

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server queries AD domains to obtain a list of Organizational Units (OUs) and Windows computers on the domain. These OUs and computers are recorded in the Secret Server database. Secret Server then attempts to connect to each computer and query for the following:

- **Domain Accounts:** AD user accounts
- **IIS Application Pools:** IIS application pools run by AD accounts
- **Local Accounts:** Local Windows accounts
- **Windows Services:** Windows services run by AD accounts
- **Scheduled Tasks:** Windows scheduled tasks run by AD accounts

## **Active Directory Local Account Discovery Methods**

### **Remote Procedure Calls (RPC)**

This is the method that is used for local account discovery for all versions of Secret Server prior to release 8.6.000000 and is the default for all upgrades and fresh installations. It uses the same technology as the Windows remote password changing in Secret Server and is the most dependable and proven of the options. It can, however, be slower in some environments when scanning computers over a WAN.

### **Windows Management Instrumentation (WMI)**

This method uses the WMI technology to query the Windows computer. In some environments, this method can be faster than the Remote Procedure Call. It does, however, require having the proper permissions and network configuration setup correctly for WMI to run.

### **Attempt WMI First, and Fallover to RPC if Needed**

This option attempts to use the WMI method first, and if that fails to work correctly, it attempts the RPC method for local account discovery. This option is potentially slower because it has the possibility of performing two separate scans for each computer.

## Creating an Active Directory Discovery Source

Discovery sources define a set of discovery operations. You must create one based on the built-in types prior to running discovery. To do so for AD:

**Note:** Adding a new domain as a discovery source also adds it as a synchronization source and vice versa.

**Note:** If you add a domain as an AD synchronization source within Secret Server but discovery was not initially enabled, the domain is listed as an inactive discovery source. To see such a domain, on the Discovery Sources page, click to select the Show Inactive and Disabled check box.

1. Click **Admin > Discovery**. The Discovery Sources tab of the Discovery page appears.
2. Note the list of existing discovery sources.

**Note:** If you upgraded from an earlier Secret Server version and have created an AD domain within Secret Server, a corresponding discovery source is displayed on this page. If discovery was not enabled on that domain, the discovery source Active column is not checked for that discovery source.

3. Click the **Create** button and select **Active Directory** to choose that discovery source type. A Discovery Source page appears for that type.
4. Type the parameters for the discovery source name, FQDN, and friendly name. The parameters with asterisks are required.
5. Ensure the **Active** check box is selected. This activates this discovery Source for scanning. Active discovery sources are scanned at the defined discovery interval defined. If you have multiple discovery sources, the discovery source with the most un-scanned computers is scanned first.
6. Next, you select a secret that is used as the credentials for discovery scanning and AD synchronization. These credentials must have the proper rights to scan the remote machines. Click the **No Secret Selected** link. The Select Secret popup page appears.
7. Search for and click the secret you want to use for the account credentials during the scan. The popup page closes. The name of the secret you chose replaces the No Secret Selected link.

**Or** create a new secret for the credentials:

1. Click the **Create New Secret** link. The Create New Secret page appears.
2. Click the **Generic Discovery Credentials** secret template. Another Create New Secret page appears:
3. Type or select the parameters needed for the discovery operation. Parameters with asterisks are required.
4. Click the **Create Secret** button.
8. Click the **Discovery Site** dropdown list to select the desired site for the discovery source. If distributed engines are setup, the list shows all active sites. If no distributed engines are setup, the list defaults to local, and you cannot change it.
9. Click the **Discover Specific OU** check box to limit your discovery to an OU. See [Enabling Specific OU Domain Discovery](#) to define the scanned OU. When you select this option, a Domain Scope tab appears on the Discovery Source page for the created AD discovery source.
10. Leave the **Machine Resolution Type** dropdown list set to **Use Machine and Fully Qualified Name** unless you have a specific reason to change it.
11. Click the **Create** button. Secret Server attempts to access the domain with your specified credentials to ensure the configuration is correct. Thus, Secret Server must have access to the domain provided, and the account credentials must work.

## Setting Permissions for Active Directory Scans

### Local Windows Accounts

The scanning account needs the "Access This Computer From the Network" permission (and possibly one more) on the endpoint:

1. Open the local group policy editor (gpedit.msc).
2. Go to **Computer Configuration > Windows Settings > Security Settings > Local Policies > User Rights Assignment**.
3. Double-click the **Access this computer from the network** policy. The properties for the policy appears.
4. Ensure the scanning account is one of the listed users. If not, click the **Add User or Group** button to add it.
5. Look at the following list of operating systems and updates to determine if any of them match your system:
  - Windows 10, version 1607 and later
  - Windows 10, version 1511 with [KB 4103198](#) installed
  - Windows 10, version 1507 with [KB 4012606](#) installed
  - Windows 8.1 with [KB 4102219](#) installed
  - Windows 7 with [KB 4012218](#) installed
  - Windows Server 2019
  - Windows Server 2016
  - Windows Server 2012 R2 with [KB 4012219](#) installed
  - Windows Server 2012 with [KB 4012220](#) installed
  - Windows Server 2008 R2 with [KB 4012218](#) installed

**Note:** For more information on this security issue, see [Network access: Restrict clients allowed to make remote calls to SAM](#).

### Windows Services, Scheduled Tasks, App Pools, and COM+ Applications

**Note:** There are special considerations for discovering service accounts running COM+ Applications, please contact Delinea for more information.

To scan for service accounts, the account entered must be a domain account that is in the Administrators group on the target machines. Follow the instructions below in either case to ensure your account has the privileges to run a successful scan:

1. Open the group policy editor for your domain policy.
2. Go to **Computer Configuration > Preferences > Control Panel Settings**.
3. Right-click **Local Users and groups** and select **New > Local Group**.
4. Leave the **Action** dropdown list set to **Update**.
5. Click to select **Administrators (Built-in)** in the **Group Members** dropdown list.
6. Click the **Add...** button.
7. Search for the account you will use for discovery scanning.
8. Click the **OK** button to save your changes. The next time the group policy updates across your environment, the discovery account will be part of the local administrators group.
9. For strong security, configure the group policy to limit the logon privileges of that account:

1. Open the group policy editor
2. For your domain policy, go to **Computer Configuration > Policies > Windows Settings > Security Settings > Local Policies > User Rights Assignment**.
3. Add your discovery account to the **Deny log on locally** policy.
4. Add your discover account to the **Deny log on through Remote Desktop Services** policy.
5. (Optional) Ensure the account is not part of the remote desktop users group.

## Running and Interpreting Active Directory Discovery

This topic discusses how to configure, run, and interpret discovery scans on Active Directory systems. After the initial configuration, normally the discovery source is set to active, which runs the follow-on tasks automatically. You can also manually run either a discovery (locate computers on the domain) or computer (inspect the individual computers) scan.

### Step One: Discovery Configuration

Running a discovery on an AD system is easy, assuming everything was configured correctly. To that end, follow these instructions first:

- [Setting Permissions for Active Directory Scans](#)
- [Creating Active Directory Discovery Sources](#)
- [Enabling Specific OU Domain Discovery](#) (optional)

### Step Two: Discovery Scan

When you complete the configuration and there is at least one active discovery source and discovery is enabled (the Active check box is selected), you can run a discovery scan manually or wait for an automatic one to start. A typical scan:

1. Runs discovery matching: The discovery matcher creates a link between existing active secrets and any existing secrets in Secret Server based on their machine names, accounts and dependencies. The matcher is automatic. When matches are found, the corresponding existing discovery results appear as "managed" in the discovery network view with a link to the existing secret or dependency.
2. Runs discovery rules: Secret Server attempts to match any unmanaged discovery results to the rule's parameters. If a rule matches the results, discovery automatically imports the results using the settings in the discovery rule. Once finished, discovery begins.
3. Runs the find host ranges scanner: The scanner (using the Windows discovery base scanner) runs with an Active Directory domain input template. The scanner determines which OUs are to be scanned and populates its organizational unit output template with a list of those OUs. The output template will be used by the following find machine scanner and also by the find local accounts scanner, which does not require machine information.
4. Runs the find machine scanner: The scanner (using the Windows Discovery base scanner) examines OUs from its organizational unit input template via LDAP and creates a list of machines with which it populates its Windows computer output template. This is the list of computers to run a dependency scan on. The find dependencies scanner uses this instance of the output template as its input template.

**Note:** You can see logs of this process by going to the Discovery Logs tab on the Discovery page.

To run a manual discovery scan, on the **Admin** menu, click the **Run Discovery Now** button and select **Run Discovery Scan**.

### Step Three: Computer Scan

Once the computers in the desired AD domain or OU are discovered, a computer scan runs AD queries on each machine found during the discovery scan to attempt to collect the information the discovery source was configured to collect, which can include local accounts, Windows services, scheduled tasks, and IIS application pools. Specifically, the scan:

1. Runs the find local accounts scanner: Using the file load discovery base scanner, Secret Server examines OUs from its organizational unit input template via LDAP and creates a list of all AD admin accounts with which it populates its Active Directory account output template. This is the list of discovered admin accounts.
2. Runs the find dependencies scanner: Using the Windows discovery base scanner, Secret Server examines a list of machines from its Windows computer input template using various technologies. For example, application pools use Microsoft Web Administration (WMA) or, failing that, Windows Management Instrumentation (WMI). Services use WMI, and scheduled tasks use Windows' task



scheduler interfaces. The find dependencies scanner can return any number of output templates as desired. These include: com+ application, computer dependency (basic), PS dependency, remote file, SQL dependency (basic), SSH dependency (basic), SSH key rotation dependency, Windows application pool, Windows scheduled task, and Windows service.

**Note:** You can see logs of this process by going to the Computer Scan Logs tab on the Discovery page.

To run a manual computer scan, on the **Admin** menu, click the **Run Discovery Now** button and select **Run Computer Scan**.

## Step Four: Viewing Discovery Results

### Browsing Discovery Results

1. Go to **Admin > Discovery**. The Discovery Sources tab of the Discovery page appears.
2. Click the **Network View** tab.

The Discovery Network View page shows any discovered computer accounts. The domain tree on the left displays the domains as folders with OUs for that domain presented as folder contents. Clicking on a folder and then on an OU displays the computers in that OU in the table on the right.

**Note:** For large numbers of domains you can type the domain name in the unlabeled search box over the domain folder tree and press <Enter> to narrow what domains are presented to you.

The discovery page has tabs for local account, service accounts, and domain or cloud accounts. All are very similar and draw from the same network tree on the left.

### Searching Discovery Results

To search for a specific discovery source or OU, type the source or OU name in the search bar displayed at left. If results are found, click the result shown below the search field to highlight it. Now, only machines from that source or OU will be displayed at right.

To search for a specific computer name, account, or service name, type the search term in the search field on the right. Matching results are filtered below the search field.

To use advanced search settings, click the filter icon beside the search field. The filters panel appears.

Select an option in the **Filters** panel to match an account, computer, operating system, or rule.

**Note:** "Rule" only appears in the list box if discovery rules exist for local accounts. When you select it, another menu appears for selecting a rule. For more information about creating and searching with rules, see [Discovery Rules](#).

Click the **Managed** option buttons to select accounts managed or unmanaged by Secret Server.

### Understanding Discovery Results




The table below describes the contents of each column:

**Table:** Discovery Results

Account	Username of discovered account.	Both
---------	---------------------------------	------

<b>Computer</b>	Computer name of the machine scanned. This is obtained from AD during the first part of the discovery process.	Both
<b>Last Connected</b>	Last date a user logged into the machine.	Local
<b>Last Scanned</b>	Last date that the machine was scanned by discovery.	Both
<b>Org Unit</b>	Organizational Unit the machine is joined to. This information is obtained from AD during the first part of the discovery process.	Local
<b>Secret</b>	If a secret name appears here, a credential secret already exists for the account listed in the account column. Otherwise, this column is blank.	Both
<b>Service Name</b>	Name of a discovered dependency.	Service
<b>Status</b>	Indicates that an account is managed by Secret Server, connectivity issues, or no accounts detected. For more information about error messages, see <a href="#">Discovery Error Messages</a> .	Both
<b>Type</b>	Discovered dependency type icon. See the following table.	Service

**Table:** Service Account Dependency Types

<b>Application Pool</b>		IIS application pool name
<b>Scheduled Task</b>		Scheduled task name
<b>Windows Service</b>		Service name

**Note** To correctly identify and import IIS application pools for IIS 7 or higher, Secret Server requires a trust relationship between the scanned domain and domain that the Secret Server Web server is joined to.

## AWS Account Discovery

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

**Note:** Discovery must be enabled in Secret Server to discover AWS accounts.

Secret Server can scan Amazon Web Services (AWS) for accounts that can access the cloud resource. Two types of secrets can be discovered and managed through SS:

- AWS Access Key: Keys used for programmatic integration with AWS.
- AWS Console Account: User login accounts for AWS.

## AWS Instance Discovery

Secret Server can now scan for instance resources in AWS. You can add this ability in the scanner settings section or through the wizard.

1. Create and AWS discovery source. See [Enabling AWS Discovery](#).
2. Navigate to **Admin > Discovery**:

**Admin > Discovery**

Discovery Sources | Configuration | Discovery Logs | Computer Scan Logs

Discovery  
Last Started: 4 hours, 22 minutes ago  
Next Run: 19 hours, 37 minutes

Computer Scan  
Last Started: 4 hours, 50 minutes ago  
Next Run: 19 hours, 9 minutes

Discovery Network View | Create Discovery Source ▾ | Run Discovery Now ▾

4 Items Include Inactive

NAME	ACTIVE	TYPE	SOURCE LAST RUN
AWS Discovery		AWS (Amazon Web Services)	7/17/2020 10:50 am
Gamma Linux		Unix	7/17/2020 10:46 am
gamma.thycotic.com		Active Directory	7/17/2020 10:31 am
Test_Esxi		PowerShell	7/17/2020 10:55 am

3. Click the **Create Discovery Source** dropdown list and select **AWS (Amazon Web Services)**. The AWS Discovery Source wizard Overview page appears:

**AWS Discovery Source**

[Overview](#)

**Getting Started**

Amazon Web Services (AWS) Discovery allows you to use Secret Server to scan for IAM Credentials, Regions, and Instances.

The Wizard will help you get AWS Discovery configured in 5 simple steps:

1. Name the Discovery Source.
2. Choose the Site used for Discovery scanning.
3. Select the IAM Credential Scanner.
4. Provide the Region Scanner information.
5. Choose a Secret to use as credentials for Discovery scanning.

Skip Wizard | Cancel | Next

4. Click the **Next** button. The Discovery Source Name page appears:

## AWS Discovery Source

[Overview](#) > [Discovery Source Name](#)

### Discovery Source Name

Define the Name of the new Discovery Source

 Choose a name that will help quickly identify this Discovery source in the future.

Previous

Cancel

Next

5. Type the name of the AWS discovery source in the **Discovery Source Name** text box.
6. Click the **Next** button. The Site page appears:


## AWS Discovery Source

[Overview](#) > [Discovery Source Name](#) > [Site](#)

### Add Site

Select the Site to be used for this Discovery Source

Local ▾

 The list contains all active Sites regardless of whether they have an active Engine.

Previous

Cancel

Next

7. Click the **Add Site** list box to select the site.
8. Click the **Next** button. AWS Service Account Scanner page appears:

## AWS Discovery Source

[Overview](#) > [Discovery Source Name](#) > [Site](#) > [IAM Credential Scanner](#)

### IAM Credential Scanner

Select which IAM users to scan.

FIND ACCOUNTS

AWS User Account Scanner

☒

AWS Access Key Scanner

☒

Previous

Cancel

Next

9. Click the check boxes for the scanners you desire.

10. Click the **Next** button.

## AWS Discovery Source

[Overview](#) > [Discovery Source Name](#) > [Site](#) > [IAM Credential Scanner](#) > [AWS Region Scanner](#)

### AWS Region Scanner

Enter a comma-delimited list of regions that will be scanned for availability zones. Example: us-east-1,us-west-1

SCAN AWS INSTANCES

Scan AWS Instances

☐

SCAN AWS REGIONS

AWS Region Scanner

FIND MACHINES

AWS Windows Machine Scanner

☐

AWS Machine (Non-Windows) Scanner

☐

Regions must be listed in a comma delimited list in order for instances to be discovered.

Previous

Cancel

Next

11. Click to select the **Scan AWS Instances** check box.
12. Type the regions you wish to scan for instances. The regions must be listed in a comma-delimited list for instances to be discovered.


**Note:** See [Regions, Availability Zones, and Local Zones](#) for more information on AWS regions.

13. Click to select the check boxes for the scanners you desire:
  - **AWS Windows Machine Scanner:** This is a machine scanner that scans each region and pulls all of the AWS Windows OS VM instances.
  - **AWS Machine (Non-Windows) Scanner:** This is a machine scanner that scans each region and pulls all of the AWS Non-Windows OS VM instances.
14. Click the **Next** button. The Credential Secrets page appears:

**AWS Discovery Source**

Overview > Discovery Source Name > Site > IAM Credential Scanner > AWS Region Scanner > Credential Secrets

**Credential Secrets**  
Select the IAM Access Key Secret to be used as Authentication Credentials for Discovery.  
[Add Secret](#)  
  
If a suitable Secret is not already stored in Secret Server, create it below.  
[Create New Secret](#)

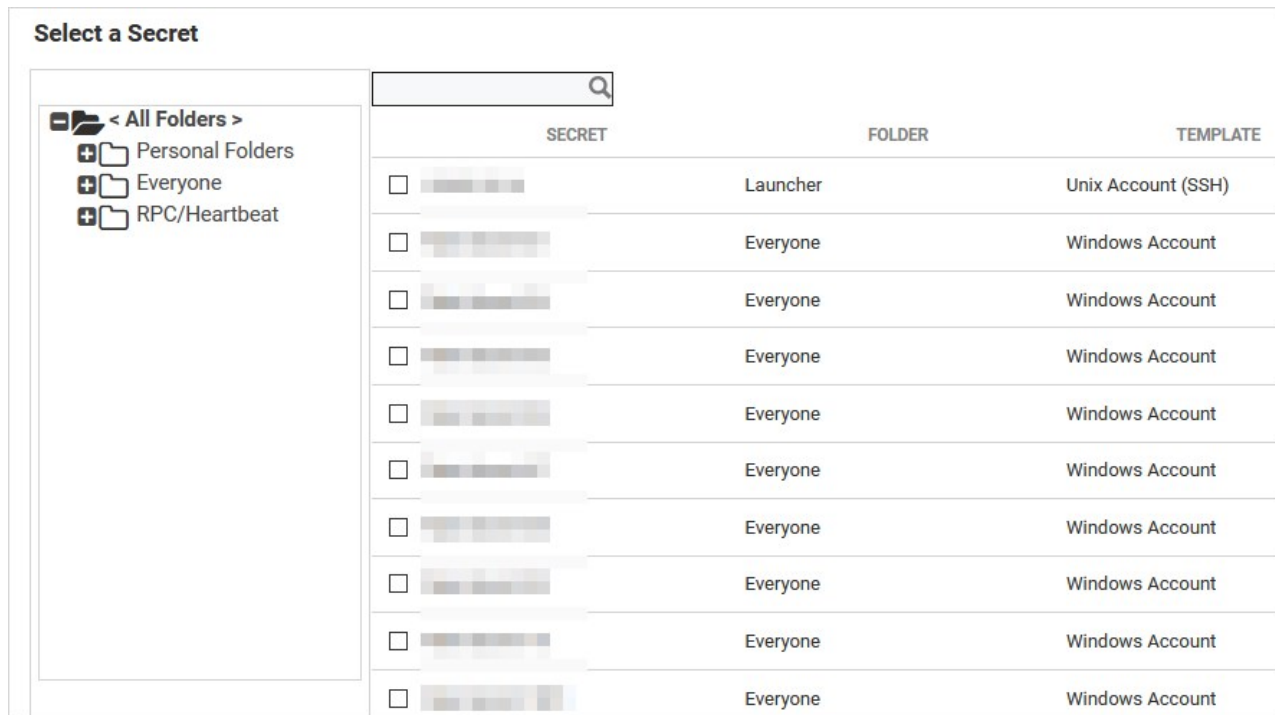
 Only AWS IAM Access Key may be used. IAM Console passwords accounts may not be used to query the API.

Previous

Cancel

Finish

15. Click the **Add Secret** link. The Select a Secret popup appears:



16. Navigate the folder tree and select the secret you created earlier. As soon as you select the check box, the popup disappears and the secret appears under the Add Secret link.
17. Click the **Finish** button.



## Enabling AWS Discovery

### AWS Identity and Access Management (IAM)

1. For Secret Server to communicate with AWS, users with sufficient privileges need to create an access key for their account in AWS Identity and Access Management (IAM). The account used to do this requires the following permissions to discover users and access keys:

- iam:ListUsers
- iam:GetLoginProfile
- iam:ListAccessKeys

**Note:** These permissions are limited to the resources the user is allowed to access.

2. Once this access key is created, use the access key and secret key to create a secret in Secret Server using the Amazon IAM key template.
3. Create a new AWS discovery source and use the Amazon IAM key as the credentials secret for that discovery source.

**Note:** AWS only allows programmatic integration through access keys. This type of secret is required for discovery to work. Discovery must be enabled in Secret Server for this feature to work.

### Amazon Elastic Compute Cloud (EC2)

Amazon Elastic Compute Cloud (EC2) is a part of AWS that allows users to rent virtual computers on which to run their own computer applications. The EC2 account used to do this requires the following permissions to discover users and access keys:

- EC2:DescribeInstances
- EC2:DescribeAvailabilityZones

The configuration is very similar to IAM.

## Password Management in AWS

Secret Server can manage password and access keys for AWS IAM accounts.

### Amazon IAM Keys

Password changing, privileged password changing, and running heartbeats are available for Amazon IAM key secrets. When an Amazon IAM key has its password changed through Secret Server, the new secret key is generated automatically and is not set by user input.

During password changing, you can disable or remove old keys through settings available in the advanced configuration:

- `<add key="ShouldDeletePreviousKey" value="true" />`
- `<add key="ShouldInactivatePreviousKey" value="true" />`

**Important:** Altering advanced settings can significantly impact the performance and behavior of Secret Server, so there is no direct link anywhere in Secret Server to the Advanced Settings page. If you need to change any advanced setting (as mentioned in this guide), please contact Delinea Technical Support.

### Amazon IAM Console Password

Password changing, and privileged password changing are available for Amazon IAM console password secrets. Due to AWS IAM's restrictions on programmatic integration, this secret type cannot use Secret Server heartbeat.

In addition, an Amazon IAM key secret must be associated with an Amazon IAM console password secret for password changing to occur. To associate the two:

1. Create the Amazon IAM console password secret, and an Amazon IAM Key secret for an account that has the permissions to change the console user's password. This can be the console account's own access keys, if the user has permission.
2. Navigate to the RPC tab of the Amazon IAM Console Password.
3. Under **Change Password Using Privileged Account** select **Edit** and choose the IAM key secret created in the previous step. RPC should now be possible on the console password secret.

### Permissions Required for Secret Key Changes

**Note:** These permissions are at the most granular level. You can implement broader methods through wildcard resource restrictions, permission policies, or groups.

Privileged Permissions: (those the AWS account needs to change another users' access keys):

- `iam:DeleteAccessKey ON RESOURCE arn:aws:iam::<account>:user/<otherUserName>`
- `iam:UpdateAccessKey ON RESOURCE arn:aws:iam::<account>:user/<otherUserName>`
- `iam:CreateAccessKey ON RESOURCE arn:aws:iam::<account>:user/<otherUserName>`
- `iam:ListAccessKeys ON RESOURCE arn:aws:iam::<account>:user/<otherUserName>`

Basic Permissions (those the AWS account needs to change its own access keys):

- `iam:DeleteAccessKey ON RESOURCE arn:aws:iam::<account>:user/${aws:username}`
- `iam:UpdateAccessKey ON RESOURCE arn:aws:iam::<account>:user/${aws:username}`
- `iam:CreateAccessKey ON RESOURCE arn:aws:iam::<account>:user/${aws:username}`

- iam:ListAccessKeys ON RESOURCE arn:aws:iam::<account>:user/\${aws:username}

## Permissions Required for Changing the Amazon IAM Console Password

**Note:** These permissions are at the most granular level. You can implement broader methods through wildcard resource restrictions, permission policies, or groups.

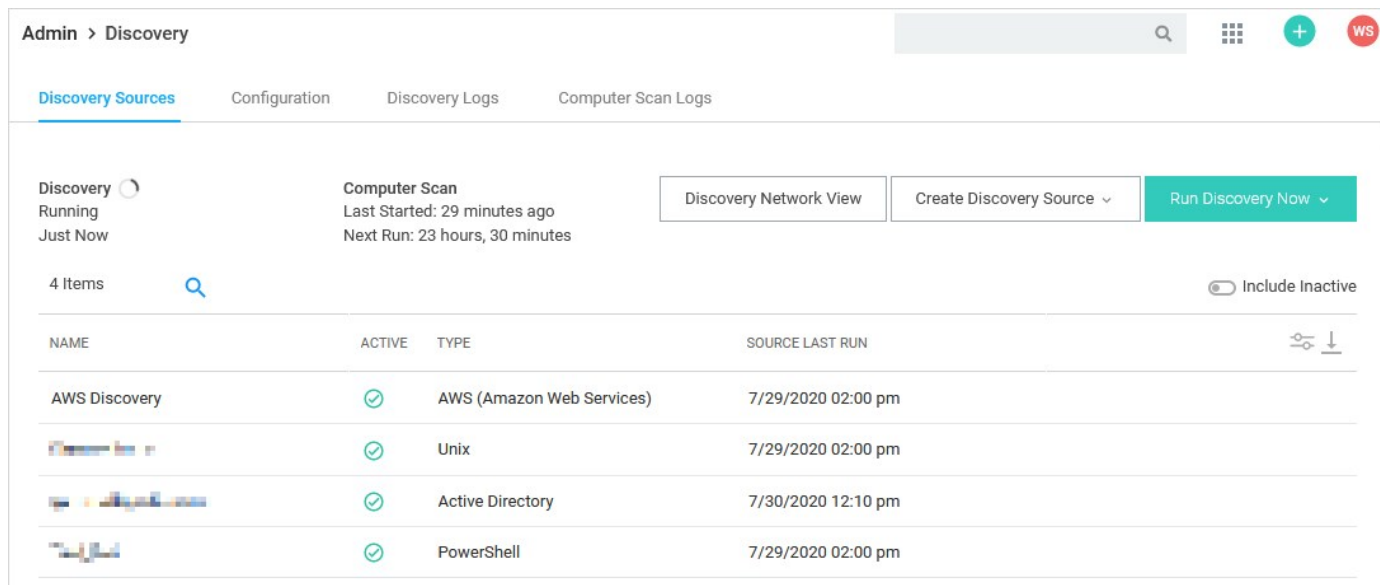
The permissions are:

- Privileged Permission: iam:UpdateLoginProfile ON resource arn:aws:iam::<account>:user/<otherUserName>
- Basic Permission: iam:ChangePassword ON RESOURCE arn:aws:iam::<account>:user/\${aws:username}

## Viewing AWS Discovery Source Scanners


To view these scanners:

1. Go to **Admin > Discovery**.





Admin > Discovery








Discovery Sources Configuration Discovery Logs Computer Scan Logs

Discovery  Running Just Now

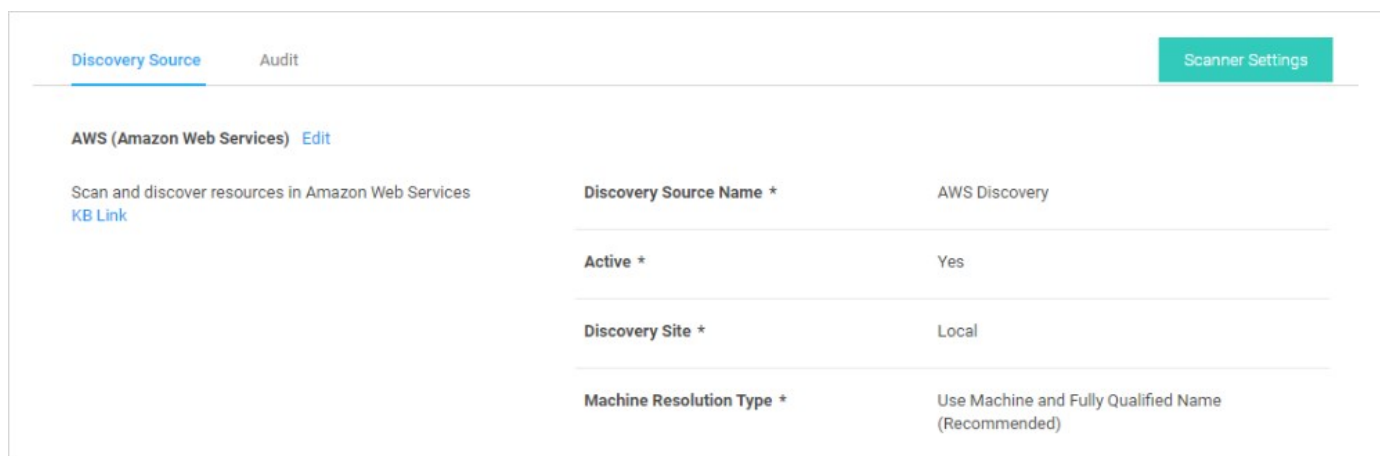
Computer Scan Last Started: 29 minutes ago Next Run: 23 hours, 30 minutes


Discovery Network View Create Discovery Source Run Discovery Now

4 Items   Include Inactive

NAME	ACTIVE	TYPE	SOURCE LAST RUN
AWS Discovery		AWS (Amazon Web Services)	7/29/2020 02:00 pm
		Unix	7/29/2020 02:00 pm
		Active Directory	7/30/2020 12:10 pm
		PowerShell	7/29/2020 02:00 pm

2. Click the discovery source name link in the table. The Discovery Source page for it appears:



Discovery Source Audit 

AWS (Amazon Web Services) [Edit](#)

Scan and discover resources in Amazon Web Services [KB Link](#)

Discovery Source Name \* AWS Discovery

Active \* Yes

Discovery Site \* Local

Machine Resolution Type \* Use Machine and Fully Qualified Name (Recommended)

3. Click the **Scanner Settings** button in the top right of the page. The Discovery Source Scanner Settings page appears, which lists the scanners.

Discovery Source Scanner Settings

FIND HOST RANGES

+ Add New Host Range Scanner

NAME	INPUT TEMPLATE	OUTPUT TEMPLATE	OPTIONS
AWS Region Scanner	AWS Discovery Source	AWS Region	
AWS Path Scanner	AWS Discovery Source	AWS Path	

Scanners: 2

FIND MACHINES

+ Add New Machine Scanner

NAME	INPUT TEMPLATE	OUTPUT TEMPLATE	OPTIONS
AWS Windows Machine Scanner	AWS Region	Windows Computer	
AWS Machine (Non-Windows) Scanner	AWS Region	Computer	

Scanners: 2

FIND ACCOUNTS

+ Add New Account Scanner

NAME	INPUT TEMPLATE	OUTPUT TEMPLATE	OPTIONS
AWS User Account Scanner	AWS Path	AWS User Account	
AWS Access Key Scanner	AWS Path	AWS Access Key	

Scanners: 2

FIND DEPENDENCIES

+ Add New Dependency Scanner

Add a dependency scanner once you have a machine scanner added to the discovery source.

4. Click pencil edit icon for the machine listing. The settings for that scanner appears:

Settings - AWS Windows Machine Scanner

SECRET CREDENTIALS

1. AWS Discovery cred

[Add Secret](#)
[Add Secret Search Filter](#)

Create Secret Search Filter

ADVANCED SETTINGS

Platform Include Filter

Platform Exclude Filter

Custom Additional Filters

Instance Name Preference

PublicDnsName

▼

✓ OK

✗ Cancel

5. Complete the following settings:

- **Platform Include Filter:** Comma separated list for platforms to include in the scan. Example: windows.
- **Platform Exclude Filter:** Comma separated list for platform to exclude from the scan. Example: windows,
- **Custom Additional Filters:** Additional filters to scan. Example: tag:Purpose=store,database;
- **Instance Name Preference:** If found on the instance, this is used for the Computer Name. Consider how the machine will be accessed with the selection. If selection is not found, it defaults to PrivateDnsName.

6. Click the **OK** button.

## Google Cloud Platform Discovery

### Overview

Secret Server can manage Google Cloud Platform (GCP) service accounts and VM instances. This feature allows users to run discovery to pull and manage VM Instances, as well as import and manage GCP service accounts.

### Configuration

#### Task 1: Creating GCP Service Accounts

These are special accounts created in GCP to make authorized API calls for Compute Engine and other GCP applications.

**Note:** See [GCP Service Accounts](#) for more information.

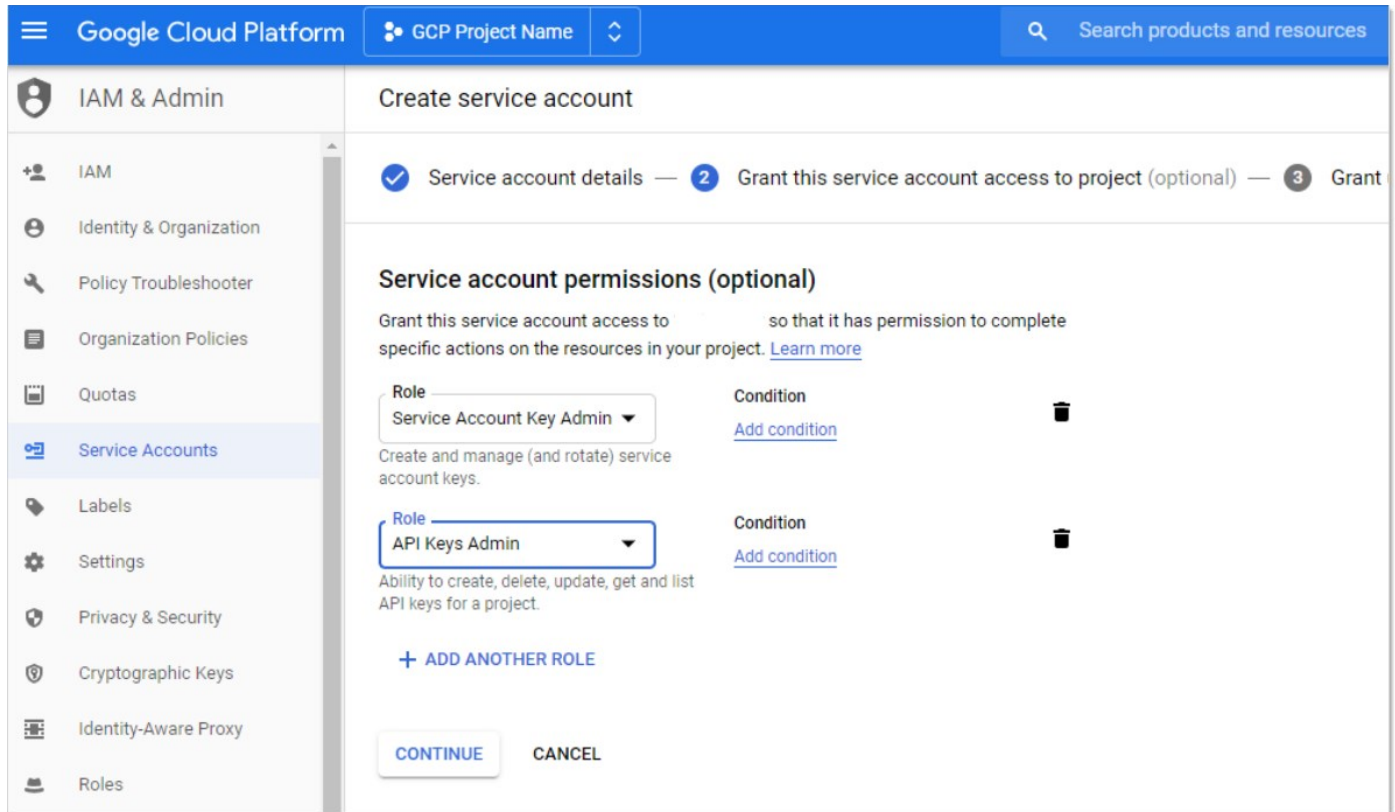
Secret Server uses the GCP service account to make authorized API calls to GCP to pull projects, zones, instances, service accounts and service account keys.

To create the service account:

1. Click the **IAM & Admin** dropdown list in the left menu in GCP and select **Service Accounts**. A list of service accounts appears.
2. Click the **+ Create Service Account** button. The "Service account details" page of the Create Service Account wizard appears:

The screenshot shows the 'Create service account' wizard in the Google Cloud Platform console. The left sidebar shows the 'IAM & Admin' menu with 'Service Accounts' selected. The main content area is titled 'Create service account' and shows a progress bar with three steps: 1. Service account details (active), 2. Grant this service account access to project (optional), and 3. Grant users access to this service account (optional). The 'Service account details' section contains three text boxes: 'Service account name' with the value 'account-mgr', 'Service account ID' with the value 'account-mgr' and a dropdown showing '@gcpprojectname.iam.gserviceaccount.com', and 'Service account description' with the placeholder text 'Describe what this service account will do'. At the bottom are 'CREATE' and 'CANCEL' buttons.

3. Type the service account name in the **Service Account Name** text box.
4. Start to type the service account ID name and select the service account in the **Service Account Name** text/list box.
5. Click the **Create** button. The "Grant this service account access to project (optional)" page appears:



6. Click the **Role** list box and select **Service Account Key Admin**.
7. Click the **+ Add Role** button to add another role.
8. Click the new **Role** list box and select **API Keys Admin roles**.
9. Click the **Continue** button. The "Grant users access to this service account (optional)" page appears:



Google Cloud Platform | GCP Project Name | Search products and resources

**IAM & Admin**

- IAM
- Identity & Organization
- Policy Troubleshooter
- Organization Policies
- Quotas
- Service Accounts**
- Labels
- Settings
- Privacy & Security
- Cryptographic Keys
- Identity-Aware Proxy
- Roles
- Audit Logs
- Groups

**Create service account**

✓ Service account details — ✓ Grant this service account access to project (optional) — 3 Grant users access to this service account (optional)

**Grant users access to this service account (optional)**

Grant access to users or groups that need to perform actions as this service account.  
[Learn more](#)

Service account users role ?  
Grant users the permissions to deploy jobs and VMs with this service account

Service account admins role ?  
Grant users the permission to administer this service account

**Create key (optional)**

Download a file that contains the private key. Store the file securely because this key can't be recovered if lost. However, if you are unsure why you need a key, skip this step for now.

**Keys**

[+ CREATE KEY](#)

**DONE** **CANCEL**

10. Click the **+ Create Key** button in the **Keys** section. The "Create key (optional)" popup appears:

**Create key (optional)**

Download a file that contains the private key. Store the file securely because this key can't be recovered if lost. However, if you are unsure why you need a key, skip this step for now.

**Key type**

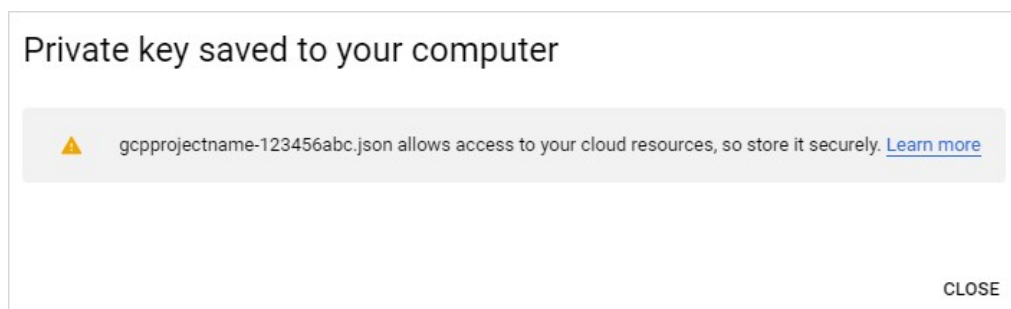
☒ **JSON**  
Recommended

☐ **P12**  
For backward compatibility with code using the P12 format

**CREATE** **CANCEL**

11. Click to select the **JSON** selection button.

12. Click the **Create** button. This creates and downloads a JSON private key file. A confirmation popup appears:



13. Click the **Close** button in the bottom right. The service account is created, and its JSON private key is on your computer.

**Note:** Note where you downloaded the file. You will need it later in this instruction.

**Note:** For more information on this process, see [Creating and managing service accounts](#) on the GCP website.

## Task 2: Setting GCP Permissions

GCP permissions are IAM permissions from the IAM & Admin section of GCP. Without the proper permissions, GCP discovery, RPC, and heartbeat may not function properly.

For the service accounts to have access to a project, you must add the service account IAM permissions in each Project. If you did not add the permissions when you created the service account, you need to add the IAM permissions in the project they were created in as well.

### Discovery

To run discovery in Secret Server, the GCP service account needs the "project viewer" read only permission, which can list projects, zones, service accounts, and instances.

To add the permission In GCP:

1. Click the **IAM & Admin** dropdown list in the left menu in GCP and select **IAM**. The "Permissions for project..." page appears.
2. Click the **Add** button. The "Add member to..." page appears.
3. Type the service account email address in the **Members** text box.
4. Click the **Roles** dropdown list to select **Project > Viewer** (you can also type it).
5. Click the **Add** button. The new member appears in the table on the "Permissions for project..." page.

### RPC/Heartbeat

To run RPC/Heartbeat in Secret Server, the service account needs the "service account key admin" permission, which can create, delete, and rotate service account keys.

To add the permission In GCP:

1. Click the **IAM & Admin** dropdown list in the left menu in GCP and select **IAM**. The "Permissions for project..." page appears.
2. Click the **Add** button. The "Add member to..." page appears.
3. Type the service account email address in the **Members** text box.
4. Click the **Roles** dropdown list to select **Service Account Key Admin** (you can also type it).

5. Click the **Add** button. The new member appears in the table on the "Permissions for project..." page.

### Task 3: Creating a GCP IAM Service-Account Secret

Secret Server now has a build in GCP IAM Service Account Key template.

**Note:** To create a Secret using GCP IAM service account key template, you must have the service account's JSON private key file from GCP (created earlier).

Create a new secret (see [Creating Secrets](#) for details):

1. Click the **+** on the **Secrets** item on the main menu. The "Create New Secret" page appears:

## Create New Secret

Please select a folder to synchronize. [Change](#)

Choose a Secret Template

- Active Directory Account
- Amazon IAM Console Password
- Amazon IAM Key
- Bank Account
- Cisco Account (SSH)
- Cisco Account (Telnet)
- Cisco Enable Secret (SSH)
- Cisco Enable Secret (Telnet)
- Cisco VPN Connection
- Combination Lock
- Contact
- Copy of CreditCard
- Credit Card
- DevOps Secret Vault Client Credentials
- Generic Discovery Credentials
- Generic ODBC (DataSource)
- Google IAM Service Account Key
- Healthcare
- HP iLO Account (SSH)
- IBM iSeries Mainframe

Cancel
Create Secret

2. Select **Google IAM Service Account Key** as the template. Another "Create New Secret" page, tailored to GCP, appears:

## Create New Secret

**Secret Template**
Google IAM Service Account Key [Change](#)

**Folder**
No Folder Selected

**Secret Name \***

**Email \***

**Private Key Id \***

**JSON Private Key \***
[Change](#)

**Notes**

**Site**
Local

**Auto Change Enabled**
☐

Cancel

Create Secret

- Click to select a folder for the new secret.
- Type the secret's name in the **Secret Name** text box.
- Type the service account email address (use client\_email from the JSON private key file) in the **Email** text box.
- Type the private key ID (use private\_key\_id from the JSON private key file) in the **Private Key ID** text box.
- Click the **Change** button to upload the JSON private key file you created earlier.
- Click the **Create Secret** button.

#### Task 4: Creating an RPC/Heartbeat Password Changer

Secret Server can check if a service Account key is valid and can rotate the Service Account key. This should work the same as any other

RPC or Heartbeat. **Note:** RPC and Heartbeat must be enabled

RPC/Heartbeat can be tested from the Password Changers page


1. In Secret Server, go to **Admin > Remote Password Changing**:


### Remote Password Changing Configuration


Enable Remote Password Changing	Yes
Enable Password Changing on Check In	No
Enable Heartbeat	Yes


[Advanced \(not required\)](#)


Days to Keep Operational Logs	30
-------------------------------	----


 Back

 Edit

 Configure Password Changers

 Configure Dependency Changers

 Distributed Engine Configuration

 View Audit

2. Click the Configure Password Changers button. The Password Changers Configuration page appears:

## Password Changers Configuration

PASSWORD TYPE NAME	SCAN TEMPLATE	ACTIVE
Active Directory Account	Active Directory Account	Yes
Amazon IAM Console Password Privileged Account	AWS User Account	Yes
Amazon IAM Key	AWS Access Key	Yes
Blue Coat Account Custom (SSH)	SSH Local Account	Yes
Blue Coat Enable Password Custom (SSH)	SSH Local Account	Yes
Cisco Account Custom (SSH)	SSH Local Account	Yes
Cisco Account Custom (Telnet)	SSH Local Account	Yes
Cisco Enable Secret Custom (SSH)	SSH Local Account	Yes
Cisco Enable Secret Custom (Telnet)	SSH Local Account	Yes
ESX/ESXi (API)	ESXi Local Account	Yes
F5 BIG-IP Root Account (SSH)	SSH Local Account	Yes
Generic Discovery-Only Credentials	< None >	Yes
Generic ODBC (DataSource)	SQL Local Account	Yes
Google IAM Service Account Key	GCP Service Account	Yes
HP iLO Account Custom (SSH)	SSH Local Account	Yes

- Click the **Google IAM Service Account Key** link. The "Google IAM Service Account Key" page appears:

### Google IAM Service Account Key

Verify Password Changed Commands

Test Action

i

This process is done through internal commands. The commands cannot be edited.

Password Change Commands

Test Action

i

This process is done through internal commands. The commands cannot be edited.

Password Change By Admin Credentials Commands

Test Action

i

This process is done through internal commands. The commands cannot be edited.

Back

Configure Scan Template

View Audit

4. Test the heartbeat: Click the **Test Action** button in the **Verify Password Changed Commands** section. The Test Action popup appears:

Test Action

Please enter the information to test the action. Note this test may take a while to complete since it will run against the actual host.

FIELDS

EMAIL

account-manager@gcpp

JSONPRIVATEKEY

{  
"type":

PRIVATEKEYID

123456abcde

Site

Local

✓ OK

✕ Cancel

5. Ensure that the **JSONPRIVATEKEY** text box is populated. The others are optional.
6. Click the **OK** button. The popup goes away. If successful, this appears on the previous page:

Verify Password Changed Commands

↗ Test Action

Password Verify was Successful

(No console output).

7. Test RPC: Click the **Test Action** button in the **Password Change Commands** section. The Test Action popup appears:



Test Action

Please enter the information to test the action. Note this test may take a while to complete since it will run against the actual host.

Warning: This will change the password on the target account if successful.

FIELDS

EMAIL

account-manager@gcpp

JSONPRIVATEKEY

{  
"type":

PRIVATEKEYID

123456abcde

Site

Local

OK

Cancel

- Ensure that the **JSONPRIVATEKEY** and **Email** text boxes are populated. The others are optional.
- Click the **OK** button. The popup goes away. If successful, this appears on the previous page:

Password Change Commands

Test Action

Password Successfully Changed

(No console output).

- Test RPC with admin credentials: Click the **Test Action** button in the **Password Change By Admin Credentials Commands** section. The Test Action popup appears:

Test Action

Please enter the information to test the action. Note this test may take a while to complete since it will run against the actual host.

Warning: This will change the password on the target account if successful.

FIELDS

EMAIL	service-account@gcppro
JSONPRIVATEKEY	
PRIVATEKEYID	123456abcde
Admin EMAIL	account-manager@gcpp
Admin JSONPRIVATEKEY	{ "type":
Admin PRIVATEKEYID	123456abcdeadmin
Site	Local

OK

Cancel

- Ensure that all text boxes are populated except **JSONPRIVATEKEY**, **Admin Email**, and **Admin PRIVATEKEYID**, which are optional.
- Click the **OK** button. The popup goes away. If successful, this appears on the previous page:

Password Change By Admin Credentials Commands

Test Action

Password Successfully Changed using Admin Credentials

(No console output).

## Task 5: Creating a GCP Discovery Source

Secret Server now has a built-in GCP discovery source wizard that creates the scanners to pull the projects, zones, service accounts. To create a GCP discovery source:

- In Secret Server, go to **Admin > Discovery**:

Admin > Discovery

Discovery Sources Configuration Discovery Logs Computer Scan Logs


**Discovery**  
 Last Started: 4 hours, 22 minutes ago  
 Next Run: 19 hours, 37 minutes







**Computer Scan**  
 Last Started: 4 hours, 50 minutes ago  
 Next Run: 19 hours, 9 minutes

Discovery Network View

Create Discovery Source ▾

Run Discovery Now ▾

4 Items  Include Inactive

NAME	ACTIVE	TYPE	SOURCE LAST RUN	 
AWS Discovery		AWS (Amazon Web Services)	7/17/2020 10:50 am	
Gamma Linux		Unix	7/17/2020 10:46 am	
gamma.thycotic.com		Active Directory	7/17/2020 10:31 am	
Test_Esxi		PowerShell	7/17/2020 10:55 am	

- Click the **Create Discovery Source** dropdown list and select **GCP (Google Platform)**. The GCP Discovery Source wizard Overview page appears:

**GCP Discovery Source**


[Overview](#)


**Getting Started**


Google Cloud Platform (GCP) Discovery allows you to use Secret Server to scan for Projects, Zones, Service Accounts, and Instances.

The Wizard will help you get GCP Discovery configured in 5 simple steps:

1. Name the Discovery Source.
2. Choose the Site used for Discovery scanning.
3. Select the Service Account Scanner.
4. Select the Instance Scanner.
5. Choose a Secret to use as credentials for Discovery scanning.

 Skip Wizard

 Cancel

 Next

- Click the **Next** button. The Discovery Source Name page appears:

## GCP Discovery Source

[Overview](#) > [Discovery Source Name](#)

### Discovery Source Name

Define the Name of the new Discovery Source

 Choose a name that will help quickly identify this Discovery source in the future.

← Previous
✕ Cancel
Next →

4. Type the name of the GCP discovery source in the **Discovery Source Name** text box.

5. Click the **Next** button. The Site page appears:

## GCP Discovery Source


[Overview](#) > [Discovery Source Name](#) > [Site](#)

### Add Site

Select the Site to be used for this Discovery Source

Local

▼

 The list contains all active Sites regardless of whether they have an active Engine.

← Previous
✕ Cancel
Next →

6. Click the **Add Site** list box to select the site.

7. Click the **Next** button. GCP Service Account Scanner page appears:

## GCP Discovery Source

[Overview](#) >
[Discovery Source Name](#) >
[Site](#) >
[GCP Service Account Scanner](#)

### GCP Service Account Scanner

Finds Service Accounts defined in GCP

FIND ACCOUNTS

GCP Service Account Scanner
☒

Previous

Cancel

Next

8. Click the **Next** button.

## GCP Discovery Source

[Overview](#) >
[Discovery Source Name](#) >
[Site](#) >
[GCP Service Account Scanner](#) >
[GCP Instance Scanner](#)

### GCP Instance Scanner

Finds machines hosted in GCP.

SCAN GCP INSTANCES

Scan GCP Instances
☐

FIND MACHINES

GCP Windows Instance Scanner
☐

GCP (Non-Windows) Instance Scanner
☐

Previous

Cancel

Next

9. Click to select the **Scan GCP Instances** check box.

10. Click the check boxes for the scanners you desire. Currently, there are four discovery scanners for the GCP discovery source.

**Note:** In the future, we may add an Instance Local Account and a Service Account Dependency scanner.

- GCP Project Scanner:** This is a host range scanner that scans the GCP and pulls all of the projects that the provided GCP service account secret has access to.
- GCP Windows Instance Scanner:** This is a machine scanner that scans each project and pulls all of the GCP Windows OS VM instances.

- **GCP (Non-Windows) Instance Scanner:** This is a machine scanner that scans each project and pulls all of the GCP Non-Windows OS VM instances.
- **GCP Service Account Scanner:** This is an account scanner that scans each project and pull all of the GCP Service accounts.

11. Click the **Next** button. The Credential Secrets page appears:

### GCP Discovery Source

[Overview](#) > [Discovery Source Name](#) > [Site](#) > [GCP Service Account Scanner](#) > [GCP Instance Scanner](#) > [Credential Secrets](#)


#### Credential Secrets

Select the GCP IAM Service Account Key Secret to be used as Authentication Credentials for Discovery.

[Add Secret](#)

If a suitable Secret is not already stored in Secret Server, create it below.

[Create New Secret](#)

 Only GCP IAM Service Account Key may be used.

Previous

Cancel

Finish

12. Click the **Add Secret** link. The Select a Secret popup appears:

### Select a Secret

< All Folders >

Personal Folders

Everyone

RPC/Heartbeat

SECRET

FOLDER

TEMPLATE

<input type="checkbox"/>	Launcher	Unix Account (SSH)
<input type="checkbox"/>	Everyone	Windows Account
<input type="checkbox"/>	Everyone	Windows Account
<input type="checkbox"/>	Everyone	Windows Account
<input type="checkbox"/>	Everyone	Windows Account
<input type="checkbox"/>	Everyone	Windows Account
<input type="checkbox"/>	Everyone	Windows Account
<input type="checkbox"/>	Everyone	Windows Account
<input type="checkbox"/>	Everyone	Windows Account
<input type="checkbox"/>	Everyone	Windows Account

13. Navigate the folder tree and select the secret you created earlier. As soon as you select the check box, the popup disappears and the

secret appears under the Add Secret link.

14. Click the **Finish** button.

## Viewing Discovery Scanners for the GCP Discovery Source

To view these scanners:

1. In Secret Server, go to **Admin > Discovery**:
2. Go to **Admin > Discovery**.
3. Click the discovery source name link in the table. The Discovery Source page for it appears.
4. Click the **Scanner Settings** button in the top right of the page. The Discovery Source Scanner Settings page appears, which lists the scanners.

## Instance Custom Filter

This option is only available for the instance scanners. The Custom Filter Setting can be used to include or exclude instances using a filter expression on the name, label, or any other field allowed by GCP. The filter must:

- Be a string, number, or Boolean value
- Use these comparison operators: =, !=, >, or <
- Use parentheses ( ) around each filter
- Combine different filters using AND or OR (all caps). For example: (name="instanceName") AND (labels.key="value")

**Note:** See [Method: instances.aggregatedList](#) for more on filtering instances.

Other useful filters:

Status:

status="StatusValue"

StatusValue can be Running Or Terminated

Zone:

zone=https://www.googleapis.com/compute/v1/projects/{ProjectName}/zones/{ZoneName}

**Note:** Unfortunately, at this time of this topic, Google has an [open issue](#) of the tag filter not working.

## Importing Service Accounts

From the Discovery Network View, Secret Server can import Service Account keys and automatically take over the account. This import process will create a new Secret for the Service Account key, delete the associated key, create a new key, and save the json private key file with the Secret, so this can be easily managed by Secret Server.

To Import a Service Account

1. Go to **Admin > Discovery**.
2. Click the **Discovery Network View** button. The Discovery Network View page appears.
3. Select the **Domain\Cloud Account** tab

4. Click to select the Service Account(s) to import in the unlabeled Domain/Cloud tree on the left.
5. Click the **Import** button. The importation wizard begins:

**Bulk Operation: Import Accounts**

The account(s) will be imported as 1 new Secret(s).

Secret > Key > Import Key > Key Rotation >

**Scan Template** GCP Service Account

**Secret Type** Google IAM Service Account Key

**Folder** GCP\Imports

**Secret Name** \$EMAIL - Import \*

**Site** Local

Previous Next

6. For secrets:
  1. Click the **Secret Type** dropdown list and select **Google IAM Service Account Key**.
  2. Click the link after **Folder** to select a folder.
  3. Type a name in the **Secret Name** text box (It auto fills \$EMAIL).
  4. Click the Site dropdown list to select a site.
7. Click the **Next** button. The Key page appears:

**Bulk Operation: Import Accounts**

The account(s) will be imported as 1 new Secret(s).

Secret > Key > Import Key > Key Rotation >

**Key**

This will take over the selected account(s) and create a new key for each.

Previous Next

8. When importing GCP service account keys, the only option is take over the account. Meaning, Secret Server triggers a remote password change on import to rotate the imported key and obtain a new JSON private key file. With the JSON private key file, Secret Server can then manage the GCP service account.
9. Click the **Next** button. The Import Key page appears:



Bulk Operation: Import Accounts

×

The account(s) will be imported as 1 new Secret(s).

Secret > Key > Import Key

Key Rotation >

i

The privileged account below will be used only on the initial take-over of the account.

Credentials

Select Secrets to be used for taking over the account(s).

[GCP Account Mgr](#)
[Clear](#)

← Previous

Next →

10. Click the link to select a secret to use for the initial take over of the account.

11. Click the **Next** button. The Key Rotation page appears:

Bulk Operation: Import Accounts

×

The account(s) will be imported as 1 new Secret(s).

Secret > Key > Import Key > Key Rotation

i

When passwords for these Secrets are changed in the future, Secret Server will use the settings below.

☒ Use Secret Credentials
   
☐ Use Privileged Account

← Previous

Finish

12. For key rotation, click one of two selection button options to choose a secret for future key rotations. Either option would need the permissions mentioned above. When the password for the chosen secret are changed in the future, Secret Server will use one of these two options:

- **Use Secret Credentials:** Use the imported service account to rotate itself, and it has permissions to rotate keys.
- **Use Privileged Account:** Use another service account that has permissions to rotate keys

13. Click the **Finish** button.

## GCP APIs

### Overview

To make API calls to GCP, you need to enable the following APIs to use GCP discovery in Secret Server. More information can be found on the [GCP Getting Started](#) page. The APIs are:

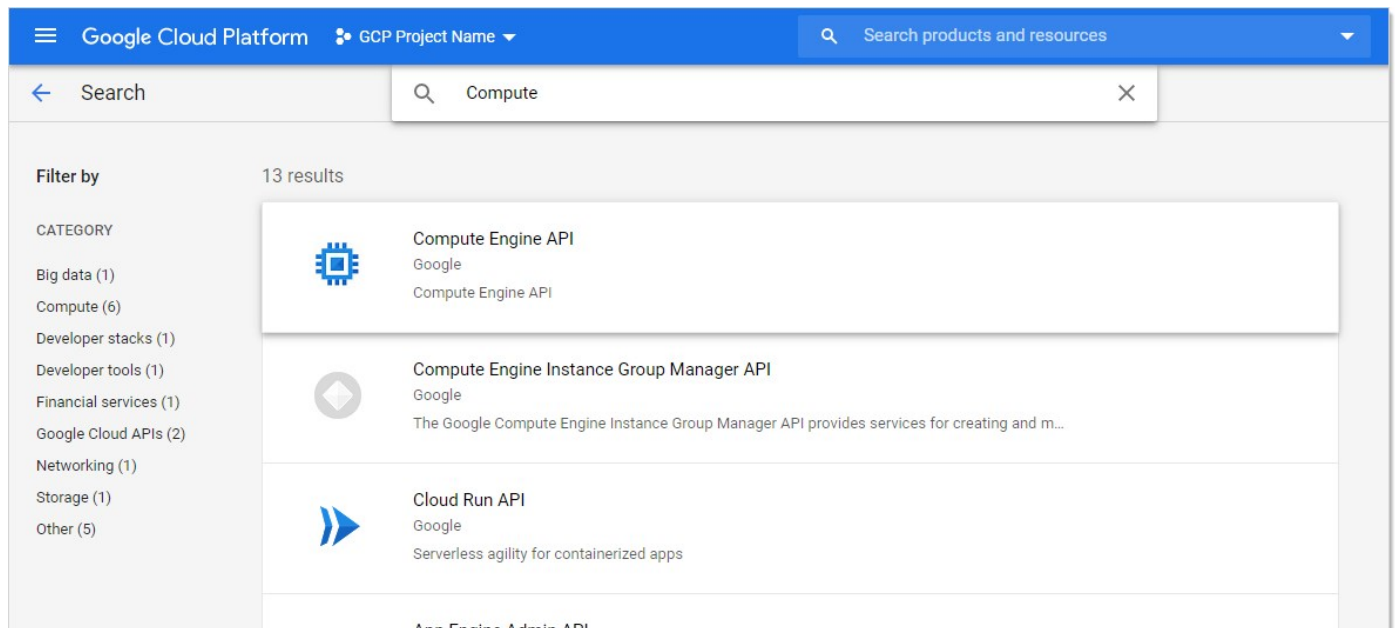
- **Cloud Resource Manager API:** Used for managing GCP resource containers, such as Projects.

- **Compute Engine API:** Used for managing GCP instances (virtual machines).
- **Identity and Access Management (IAM) API:** Used for managing identity and access control for GCP resources, such as service accounts.

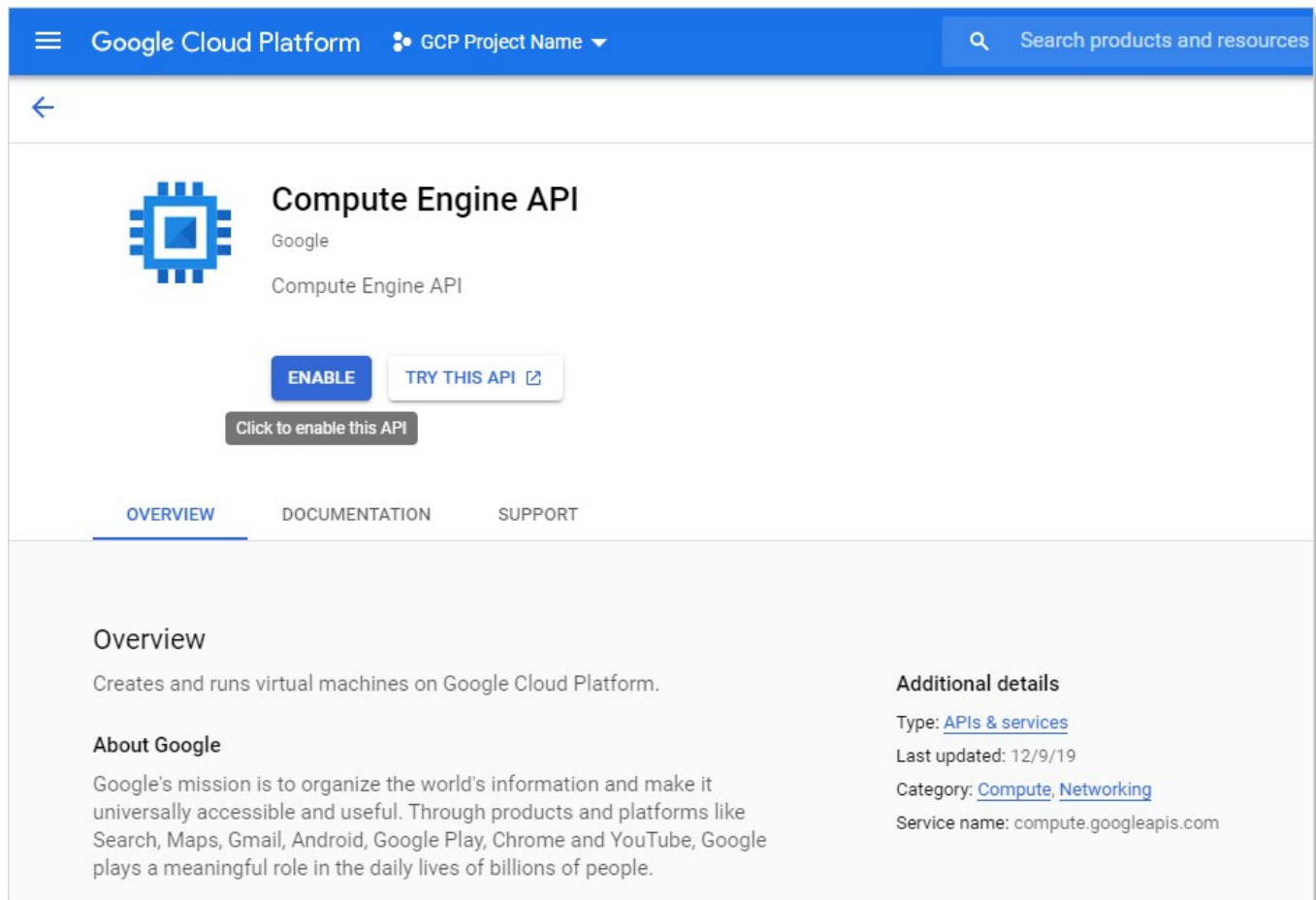
## Enabling GCP APIs

In GCP:

1. In GCP, click the **APIs & Services** menu item and select **Library**. The Library page appears.
2. Type the name of the API in the Search text box and press **<Enter>**. Matching APIs appear:



3. Click the button for the desired API. That API's page appears:



4. Click the **Enable** button.

## Errors and Solutions

### Create Keys Failed: Access Denied

#### Error

Create Keys Failed: AccessDenied, Google.Apis.Requests.RequestError Permission iam.serviceAccountKeys.create is required to perform this operation on service account projects/-/serviceAccounts/discovery-me@gcpprojectname.iam.gserviceaccount.com. [403] Errors [ Message[Permission iam.serviceAccountKeys.create is required to perform this operation on service account projects/-/serviceAccounts/discovery-me@gcpprojectname.iam.gserviceaccount.com.] Location[ - ] Reason[forbidden] Domain[global] ]

#### Likely Cause

The service account used to rotate the key does not have necessary permission to perform this task.

#### Solution

1. Go to the GCP console.
2. Select **IAM > Permissions**.
3. Select the service account.

4. Add the **Service Account Key Admin** permission.
5. Once the service account has permission:
  1. In Secret Server, select the secret to rotate.
  2. Stop the current rotation.
  3. Try the operation again.

## Create Keys Failed: Maximum Number of Keys on Account Reached

### Error

Create Keys Failed: ArgumentError, Google.Apis.Requests.RequestError Maximum number of keys on account reached. [429] Errors [ Message[Maximum number of keys on account reached.] Location[ - ] Reason[rateLimitExceeded] Domain[global] ]

### Likely Cause

The rotated service account has reached the maximum number of keys allowed. GCP maximum is 10 keys.

### Solution

1. Go to the GCP console.
2. Select **IAM > Permissions**.
3. Remove the unused keys.
4. Once the service account has less than 10 keys, in Secret Server:
  1. In SS, select the secret to rotate.
  2. Stop the current rotation.
  3. Try the operation again.

## Discovery Consumer: Syncing OUs Failed

### Error

DiscoveryConsumer: Synchronizing Organizational Units failed for [Our Google Cloud]! Error: An issue was encountered during the scan. Google.Apis.Requests.RequestError Access Not Configured. Compute Engine API has not been used in project 123456 before or it is disabled. Enable it by visiting <https://console.developers.google.com/apis/api/compute.googleapis.com/overview?project=123456> then retry. If you enabled this API recently, wait a few minutes for the action to propagate to our systems and retry. [403] Errors [ Message[Access Not Configured. Compute Engine API has not been used in project 123456 before or it is disabled. Enable it by visiting https://console.developers.google.com/apis/api/compute.googleapis.com/overview?project=123456 then retry. If you enabled this API recently, wait a few minutes for the action to propagate to our systems and retry.] Location[ - ] Reason[accessNotConfigured] Domain[usageLimits] ] , -2146233088

### Likely Cause

The discovery service account used for has access to a GCP project that has not been set up or is disabled.

### Solution

1. Go to GCP console.
2. Go to **Compute Engine > VM Instances**.
3. Set up the compute engine

**Note:** This requires billing information.

## Discovery Consumer: Syncing Machines Failed

### Error

DiscoveryConsumer: Synchronizing Machines failed for [GCP Discovery Source]! Error: An issue was encountered during the scan. Google.Apis.Requests.RequestError Invalid value for field 'filter': 'filename="value"'. Invalid list filter expression. [400] Errors [ Message[Invalid value for field 'filter': 'filename="value"'. Invalid list filter expression.] Location[ - ] Reason[invalid] Domain[global] ] , -2146233088 Exception Caught: Google.Apis.Requests.RequestError Invalid value for field 'filter': 'filename="value"'. Invalid list filter expression. [400] Errors [ Message[Invalid value for field 'filter': 'filename="value"'. Invalid list filter expression.] Location[ - ] Reason[invalid] Domain[global] ] Attempting GCP scan for Instances Parameters are valid. Checking for permissions to list Projects.. Has permissions to list Projects.. Starting scan..

### Likely Cause

The instance scanner custom filter is not valid.

### Solution

1. In Secret Server, go to the GCP discovery source.
2. Edit the instance scanner.
3. Update the "custom filter" setting.

**Note:** See [Method: instances.aggregatedList](#) for more on filtering instances.

## Discovery Consumer: Machine Scan Completed but Computers Failed Authentication

### Error

DiscoveryConsumer: Synchronizing Machines failed for [GCP Discovery Source]! Error: An issue was encountered during the scan. Google.Apis.Requests.RequestError Invalid value for field 'filter': 'filename="value"'. Invalid list filter expression. [400] Errors [ Message[Invalid value for field 'filter': 'filename="value"'. Invalid list filter expression.] Location[ - ] Reason[invalid] Domain[global] ] , -2146233088 Exception Caught: Google.Apis.Requests.RequestError Invalid value for field 'filter': 'filename="value"'. Invalid list filter expression. [400] Errors [ Message[Invalid value for field 'filter': 'filename="value"'. Invalid list filter expression.] Location[ - ] Reason[invalid] Domain[global] ] Attempting GCP scan for Instances Parameters are valid. Checking for permissions to list Projects.. Has permissions to list Projects.. Starting scan..

### Likely Cause

The instance scanner custom filter is not valid.

### Solution

1. In Secret Server, go to the GCP discovery source.
2. Edit the instance scanner.
3. Update the "custom filter" setting.

**Note:** See [Method: instances.aggregatedList](#) for more on filtering instances.

## Invalid Grant: Account Not Found

### Error

An issue was encountered during the scan. Error:"invalid\_grant", Description:"Invalid grant: account not found", Uri:"", -2146233088

### Likely Cause

The service account does not exist in GCP. There may be a typo or it was deleted.

## Solution

1. Go to GCP console.
2. Create a service account to use. See [Task 1: Creating GCP Service Accounts](#).

## Request Error: Caller Does Not Have Permission

### Error

An issue was encountered during the scan. Google.Apis.Requests.RequestError The caller does not have permission [403] Errors [Message[The caller does not have permission] Location[ - ] Reason[forbidden] Domain[global]], -2146233088

### Likely Cause

The service account does not have permissions in IAM.

## Solution

1. Go to GCP console.
2. Select IAM.
3. Click the **Service Account** menu item to create a service account with the desire permissions. See [Task 1: Creating GCP Service Accounts](#) and [Task 2: Setting GCP Permissions](#) (#Task-2:-Setting-GCP Permissions).

## Unix Account Discovery

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Unix account discovery follows these steps:

1. During configuration, Secret Server is given a list of IP address ranges and ports on the network to scan for. See [Creating a Unix Discovery Source](#)
2. Within that range, discovery searches for computers listening on the specified ports (default is 22). The ports and other parameters are configurable via the scanners belonging to the discover source. See [Discovery Sources, Scanners, and Templates](#)
3. Secret Server then attempts to use DNS to resolve the found IPs to discover the associated computer name.
4. Secret Server saves all the collected information to its database.
5. Secret Server then attempts to connect to each computer using the provided credentials and query for a list of user accounts on the target system.

## Creating a Unix Discovery Source

Discovery sources define a set of discovery operations. You must create one based on the built-in types prior to running discovery. To do so for Unix:

### Creating the Discovery Source

1. Click **Admin > Discovery**. The Discovery Sources tab of the Discovery page appears:

Admin > Discovery

Discovery Sources Configuration Discovery Logs Computer Scan Logs

Discovery Network View Create Discovery Source Run Discovery Now

Discovery  
Last Started: 2 months, 8 days ago  
Next Run: soon

Computer Scan  
Last Started: 2 months, 8 days ago  
Next Run: soon

4 Items Include Inactive

NAME	ACTIVE	TYPE	SOURCE LAST RUN
Test_Esxi	✓	PowerShell	11/18/2020 03:32 ...
gamma.thycotic.com	✓	Active Directory	11/19/2020 03:45 ...
Gamma Linux	✓	Unix	11/18/2020 03:32 ...
AWS Discovery	✓	AWS (Amazon Web...	11/18/2020 03:32 ...

2. Note the list of existing discovery sources.
3. Click the **Create Discovery Source** button and select **Unix** to choose that discovery source type. A Discovery Source page appears for that type:




## Unix Discovery Source

[Overview](#)

### Getting Started

The Wizard will help you get Unix Discovery configured in 4 simple steps:

1. Name the Discovery Source.
2. Define the Host ranges of the IP address that you would like to scan.
3. Choose the Site used for the Discovery scanning.
4. Choose a Secret to use as credentials for scanning.



For information on public key digest validation, see the following KB article:  
<https://updates.thycotic.net/links.ashx?PublicKeyDigest>

⏮ Skip Wizard
✖ Cancel
⏭ Next

4. The page briefly summarizes what a Unix discovery Source is. The Unix setup does not allow you to skip the creation wizard. A Unix discovery source created with the wizard has the command set, ports, maximum TCP connections, and parse format settings assigned default values. You can change these by editing the discovery source scanners after finishing the wizard.

5. Click the **Next** button to continue. The Discovery Source Name wizard page appears:

## Unix Discovery Source

[Overview](#) > [Discovery Source Name](#)

### Discovery Source Name

Define the Name of the new Discovery Source



Choose a name that will help quickly identify this Discovery source in the future.

⏮ Previous
✖ Cancel
⏭ Next

6. Type an identifying, human-readable name in the **Discovery Source Name** text box.
7. Click the **Next** button. The Scan Range page of the wizard appears:

## Unix Discovery Source

[Overview](#) > [Discovery Source Name](#) > [Scan Range](#)

### IP Scan Range


The IP Address Range to scan for Unix computers.

*Examples:*

192.168.40.1/24

192.168.40.123-249

192.168.40.1-192.168.60.255



Advanced Settings that allow customization of how Unix Discovery works are available after the Wizard is complete.

Previous

Cancel

Next

- Type the desired range in the **IP Scan Range** text box using one of the listed formats. Multiple entries should each be on their own line. Host name entries are also allowed. The more precisely you specify the ranges you wish to discover Unix machines on, the faster the discovery scan will run.
- Click the **Next** button. The Add Site wizard page appears:


## Unix Discovery Source

[Overview](#) > [Discovery Source Name](#) > [Scan Range](#) > [Site](#)

### Add Site

Select the Site to be used for this Discovery Source

Local ▾



The list contains all active Sites regardless of whether they have an active Engine.

Previous

Cancel

Next

- Click the **Add Site** dropdown list to select the desired site for the discovery source. If distributed engines are setup, the list shows all active sites. If no distributed Engines are setup, the list defaults to local, and you cannot change it.
- Click the **Next** button. The Credential Secrets wizard page appears:

## Unix Discovery Source

[Overview](#) >
[Discovery Source Name](#) >
[Scan Range](#) >
[Site](#) >
[Credential Secrets](#)


### Credential Secrets

Select at least one Secret to be used as Authentication Credentials for Discovery.

[Add Secret](#)

If a suitable Secret is not already stored in Secret Server, create it below.

[Create New Secret](#)


These credentials will be used to scan for accounts in Discovery.

Previous

Cancel

Finish

12. **Either** click the **Add Secret** link to search for and click the secret you want to use for the account credentials during the scan. The popup page closes, and the selected secret appears:

### Credential Secrets

Select at least one Secret to be used

[Add Secret](#)

Fake Secret 04 [Remove](#)

**Or** create a new secret for the credentials:

1. Click the **Create New Secret** link. The New (secret) popup page appears:

**New**

**i** This folder is for work related Secrets only. Do not store personal non-work Secrets, such as your Online Banking password, in this folder.

**General**

<b>Secret Template</b>	Generic Discovery Credentials ▼	
<b>Secret Name</b> *	<input type="text"/>	
<b>Username</b> *	<input type="text"/>	
<b>Password</b> 🔒	<input type="password"/> <input type="button" value="Generate"/>	
<b>Notes</b>	<div style="border: 1px solid #ccc; height: 80px;"></div>	
<b>Private Key</b>	<input type="button" value="Choose File"/> No file chosen <input type="checkbox"/> Generate New SSH Key	
<b>Private Key Passphrase</b> 🔒	<input type="password"/> <input type="button" value="Generate"/>	
<b>Folder</b>	<input type="button" value="Folder icon"/> \Personal Folders\Will Sprunk <a href="#">Clear</a>	
<b>Inherit Secret Policy</b>	<input checked="" type="checkbox"/>	
<b>Secret Policy</b>	< No Policy >	
<b>Site</b>	Local ▼	

2. Click the **Secret Template** dropdown list and select **Generic Discovery Credentials** secret template.
3. Type or select the parameters needed for the discovery operation. Parameters with asterisks are required.
4. Click the **Save and Add New** button. The popup page disappears.
13. Click the **Add Secret** link to add any additional secret credentials. When using multiple credentials, discovery goes through the list of secrets attempting each credential until it either has a successful authentication or has run out of provided accounts. This loop is done for each computer.
14. Click the **Finish** button to complete the wizard. You are returned to the Discovery Sources page where you see the new Unix discovery source.
15. Proceed to the next section to further customize the discovery source scanners.

## Editing the Unix Discovery Source Scanners

1. Click **Admin > Discovery**. The Discovery Sources tab of the Discovery page appears:

Admin > Discovery

Discovery Sources Configuration Discovery Logs Computer Scan Logs

Discovery Network View Create Discovery Source Run Discovery Now

Discovery  
Last Started: 2 months, 8 days ago  
Next Run: soon

Computer Scan  
Last Started: 2 months, 8 days ago  
Next Run: soon

4 Items Include Inactive

NAME	ACTIVE	TYPE	SOURCE LAST RUN
Test_Esxi	✓	PowerShell	11/18/2020 03:32 ...
gamma.thycotic.com	✓	Active Directory	11/19/2020 03:45 ...
Gamma Linux	✓	Unix	11/18/2020 03:32 ...
AWS Discovery	✓	AWS (Amazon Web...	11/18/2020 03:32 ...

- In the list of existing discovery sources, click the name of the one you want to edit. The Unix discovery source's page appears, in this case, Gamma Linux.

Admin > Discovery > Gamma Linux

Discovery Source Audit Scanner Settings

Unix Edit

The default command sets that Secret Server ships with will work to discover machines and accounts in most Unix environments.

By default, the Find Non-Daemon Users (Basic Unix) command set will be used. If the built-in account should be discovered, the Discovery Source must be updated to use the Find All Users (Basic Unix) command set. New command sets can be created by clicking Configure Command Sets when on the Discovery Sources list page  
[KB Link](#)



Discovery Source Name *	Gamma Linux
Active *	Yes
Discovery Site *	Local
Machine Resolution Type *	Use Machine and Fully Qualified Name (Recommended)

- Click the **Scanner Settings** button. The Discovery Source Scanner Settings page appears:

Discovery Source Scanner Settings

FIND HOST RANGES



Add New Host Range Scanner

NAME	INPUT TEMPLATE	OUTPUT TEMPLATE	OPTIONS
Manual Host Range	Discovery Source	Host Range	 

Scanners: 1

FIND MACHINES



Add New Machine Scanner

NAME	INPUT TEMPLATE	OUTPUT TEMPLATE	OPTIONS
Unix Machine	Host Range	Computer	 

Scanners: 1

FIND ACCOUNTS


Add New Account Scanner

NAME	INPUT TEMPLATE	OUTPUT TEMPLATE	OPTIONS
Unix Non-Daemon User	Computer	SSH Local Account	 

Scanners: 1

FIND DEPENDENCIES

Add New Dependency Scanner

 Add a dependency scanner once you have a machine scanner added to the discovery source.

4. A summary of the scanner, inputs, and outputs is as follows:

**Table:** Unix Scanner Summary

I Scanner | Input Template | Output Template | | ----- | ----- | ----- | | Manual Host Range (Find Host Ranges) | Discovery Source | Host Range | | Unix Machine (Find Machines) | Host Range | Computer | | Unix User (Find Accounts) | Computer | SSH Local Account | | Unix Non-Daemon User (Find Accounts) | Computer | SSH Local Account | | SSH Public Key Scanner (Find Accounts) | Computer | SSH Public Key | | None (Find Dependencies) | None | None | [Unexpected Link Text](#) Notice that there is no dependency scanner defined, and it was not an option in the discovery source wizard used to create this scanner set, so if you want to discover dependencies, you *must* manually edit the scanner set.

**Note:** If no dependency scanners are available with an input template matching an output scan template from the previous step that has not already been used by another scanner in this step, you cannot add a dependency scanner. The output template must be unique for each scanner but the input template may be shared.

- Manual Host Range is the first scanner of the discovery source, and it is located in the Find Host Ranges section. The input template for that scanner is Discovery Source. This means the initial information comes from info you entered into the discovery source when you created it. Similarly, the output template is Host Range as you would expect.
- Click the pencil icon. The Settings - Manual Host Range page appears:

**Settings - Manual Host Range** [X]

**SECRET CREDENTIALS**

[Add Secret](#)  
[Add Secret Search Filter](#) ⓘ [Create Secret Search Filter](#)

**ADVANCED SETTINGS**

Lines

10.60.12.1/24  
10.60.19.1/24 ⓘ

✓ OK    ✕ Cancel

- Note the following:
  - The host IP ranges and credential secret could have been filled in when creating the discovery source. In this particular case, no credential secret was linked to the discovery source.
  - The Unix discovery source finds all machines and local accounts on a set of manually defined host ranges for Unix machines accessible with SSH.
  - The **Lines** text box may input multiple IP address ranges but not overlapping IP address ranges on the same discovery source. There should be one IP address range per line in the input text box.
- The next scanner, Unix Machine, is the consumer of the Computer output template, has the following configurations available:

**Settings - Unix Machine**

**SECRET CREDENTIALS**

1. gamma root

[Add Secret](#)

[Add Secret Search Filter](#) ? Create Secret Search Filter

**COMMAND SET**

Find Machines (Basic Unix)

**ADVANCED SETTINGS**

Ports  ?

Max TCP Connections  ?

Attempt Authentication ☒ ?

9. Note the following:

- Each machine is scanned using SSH and the settings defined in the scanner. To obtain more information from the machine scan, use the default custom commands and authentication and the scanner can return the OS of the Unix machine.
- The **Secrets Credentials** may be generic discovery Credentials or a Unix Account (SSH) secret. You can add multiple accounts when editing the scanner. The secret should contain a host name instead of an IP address to minimize potential problems with Secret Server or the machines associated with that account.
- The **Command Set** contains customizable Unix command sets sent over an SSH connection that are used to gather information from them machine when it is scanned. The command set is defined on the discovery scanner. To change a command set, you must create a new machine scanner.

**Note:** Click the Configure Command Sets button on the Discovery Network View page to view a list of all of the custom command sets that are available for discovery. You can select any existing command set to edit, or you can create a new one. When you create a new command set, you must give it a name and save it before you are able to enter commands.

- Commands are only run on machines when authentication is enabled and a credential secret is added to the Find Machine settings.
- The default command set is Find Machine (Basic Unix). This command set returns the OS.
- The **Ports** text box contains a comma-delimited list of port values (1-65535). SSH generally uses port 22.
- The **Max TCP Connections** text box limits the concurrent threads used for scanning your network.
- The **Attempt Authentication** check box must be selected to run commands on the machines being scanned. The credentials supplied by the secret will be used to access each machine during the scan. If the credentials are correct, the custom commands are run to extract the OS information from the machine.



10. The next scanner, Unix Non-Daemon User, has the following configurations available:

**Settings - Unix Non-Daemon User**

**SECRET CREDENTIALS**

1. gamma root

[Add Secret](#)

[Add Secret Search Filter](#) ?

Create Secret Search Filter

**COMMAND SET**

Find Non-Daemon Users (Basic Unix)

**ADVANCED SETTINGS**

Port: 22 ?

User Regex Format: ^\s\*([^\s.]+):([^\s.]\*):([^\s.]\*):{ ?

Parse Format: Username, Password, U: ?

Newline Separator Character: New Line (\n) ?

OK Cancel

11. Note the following:

- The **Secret Credentials** secret is the same one used for the Unix Machine scanner, but it is possible to use a different one.
- As earlier, the **Ports** text box is a comma-separated list of port values (1-65535). SSH generally uses port 22. The default port used when attempting to scan a machine for users. This may be overridden by a specific port found during machine scanning.
- The **User Regex Format** text box contains a regular expression that finds the lines of text received during the scan that are valid for user parsing. The matched groups in the regular expression should correspond to the comma-separated items in the parse format.
- The **Parse Format** text box defines the order of values retrieved during a scan. If the parse names match the fields defined in the imported secret, the values will be populated from the data collected on the scan.
- The **Newline Separator Character** text box defines the character that divides the lines in the output received during a scan.

12. The next scanner, SSH Public Key Scanner, has the following configurations available:

Settings - SSH Public Key Scanner

SECRET CREDENTIALS

1. gamma root

Add Secret

Add Secret Search Filter

Create Secret Search Filter

COMMAND SET

Find SSH Public Keys (Basic Unix)

ADVANCED SETTINGS

Port

22

User Regex Format

^###\s\*([^\s]+)##([^\s]+)

Parse Format

Directory, Username, File

Newline Separator Character

New Line (\n)

OK

Cancel

13. Note the following:

- The Secret Credentials secret is the same one used for the Unix Machine scanner, but it is possible to use a different one. To discover user SSH public keys, the secret user should have sudo or su permissions.
- As earlier, the Ports text box is a comma-separated list of port values (1-65535). SSH generally uses port 22. The default port used when attempting to scan a machine for users. This may be overridden by a specific port found during machine scanning.
- The User Regex Format text box contains a regular expression that finds the lines of text received during the scan that are valid for SSH public key parsing. The matched groups in the regular expression should correspond to the comma-separated items in the parse format.
- The Parse Format text box defines the order of values retrieved during a scan. If the parse names match the fields defined in the imported secret, the values will be populated from the data collected on the scan.
- The Newline Separator Character text box defines the character that divides the lines in the output received during a scan.

## Discovering SSH Public Keys

Secret Server can scan for SSH public keys on Unix machines. You can add this ability in the scanner settings section of Unix Account Discovery.

**Note:** This instruction assumes you already created a Unix account discovery source. See [Creating a Unix Discovery Source](#).

### Task 1: Viewing Discovery Scanners for the Unix Discovery Source

To view the scanners:

1. In Secret Server, click **Admin > Discovery**. The Discovery Sources tab of the Discovery page appears:

Admin > Discovery

Discovery Sources Configuration Discovery Logs Computer Scan Logs

Discovery Network View Create Discovery Source Run Discovery Now

Discovery  
Last Started: 2 months, 8 days ago  
Next Run: soon

Computer Scan  
Last Started: 2 months, 8 days ago  
Next Run: soon

4 Items Include Inactive

NAME	ACTIVE	TYPE	SOURCE LAST RUN
Test_Esxi	✓	PowerShell	11/18/2020 03:32 ...
gamma.thycotic.com	✓	Active Directory	11/19/2020 03:45 ...
Gamma Linux	✓	Unix	11/18/2020 03:32 ...
AWS Discovery	✓	AWS (Amazon Web...	11/18/2020 03:32 ...

2. Click the discovery source name link in the table for your new Unix discovery source. The Discovery Source page for it appears:

[Discovery Source](#)
[Audit](#)
[Scanner Settings](#)

**Unix**
[Edit](#)

The default command sets will work to discover machines and accounts in most Unix environments.

By default, the Find Non-Daemon Users (Basic Unix) command set will be used. If the built-in account should be discovered, the Discovery Source must be updated to use the Find All Users (Basic Unix) command set. New command sets can be created by clicking Configure Command Sets when on the Discovery Sources list page  
[KB Link](#)

**Discovery Source Name \***
IAMBugTest

**Active \***
Yes

**Discovery Site \***
Local



**Machine Resolution Type \***
Use Machine and Fully Qualified Name (Recommended)

- Click the **Scanner Settings** button in the top right of the page. The Discovery Source Scanner Settings page appears, which lists the scanners:

## Discovery Source Scanner Settings

### FIND HOST RANGES



#### + Add New Host Range Scanner

NAME	INPUT TEMPLATE	OUTPUT TEMPLATE	OPTIONS
Manual Host Range	Discovery Source	Host Range	 

Scanners: 1

### FIND MACHINES


#### + Add New Machine Scanner

NAME	INPUT TEMPLATE	OUTPUT TEMPLATE	OPTIONS
Unix Machine	Host Range	Computer	 

Scanners: 1

### FIND ACCOUNTS


#### + Add New Account Scanner

NAME	INPUT TEMPLATE	OUTPUT TEMPLATE	OPTIONS
Unix Non-Daemon User	Computer	SSH Local Account	  
SSH Public Key Scanner	Computer	SSH Public Key	  

Scanners: 2

### FIND DEPENDENCIES

#### + Add New Dependency Scanner

 Add a dependency scanner once you have a machine scanner added to the discovery source.

## Task 2: Adding the SSH Public Key Scanner for the Unix Discovery Source

1. In the **Find Accounts** section, click **Add New Account Scanner**. The Available Scanners page appears:

Available Scanners <span>✕</span>				
SELECT	NAME	BASE SCANNER	INPUT TEMPLATE	OUTPUT TEMPLATE
<input type="checkbox"/>	ESXi Local Account	ESX Discovery	Computer	ESXi Local Account
<input type="checkbox"/>	File Load Local Account	File Load Discovery	Computer	Account (Basic)
<input type="checkbox"/>	SSH Public Key Scanner	SSH Discovery	Computer	SSH Public Key
				<span>✕ Cancel</span>

- Click the **SSH Public Key Scanner**.
- Click the **Add Secret** link and choose secret(s) that have Unix sudo or su permissions for the host range selected in the discovery source. These permissions are necessary to navigate each user's home directory on a machine in search of SSH public key entries in the user's <user home directory>/ssh/authorized\_keys file.

### Task 3: Importing SSH Public Keys

From the Discovery Network View, Secret Server can import SSH public keys and potentially take over the account. The import process creates a new secret for the SSH public key in one of two ways:

- Including a provided matching SSH private key and passphrase.
- Taking over the key by creating a new key and saving the private key file and passphrase with the secret. This can be easily managed by Secret Server.

To Import an SSH public key or keys:

- Go to **Admin > Discovery**:

Admin > Discovery

Discovery Sources Configuration Discovery Logs Computer Scan Logs

Discovery Network View Create Discovery Source Run Discovery Now

Discovery  
Last Started: 2 months, 8 days ago  
Next Run: soon

Computer Scan  
Last Started: 2 months, 8 days ago  
Next Run: soon

4 Items Include Inactive

NAME	ACTIVE	TYPE	SOURCE LAST RUN
Test_Esxi	✓	PowerShell	11/18/2020 03:32 ...
gamma.thycotic.com	✓	Active Directory	11/19/2020 03:45 ...
Gamma Linux	✓	Unix	11/18/2020 03:32 ...
AWS Discovery	✓	AWS (Amazon Web...	11/18/2020 03:32 ...

2. Click the **Discovery Network View** button. The Discovery Network View page appears.

Discovery Network View

Explain

Local Accounts Public Keys Service Accounts Domain \ Cloud Accounts

Unix Discovery Source 192.168.60.0-192.168.60.255

Advanced

Search By All

Account Status All

Include Child Organization Units ☐

+ Create Rule

Column Selection

COMPUTER	ACCOUNT	SCAN TEMPLATE	OS	CONTAINER	SECRET
192.168.60.52			Linux	192.168.60.0-192.168.60.	
bsdradiusserver.te...	root	SSH Local Account	FreeBSD	192.168.60.0-192.168.60.	
bsdradiusserver.te...	toor	SSH Local Account	FreeBSD	192.168.60.0-192.168.60.	
bsdradiusserver.te...	uucp	SSH Local Account	FreeBSD	192.168.60.0-192.168.60.	

3. Click the **Public Keys** tab.

**Discovery Network View**

[Explain](#)

Local Accounts   **Public Keys**   Service Accounts   Domain \ Cloud Accounts

Unix Discovery Source  
 192.168.60.0-192.168.60.255

Advanced

Search By All ▼  
 Account Status All ▼  
 Include Child Organization Units ☐

Column Selection
 

<input type="checkbox"/>	COMPUTER	ACCOUNT ↕	SCAN TEMP
<input checked="" type="checkbox"/>	192.168.60.52		
<input type="checkbox"/>	bsdradiusserver...	mrnwosu	SSH Pub

- Click to select the public keys to import.
- Click the **Import** button. The importation wizard begins:

**Bulk Operation: Import Accounts** ✕

The account(s) will be imported as 1 new Secret(s).

[Secret](#)   Private Key >   Import Key >   Key Rotation >

**Scan Template** SSH Public Key

**Secret Type** Unix Account (SSH Key Rotation-No Password) ▼

**Folder** [Launchers](#)

**Secret Name** \$MACHINE\USERNAME Key \*

**Site** Local ▼

- Click the **Secret Type** dropdown list and select either **Unix Account (SSH Key Rotation - No Password)** or **Unix Account (Privileged Account SSH Key Rotation - No Password)**.
- Click the **Folder** link to select a folder.
- Type a name in the **Secret Name** text box. (It auto fills \$MACHINE\USERNAME Key).
- Click the **Site** dropdown list to select a site.
- Click the **Next** button. The Private Key page appears:



Bulk Operation: Import Accounts

×

The account(s) will be imported as 1 new Secret(s).

Secret

>

Private Key

Import Key

>

Key Rotation

>

☒ I have the matching private key.
   
☐ I want to change the public SSH key on the Account.

i

This will save the provided private key for the selected account(s).

← Previous

Next →

11. Click to select a selection button:

- Choose **I have the matching private key** if you want to upload a private key and passphrase known to match the public key discovered. There is a test button on the next page to verify the match.
- Choose **I want to change the public SSH key on the Account** if you wish to take over the discovered public key.

12. Click the **Next** button.

- If you chose **I have the matching private key**, the Import Key wizard page appears:

Bulk Operation: Import Accounts

×

The account(s) will be imported as 1 new Secret(s).

Secret

>

Private Key

>

Import Key

Key Rotation

>

Current private key

Choose File

Current passphrase

🔒

Public Key

ssh-rsa  
 AAAAB3NzaC1yc2EAAAADAQABAAQAC3/DJbP8Eae  
 gK0JPDGmtDy9zg332XGwYj2hhEnJ0Q22aaLcHdVs5sE  
 ZV0qixwwumlxWM/b3gYmsY0j7qwbs1BbRa06wuoi72y  
 V/7htq3EKg69+WpDXjnQa63NvOSuGH+Kbg3UHqSZuH1  
 XntiW8pvDKa4WRcOzQ5W7laAaF9+b+T2kPRqA1B1dKg  
 g30ry+y4wgxtOwoAWFi8YRx+GEFe5uKrGsuasFQWT1vv  
 R7zE6WXredmdqkx0suYvCf0JOJ29+DlIjnyppkgU4CyxR  
 dBp6vezliDh5c+7HNMr/otSy6DbQCdUEY14oxBllFyMwst  
 Pw6vKjkHeka1HNwF+rQxLiLV

Test SSH key pair match with discovered public key

← Previous

Next →

The public key chosen to import will be displayed, along with a **Choose File** button and **Current Passphrase** field. Test the key match with the public key by clicking the **Test** button below.

**Note:** You cannot import this public key if the key pair is not a match. If the private key or passphrase is unknown, use

takeover to import this public key.

**Note:** You may import multiple public keys this way if they are all identical by selecting multiple checkboxes in the Admin Network view page.

Click the **Next** button. You may add a unix sudo or su secret here for future password changing.

- If you chose the **I want to change the public SSH key on the Account** selection button, the selected secrets are all taken over and each given a random new SSH key.

13. Click the **Next** button. The Initial Takeover page appears:

Bulk Operation: Import Accounts

×

The account(s) will be imported as 1 new Secret(s).

Secret

>

Private Key

>

Initial Takeover

>

Key Rotation

i

The commands for the selected password type below will be run only on the initial take-over of the account.

Credentials

Select Secrets to be used for taking over the account(s).

ubuntu\toor Remove

Add Secret

← Previous

Next →

14. Click the **Add Secret** link to choose a Unix sudo or su secret to take over the public key on the account. This removes the public key from the user's authorized keys file and adds a new random SSH key.

15. Click the **Next** button, the **Key Rotation** page appears:

Bulk Operation: Import Accounts

×

The account(s) will be imported as 1 new Secret(s).

Secret

>

Private Key

>

Import Key

>

Key Rotation

i

When passwords for these Secrets are changed in the future, Secret Server will use the settings below.

Secret Type Unix Account (SSH Key Rotation-No Password)

Credentials

Select Secrets to be used for future password changing.

Add Secret

← Previous

🚩 Finish

16. Click the **Add Secret** link to choose a Unix sudo or su secret for future key rotations.

- Click the **Finish** button to complete the dialog and import the selected secrets.

## Task 4: Creating SSH Public Key Import Rules

Discovery rules automatically create secrets and send emails when local accounts or public keys match the rule. To create a rule to import discovered SSH public keys:

- In Secret Server, click **Admin > Discovery**. The Discovery Sources tab of the Discovery page appears:

Admin > Discovery

Discovery Sources Configuration Discovery Logs Computer Scan Logs

Discovery Network View Create Discovery Source Run Discovery Now

Discovery  
Last Started: 2 months, 8 days ago  
Next Run: soon

Computer Scan  
Last Started: 2 months, 8 days ago  
Next Run: soon

4 Items Include Inactive

NAME	ACTIVE	TYPE	SOURCE LAST RUN
Test_Esxi	✓	PowerShell	11/18/2020 03:32 ...
gamma.thycotic.com	✓	Active Directory	11/19/2020 03:45 ...
Gamma Linux	✓	Unix	11/18/2020 03:32 ...
AWS Discovery	✓	AWS (Amazon Web...	11/18/2020 03:32 ...

- Click the **Discovery Network View** button. The Discovery Network View page appears:

**Discovery Network View**

[Explain](#)

Local Accounts   Public Keys   Service Accounts   Domain \ Cloud Accounts

Unix Discovery Source  
192.168.60.0-192.168.60.255

Advanced

Search By: All

Account Status: All

Include Child Organization Units: ☐

**+ Create Rule**

Column Selection

<input type="checkbox"/>	COMPUTER	ACCOUNT	SCAN TEMPLATE	OS	CONTAINER	SECRET
<input checked="" type="checkbox"/>	192.168.60.52			Linux	192.168.60.0-192.168.60.	
<input type="checkbox"/>	bsdradiusserver.te...	root	SSH Local Account	FreeBSD	192.168.60.0-192.168.60.	
<input type="checkbox"/>	bsdradiusserver.te...	toor	SSH Local Account	FreeBSD	192.168.60.0-192.168.60.	
<input type="checkbox"/>	bsdradiusserver.te...	uucp	SSH Local Account	FreeBSD	192.168.60.0-192.168.60.	

3. Click the **Public Keys** tab:

**Discovery Network View**

[Explain](#)

Local Accounts   **Public Keys**   Service Accounts   Domain \ Cloud Accounts

Unix Discovery Source  
192.168.60.0-192.168.60.255

Advanced

Search By: All

Account Status: All

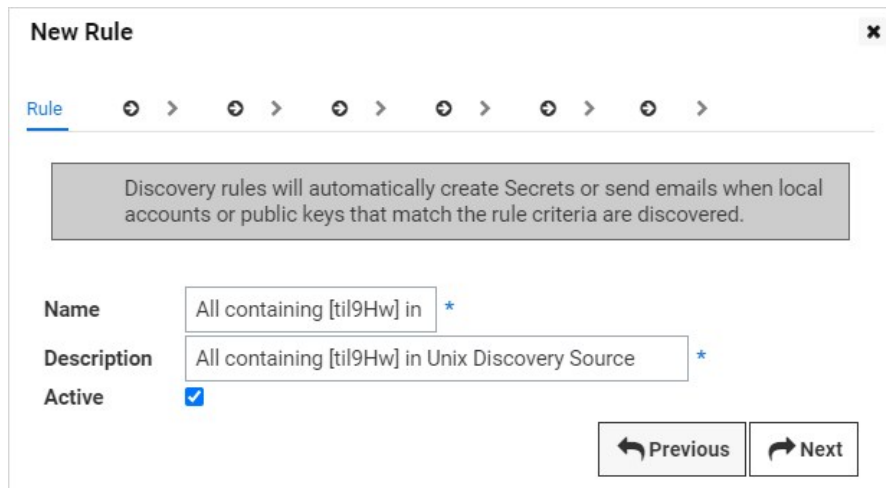
Include Child Organization Units: ☐

**+ Create Rule**

Column Selection

<input type="checkbox"/>	COMPUTER	ACCOUNT	SCAN TEMPLATE
<input checked="" type="checkbox"/>	192.168.60.52		
<input type="checkbox"/>	bsdradiusserver...	mrnwosu	SSH Pub

4. Click the **Create Rule** button. The New Rule wizard begins:



**New Rule** [X]

Rule [Progress Indicators]

Discovery rules will automatically create Secrets or send emails when local accounts or public keys that match the rule criteria are discovered.

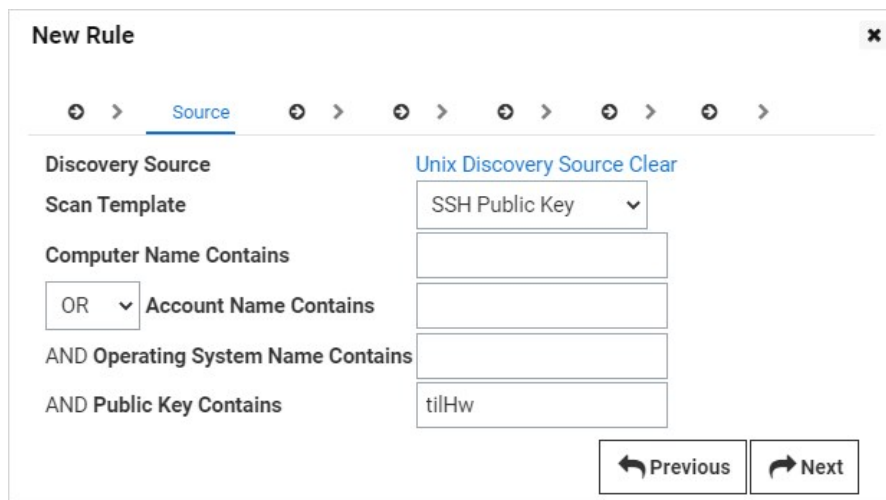
**Name** All containing [til9Hw] in \*

**Description** All containing [til9Hw] in Unix Discovery Source \*

**Active** ☒

Previous Next

5. Type a rule name in the **Name** text box.
6. Type a description for the rule in the **Description** text box.
7. Ensure the **Active** check box is selected.
8. Click the **Next** button. The **Source** page of the wizard appears:



**New Rule** [X]

[Progress Indicators] Source [Progress Indicators]

**Discovery Source** Unix Discovery Source Clear

**Scan Template** SSH Public Key ▾

**Computer Name Contains** [Text Box]

OR ▾ **Account Name Contains** [Text Box]

**AND Operating System Name Contains** [Text Box]

**AND Public Key Contains** tilHw

Previous Next

9. Select or type in the filter criteria as desired. Accounts or public keys matches are found during the next discovery run and are imported as secrets.
10. Click the **Next** button. The **Secret** page of the wizard appears:

**New Rule**

Secret

Create Secrets ☒

Secret Type Unix Account (SSH Key Rotation-No Password) ▾

Folder [Launchers](#)

Secret Name \$MACHINE\USERNAME \*

New Secret Permissions New Secrets copy permissions from folder ▾

Site Local ▾

Previous Next

11. Click the **Secret Type** dropdown list and select either **Unix Account (SSH Key Rotation - No Password)** or **Unix Account (Privileged Account SSH Key Rotation - No Password)**.
12. Click the **Folder** link to select a folder.
13. Type a name in the **Secret Name** text box (It auto fills \$MACHINE\USERNAME Key).
14. Click the **New Secret Permissions** dropdown list to choose how permissions are propagated for the new secret.
15. Click the **Site** dropdown list to select a site.
16. Click the **Next** button. The **Private Key** page of the wizard appears:

**New Rule**

Private Key

☒ I have the matching private key.

☐ I want to change the public SSH key on the Account.

**i** This will save the provided private key for the selected account(s).

Previous Next

17. Click to select a selection button:
  - Choose **I have the matching private key** if you want to upload a private key and passphrase known to match the public key discovered.
  - Choose **I want to change the public SSH key on the Account** if you wish to take over the discovered public key.
18. Click the **Next** button.
  - If you chose **I have the matching private key**, the Import Key wizard page appears:

The screenshot shows the 'New Rule' wizard with the 'Import Key' step selected. The interface includes a progress bar at the top with several steps, each with a circular icon and a right-pointing arrow. The 'Import Key' step is highlighted in blue. Below the progress bar, there are two input fields: 'Current private key' with a 'Choose File' button and a red asterisk, and 'Current passphrase' with a lock icon and a text box. Below these fields, the text 'Public Key Contains' is followed by 'tilHw'. At the bottom right, there are two buttons: 'Previous' with a left arrow and 'Next' with a right arrow.

1. Click the **Choose File** button to select a key file. Type the passphrase in the **Current passphrase** text box.

**Note:** Public keys matching the filter will not be imported if the private key and passphrase provided are not a valid match. If you do not know the private key or passphrase is unknown, use takeover to import these public keys.

2. Click the **Next** button.
  3. Click the **Add Secret** link to add an optional Unix sudo or su secret for future password changing.
  4. Click the **Next** button. The Key Rotation page of the wizard appears (see below).
- If you chose the **I want to change the public SSH key on the Account** selection button, an initial takeover page appears:

The screenshot shows the 'New Rule' wizard with the 'Initial Takeover' step selected. The progress bar at the top has the 'Initial Takeover' step highlighted in blue. Below the progress bar, there is a blue information box with a white 'i' icon and the text: 'The commands for the selected password type below will be run only on the initial take-over of the account.' Below this box, the section 'Credentials' is followed by the text 'Select Secrets to be used for taking over the account(s).' and a list of secrets: 'ubuntu\toor Remove'. Below the list, there is a link 'Add Secret'. At the bottom right, there are two buttons: 'Previous' with a left arrow and 'Next' with a right arrow.

1. Click the **Add Secret** link to add a Unix sudo or su secret to take over the public key on a discovered account. This will remove the public key from the user's authorized keys file and adds a new random SSH key.
2. Click the **Next** button. The Key Rotation page of the wizard appears.

**New Rule**

< >

< >

< >

< >

< >

Key Rotation

< >

When passwords for these Secrets are changed in the future, Secret Server will use the settings below.

**Secret Type** Unix Account (SSH Key Rotation - No Password)

**Credentials**  
Select Secrets to be used for future password changing.  

ubuntu\toor Remove

[Add Secret](#)

Previous

Next

- Click the **Add Secret** link to add an optional Unix sudo or su secret for future key rotation.
- Click the **Next** button. The **Alerts** page of the wizard appears:

New Rule

Alerts

ACCOUNTS FOUND

Send Email Alert for Accounts Found

☐

LIMIT DISCOVERY TAKE-OVER IMPORT

i

If the number of accounts that will be taken over exceeds the max threshold, the import is cancelled and the subscribed users below are notified by email.

Take-Over Threshold

1000

\*

SUBSCRIBED USERS

☒ Notify Discovery Administrator(s)

☐ Notify Subscribed User(s)

Previous

Finish

- Click to select the **Send Email Alert for Accounts Found** check box if you want an email alert if public keys found during discovery matched the rule and were successfully imported.
- Type a number in the **Take-Over Threshold** text box if you want to limit the number of accounts imported.



23. Click to select the **Subscribed Users** selection button to chose who gets notified.
24. Click the **Finish** button to save the rule. The rule is evaluated the next time discovery runs.
25. Return to the Discovery Network View page.
26. Click **View Rules** to see a list of rule for your discovery source.

## VMware ESX/ESXi Account Discovery

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

During configuration, Secret Server is given a list of IP addresses or computer names that correspond to ESX or ESXi servers. Secret Server then connects to each server using the provided credentials to query for a list of user accounts on the target system.

## Creating an ESX/ESXi Discovery Source

Discovery sources define a set of discovery operations. You must create one based on the built-in types prior to running discovery. To do so for ESX/ESXi:

1. Click **Admin > Discovery**. The Discovery Sources tab of the Discovery page appears:

Admin > Discovery

Discovery Sources Configuration Discovery Logs Computer Scan Logs

Discovery Network View Create Discovery Source Run Discovery Now

Discovery  
Last Started: 2 months, 8 days ago  
Next Run: soon

Computer Scan  
Last Started: 2 months, 8 days ago  
Next Run: soon

4 Items Include Inactive

NAME	ACTIVE	TYPE	SOURCE LAST RUN
Test_Esxi	✓	PowerShell	11/18/2020 03:32 ...
gamma.thycotic.com	✓	Active Directory	11/19/2020 03:45 ...
Gamma Linux	✓	Unix	11/18/2020 03:32 ...
AWS Discovery	✓	AWS (Amazon Web...	11/18/2020 03:32 ...

2. Note the list of existing discovery sources.
3. Click the **Create Discovery Source** button and select **VMware ESX/ESXi** to choose that discovery source type. A Discovery Source page appears for that type:

ESX Discovery Source

Overview

**Getting Started**

The Wizard will help you get ESX/ESXi Discovery configured in 4 simple steps:

1. Name the Discovery Source.
2. Define the IP addresses of the ESX/ESXi Servers.
3. Choose the Site used for Discovery scanning.
4. Choose a Secret to use as credentials for scanning.

Skip Wizard Cancel Next

4. The page briefly summarizes what an ESX/ESXi discovery Source is. The ESX/ESXi setup does not allow you to skip the creation wizard.

A Unix discovery source created with the wizard has the setting assigned a default value. You can change these by editing the discovery source after finishing the wizard.

- Click the **Next** button to continue. The Discovery Source Name wizard page appears:

The screenshot shows the 'ESX Discovery Source' wizard with the 'Discovery Source Name' step selected. The breadcrumb trail is 'Overview > Discovery Source Name'. The title is 'Discovery Source Name' with the instruction 'Define the Name of the new Discovery Source'. There is an empty text input field. A blue information box contains the text: 'Choose a name that will help quickly identify this Discovery source in the future.' At the bottom are three buttons: 'Previous' (with a left arrow), 'Cancel' (with an X), and 'Next' (with a right arrow).

- Type an identifying, human-readable name in the **Discovery Source Name** text box.
- Click the **Next** button. The Servers page of the wizard appears:

The screenshot shows the 'ESX Discovery Source' wizard with the 'Servers' step selected. The breadcrumb trail is 'Overview > Discovery Source Name > Servers'. The title is 'ESX/ESXi Server IP Address/DNS Name' with the instruction 'Enter the IP Addresses or DNS Names of the ESX/ESXi Servers to scan for accounts. Enter one per line.' Below this is an example of three lines of input: '192.168.40.124', '192.41.50.205', and 'ESXSVR01'. There is a large text input area with a small icon in the bottom right corner. A blue information box contains the text: 'Advanced Settings that allow customization of how ESX Discovery works are available after the Wizard is complete.' At the bottom are three buttons: 'Previous' (with a left arrow), 'Cancel' (with an X), and 'Next' (with a right arrow).

- Type IP address or DNS name in the **ESX/ESXi Server IP Address/DNS Name** text box. Multiple entries should each be on their own line.
- Click the **Next** button. The Add Site wizard page appears:

**ESX Discovery Source**

Overview > Discovery Source Name > Servers > Site

**Add Site**  
Select the Site to be used for this Discovery Source

Local ▼

*The list contains all active Sites regardless of whether they have an active Engine.*

Previous Cancel Next

- Click the **Add Site** dropdown list to select the desired site for the discovery source. If distributed engines are setup, the list shows all active sites. If no distributed Engines are setup, the list defaults to local, and you cannot change it.
- Click the **Next** button. The Credential Secrets wizard page appears:

**ESX Discovery Source**

Overview > Discovery Source Name > Servers > Site > Credential Secrets

**Credential Secrets**  
Select at least one Secret to be used as Authentication Credentials for Discovery.

[Add Secret](#)

If a suitable Secret is not already stored in Secret Server, create it below.  
[Create New Secret](#)

*These credentials will be used to scan for accounts in Discovery  
You may need to install the VMware vSphere PowerCLI 5.5 Release 2. Please read this KB article:  
<https://updates.thycotic.net/link.ashx?VMWarePasswordChanging>*

Previous Cancel Finish

- Either** click the **Add Secret** link to search for and click the secret you want to use for the account credentials during the scan. The popup page closes, and the selected secret appears:

**Credential Secrets**  
Select at least one Secret to be used

[Add Secret](#)

Fake Secret 04 [Remove](#)

**Or** create a new secret for the credentials:

1. Click the **Create New Secret** link. The New (secret) popup page appears:

**New**

**This folder is for work related Secrets only. Do not store personal non-work Secrets, such as your Online Banking password, in this folder.**

General

Secret Template: Generic Discovery Credentials

Secret Name: \*

Username: \*

Password: \* Generate

Notes:

Private Key: Choose File No file chosen ☐ Generate New SSH

Private Key Passphrase: \* Generate

Folder: \Personal Folders\Will Sprunk Clear

Inherit Secret Policy: ☒

Secret Policy: < No Policy >

Site: Local

Save Save and Share Save and Add New Cancel

2. Click the **Secret Template** dropdown list and select **Generic Discovery Credentials** secret template.
3. Type or select the parameters needed for the discovery operation. Parameters with asterisks are required.
4. Click the **Save and Add New** button. The popup page disappears.
13. Click the **Add Secret** link to add any additional secret credentials. When using multiple credentials, discovery goes through the list of secrets attempting each credential until it either has a successful authentication or has run out of provided accounts. This loop is done for each computer.
14. Click the **Finish** button to complete the wizard. You are returned to the Discovery Sources page where you see the new ESX/ESXi discovery source.

## VMware ESX/ESXi Account Discovery and RPC Configuration

**Note:** Please see the [Discovery Topic](#) for a comprehensive guide to configuring and using discovery.

### Overview

The ESX/ESXi (API) password changer verifies (using heartbeat) and changes VMware ESX/ESXi passwords via the vSphere API. Password changing and discovery for Secret Server 10.6 and later requires PowerCLI 6.5.1 or higher.

Either PowerCLI 6.5.1 or higher must be installed on the servers running discovery or your local Secret Server machine or machines running distributed engine. Earlier versions of the password changer are now deprecated.

**Important:** VMware PowerCLI 11.5 does not work due to VMware.Binding.WsTrust.dll file missing from the directory.

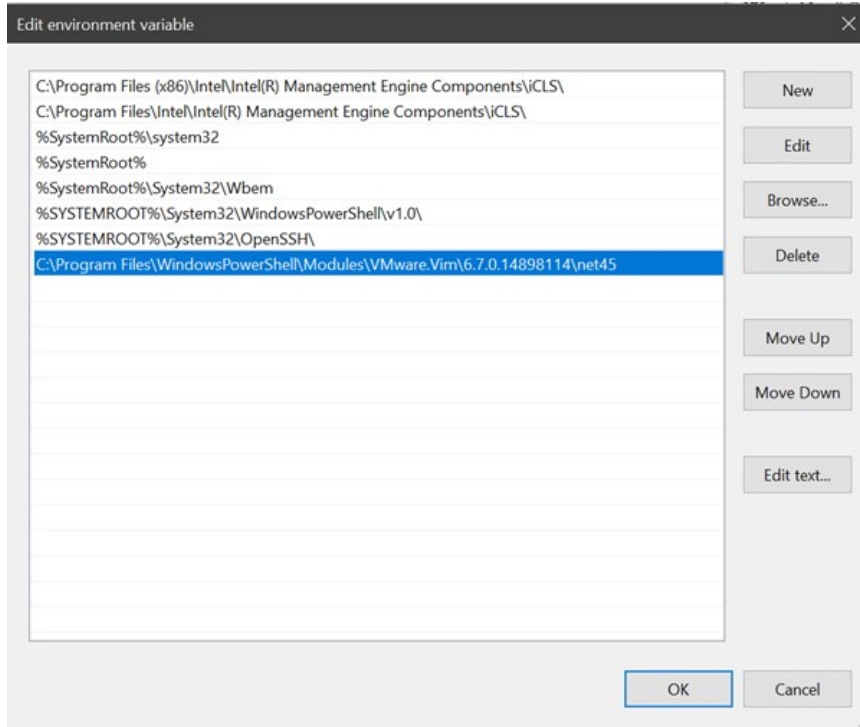
### Details

Secret Server searches the machine's Windows path PATH for the VMWare SDK, therefore installing the correct version of it is all that is needed. On the machine you install VMware PowerCLI, update the Windows "Path" environment variable to include the folder where the file VMware.Vim.dll is located.

**Note:** After installing the VMware PowerCLI, the default installation path is: C:\Program Files\WindowsPowerShell\Modules\VMware.Vim\[version]\net45. The PowerCLI installation path **must be** in the system PATH variable.

To edit your PATH:

1. Add C:\Program Files\WindowsPowerShell\Modules\VMware.Vim\[version]\net45 to the PATH using the system panel (sysdm.cpl).
2. From the **System Properties** dialog, select **Advanced** tab
3. Click **Environment Variables...**
4. Under the **System Variables** section, highlight **Path** then **Edit**. The Edit Environment Variable dialog box appears:



5. Click the **New** button
6. Type C:\Program Files\WindowsPowerShell\Modules\VMware.Vim\[version]\net45, similar to the example above:
7. Click the **OK** button when done.

## Download Locations

Download supported versions of PowerCLI from VMware:

[VMware PowerCLI 11.4.0](#)

## Troubleshooting and Issues

- The error "The VMware VIM API is not installed or is the wrong version" indicates that PowerCLI needs to be installed.
- We recommend not using an outdated SDK with an updated version of VMWare.
- Secret Server's VMWare password changer rejects self-signed SSL certificates. Make sure your VMWare servers have valid SSL certificates (see below for settings).
- The error "Exception: The remote certificate is invalid according to the validation procedure" indicates that vCenter server root certificates needs to be installed. More info [here](#).
- For Secret Server installed editions, you may need to restart the Secret Server website after installing PowerCLI. Do this by recycling the Secret Server application pool or performing an IIS reset.
- For distributed engines, the distributed engine service may need to be restarted after PowerCLI is installed.

## ESXi Certificate Settings



**Note:** VMware recommends not including a CRL/CDP in certificate templates. To that end, we recommend adding the X509RevocationMode.NoCheck option to the ESXi.CertificateChainPolicyOptions setting.

Delinea added a configuration option for Secret Server to allow ESXi TLS connections to ignore self-signed certificates, allow certificates from specific issuers (even if issuer is not in trusted certificate lists), or completely skip certificate validation when using ESXi password changer, heartbeat, or discovery.

**Important:** For security reasons, we do **not** encourage customers to use self-signed certificates. Therefore, the new configuration settings listed below are not accessible through the UI. If you need to alter the default ESXi certificate validation settings, **submit a case through Delinea's Support Portal** for assistance.

New advanced configuration settings include:

- **ESXi.IgnoreSelfSignedCerts:** If true, ignores any self-signed certs (subject = issuer) from ESXi hosts during heartbeat, RPC, and discovery.
- **ESXi.CertIssuersToIgnore:** Semi-colon delimited list of issuer names (in format shown on certificate---such as "O=Issuer Name"). Ignores partial chain errors due to certificate being issued by any issuer in this list when that issuer is not in the trusted root or intermediate CAs lists on the server.
- **ESXi.IgnoreAllCertErrors:** If true, certificate validation will not be performed. All certificate errors will be ignored.
- **ESXi.CertificateChainPolicyOptions:** Identical to TLS Audit option, but specifically for ESXi. Allows setting X509 options to be applied to certificate validation. This is a comma-delimited list of options. See TLS Auditing or the Details section for more information.
- **ESXi.ClientCertificateIds:** identical to TLS Audit option, but specifically for ESXi. If ESXi host requires the client to present a valid certificate, this is a semi-colon delimited list of client certificates on the server to try to present.
- **ESXi.AuditTlsErrorsDebug:** Identical to TLS Audit option, but specifically for ESXi. If set to true and Secret Server (or DE) auditing is set to DEBUG, detailed debug messages about the certificate chain will be written to the log file.
- **ESXi.IgnoreDefaultHostCert:** Sets all the TLS configuration options necessary to not fail due to a default ESXi host certificate and its issuer not being in the trusted certificates lists. This is a combination of setting the issuer to ignore and not performing a revocation check. Setting this to true should be the first change to make when attempting to resolve heartbeat, RPC, or discovery issues to ESXi hosts when using PowerCLI versions later than 5.5.

**Note:** Issues with self-signed certificates previously implemented by customers were caused by a security update to the VMware vSphere PowerCLI in versions after 5.5 that no longer permits the use of self-signed certificates.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

The sub-topics of this contain information that is common to discovery on all platforms.

## Account Permissions for Discovery

### Unix

#### Local Accounts

The scanning account needs to be able to connect over SSH and read the contents of `/etc/passwd`. If discovery needs to take over an account then the scanning account will also need the ability to run `sudo passwd <username>`

#### SSH Public Keys

The scanning account needs the ability to login and execute `sudo` without a password prompt.

**Note:** Please see [Discovering SSH Public Keys](#) for more information.

### ESXi

The scanning account needs "Shell Access" and the "Query VRM Policy" permission.

#### Local Windows Accounts

The scanning account needs the "Access This Computer From the Network" permission (and possibly one more) on the endpoint:

1. Open the local group policy editor (`gpedit.msc`).
2. Go to **Computer Configuration > Windows Settings > Security Settings > Local Policies > Security Options**.
3. Double-click the **Access this computer from the network** policy. The properties for the policy appears.
4. Ensure the scanning account is one of the listed users. If not, click the **Add User or Group** button to add it.

**Important:** Modifying this policy may overwrite or remove access to the device for remote processes. This policy is not usually configured by default, so any existing inherited permissions could be overwritten.

5. Look at the following list of operating systems and updates to determine if any of them match your system:

- Windows 10, version 1607 and later
- Windows 10, version 1511 with [KB 4103198](#) installed
- Windows 10, version 1507 with [KB 4012606](#) installed
- Windows 8.1 with [KB 4102219](#) installed
- Windows 7 with [KB 4012218](#) installed
- Windows Server 2019
- Windows Server 2016
- Windows Server 2012 R2 with [KB 4012219](#) installed
- Windows Server 2012 with [KB 4012220](#) installed
- Windows Server 2008 R2 with [KB 4012218](#) installed

**Note:** For more information on this security issue, see [Network access: Restrict clients allowed to make remote calls to SAM](#).

6. If you found a match, do the following too:

1. Go to **Computer Configuration > Windows Settings > Security Settings > Local Policies > Security Options**.
2. Double-click the **Network access: Restrict clients allowed to make remote calls to SAM** policy. The policy properties appear.

3. Click the **Edit Security** button to select an account for the Security descriptor text box. The Security Setting for Remote Access to SAM dialog box appears.
4. Ensure the scanning account is present (if not add it).
5. Click the account in the **Group or user names** list. The permissions for that account appear.
6. Ensure the **Allow** check box next to the **Remote Access** permission is selected.
7. Click the **OK** button.

**Note:** The discovery account must be part of the local admin's group to be able to pull back any local accounts.

## Windows Services, Scheduled Tasks, App Pools, and COM+ Applications

**Note:** There are special considerations for discovering service accounts running COM+ Applications, please see [COM+ Dependency Scanner](#).

To scan for service accounts, the account entered must be a domain account that is in the Administrators group on the target machines. Follow the instructions below in either case to ensure your account has the appropriate privileges to run a successful scan:

1. Open the group policy editor for your domain policy.
2. Go to **Computer Configuration > Preferences > Control Panel Settings**.
3. Right-click **Local Users and groups** and select **New > Local Group**.
4. Leave the **Action** dropdown list set to **Update**.
5. Click to select **Administrators (Built-in)** in the **Group Members** dropdown list.
6. Click the **Add...** button.
7. Search for the account you will use for discovery scanning.
8. Click the **OK** button to save your changes. The next time the group policy updates across your environment, the discovery account will be part of the local administrators group.
9. For strong security, configure the group policy to limit the logon privileges of that account:
  1. Open the group policy editor
  2. For your domain policy, go to **Computer Configuration > Policies > Windows Settings > Security Settings > Local Policies > User Rights Assignment**.
  3. Add your discovery account to the **Deny log on locally** policy.
  4. Add your discover account to the **Deny log on through Remote Desktop Services** policy.
  5. (Optional) Ensure the account is not part of the remote desktop users group.

## Discovery Best Practices

### Overview

This document covers the most common settings to tune to make discovery more efficient. Environmental factors contribute to some these settings.

### Global Settings

The settings below might make discovery more efficient, regardless an organization's size.

### Enabling Port Scanning

#### Introduction

*Port scanning* is a scan that can be conducted before the regular discovery scan to potentially reduce discovery time—if specified ports are unavailable on a given machine, the standard discovery scan will eventually timeout (the default is five minutes). Port scanning eliminates that timing out process, which saves time.

**Figure:** Edit Discovery Scanner for Windows Local Accounts

Edit Discovery Scanner - Windows Local Accounts

ADVANCED SETTINGS

Get Additional Local Account Info
☐
?

Local Account Discovery Method
Remote Procedure Call (RPC)
?

Scanner Timeout (minutes)
5
?

Port Scan Enable
☐
?

Port Scan Timeout
30
?

Port Scan List
135,445
?

Exclude By Name List (semi-colon)
?

OK

Cancel

Port scanning for discovery has three configurations or controls:

- Port Scan Enable: Whether to port scan at all. Defaults to unchecked.
- Port Scan Timeout: How long (in seconds) the port scan will try before giving up. Defaults to 30.
- Port Scan List: A comma-delimited list of ports to scan. These depend on the configuration of the systems you will scan. Defaults to NetBIOS (135) and Active Directory services (445).

Examples of scanners that have a port-scanning timeout option for Active Directory include:

- Windows local accounts
- Active Directory user accounts
- All dependency scanners

## Accessing Port Scanning

Simply go to **Admin > Discovery Configuration > Edit Discovery Sources (button) > Configure Discovery Scanners (button) > Accounts (tab)**, and then click the pencil icon for the desired scanner. If the configurations are on that page, that scanner supports port scanning. See the previous figure.

## Additional Reasons to Consider Discovery Port Scanning

### Lowering the Discovery Scanner Timeout May Cause Issues

If you lower the regular discovery scanner timeout, without port scanning enabled, you may kill a running scan. In addition, non-Active-Directory discovery scanners, such as a custom PowerShell scanner, that are slow or prone to hanging may also be disrupted or even crash if the regular discovery scanner timeout is set too low. As a best practice, we recommend enabling port scanning and not lowering the regular scanner timeout, which defaults to five minutes, unless Delinea Support asks you to. Do not lower the port scanning timeout below 15 seconds.

### Secrets with Multiple Dependencies May Create Especially Long Timeouts

Without discovery port scanning enabled, discovery scanners rely on the standard timeout, which defaults to five minutes. If a secret has multiple dependencies, the system may have a chain of discovery timeouts to process, one at a time. With the default five-minute timeout on all the systems, timing out can take a long time, especially if you have a lot of machines turned off or unavailable. Discovery port scanning greatly reduces that.

To calculate the maximum timeout for discovery use this formula (with all systems using the same timeout value and each secret having the same number of dependencies):

$$(\text{number of secrets}) \times (\text{number of dependencies}) \times (\text{timeout value}) = (\text{maximum minutes for discovery scans})$$

For example, using the default five-minute timeout value for 35 secrets, each with three dependencies:

$$35 \times 3 \times 5 = 525$$

Thus, 8.75 hours (525 ÷ 60) of timeout are possible and enabling discovery port scanning becomes a really good idea, especially if you have a lot of machines down at any given time.

**Note:** We can ignore clustered objects as part of a discovery scan, but we cannot ignore disabled computer objects, so Secret Server tries to scan each object that exists within AD. If you have a centralized area for disabled computer objects, consider configuring discovery to be OU specific and excluding your disabled computers OU to make discovery more efficient.

## When to Run Discovery

Currently, you cannot set when discovery runs via a control or setting. You can, however, approximately set when it runs by disabling and enabling it at the desired time. It runs daily around the same time as when it was first enabled and then again according to whatever the [discovery scan offset hours](#) interval was set to. If you are running discovery once per day, we suggest:

- Choosing a start time outside your normal business hours, such as midnight.
- First running several ad-hoc discoveries when your network traffic normally drops at the end of the day. Record how long each discovery process takes. Remember, this can vary greatly if a lot of machines are down, which is why we suggest conducting more than one discovery.


**Note:** It might be fun to run one test with discovery port scanning disabled, just to see the difference.

- Using the average time the test runs took, calculate when to start discovery at a time when no anticipated portion of the discovery period is during your high-traffic times. We suggest having an end buffer as long as possible to account for variability, so if your average discovery time is fairly long, it might be best to start discovery soon after your network traffic drops off for the evening. This is especially true if your machine pool is growing.

For example, if your tested average discovery time was four hours and your network traffic is busy between 0600 and 1800, you should run discovery between 1800 and 0200, the closer to 1800 the better.

## Discovery Settings

**Figure:** Discovery Settings Page

Discovery Sources	Configuration	Discovery Logs	Computer Scan Logs
<div>Discovery <a href="#">Edit</a></div> <p>Discovery is used to scan for machines, local accounts and dependencies on Active Directory, Unix systems, and VMware ESX servers, AWS, and GCP. Discovery is easy to set up and provides a great range of customizations for specific network requirements.</p> <p><a href="#">Learn More</a> </p>			
Enable Discovery		Yes	
Discovery Interval Days		0	
Discovery Interval Hours		1	
Ignore Cluster Node Objects		No	
Discovery Scan Offset Hours		0	
Days to Keep Operational Logs		30	
Deactivate Dependency Not Found Threshold		1	

The settings are:

- Discovery interval for days and hours: How often you want the regular discover scan to occur.
- Ignore Cluster Node Objects: Tells Secret Server to not run discovery on machines identified as "msclustervirtualserver." Do not change this setting.
- See [Discovery Scan Offset Hours](#) for a discussion of the last setting.
- Deactivate Dependency Not Found Threshold: If set to 0, this setting means we will never disable dependencies if they are not found during a scan. If set to a higher number, it means the number of times that we will miss the dependency before deleting the dependency.

**Note:** There is another "Discovery Batch Size" setting on the Advance Settings page, which is usually only available to Delinea Customer Support. This setting, too, is legacy, and should not be set.

## Environment-Specific Considerations

### Discovery Scan Offset Hours

This section discusses a setting that allows you to quickly discover changes without greatly increasing traffic.

**Figure:** Discovery Settings Page in View Mode

DISCOVERY SETTINGS	
Enable Discovery	Yes
Synchronization Interval for Discovery	1 day 0 hours
Ignore Cluster Node Objects	No
Engine AD Discovery Batch Size	1
Discovery Scan Offset Hours	0

The "discovery scan offset hours" (DSOH) setting is for customers that need to detect new (to the network) systems quickly without excessive network traffic during business hours. For example, you might need this feature if you have lots of server testing (systems are up and down) or laptops (systems are connected or not). The trick is doing this while minimizing the networking load.

We accomplish this with discovery scan offsets. With these, you have multiple synchronization scans per day, rather than just one, where Secret Server attempts to scan each and every system, but first Secret Server looks up each system to see if that system is flagged for scanning. The process goes like this:

1. Initially, Secret Server scans each discovered system and resets its DSOH timer, which is set to the number of hours defined by the DSOH setting value. Secret Server has a separate timer for each scanned system.
2. Once set, each timer starts counting down. Until that timer runs out, Secret Server ignores the scanned system if it runs a discovery scan.
3. When the timer is finished, the system is again flagged for scanning.
4. The next time Secret Server does a discovery scan, it sees the flag is present and scans the system.

The period the "scan me" flag is down (the period the timer is running) is defined by the DSOH setting. Thus, DSOH essentially tells Secret Server how long before scanning that discovered system again.

For example, if you have a discovery scan offset of 12 hours and a discovery interval of four hours:

1. Start: The first time discovery runs, it scans every object because each one's timer is zeroed out, which makes it flagged for scanning. After scanning, each object's timer starts to count down, which makes it unflagged for scanning.



2. At four-hours: The next time discovery runs , it ignores the objects that were scanned the first time (because their timer was set to 12 hours), but it does process any newly discovered objects.
3. At eight-hours: In four more hours the same happens—only new objects are processed.
4. At 12 Hours: In four more hours, the scan runs again. This time, the 12-hour scan offset has expired, and all the timers of the original objects are zeroed out. The process begins anew—discovery scans every object because its timer is zeroed out, which makes it flagged for scanning. After scanning, each object's timer starts to count down, which makes it unflagged for scanning.

## Advanced Settings

**Note:** These settings reside in the ConfigurationAdvanced.aspx file, which you should not edit unless Delinea Support asks you to.

### Run Secret Computer Matcher Once per Discovery

**Figure:** Secret Computer Matcher Once per Day

Remote Password Changing Heartbeat Interval (Seconds)	< Not Set >
Remote Password Changing: Check for DNS Mismatch	< Not Set >
Secret Computer Matcher Dependency Password Type	< Not Set >
Secret Computer Matcher Once Per Discovery	< Not Set >
Session Callback Interval (Seconds)	< Not Set >
Should Save Files to Database	< Not Set >

During the discovery process, secrets are matched with their machine. For smaller customers, this likely has little performance impact. For very large customers, the performance impact is noteworthy. We recommend that large businesses enable this option to decrease matcher resource use.

By default, the secret computer matcher runs once every five hours (this is non-configurable). This means the matcher runs four times per day, and only one of those times could coincide with discovery running at four-hour intervals. The other three will not run in tandem with discovery and thus will increase network traffic. If you enable this setting, the matcher will instead run after each discovery completes. If discovery only runs once, the matcher only runs once too. This more efficient because discovery can take hours to run, and having the matcher run several times during that period wastes processing.

### Limit the Network Traffic Caused by Nested Organizational Units

**Figure:** Discovery: Bypass "Scan Specific OUs"

Dependency Discovery: Ignore Domain Being Scanned	< Not Set >
Disable RADIUS NAS IP Address Attribute	< Not Set >
Disable SysLog Connection Caching	< Not Set >
Discovery: Bypass "Scan Specific Ous"	< Not Set >
Discovery Batch Size	< Not Set >
ESXi: Enable TLS Debugging and Connection Tracking	< Not Set >
ESXi: Certificate chain policy options	< Not Set >

If you configure discovery for Active Directory to scan by separate OUs and not by the entire domain, nested OUs can overwhelm your message bus. This occurs because each OU generates its own message unless you enable this setting. So if your enterprise has a complex tree of nested OUs, as many large businesses do, you could experience this issue. Smaller enterprises with single or a small number of nested OUs can ignore it. If you change the configuration in the Advance Configuration page file, it will affect all discovery source settings

(some scanners have a similar configuration that only affects them). Alternatively, for more flexibility, you can configure this individually at the scanner level by checking the Bypass Specific OU Scan check box on the Settings - Active Directory tab for the scanner:

**Figure:** Tuning Active Directory Settings

**Settings - Active Directory Computers**

**SECRET CREDENTIALS**

1. svc-pslab-discovery

[Add Secret](#)

[Add Secret Search Filter](#)

[Create Secret Search Filter](#)

**ADVANCED SETTINGS**

Engine Max Concurrent Discovery Threads

Bypass Specific OU Scans ☐

OK Cancel

## Engines and Engine Workers

The number of distributed engines and engine workers within your environment can affect how fast discovery completes. Increasing CPU counts on your existing engines may help them to complete a diverse set of tasks more efficiently but might not have much effect on discovery processing time. If an engine is doing discovery, only a subset of consumers run and they will run into a prefetch count limit (30 messages per engine). Thus, increasing the number of engines and engine workers might decrease total discovery time by increasing that prefetch limit.

## Discovery Error Messages

The following are common error messages received when performing discovery and their possible causes:

### User credentials cannot be used for local connections

This error typically occurs when attempting to run discovery on the server that Secret Server is running on, due to WMI restrictions.

### No AD Account Services

No services run by Active Directory accounts have been found on the machine.

### Computer is inaccessible or does not exist

Port 135 is blocked.

### The target computer could not be reached

The machine is not connected to the network.

### Access Denied

The account used to sync the domain with Secret Server does not have domain admin or local admin privileges for the machine it is attempting to scan for accounts.

### Bad parameters - Script Error: Cannot bind argument to parameter 'Message' because it is null.

There is a mismatch between parameters referenced by the script and the arguments passed in. Check the script arguments on the scanner or dependency changer against the script.

## Discovery on Non-Domain Joined or Unix Targets

## Overview

When running discovery on non-domain joined targets or Unix targets, there are two methods of finding local administrator credentials to authenticate to the target, and the methods can be used together.

- Specify a secret with an expected default password, recommended for performing an initial scan if you have a known password or key for a privileged account.
- Specify a secret search filter, recommended when you cannot use a default password because each machine's account password is unique. A Secret Search Filter dynamically searches for a secret with a name or folder location that corresponds to the target scanned. If a matching secret is found, Secret Server will authenticate to the target using the administrator credentials in the secret.

**Note:** To use a secret search filter, the administrator account names must exist as secrets in Secret Server and they must follow a regular naming pattern.

**Note:** The discovery secret search filter is available in Secret Server 10.0.000006 and newer.

## Setting Credentials on a Discovery Scanner

1. In a discovery source, click the Edit icon on a scanner.

**Settings - Active Directory Computers**

**SECRET CREDENTIALS**

1. [register-2016-gamma-admin](#)  
[Add Secret](#)  
[Add Secret Search Filter](#)

Create Secret Search Filter

**ADVANCED SETTINGS**

Engine Max Concurrent Discovery Threads: 5

Bypass Specific OU Scans: ☒

OK Cancel

2. In the Settings window, under **Secret Credentials**, choose among the following options:
  - Click **Add Secret** to specify a default credential.
  - Click **Add Secret Search Filter** to specify an existing secret search filter.
  - Click **Create Secret Search Filter** to create a new secret search filter.

Secret Server will try the secrets and secret search filters in sequence until it finds a match.

## Creating a Secret Search Filter

1. In the **Secret Credentials** section, click **Create Secret Search Filter**.

**New Secret Search Filter**

Secret Name Pattern: \$MACHINE\ssystem

Secret Template: Oracle Account

Folder: Oracle Clear

Include Subfolders: ☒

Allow Partial Match: ☐

Expect Single: ☒

Active: ☒

2. In the New Secret Search Filter window, specify a secret name pattern and settings as described below:

- **Secret Name Pattern:** Specifies the pattern that Secret Server will search for. The search is dynamic based on the target. In the example depicted in the screen shot, if scanning a machine named `appserver01`, Secret Server will also search for a secret named `appserver01\system`.
- **Secret Template:** Specifies the template that returned secrets should be based on. In the example depicted in the screen shot, only secrets based on the Oracle Account template will be returned.
- **Folder:** Specifies the folder to search within.
- **Include Subfolders:** Specifies that the search should include not only the specified folder, but the subfolders as well.
- **Allow Partial Match:** Specifies that secret names will be returned if they partially match the pattern. By default the secret name must be an exact match to the secret name pattern.
- **Expect Single:** Specifies that only one result should be returned. If more than one is returned, Secret Server will log an error to the discovery log.

3. Click **OK** and go back to your discovery source.

4. Click **Add Secret Search Filter** and select the filter you just created.

Now, when scanning a machine, Secret Server will try a default credential, and then it will try the secret returned by the search filter.

## Introduction to Discovery Sources, Scanners, and Templates

### Discovery Source

A *discovery source* is a named collective, ordered system that conducts discovery. There are five broad types: Active Directory, Amazon Web Services, Unix, VMware ESX\ESXi, and Google Cloud Platform.

Configuring discovery is defining the parameters of the discovery source, once the general type is chosen.

Each discovery source is a configurable definition of how to scan for computer assets in a given environment. A subcomponent of discovery source, called a scanner, details how to perform those scans.

### Discovery Scanner

A *discovery scanner* is a component of a discovery source that that collects information during a discovery. There are four general types of scanners, called *scan templates* (in their sequential running order):

- Find host ranges
- Find machines
- Find (local) accounts
- Find dependencies

**Note:** They are called *scan templates* because when you create an instance of a discovery source, it includes scanners based on a standardized set of scanners specific to the platform the discovery source is designed for and the type of performed scan. That is, when you create a discovery source, you are instantiating a set of scanner objects copied from a set of static templates. You cannot modify the templates, but you can modify the scanners based on them.

Thus, a discovery source consists of an ordered sequence of discovery scanners, along with some data specific to the whole discovery source. Each scanner has a defined input and output, which are also based on object templates. A discovery source can have more than one scanner of a given type.

### Discovery Input Template

The defined input type for a discovery scanner. An instance of the template contains the data needed to conduct the scan. The input template is often, but not always, an output template of the preceding scanner in the sequence. Some examples include Active Directory domain, AWS discovery source, organizational unit, and Windows computer.

### Discovery Output Template

The defined output type for a discovery scanner. An instance of the template contains the data produced by the scan. The output template is often, but not always, an input template of the next scanner in the chain. Other times, the output may be used by another non-adjacent scanner in the discovery source.

You can also have more than one scanner of the same type in the same discovery source. For example, you could have both the Windows Local Accounts and Active Directory User Accounts scanner active in the Find Accounts section. Click the + icon next to the scanner section to see what other scanners are available there.

Some examples include: Active Directory account, AWS access key, ESXi local account, host range, organizational unit, and Windows local account.

### Example

The following figure shows the data flow through the discovery source as the scanners receive and output data via input and output templates. The dataflow is as follows:

1. The original input, the domain, comes from the discovery source and was manually inputted.
2. The Active Directory Organizational Units (of type Find Host Ranges) scanner receives the domain via the Active Directory Domain input template.
3. The scan discovers the OUs of the inputted domain and returns those OUs via the Organizational Unit output template.
4. The Active Directory Computers (of type Find Machines) scanner receives the OUs from the Organizational Unit output template.
5. The scanner discovers the Windows computers belonging to the inputted OUs and returns those Windows computers via the Windows Computer output template.
6. The Windows Local Accounts (of type Find Accounts) scanner receives the Windows computers from the Windows Computer output template.
7. The scanner discovers local accounts belonging to the inputted Windows computers and returns those local accounts via the Windows Local Account output template to Secret Server *and* to the Windows Service scanner.
8. The Windows Service (of type Find Dependencies) scanner receives the Windows computers from the Windows Computer output template. This is the same input received in the last step by SS.
9. The scanner discovers Windows services belonging to the inputted Windows computers and returns those Windows services via the Windows Service output template to SS.

## Editing and Adding Discovery Scanners

Many of the discovery scanners can be edited after instantiation by the discovery source. Sometimes the editable data is the same as was originally inputted for the discovery, and sometimes it is something else altogether.

The Secret Credentials section is the same as the credential secret defined when creating the discovery source. The Advanced Settings section contains settings that were not initially configurable in the discovery scanner.

In this case, you see many default configuration settings that were not originally settable in the discovery source. For example, you can use a different credential secret or change the ports scanned by the scanner. As mentioned above, you can also add entire scanners too—that is, more than one scanner of the same type.

## Enabling Specific OU Domain Discovery

1. On the **Admin** menu click **Discovery**. The Discovery Sources tab appears:

Admin > Discovery

Discovery Sources Configuration Discovery Logs Computer Scan Logs

Discovery Network View Create Discovery Source Run Discovery Now

Discovery  
Last Started: 2 months, 10 days ago  
Next Run: soon

Computer Scan  
Last Started: 2 months, 10 days ago  
Next Run: soon

4 Items Include Inactive

NAME	ACTIVE	TYPE	SOURCE LAST RUN
Test_Esxi	✓	PowerShell	11/18/2020 03:32 pm
gamma.thycotic.com	✓	Active Directory	11/19/2020 03:45 pm
Gamma Linux	✓	Unix	11/18/2020 03:32 pm
AWS Discovery	✓	AWS (Amazon Web Ser...	11/18/2020 03:32 pm

2. Click the link for the discovery source you want to configure. The Discovery Source tab for that discovery source appears:



Admin > Discovery > gamma.thycotic.com

+

WS

Discovery Source

Audit

Scanner Settings

Active Directory [Edit](#)

Active Directory Discovery allows Secret Server to scan for Active Directory (AD) machines, Active Directory user accounts, local Windows accounts and dependencies on an AD domain. Secret Server will first discover machines from your domain; next, each machine is scanned for local Windows accounts and dependencies. By default, you can have Secret Server scan for local accounts, domain accounts, scheduled tasks, Windows services, and IIS application pools.

You can find additional accounts and dependencies by creating PowerShell scanners. PowerShell scanners are an advanced topic described in the Extensible Discovery section [KB Link](#)

Discovery Source Name *	gamma.thycotic.com
Fully Qualified Domain Name *	gamma.thycotic.com
Friendly Name *	Gamma Domain
Active *	Yes
Discovery Secret *	Gamma Domain\alwayson
Discovery Site *	Local
Discover Specific OU *	No
Machine Resolution Type *	Use Machine and Fully Qualified Name (Recommended)
Use LDAPS *	No

3. Click the Edit link next to the discovery source name. The page becomes editable:

Admin > Discovery > gamma.thycotic.com

Discovery Source

Audit

Scanner Settings

Active Directory

Active Directory Discovery allows Secret Server to scan for Active Directory (AD) machines, Active Directory user accounts, local Windows accounts and dependencies on an AD domain. Secret Server will first discover machines from your domain; next, each machine is scanned for local Windows accounts and dependencies. By default, you can have Secret Server scan for local accounts, domain accounts, scheduled tasks, Windows services, and IIS application pools.

You can find additional accounts and dependencies by creating PowerShell scanners. PowerShell scanners are an advanced topic described in the Extensible Discovery section

[KB Link](#)

Discovery Source Name \*

gamma.thycotic.com

Fully Qualified Domain Name \*

gamma.thycotic.com

Friendly Name \*

Gamma Domain

Active \*

☒

Discovery Secret \*

Gamma Domain\alwayson

Create New Secret

Clear

Discovery Site \*

Local

Discover Specific OU \*

☐

Machine Resolution Type \*

Use Machine and Fully Qualified Name (Recommended)

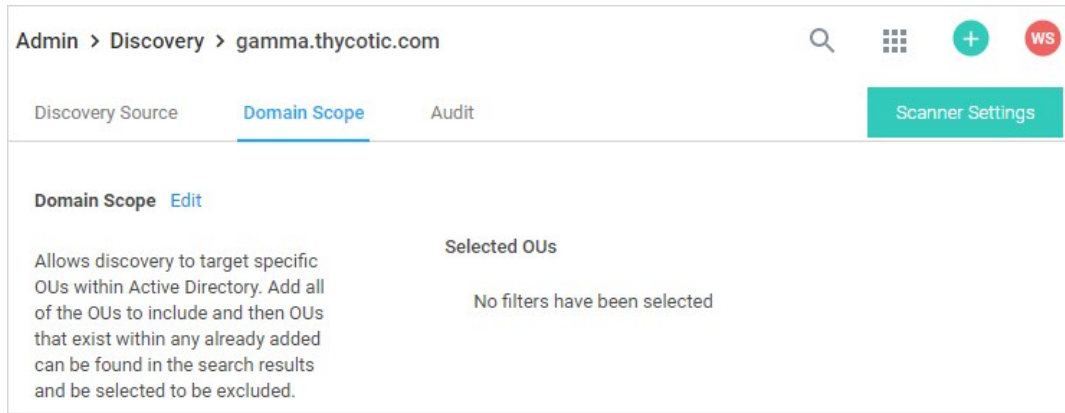
Use LDAPS \*

☐

Cancel

Save

4. Click to select the **Discover Specific OU** check box.
5. Click the Save button. The Domain Scope tab appears.
6. Click the **Domain Scope** tab:



7. Click the **Edit** link next to **Domain Scope**. The page becomes editable:

Admin > Discovery > gamma.thycotic.com

+

WS

Discovery Source
Domain Scope
Audit
Scanner Settings

### Domain Scope

Allows discovery to target specific OUs within Active Directory. Add all of the OUs to include and then OUs that exist within any already added can be found in the search results and be selected to be excluded.

#### Selected OUs

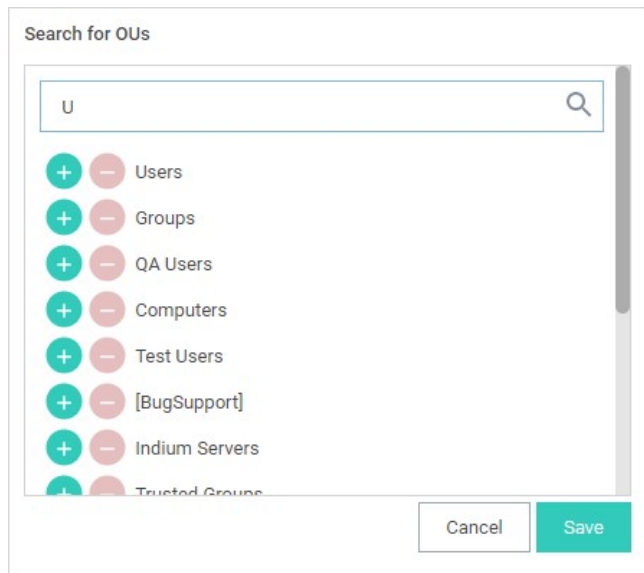
No filters have been selected

#### Search for OUs

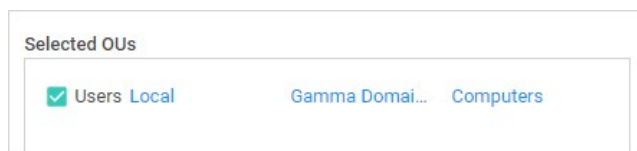
Cancel

Save

- Type the name of the desired OU in the Search for OUs text box. Matching OUs appear:



9. Click the **+** in the green icon to add the OU. To remove an OU, click the red icon. The selected OU appears:



10. Click the site link to edit the sites (distributed engines) included.
11. Click the credential secret link to edit the secret used.
12. Click the scan target link to edit what you want scanned in the OU.
13. Repeat the previous steps for any additional OUs.
14. Click the **Save** button.

**Note:** The ports required for Discovery are documented in [Secret Server Ports](#).

## Creating Discovery Rules

Discovery *account rules* automatically create secrets or send emails when local accounts that match the rule criteria are discovered.

Discovery *dependency rules* automatically add discovered dependencies to *existing* secrets when rule criteria are met—no secrets are created.

## Creating Local Account Rules

Discovery account rules are search queries against the accounts found by discovery (and visible in the discovery network view). When these rules are created and run, accounts that match rules can be automatically imported as secrets. When matches are found, email notifications can also be sent out. The rule order determines the rule application order. Drag rules to reorder them. Rules can specify a combination of the domain or OU, the computer name and the account name.

To create a rule:

1. Click **Admin > Discovery**. The Discovery Sources tab of the Discovery page appears:

**Admin > Discovery**

Discovery Sources | Configuration | Discovery Logs | Computer Scan Logs

Discovery Network View | Create Discovery Source | Run Discovery Now

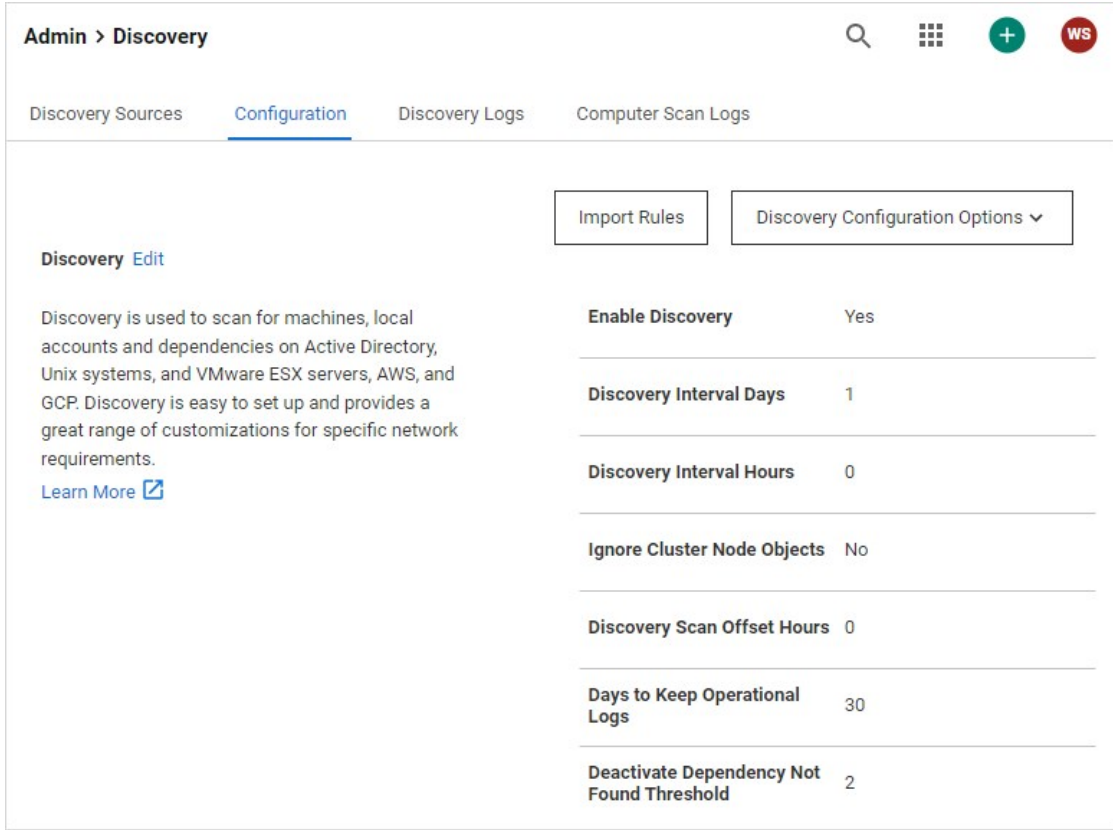
Discovery  
Last Started: 7 hours, 57 minutes ago  
Next Run: 16 hours, 2 minutes

Computer Scan  
Last Started: 16 hours, 14 minutes ago  
Next Run: 7 hours, 45 minutes

4 Items | Include Inactive

NAME	ACTI...	TYPE	SOURCE LAST RUN
GCP Discovery	✓	GCP (Google Cloud Plat...	1/13/2022 07:43 AM
gamma.thycotic.com	✓	Active Directory	1/13/2022 07:43 AM
ESXi Discovery	✓	VMware ESX/ESXi	1/13/2022 07:43 AM
delta.thycotic.com	✓	Active Directory	1/13/2022 07:43 AM

2. Click the **Configuration** tab:



3. Click the **Import Rules** button. The Discovery Rules page appears:

## Discovery Rules

[Account Rules](#)
[Dependency Rules](#)

### Explain

Discovery rules are search queries against the accounts found by Discovery (and visible in the Discovery Network View). When these rules are created and run, accounts that match rules can be automatically imported as Secrets. When matches are found, email notifications can also be sent out. The order of rules determines the order in which the rules are applied. Drag rules to reorder them. Rules can specify a combination of the Domain or OU, the Computer Name and the Account Name.

+



Create Rule


All

▼

Show Inactive ☐

### 1) Import All

Description	This will pull it all	 
Search Terms	Find Accounts On Discovery Source: <i>gamma.thycotic.com</i> where the Computer Name contains: <i>yyy</i>	
When Match Found	Create Secrets	
Active	Yes	
Scan Template	Windows Local Account	
Secret Template	Windows Account	
Folder	Everyone	
Secret Name	\$MACHINE\USERNAME	
Take-Over Threshold	1000	

 Back

Notice that a "import everything found" rule already exists.

**Note:** The rule order determines the order in which the rules are applied. Drag rules to reorder them.

- Click the **Create Rule** button. The Rule page of the New Rule wizard appears:



**New Rule**

Rule

Discovery rules will automatically create Secrets or send emails when local accounts that match the rule criteria are discovered.

Name

Description

Active ☒

Previous Next

5. Type the name for the new rule in the **Name** text box.
6. Type a description in the **Description** text box. At a minimum, leave the suggested log on account name as is.
7. Ensure the **Active** check box is selected.
8. Click the **Next** button. The Source page of the wizard appears:

**New Rule**

Source

Discovery Source

Scan Template

Computer Name Contains

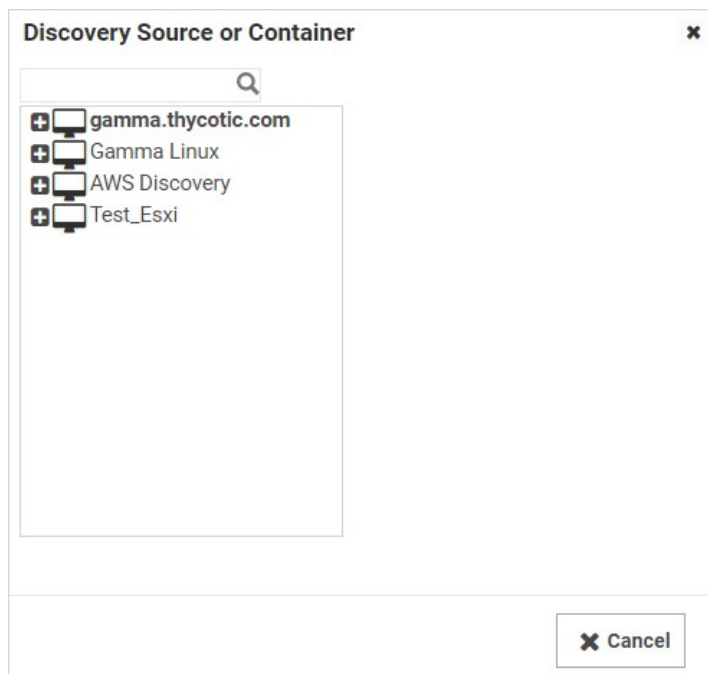
AND Account Name Contains

AND Operating System Name Contains

None Selected\*  
(Select Source) \*

Previous Next

9. Click the **Discovery Source** link to select a discovery source or container (folder). The Discovery Source or Container popup appears:



When you click a domain or subfolder with no children, the popup automatically disappears, and the information you chose appears on the Source tab:



10. If you want the rule to apply to children of what you chose, ensure the **Include Children** check box is selected.
11. Click the **Scan Template** dropdown list to select an output scan template. For a standard discovery configuration, without scripted scanners, there should only be one option here. If you added multiple local account scanners, then you can select one of their output scan templates. This limits the rule to the output results of scanners with the listed output template.
12. (Optional) Filter when the rule applies:

**Note:** Using a discovery rule as a search filter only applies to accounts that are found on computers in the OUs included in the discovery scan. To change those settings, modify the AD source to include more OUs or the entire domain.

1. (Optional) Type any computer name substring to filter the rule in the **Computer Name Contains** text box.
2. (Optional) **Either** if you want to add any of the following parameters to the computer name portion of the rule (one must apply), click to select the unlabeled AND/OR dropdown list and select **OR**. **Or** if you want to mandate using any of the following parameters in addition to the computer name portion of the rule (all must apply), select **AND**.
3. (Optional) Type any account name substring to filter the rule in the **Account Name Contains** text box.
4. (Optional) If you chose to use it, type any OS name substring to filter the rule in the **Operating System Name Contains** text box.

**Note:** The AND/OR dropdown can radically change your results, so carefully think it through. The OS name is ANDed by default—it cannot be ORed.

- Click the **Next** button. The Secret tab appears:

**New Rule**

Secret

Create Secrets ☒

Secret Type < Select >

Folder No Folder Selected

Secret Name \$MACHINE\USERNAME

New Secret Permissions Secrets inherit permissions from folder

Site Local

Previous Next

This is where you add creating secrets as accounts are discovered to the rule.

**Note:** Your previous choice of scan template (on the Source tab) alters the follow-on parameters on this tab.

- Click the **Secret Type** dropdown list to select the secret template the new secret will originate from.
- Click the **Folder** link to select a folder for the new secret to belong to.
- Click the **New Secret Permissions** dropdown list to select whether you want secrets to copy (standalone) or inherit (change with the folder) the permissions from the folder.
- Type the naming convention for the new secret in the **Secret Name** text box. You may use [dependency tokens](#) for the name. We automatically suggest a naming convention based on the hostname and username.
- Click the **Site** dropdown list to select the Secret Server local installation or a distributed engine to run the rule from.
- Click the **Next** button. The Password tab appears:

**New Rule**

Password

☒ I know the current password.


☐ I want to change the password on the Account.

*(Remote Password Changing must be enabled to take over accounts)*

Previous Next

- Click to select **I know the current password** selection button if you do not want Secret Server to change the account password when the secret is created. If you want Secret Server to change it, choose the other option.
- If you chose to change the password, additional selection buttons appear:

☐ I know the current password.  
☒ I want to change the password on the Account.  
*(Remote Password Changing must be enabled to take over accounts)*

 Choosing this option will change the password for the selected account(s) on the remote machine(s).


☒ I want to choose the password for all created Secrets.  
☐ I want a new random password for each created Secret.  
 All selected Secrets will be given the same password.

**Note:** Remote password changing must be enabled to change the password.

22. **Either** click the **I want to choose...** selection button if you want all the new secrets to have the same password, which you can later change. **Or** Click the **I want a new random password...** selection button to have Secret Server create a strong password for the secret.
23. Click the **Next** button. The Import Password tab appears:

**New Rule** ✕


>  >  >  > Import Password >  >  >


Current password   !


For the random password choice, you see:


**Edit Rule** ✕

>  >  >  > Import Password >  >  >

New password   \*

 The privileged account below will be used only on the initial take-over of the account.

Password Type  

**Credentials**  
 Select Secrets to be used for taking over the account(s).  
 gamma.thycotic.com\   Clear

24. If you chose a random password:

1. Type the new password for the account used to take over the accounts for the password change in the **New Password** text box. This is *not* the password for the created secret.
2. Click the **Password Type** dropdown list to select a password template.
3. Click the folder link to select the existing secrets to use for taking over the accounts.
4. For Unix Rules, select the password type command set for taking over the account. You can hold your cursor over the eye icon to see the commands to be used to change the password.

25. Type the password to use in the **Current Password** text box.

26. Click the **Next** button. The Password Changing tab appears:

The screenshot shows the 'Edit Rule' dialog box with the 'Password Changing' tab selected. The dialog has a title bar with a close button (X). Below the title bar is a breadcrumb navigation bar with several steps, the last of which is 'Password Changing'. The main content area contains two informational messages: a blue box stating 'When passwords for these Secrets are changed in the future, Secret Server will use the settings below.' and an orange box with a warning icon stating 'Microsoft security patch KB3178465 has removed the ability for Windows local accounts to change their own password, it is recommended to use a privileged account to change the password instead'. Below these messages are two radio buttons: 'Use Secret Credentials' (selected) and 'Use Privileged Account'. At the bottom right are 'Previous' and 'Next' buttons.

If you do not have RPC enabled, you will see this instead:

The screenshot shows the 'New Rule' dialog box with the 'Password Changing' tab selected. The dialog has a title bar with a close button (X). Below the title bar is a breadcrumb navigation bar with several steps, the last of which is 'Password Changing'. The main content area contains a single informational message in a blue box with an 'i' icon stating 'Remote Password Changing must be enabled in order to change passwords.' At the bottom right are 'Previous' and 'Next' buttons.

27. Click to select the password changing selection button to choose whether you want to access the accounts with a secret credential or a privileged account. If you choose the latter, you will be prompted to select a secret for that account.

28. Click the **Next** button. The Alerts tab appears:

**New Rule**

ACCOUNTS FOUND

Send Email Alert for Accounts Found ☐

Previous Finish

29. Click to select the **Send Email Alert for Accounts Found** check box. Additional controls appear:

**New Rule**

ACCOUNTS FOUND

Send Email Alert for Accounts Found ☒

SUBSCRIBED USERS

☒ Notify Discovery Administrator(s)

☐ Notify Subscribed User(s)

Previous Finish

30. Click to select the **Subscribed Users** selection button to choose who receives an email alert. If you select **Notify Subscribed User(s)** a text box appears for you to add email addresses. Other wise Secret Server discovery admins receive one.

31. Click the **Finish** button. The rule is created.

## Creating Dependency Rules

Dependency rules automatically add dependencies (Windows services, schedule tasks, application pools) to existing secrets. You can receive email notifications of linkages by adding an event subscription in the Event Subscriptions page. Rules can specify a combination of the domain or OU.

**Note:** The rule order determines the order in which the rules are applied. Drag rules to reorder them.

**Note:** You must have a discovery scanner and dependency template configured to apply a dependency rule.

1. Click **Admin > Discovery**. The Discovery Sources tab of the Discovery page appears:

Admin > Discovery

Discovery Sources

Configuration

Discovery Logs

Computer Scan Logs

Discovery

Edit

Discovery is used to scan for machines, local accounts and dependencies on Active Directory, Unix systems, and VMware ESX servers, AWS, and GCP. Discovery is easy to set up and provides a great range of customizations for specific network requirements.

[Learn More](#)

Import Rules

Discovery Configuration Options

Enable Discovery	Yes
Discovery Interval Days	1
Discovery Interval Hours	0
Ignore Cluster Node Objects	No
Discovery Scan Offset Hours	0
Days to Keep Operational Logs	30
Deactivate Dependency Not Found Threshold	2

- Click the **Import Rules** button. The Discovery Rules page appears:

Discovery Rules

Account Rules
Dependency Rules

[Explain](#)

+

Create Rule

Show Inactive
☐

1) Import All

Description
This will pull it all

Search Terms
Find Accounts On Discovery Source: *gamma.thycotic.com* where the Computer Name contains: \*and the Account Name contains: \*and the Operating System Name contains: \*

When Match Found
Create Secrets

Active
Yes

Scan Template
Windows Local Account

Secret Template
Windows Account

Folder
Everyone

Secret Name
\$MACHINE\USERNAME

Take-Over Threshold
1000

Back

- Click the **Dependency Rules** tab:

Discovery Rules

Account Rules
Dependency Rules

[Explain](#)

+

Create Rule

Show Inactive
☐

Back

- Click the **Create Rule** button. The New Rule page appears:



New Rule

Dependency rules will automatically add dependency to existing Secrets. Note: No Secrets will be created.

Name

\*

Discovery Source

None Selected\*

Scan Template

(Select Source) \*

Dependency Template

(Select Source) \*

Site:

Use Site from Secret ▾

Settings

Privileged Account

No Secret Selected

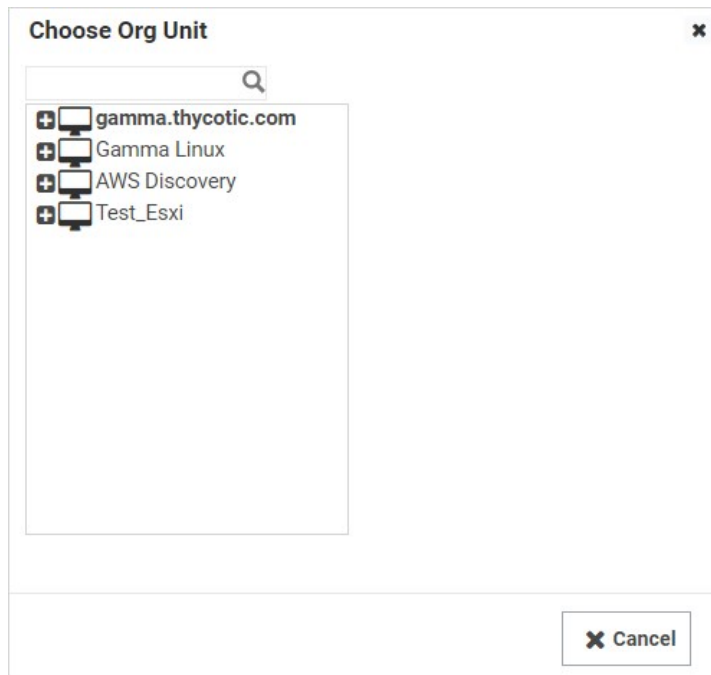
Windows Services: Restart on Change

☒

✓ OK

✕ Cancel

- Click the **Discovery Source** link to select a discovery source or container (folder). The Choose Org Unit popup appears:



When you click a domain or subfolder with no children, the popup automatically disappears.

7. Click the **Scan Template** dropdown list to select an output template.
8. Click the **Dependency Template** dropdown list to select a dependency template.
9. Click the **Site** dropdown list to select the Secret Server local installation or a distributed engine to run the rule from.
10. Click the **Privileged Account** link to choose a secret for the scanning account.
11. Click to select the **Windows Services: Restart on Change** check box if you want the services restarted after discovery.
12. Click the **OK** button.

## **Discovery and Sites—Where Does Secret Server Run Discovery Scans?**

Like many operations in Secret Server, you can configure discovery to run locally on IIS machines running Secret Server using website processing or by running through a distributed engine. Distributed engines are agents that you can deploy to remotely process work. They are useful for scenarios where performance is an issue or the work must take place in a remote network where the ports required by discovery are not available. You can configure discovery to use a single site location per discovery source or on a per-OU basis for AD.

## Overview

**Note:** It is important to have an understanding of built-in discovery scanning before attempting to create your own custom scanner. Please see [Discovery Sources, Scanners, and Templates](#) and [How Discovery Works](#).

Extensible discovery lets you extend the already powerful scanning abilities of Secret Server by creating custom scanners that run PowerShell. You can use either built-in or custom scanners and templates at each step of the discovery process in extensible discovery.

If the built-in discovery sources, scanners, or input and output template, cannot you meet your needs, you can use PowerShell scripts to perform any part of discovery. Doing so requires that you define your own input and output templates and scanners and then add them to a new or existing discovery source.

## When to Use Extensible Discovery

Creating a discovery source using scripted scanners can be a lot of work to set up, so when should you consider it? If you only need to discover local administrator accounts with standard dependencies (Windows services, application pools, and scheduled tasks), our built-in scanners will do the job, and extensible discovery is not necessary. However, your network probably contains other items you want to discover and bring under managed control. Here are some examples:

- Discover configuration files containing passwords and automatically add them as dependencies.
- Scan computers not joined to the domain.
- Create "dependencies" that run a SQL, SSH, or PowerShell script when a secret's password changes to log events to an external source, such as an external auditing system or an external monitoring system).
- Record information not currently imported by local account discovery or custom fields in a secret template.
- Discover SQL Server logins as "local accounts" and import them as SQL Server account secrets.

**Note:** To run PowerShell scanners against machines for local account and dependency discovery, you may need to configure WinRM and CredSSP. See [Configuring WinRM for PowerShell](#) and [Configuring CredSSP for WinRM with PowerShell](#)

## Extensible Discovery Tutorial

**Note:** Extensible Discovery can be a long process for new users. It has many hands-on steps. As such, we believe a step-by-step tutorial is the best way to learn it.

Discovery scanners can run custom PowerShell scripts, as well as our built-in scanners for Active Directory, UNIX, and VMWare ESXi. You can use one or more built-in or custom scanners at each step of the discovery process: host range discovery, machine discovery, local account discovery, and dependency discovery.

Roughly, this tutorial has four tasks:

- Understanding the process
- Setting up scripts
- Creating scan templates
- Setting up discovery scanners and sources. You define dependency templates to change items manually added to secrets and added through discovery rules.

The tutorial shows you how to take full advantage of extensible discovery by creating an Active Directory discovery source that replaces each of the built-in scanners with a PowerShell script.

For simplicity, we will only create a Windows service dependency scanner in the dependencies step, but you can add additional built-in or custom PowerShell scanners to scan for application pools, scheduled tasks, or any other item that requires an action triggered when a secret's password is changed.

## Task One: Understanding the Process

For most of this tutorial we will use the "Extensible Discovery Configuration" page as our launch page into each of the features that needs to be configured. Setting up Extensible Discovery requires making changes on several pages. The "Extensible Discovery Configuration" page has buttons linking to each of these pages as well as short explanations of what you need to do on them. The high-level process is:

1. Create the scripts for each discovery step.
2. If necessary, create scan templates to define the information to return from the objects discovered at each step.  
  
**Note:** You want to avoid altering scan templates unless you absolutely need to. First, ensure the regular scanners cannot do the job. Once you change a template, you cannot use out-of-the-box scanners and must maintain your own PowerShell scripts for the local account and dependency scanners.
3. Create discovery scanners for each step to define which script to use for scanning, which scan template represents the objects used as the source of data for the script, and which scan template represents the object returned from the script.
4. Create a discovery source that is configured to use these discovery scanners in lieu of the default scanners.
5. Create a dependency changer for the type of dependency we want to manage.
6. Create a dependency template for the changer.
7. Manually add a dependency to a secret using the dependency changer.
8. Create a local account rule to import discovered accounts as secrets.
9. Create a dependency rule to import discovered dependencies as secrets.

## Task Two: Creating the Scripts for Each Discovery Step


First, we add the scripts that we will use as our scanners to Secret Server:

**Note:** To use extensible discovery, you must use a Secret Server edition that supports scripts or has an "Advanced Scripting" add-on license.

1. Go to **Admin > Scripts**. The PowerShell tab of the Scripts page appears:





















## Scripts

PowerShell
SQL
SSH



Script testing will execute from the Web Server you are connected to but scripts may run on other nodes outside of testing

+ Create New
[Information on PowerShell Scripts](#)

NAME	DESCRIPTION	CATEGORY	ACTIVE	USAGE COUNT	
Create OU Placeholder	Discovery	Discovery Scanner	Yes	2	   
Find Users in AD	Users	Discovery Scanner	Yes	0	   
Find Host Ranges	HostRange	Discovery Scanner	Yes	0	   
Find Machines	Machine	Discovery Scanner	Yes	0	   
Find Local Accounts	local Acc	Discovery Scanner	Yes	0	   

- Click the **Create New** button. The New PowerShell Script popup page appears:

### New PowerShell Script

Name

Description

Category

Untyped

Script

1	
---	--

✓ OK

✗ Cancel

3. For each of the scripts listed below:

1. Use the name below for the **Name** text box.
2. Copy and paste each script into a separate, new script.
3. Use the **Discovery Scanner** category for each script.
4. Click the **OK** button.
5. Repeat the process for each script below.

## Script Name: Host Range Scanner

```
$passwordArg = $args[2]
$username = $args[1]
$domain = $args[0]

write-debug "$domain $username $passwordArg"

$distinguisheddomain = "DC=" + ($domain.Split('.') -join ",DC=");

$spassword = ConvertTo-SecureString "$passwordArg" -AsPlainText -Force #Secure PW
$cred = New-Object System.Management.Automation.PSCredential ("$domain$username", $spassword) #Set credentials for PSCredential logon

$ous = Get-ADOrganizationalUnit -filter 'Name -like ""' -Server $domain -Credential $cred | select-object -property Name, ObjectGUID, @{Name = 'DistinguishedName'; Expression = {$_DistinguishedName.Replace("$distinguisheddomain","")}}, ObjectClass

return $ous

# Script Args: $[1]$Domain $[1]$Username $[1]$Password
```

## Script Name: Machine Scanner

```
$Ou = $args[0];
$domain = $args[1];
$distinguisheddomain = "DC=" + ($domain.Split('.') -join ",DC=");

if ($distinguisheddomain.ToLower() -eq $Ou.ToLower()) {
    $searchbase = $distinguisheddomain
} else {
    $searchbase = "$Ou,$distinguisheddomain"
}

$FoundComputers = @()

$ComputersinOU = Get-ADComputer -Filter 'Name -like ""' -Server $domain -SearchBase $searchbase -properties *

foreach ($comp in $ComputersinOU) {
    $object = New-Object -TypeName PSObject
    $object | Add-Member -MemberType NoteProperty -Name ComputerName -Value $comp.Name
    $object | Add-Member -MemberType NoteProperty -Name DNSHostName -Value $comp.DNSHostName
    $object | Add-Member -MemberType NoteProperty -Name ADGUID -Value $comp.ObjectGuid
    $object | Add-Member -MemberType NoteProperty -Name OperatingSystem -Value $comp.OperatingSystem
    $object | Add-Member -MemberType NoteProperty -Name DistinguishedName -Value $comp.DistinguishedName.Replace("$distinguisheddomain","")

    $FoundComputers += $object
}

}
```

```
return $FoundComputers
```

```
# args: $target ${1}$domain
```

## Script Name: Local Account Scanner

```
$ComputerName = $args[0]
```

```
$Username = $args[1]
```

```
$domain = $args[2]
```

```
$password = $args[3]
```

```
$objComputer = New-Object System.DirectoryServices.DirectoryEntry("WinNT://$ComputerName", "$domain$username", $password)
```

```
$children = $objComputer.Children | select-object SchemaClassName, Path, Name, Properties, userflags, SIDType, Disabled
```

```
$results = @()
```

```
foreach ($child in $children){
```

```
    Write-Debug $child
```

```
    if ($child.SchemaClassName -eq 'User'){
```

```
        write-debug "adding to results"
```

```
        $object = New-Object -TypeName PSObject;
```

```
        $object | Add-Member -MemberType NoteProperty -Name Username -Value ${child.Name}(http://child.name/)[0];
```

```
        $object | Add-Member -MemberType NoteProperty -Name Resource -Value $ComputerName;
```

```
        $object | Add-Member -MemberType NoteProperty -Name Disabled -Value $child.Disabled;
```

```
        $results += $object;
```

```
    }
```

```
}
```

```
return $results
```

```
# Arguments $target ${1}$username ${1}$Domain ${1}$Password
```

## Script Name: Windows Service Dependency Scanner

```
$ComputerName = $args[0]
```

```
$accounts = Get-WMIObject Win32_Service -ComputerName $computername | Where-Object{($_.StartName -like "*" -or $_.StartName -like "*@*") -and $_.StartName -notlike "NT *"}

```

```
if ($accounts) {
```

```
    $dependencyaccounts = @()
```

```
    foreach($dependency in $accounts)
```

```
    {
```

```
        $object = New-Object -TypeName PSObject;
```

```
        $object | Add-Member -MemberType NoteProperty -Name ServiceName -Value $dependency.DisplayName;
```

```
        $object | Add-Member -MemberType NoteProperty -Name Enabled -Value $dependency.Started;
```

```
        if ($dependency.startname.contains('@'))
```

```
        {
```

```
            $accountinfo = $dependency.startname.split('@')
```



```

$username = $accountinfo[0]
$domain = $accountinfo[1]
}
else
{
    $accountinfo = $dependency.startname.split('\')
    $username = $accountinfo[1]
    $domain = $accountinfo[0]
}

$object | Add-Member -MemberType NoteProperty -Name Username -Value $username;
$object | Add-Member -MemberType NoteProperty -Name Machine -Value $ComputerName;
$object | Add-Member -MemberType NoteProperty -Name Domain -Value $domain;
$object | Add-Member -MemberType NoteProperty -Name DependencyType -Value 'Powershell Script';
$object | Add-Member -MemberType NoteProperty -Name AccountStatus -Value 'Expired';
$dependencyaccounts += $object
$object = $null
}

return $dependencyaccounts;
}

throw "Error - no service accounts found"

return $null

# args: $target

```

## Task Three: Creating Scan Templates

The second task is to create scan templates for each object to be discovered. Scan templates define the types of objects that can be retrieved by discovery scanners. The goal of discovery scanning is to retrieve the following:

- Accounts that can be imported and managed as secrets
- Entities (dependencies) requiring knowledge of password changes to managed secrets.

The process of finding these usually involves the following scans prior to scanning for accounts and dependencies:

- Host ranges where machines containing accounts can be found. For Active Directory, this usually involves scanning a domain for organization units or defining which organization units in a domain to check. For Unix and ESXi, this usually involved defining one or more lists of IP address ranges to scan.
- Machines to be scanned for accounts.

Each of these items—host ranges, machines, accounts, and dependencies—is defined by a scan template. The scan template specifies:

- At which step of the scanning process the item is created (scan type)
- The scan template from which the current template gets its required fields (Parent scan template)
- A list of fields that the item contains

The Fields section describes the list of properties that will be returned by the built-in scanner or script for the item. At a minimum, you need to define one field for each of the fields on the parent scan template. For items that are returned from a script, you can define additional

fields that the script will return on the object. These are mapped by name to the corresponding field on the scan template. These additional fields can then be used by later scanners.

Secret Server defines scan templates for all of its built-in scanners. Whenever possible, you should use these as input and output sources for your scripted scanners. Create your own scan templates if you need to capture additional information as data for your scripts or if you need to use specific input and output templates on the discovery scanners to drive multiple discovery workflows on a single discovery source. For this tutorial, we create new scan templates for the output of each of our scripts in this tutorial.

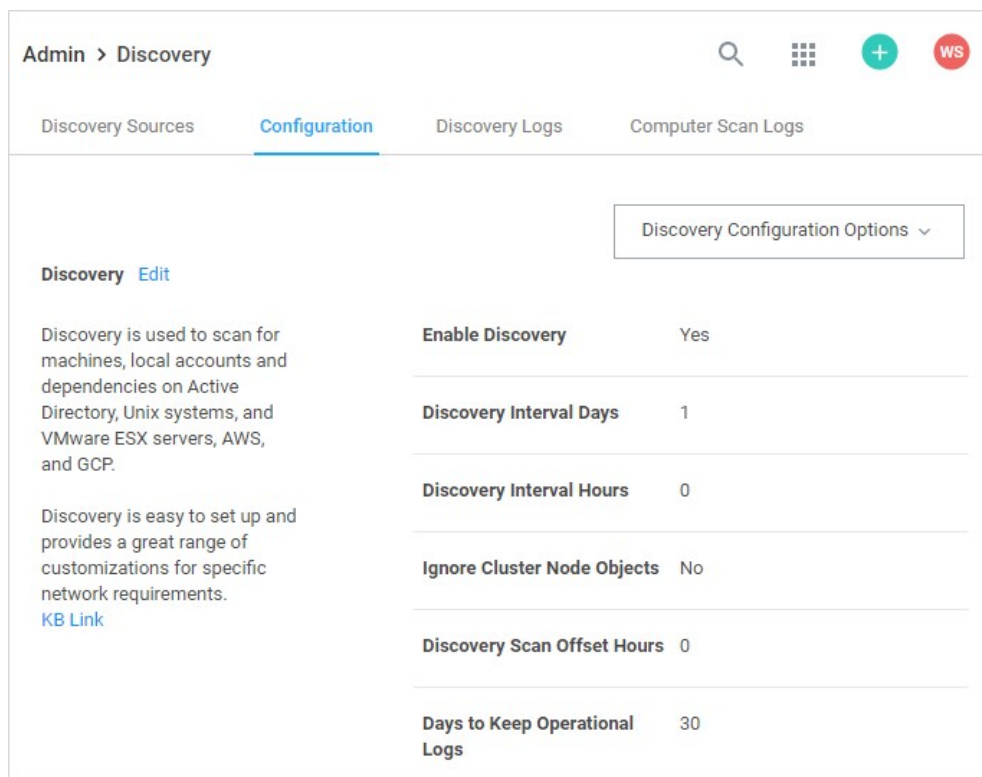
## Host Range

The first scan template is the one that stores the results from our Host Range Scanner script. The script outputs an object with the following properties:

- Name
- ObjectGUID
- DistinguishedName

Thus, our scan template must have fields to store the values of these three properties. The process is as follows:

1. Go to **Admin > Discovery**.
2. Click the **Configuration** tab:



3. Click the **Discovery Configuration Options** button and select **Extensible Discovery**. The Extensible Discovery Configuration page appears:

## Extensible Discovery Configuration

### EXTENSIBLE DISCOVERY OVERVIEW

Extensible Discovery allows custom PowerShell Scripts to programmatically discover items in a network and bring them under management. Anything that supports PowerShell interaction can be discovered and then managed by Secret Server. Before attempting to use Extensible Discovery it is advisable that you thoroughly understand Secrets, Dependencies, and Secret Server's built in Discovery process. Below are the steps needed to successfully utilize Extensible Discovery. Additional information may be found [here](#).

### Scripts

Scripts allow you to define PowerShell scripts that find objects on your network, that you link into Secrets via Scan Templates, Discovery Scanners, and Discovery Sources.

[</> Edit Scripts](#)

### Scan Templates

Scan Templates define the objects you are trying to find on your network. On the Scan Template, you select what type of object you are trying to find – Dependencies, Local Accounts, Machines, Host Ranges – the base parent for the Object, and the properties you want to retrieve from the object. Account-based Scan Templates can be mapped to a Password Changer for matching existing Secrets.

[🔧 Configure Scan Templates](#)

### Discovery Scanners

Discovery Scanners define the details of what is to be discovered by linking input and output Scan Templates to scripts or predefined scanners.

[⚙️ Configure Discovery Scanners](#)

4. Click the **Configure Scan Templates** button. If you are working from a new installation of Secret Server, you should see the following:

## Scan Templates

[Host Ranges](#)
[Machines](#)
[Accounts](#)
[Dependencies](#)

+

Create New Scan Template

NAME	ACTIVE
AWS Path	Yes
AWS Region	Yes
GCP Project	Yes
Host Range	Yes
Organizational Unit	Yes
PS Organizational Unit	Yes

Scan Templates: 6

☐ Show Inactive

Back

- On the **Host Ranges** tab, click the **Create New Scan Template** button. The Scan Template Designer page appears:

## Scan Template Designer

Name

Scan Type

Find Host Ranges

Parent Scan Template

Host Range

Active

☒

FIELDS

FIELD NAME	PARENT FIELD	INCLUDE IN MATCH
Ex: OU, Host Range	HostRange	<input checked="" type="checkbox"/>

Save

Cancel

- Type PS Organizational Unit in the **Name** text box.
- Leave the **Scan Type** dropdown list set to **Find Host Ranges**.

8. Leave the **Parent Scan Template** dropdown list set to **Host Range**.

9. In the **Fields** section, use the blue **+** button to add a field for each of our script output object's properties:

**Field Name** | **Parent Field** | -- | -- | DistinguishedName | <None> | Name | HostRange | ObjectGUID | <None> | [Unexpected Link Text](#)

10. When done, click the **Save** button.

## Machines

Next, create the scan template to contain the output from our Machine Scanner script. This script takes the name of an OU retrieved from our previous step, scans that OU for computers, and returns a list of custom objects containing some properties of each computer. In this tutorial we are capturing these properties:

- ADGUID
- ComputerName
- DistinguishedName
- DNSHostName
- OperatingSystem

**Note:** If your later scanners need more information about the computer, you can easily modify this script to return additional properties.

1. Click the **Machines** tab:

Scan Templates

Host Ranges

Machines

Accounts

Dependencies

+

Create New Scan Template

NAME	ACTIVE
Computer	Yes
PS Machine	Yes
Windows Computer	Yes

Scan Templates: 3

☐ Show Inactive

Back

2. Click the **Create New Scan Template** button. The Scan Template Designer page appears:

### Scan Template Designer

Name

Scan Type
Find Machine

Parent Scan Template
Computer

Active
☒

#### FIELDS

FIELD NAME	PARENT FIELD	INCLUDE IN MATCH
Machine	Machine	<input checked="" type="checkbox"/>
OperatingSystem	OperatingSystem	<input type="checkbox"/>

Save

Cancel

- Type PS Machine in the **Name** text box.
- Leave the **Scan Type** dropdown list set to **Find Machine**.
- Leave the **Parent Scan Template** dropdown list set to **Computer**.
- In the **Fields** section, click the blue **+** to add a field for each of our script output object's properties:

```

| Field Name | Parent Field | | ----- | ----- | | ADGUID | <None> | | ComputerName | Machine | |
DistinguishedName | <None> | | DNSHostName | <None> | | OperatingSystem | OperatingSystem | Unexpected Link Text

```

- Click the **Save** button.

## Local Accounts

Our Local Account Scanner script takes the computer name of a computer retrieved from the previous step, scan that computer for local accounts, and return a list of custom objects containing the following properties from each account:

- Disabled
- Name
- Resource

The setup of these fields on the Local Account scan template is a bit different than the other templates that we have created so far. The parent template for local accounts is "Account" and it has three fields: Username, Password, and Resource. Our script is not able to return the password on the account so the objects returned do not have that as a property. We need to map this parent field to a field on our template, but it is only used internally.

- Click the **Accounts** tab:

## Scan Templates

[Host Ranges](#)
[Machines](#)
[Accounts](#)
[Dependencies](#)

+

Create New Scan Template

NAME	ACTIVE	
Account (Basic)	Yes	
Active Directory Account	Yes	
AWS Access Key	Yes	
AWS User Account	Yes	
ESXi Local Account	Yes	
GCP Service Account	Yes	
PS Account	Yes	
SQL Local Account	Yes	
SSH Local Account	Yes	
Windows Local Account	Yes	

Scan Templates: 10

☐ Show Inactive

Back

- Click the **Create New Scan Template** button. The Scan Template Designer page appears:

### Scan Template Designer

Name

Scan Type
Find Local Accounts

Parent Scan Template
Account (Basic)

Active
☒

FIELDS

FIELD NAME	PARENT FIELD	INCLUDE IN MATCH
Ex: Machine Host, Domain	Resource	<input checked="" type="checkbox"/>
Username	Username	<input checked="" type="checkbox"/>
Password	Password	<input type="checkbox"/>

Save

Cancel

- Type PS Account in the **Name** text box.
- Leave the **Scan Type** dropdown list set to **Find Local Accounts**.
- Leave the **Parent Scan Template** dropdown list set to **Account (Basic)**.
- In the **Fields** section, click the blue **+** button to add a field for each of our script output object's properties:

Field Name | Parent Field | -- | Disabled | <None> | Name | Username | Password | Password | Resource | Resource | [Unexpected Link Text](#)

- Click the **Save** button.

## Dependencies Scan Template

The final scan template we are going to set up is one to find Windows Service dependencies. Our script will return a list of all Windows Services on a computer along with account information for that service. The properties returned by the script for each service are:

- AccountStatus
- DependencyType
- Domain
- Enabled
- Machine
- ServiceName
- Username

Thus, our setup for this scan template will be:

- Click the **Dependencies** tab:



## Scan Templates

[Host Ranges](#)
[Machines](#)
[Accounts](#)
[Dependencies](#)

Create New Scan Template

NAME	ACTIVE	
COM+ Application	Yes	
Computer Dependency (Basic)	Yes	
PS Dependency	Yes	
Remote File	Yes	
SQL Dependency (Basic)	Yes	
SSH Dependency (Basic)	Yes	
SSH Key Rotation Dependency	Yes	
Windows Application Pool	Yes	
Windows Scheduled Task	Yes	
Windows Service	Yes	

Scan Templates: 10

☐ Show Inactive

Back

- Click the **Create New Scan Template** button. The Scan Template Designer page appears:

### Scan Template Designer

Name

\*

Scan Type

Find Dependencies

Parent Scan Template

Computer Dependency (Basic)

?

Account Scan Template

None

\*

?

Active

☒

FIELDS

FIELD NAME	PARENT FIELD ?	INCLUDE IN MATCH ?
Machine	* Machine	<input checked="" type="checkbox"/>
Ex: Service Name, Scheduled Task, Dependency Name	* ServiceName	<input checked="" type="checkbox"/>
Username	* Username	<input checked="" type="checkbox"/>
	* < None >	<input type="checkbox"/>

Save

Cancel

- Type PS Dependency in the **Name** text box.
- Leave the **Scan Type** dropdown list set to **Find Dependencies**.
- Leave the **Parent Scan Template** dropdown list set to **Computer Dependencies (Basic)**.
- Set the **Account Scan Template** dropdown list set to **PS Account**.
- In the **Fields** section, click the blue **+** button to add a field for each of our script output object's properties:

Field Name | Parent Field | -- | -- | AccountStatus | None | DependencyType | None | Domain | Domain | Enabled | < None > | Machine | Machine | ServiceName | ServiceName | Username | Username | [Unexpected Link Text](#) 8. Click the **Save** button.

## Task Four: Setting up Discovery Scanners and Sources

### Discovery Scanners

Now that you have created the scan templates that our scripted discovery source will need, you can create the discovery scanners.

When creating a new scanner you specify:

- Which step the scanner runs on
- What type of base scanner to use (for example, Manual Input, Windows Discovery, or PowerShell Discovery)

- Which scan provides the input for the scan
- Which scan template represents the output of the scan.
- When using a PowerShell base scanner, you also select what script to run and any arguments to pass to the script.

To get started:

1. Return to the **Extensible Discovery** page.
2. Click the **Configure Discovery Scanners** button. The Discovery Scanners page appears:

### Discovery Scanners

[Host Ranges](#)
[Machines](#)
[Accounts](#)
[Dependencies](#)

Create New Scanner

NAME	BASE SCANNER	INPUT TEMPLATE	OUTPUT TEMPLATE	ACTIVE	OPTIONS
Active Directory Organizational Units	Windows Discovery	Active Directory Domain	Organizational Unit	Yes	
AWS Path Scanner	AWS Discovery	AWS Discovery Source	AWS Path	Yes	
AWS Region Scanner	AWS Discovery	AWS Discovery Source	AWS Region	Yes	
AWS Specific Availability Zones Scanner	AWS Discovery	AWS Discovery Source	AWS Region	Yes	
GCP Project Scanner	GCP Discovery	GCP Discovery Source	GCP Project	Yes	
Manual Host Range	Manual Input Discovery	Discovery Source	Host Range	Yes	
PS Host Ranges	PowerShell Discovery	Active Directory Domain	PS Organizational Unit	Yes	

Items: 7

☐ Show Inactive

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3. The page is similar to the scan templates page, with a tab for each type of scanner and a list of configured scanners within each tab. Secret Server comes with discovery scanners for each built-in scanner. We will add a new PowerShell scanner of each type, using the scripts and scan templates we set up in the previous sections.

## Host Ranges

1. If necessary, click the **Host Ranges** tab.
2. Click the **Create New Scanner** button. The New Discovery Scanner popup page appears:

New Discovery Scanner

SETTINGS

Name

\*

Description

\*

Active

☒

Discovery Type

Find Host Ranges

▼

Base Scanner

Manual Input Discovery

▼

Input Template

Active Directory Domain

▼

Output Template

AWS Path

▼

✓ OK

✕ Cancel

- Type PS Host Ranges in the **Name** text box.
- Type a description in the **Description** text box.
- Leave the **Discovery Type** dropdown list set to **Find Host Ranges**. This is the scanner type we are creating. This where in the discovery process the scanner runs. Discovery scanning always proceeds Host Ranges > Machines > Local Accounts > Dependencies. The scan templates, discovery scanners, and discovery source pages all organize their contents in the same order.

**Note:** Although the discovery scanning process proceeds in that order, it is important to realize the output of each step *may* not be the input of the next step. Machines take host ranges as their input, and local accounts take machines as their input, but dependencies do not take local accounts as their input. Like local accounts, dependencies are on machines, so they also take machines as their input.

- Click to select **PowerShell Discovery** in the **Base Scanner** dropdown list. The popup expands to show more controls:

**New Discovery Scanner**

**SETTINGS**

Name: PS Host Ranges \*

Description: My PS Host Scanner \*

Active: ☒

Discovery Type: Find Host Ranges ▼

Base Scanner: PowerShell Discovery ▼

Input Template: Active Directory Domain ▼

Output Template: AWS Path ▼

Script: None ▼

Script Arguments:

OK Cancel

For any scripted scanner, choose "PowerShell Discovery" as the "Base Scanner." That tells the discovery process this scanner is running a script. Other options are available here based on the discovery type, such as manual entry, Windows discovery, or SSH discovery. If you do not need to run a script for a specific step of discovery but need to use a custom scan template for the input, output, or both to create a specific workflow, you can choose an option other than "PowerShell Discovery" here.

- Click to select **Active Directory Domain** in the **Input Template** dropdown list. The input and output templates are where you define the information flow through the discovery process. Each scanner uses the output of a previous step as its input. Each scanner returns a list of results as its output. The input template defines what to use as the input data for this scanner. The output template defines what is returned from the scan and used elsewhere. To see what scanner (if any) consumes the output of a given scanner, look for the one that has the same input template as the original scanner's output.

**Note:** You can have multiple scanners in each step with the same input template, but each scanner has to have a unique output template. When a scanner runs, it compares the results of the current scan with the results of the previous scan that was stored in the database. It updates any existing records, adds new records for new items, and removes any records that do not match items found during the current scan. Thus, if there were more than one scanner with the same output template, the second scanner would overwrite the results of the first scan, making it pointless. This is why each output template must be unique.

- Click to select **PS Organizational Unit** in the **Output Template** dropdown list. This is the Host Range template we created in the previous section. Generally, each output template feeds a single scanner at the next level, but you can have multiple scanners using the same input template with each using the results to find different things. For example, you could have two local account scanners defined that both use the input from the previous find machines step—one for finding Windows local accounts and the other for finding AD accounts that have rights on the computer. In turn, each scanner returns its results to its own output scan template—one creating Windows account secrets and the other creating Active Directory account secrets.
- Click to select **Find Host Ranges** in the **Script** dropdown list. The script runs for each object matching the input template, using the arguments in the next step, finally returning an object defined by the output template.

10. Type the following in the **Script Arguments** text box, separating each with a space: `$(1)$Domain $(1)$username $(1)$Password`. Script arguments can be a combination of literal values and tokens. When the script runs, these tokens are replaced with values from the input object and any privileged accounts associated with the scanner. Privileged accounts are assigned to scanners when the scanners are added to a discovery source. The table below lists the tokens that can be used as script arguments.
11. Ensure the **Active** check box is selected.
12. Click the **OK** button to save the scanner.

## Table: Script Tokens

Token	Description
<code>\$(target)</code>	A generic placeholder for the input object. This is not used when scanning for host ranges because there is no previous scanner input source. For machine scanners, <code>\$(target)</code> refers to either the OU (for Active Directory discovery sources) or the IP address (for Unix and ESXi discovery sources) from the host range input. For local account and dependency scanners, <code>\$(target)</code> is the name of the scanned computer.
<code>\$(x)\$Username</code>	The username of the nth privileged account associated with the scanner ("x" represents n). Each scanner can have one or more privileged accounts associated with it. Thus, if you need to use the username of the first privileged account in your script, you would pass in <code>\$(1)\$Username</code> . The second would be <code>\$(2)\$Username</code> and so forth. You can have as many privileged accounts as necessary.
<code>\$(x)\$Password</code>	Similar to <code>\$(x)\$Username</code> , this is the password of the nth privileged account associated with the scanner.
<code>\$(x)\$Domain</code>	Similar to <code>\$(x)\$Username</code> , this is the fully-qualified domain name of the nth privileged account associated with the scanner.

## Machines

























Once you set up one discovery scanner, the rest should be straight-forward:

1. Click the **Machines** tab:

## Discovery Scanners


Host Ranges
Machines
Accounts
Dependencies

+
Create New Scanner

NAME	BASE SCANNER	INPUT TEMPLATE	OUTPUT TEMPLATE	ACTIVE	OPTIONS
Active Directory Computers	Windows Discovery	Organizational Unit	Windows Computer	Yes	  
AWS Machine (Non-Windows) Scanner	AWS Discovery	AWS Region	Computer	Yes	  
AWS Windows Machine Scanner	AWS Discovery	AWS Region	Windows Computer	Yes	  
GCP (Non-Windows) Instance Scanner	GCP Discovery	GCP Project	Computer	Yes	  
GCP Windows Instance Scanner	GCP Discovery	GCP Project	Windows Computer	Yes	  
Manual Machine List	Manual Input Discovery	Host Range	Computer	Yes	  
PS Machines	PowerShell Discovery	PS Organizational Unit	PS Machine	Yes	  
Unix Machine	SSH Discovery	Host Range	Computer	Yes	  

Items: 8

☐ Show Inactive

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- Click the **Create New Scanner** button. The New Discovery Scanner popup page appears.
- Type PS Machines Ranges in the **Name** text box.
- Type a description in the **Description** text box.
- Leave the **Discovery Type** dropdown list set to **Find Machine**.
- Click to select **PowerShell Discovery** in the **Base Scanner** dropdown list. The popup expands to show more controls.
- Click to select **PS Organizational Unit** in the **Input Template** dropdown list. This is the same as the output template from the last scanner.
- Click to select **PS Machine** in the **Output Template** dropdown list. This is the Host Range template we created in the previous section.
- Click to select **Machine Scanner** in the **Script** dropdown list. The script runs for each object matching the input template, using the arguments in the next step, finally returning an object defined by the output template.
- Type the following in the **Script Arguments** text box, separating each with a space: \$target \${1}\$domain.
- Ensure the **Active** check box is selected.
- Click the **OK** button to save the scanner.

## Local Accounts

Repeat the process for the local accounts scanner:





















1. Click the **Accounts** tab:

Discovery Scanners

Host Ranges
Machines
Accounts
Dependencies

+

Create New Scanner

NAME	BASE SCANNER	INPUT TEMPLATE	OUTPUT TEMPLATE	ACTIVE	OPTIONS
Windows Local Accounts	Windows Discovery	Windows Computer	Windows Local Account	Yes	 
Active Directory User Accounts	Windows Discovery	Organizational Unit	Active Directory Account	Yes	 
AWS Access Key Scanner	AWS Discovery	AWS Path	AWS Access Key	Yes	 
AWS User Account Scanner	AWS Discovery	AWS Path	AWS User Account	Yes	 
ESXi Local Account	ESX Discovery	Computer	ESXi Local Account	Yes	 
File Load Local Account	File Load Discovery	Computer	Account (Basic)	Yes	 
GCP Service Account Scanner	GCP Discovery	GCP Project	GCP Service Account	Yes	 
PS Accounts	PowerShell Discovery	PS Machine	PS Account	Yes	 
Unix Non-Daemon User	SSH Discovery	Computer	SSH Local Account	Yes	 
Unix User	SSH Discovery	Computer	SSH Local Account	Yes	 

Items: 10

☐ Show Inactive

←

Back

2. Click the **Create New Scanner** button. The New Discovery Scanner popup page appears.
3. Type PS Accounts in the **Name** text box.
4. Type a description in the **Description** text box.
5. Leave the **Discovery Type** dropdown list set to **Find Local Accounts**.
6. Click to select **PowerShell Discovery** in the **Base Scanner** dropdown list. The popup expands to show more controls.
7. Click to select **PS Machine** in the **Input Template** dropdown list. This is the same as the output template from the last scanner.
8. Click to select **PS Account** in the **Output Template** dropdown list. This is the Host Range template we created in the previous section.



- Click to select **Local Account Scanner** in the **Script** dropdown list. The script runs for each object matching the input template, using the arguments in the next step, finally returning an object defined by the output template.
- Type the following in the **Script Arguments** text box, separating each with a space: \$target \${1}\$username \${1}\$Domain \${1}\$Password.
- Ensure the **Active** check box is selected.
- Click the **OK** button to save the scanner.

## Dependencies











And repeat the process for the dependencies scanner:

- Click the **Dependencies** tab:

Discovery Scanners


Host Ranges
Machines
Accounts
Dependencies

Create New Scanner

NAME	BASE SCANNER	INPUT TEMPLATE	OUTPUT TEMPLATE	ACTIVE	OPTIONS
Application Pool	Windows Discovery	Windows Computer	Windows Application Pool	Yes	 
COM+ Application	Windows Discovery	Windows Computer	COM+ Application	Yes	 
PS Windows Services	PowerShell Discovery	PS Machine	PS Dependency	Yes	 
Scheduled Task	Windows Discovery	Windows Computer	Windows Scheduled Task	Yes	 
Windows Service	Windows Discovery	Windows Computer	Windows Service	Yes	 

Items: 5

☐ Show Inactive

 Back

- Click the **Create New Scanner** button. The New Discovery Scanner popup page appears.
- Type PS Windows Services in the **Name** text box.
- Type a description in the **Description** text box.
- Leave the **Discovery Type** dropdown list set to **Find Dependencies**.
- Click to select **PowerShell Discovery** in the **Base Scanner** dropdown list. The popup expands to show more controls.
- Click to select **PS Machine** in the **Input Template** dropdown list. This is the same as the output template from the PS Machines scanner.
- Click to select **PS Dependency** in the **Output Template** dropdown list. This is the template we created in the previous section.

9. Click to select **Windows Service Scanner** in the **Script** dropdown list. The script runs for each object matching the input template, using the arguments in the next step, finally returning an object defined by the output template.
10. Type the following in the **Script Arguments** text box: \$target.
11. Ensure the **Active** check box is selected.
12. Click the **OK** button to save the scanner.

## Discovery Sources

The final step is to create a discovery source and assign the discovery scanners we just created to it:

1. Click **Admin > Discovery**. The Discovery Sources tab of the Discovery page appears.
2. Note the list of existing discovery sources.  
  
**Note:** If you upgraded from an earlier Secret Server version and have created an AD domain within Secret Server, a corresponding discovery source is displayed on this page. If discovery was not enabled on that domain, the discovery source Active column is not checked for that discovery source.
3. Click the **Create Discovery Source** button and select **Active Directory** to choose that discovery source type. A Discovery Source page appears for that type.
4. Type the parameters for the discovery source name, FQDN, and friendly (human readable) name. The parameters with asterisks are required.
5. Ensure the **Active** check box is selected. This activates this discovery Source for scanning. Active discovery sources are scanned at the defined discovery interval defined. If you have multiple discovery sources, the discovery source with the most un-scanned computers is scanned first.
6. Next, you select a secret that is used as the credentials for discovery scanning and AD synchronization. These credentials must have the proper rights to scan the remote machines. Click the **No Secret Selected** link. The Select Secret popup page appears.
7. **Either** search for and click the secret you want to use for the account credentials during the scan. The popup page closes. The name of the secret you chose replaces the No Secret Selected link.  
  
**Or** create a new secret for the credentials:
  1. Click the **Create New Secret** link. The Create New Secret page appears.
  2. Click the **Generic Discovery Credentials** secret template. Another Create New Secret page appears.
  3. Type or select the parameters needed for the discovery operation. Parameters with asterisks are required.
  4. Click the **Create Secret** button.
8. Click the **Discovery Site** dropdown list to select the desired site for the discovery source. If distributed engines are setup, the list shows all active sites. If no distributed engines are setup, the list defaults to local, and you cannot change it.
9. Click the **Discover Specific OU** check box to limit your discovery to an OU. See **Enabling Specific OU Domain Discovery** ADD LINK to define the scanned OU. When you select this option, a Domain Scope tab appears on the Discovery Source page for the created AD discovery source.
10. Leave the **Machine Resolution Type** dropdown list set to **Use Machine and Fully Qualified Name** unless you have a specific reason to change it.

- Click to select the **Use LDAPS** check box to use secure LDAP for the discovery.
- Click the **Create** button. Secret Server attempts to access the domain with your specified credentials to ensure the configuration is correct. Thus, Secret Server must have access to the domain provided, and the account credentials must work. The new discovery source is created. It appears on the Discovery Source tab of the Discovery page.
- Click the link for the newly created discovery source. The Discovery Source tab for the source appears:

Admin > Discovery > gamma.thycotic.com

Discovery Source

Domain Scope

Audit

Scanner Settings

Active Directory

Edit

Active Directory Discovery allows Secret Server to scan for Active Directory (AD) machines, Active Directory user accounts, local Windows accounts and dependencies on an AD domain. Secret Server will first discover machines from your domain; next, each machine is scanned for local Windows accounts and dependencies. By default, you can have Secret Server scan for local accounts, domain accounts, scheduled tasks, Windows services, and IIS application pools.


You can find additional accounts and dependencies by creating PowerShell scanners. PowerShell scanners are an advanced topic described in the Extensible Discovery section

KB Link

Discovery Source Name *	gamma.thycotic.com
Fully Qualified Domain Name *	gamma.thycotic.com
Friendly Name *	Gamma Domain
Active *	Yes
Discovery Secret *	Gamma Domain\alwayson
Discovery Site *	Local
Discover Specific OU *	Yes
Machine Resolution Type *	Use Machine and Fully Qualified Name (Recommended)
Use LDAPS *	No


14. Click the Scanner Settings button. The Discovery Source Scanner Settings page appears:



### Discovery Source Scanner Settings



Specific organizational units are enabled for this Discovery Source. Click [here](#) to manage specific OUs for this Discovery Source.


#### FIND HOST RANGES




**Add New Host Range Scanner**

NAME	INPUT TEMPLATE	OUTPUT TEMPLATE	OPTIONS
Active Directory Organizational Units	Active Directory Domain	Organizational Unit	 

Scanners: 1


#### FIND MACHINES






**Add New Machine Scanner**

NAME	INPUT TEMPLATE	OUTPUT TEMPLATE	OPTIONS
Active Directory Computers	Organizational Unit	Windows Computer	 

Scanners: 1

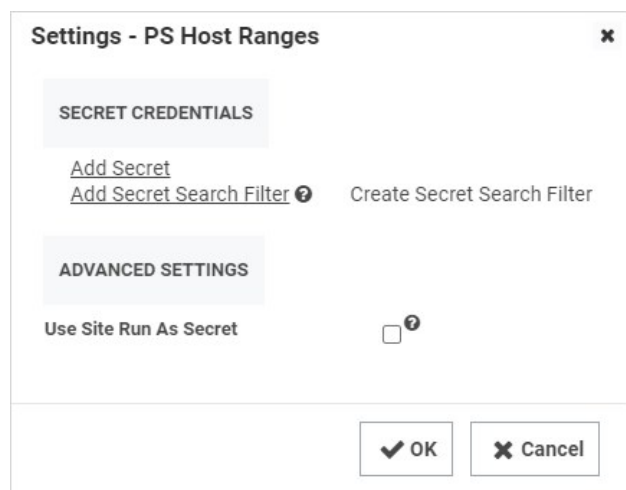
#### FIND ACCOUNTS


**Add New Account Scanner**

NAME	INPUT TEMPLATE	OUTPUT TEMPLATE	OPTIONS
Windows Local Accounts	Windows Computer	Windows Local Account	   

Scanners: 1

- Note that a discovery source with default scanner options is already created. For this tutorial, we are not using any of those scanners.
- Click the trashcan icon next to each scanner.
- In the **Find Host Ranges** section, click the **Add New Host Range Scanner** button. The Available Scanners popup appears.
- Click the **+** icon next to the PS Host Range scanner to select it. A settings popup for the scanner appears:



19. Click the **Add Secret** link. The Select a Secret popup appears.
20. Select a secret that has permissions to scan the domain, such as the account you linked to the domain when adding the discovery source.  
  
**Note:** The "Advanced Settings" section allows you to configure options necessary for running a PowerShell script. For more information see [Configuring CredSSP for WinRM with PowerShell](#).
21. Click the **OK** button to save your settings.
22. Now that you have defined the host range scanner, repeat the process for the machine scanner, **PS Machines**, with the appropriate secret. Repeat any advanced settings from the last scanner. Once you have added a machine scanner, you can add a local account scanner.
23. Repeat the process for the local account scanner, **PS Accounts**, with the appropriate secret. Repeat any advanced settings from the last scanner.
24. Finally, repeat the process for the dependency scanner, **PS Window Services**, with the appropriate secret. Repeat any advanced settings from the last scanner.
25. Your scripted discovery source is now complete. You can go to the main discovery page to run discovery followed by a computer scan. When both are done, you should see identical results in your discovery network view to what you would get if you ran discovery with our built-in scanners.

## Alerts, Auditing, Events and Logs

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server records specific events and optionally sends you alerts when they happen.

## In This Section

- [Overview](#)
- [Data Retention Policies](#)
- [Permissions](#)
- [Procedures](#)
  - [Viewing the Status and History of Audit-Data Retention Policies](#)
  - [Editing Audit Data Policies](#)
  - [Running an Old Audit-Data Purge Right Now](#)

## Overview

Secret Server can automatically delete older audit and audit-like information (both are called "audit data" here). By default, Secret Server does not delete any audit data.

**Important:** Do not configure automatic record deletion for compliance or other important data.

If enabled, old data deletion occurs automatically at 0200 EST every Sunday. Data deletion can be run immediately by clicking the "Run Now" button. The maximum record age for each audit-data retention policy is configurable to any value greater than or equal to 30 days.

## Data Retention Policies

The audit data retention offers two data retention policies:

- Personally Identifiable Information (PII): Tables containing identifiable user or organization data.
- Database Size Management: Tables that are prone to grow large, which may affect Secret Server performance.

Each policy has a title and description, which are displayed to users, as well as a defined set of Secret Server audit tables it manages. There is some overlap between the two policies' table sets as some tables fall under both PII and size management.

When an audit-data retention policy runs, all records in each table for that policy that are older than the set maximum record age in days are deleted from the database. This also includes all dependent records in other tables that would otherwise prevent deletion.

## Permissions

Access to the audit-data retention management pages in Secret Server is limited to users with the roles "View Data Retention" and "Administer Data Retention." As the names imply, only the latter role can manage audit data retention, such as editing and running now.

**Note:** The "Unlimited Admin" role does not include audit data retention management at this time.

By default, these two audit-data retention roles are not assigned to users. An admin must first assign the roles to users requiring access.

## Procedures

### Viewing the Status and History of Audit-Data Retention Policies

1. Go to **Admin > Data Retention Management:**

Admin > Data Retention Management

Data Retention
Audit

Configure automatic permanent deletion of older audit information. By default Secret Server does not delete any audit information. Do not configure deletion of records that you need for compliance or other purposes.

The deletion of old data occurs automatically at 2 AM EST every Sunday and can be run immediately by clicking Run Now below.

### Personally Identifiable Information (PII)

Personally identifiable information is information such as email addresses and names that can be used to identify an individual.

This list details which data is managed by this policy.

- Event Subscription Audit
- Dual Control Audit
- Group Audit
- Secret Audit
- Folder Audit
- Secret Policy Audit
- Workflow Template Audit
- Event Audit
- User Audit
- Admin Log

Enabled	Yes	Run Now	Edit
Max Record Age	365 Days	Edit	
Last Start Time			
Last Complete Time			

The Personally Identifiable Information (PII) policy is displayed on the Data Retention tab. If you scroll down, you will see the Database Size policy:

### Database Size Management

These tables may grow very large over time, which can impact performance.

This list details which data is managed by this policy.

- Group Audit
- SDK Client Audit
- Secret Audit
- Event Audit
- User Audit
- Secret Log
- Secret Item Transition History
- Secret History
- User Secret Event

Enabled	No	Edit
Max Record Age		
Last Start Time		
Last Complete Time		

2. Notice that each policy lists:

- The enabled status (editable)



- The maximum age audits are allowed to remain (editable)
- The last time the policy ran
- The last time the policy finished running
- All the audit data tables that the policy covers

3. To view a list of previous "runs," click the **Audit** tab. You can also hover the mouse pointer over individual records to view details:

Admin > Data Retention Management

Data Retention

Audit

9 Audits

DATE RECORDED	NAME	USER	ACTION	NOTES
11/12/2019 3:29 pm	Personally Identifia...	ThycoticSystem	Truncate Records	Removed 65 total re...
11/12/2019 3:29 pm	Personally Identifia...	ThycoticSystem	Truncat	
11/12/2019 3:29 pm	Personally Identifia...	Jonathan Cogley	Truncat	
11/12/2019 3:28 pm	Personally Identifia...	Jonathan Cogley	Edit	
11/12/2019 3:05 pm	Personally Identifia...	Jonathan Cogley	Edit	
11/12/2019 3:05 pm	Personally Identifia...	Jonathan Cogley	Edit	
11/2/2019 2:27 pm	Personally Identifia...	ThycoticSystem	Truncat	
11/2/2019 2:27 pm	Personally Identifia...	ThycoticSystem	Truncat	
11/2/2019 2:27 pm	Personally Identifia...	Jonathan Cogley	Truncate Records	Process Requested

Removed 65 total records  
 Removed 1 records from [Event Subscription Audit]  
 Removed 0 records from [Dual Control Audit]  
 Removed 0 records from [Group Audit]  
 Removed 17 records from [Secret Audit]  
 Removed 5 records from [Folder Audit]  
 Removed 3 records from [Secret Policy Audit]  
 Removed 0 records from [Workflow Template Audit]  
 Removed 6 records from [Event Audit]  
 Removed 8 records from [User Audit]  
 Removed 13 records from [Admin Log]  
 Removed 0 records from [Access Request]  
 Removed 0 records from [Access Response]  
 Removed 12 records from [Secret Access Request]

## Editing Audit Data Policies

1. Go to **Admin > Data Retention Management:**

Admin > Data Retention Management

+

JC

Data Retention
Audit

Configure automatic permanent deletion of older audit information. By default Secret Server does not delete any audit information. Do not configure deletion of records that you need for compliance or other purposes.

The deletion of old data occurs automatically at 2 AM EST every Sunday and can be run immediately by clicking Run Now below.

### Personally Identifiable Information (PII)

Personally identifiable information is information such as email addresses and names that can be used to identify an individual.

This list details which data is managed by this policy.

- Event Subscription Audit
- Dual Control Audit
- Group Audit
- Secret Audit
- Folder Audit
- Secret Policy Audit
- Workflow Template Audit
- Event Audit
- User Audit
- Admin Log

Enabled	Yes	Run Now	Edit
Max Record Age	365 Days		Edit
Last Start Time			
Last Complete Time			

- Click the **Edit** link on the **Enabled** row on the policy that you wish to edit. A popup appears (not shown).
- Click to select the **Enabled** check box.
- Click the **Save** button. The policy becomes enabled.
- Click the **Edit** link on the **Max Record Age** row on the policy that you wish to edit. A popup appears (not shown).
- Type the number of days you want to retain the data (at least 30) in the **Max Record Age** text box.
- Click the **Save** button. The maximum record age changes.

## Running an Old Audit-Data Purge Right Now

- Go to **Admin > Data Retention Management**:

Admin > Data Retention Management

JC

Data Retention
Audit

Configure automatic permanent deletion of older audit information. By default Secret Server does not delete any audit information. Do not configure deletion of records that you need for compliance or other purposes.

The deletion of old data occurs automatically at 2 AM EST every Sunday and can be run immediately by clicking Run Now below.

### Personally Identifiable Information (PII)

Personally identifiable information is information such as email addresses and names that can be used to identify an individual.

This list details which data is managed by this policy.

- Event Subscription Audit
- Dual Control Audit
- Group Audit
- Secret Audit
- Folder Audit
- Secret Policy Audit
- Workflow Template Audit
- Event Audit
- User Audit
- Admin Log

Enabled	Yes	Run Now	Edit
Max Record Age	365 Days	Edit	
Last Start Time			
Last Complete Time			

- Click the **Run Now** link on the **Enabled** row on the policy that you wish to edit. A popup appears (not shown).
- Click the **Run Now** button. The popup disappears and the policy is run now.

**Note:** If a policy is currently running and you click the Run Now button. It will not work, and a popup will tell you so. There is a built-in five-minute wait after a policy finishes before you can run it again.

- The **Last Start Time** row changes to the current time, and a progress indicator appears.
- When the run is complete, the **Last Complete Time** row changes to the current time.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Overview

You can enable the marking or obfuscation (hiding) of Personally Identifiable Information (PII) in audit exports. This allows for data exportation for review by third parties without including any PII. Marking PII prepares exports for external, separate cleanup, and obfuscation automatically hides or removes it during exportation.

PII includes many internal stored attributes, such as IP addresses, usernames, and email addresses. Metadata fields can be flagged on creation as potentially containing PII, which aids applying the same filtering to user-configured metadata fields. PII can potentially appear in:

- System logs
- Thread logs (RPC, heartbeat, discovery, and others)
- Event logs
- Log4net files

**Note:** This feature currently only applies to audit tables available in the interface.

## Procedure

1. In the Admin Side Panel, search for and click **Application**. The Application Configuration page appears.

## Configuration

Search configuration section names, labels, and actual configuration values.

### Application

General application configuration, syslog, and web services.

[Edit](#)

Allow Automatic Checks for Software Updates Yes

Early Adopter No

Send Anonymized System Metrics to Delinea No

[Anonymized System Metrics Information](#) 

[View Metric Data](#) 

Enable Webservices Yes

[View Webservices](#) 

Maximum Time for Offline Access on Mobile Devices (days) 30

- Click the **Edit** button.
- Scroll down and click to select the **Obfuscate Personally Identifiable Information** check box. An Obfuscation Level dropdown list appears:

Obfuscate Personally Identifiable Information



Obfuscation Level

Mark PII and obfuscate in Audit exports



Cancel

Save

- Click the Obfuscation Level dropdown list to select one of the following:
  - Mark PII and Obfuscate in Audit Exports:** Permanently hide or remove all PII in the exported audit report. The following PII data is hashed (replaced with unique, scrambled text that provides no PII): user ID or name, IP address, and folder path. Any other PII data is replaced with [PII REMOVED]. The hash value allows audit viewers to see that multiple entries belong to a single user

without having any specifics on who that user is.

- **Mark PII:** Delimit all PII in easy-to-search-for markers. This allows other applications to process the PII after the export.

5. Marked PII is surrounded with three square brackets on each side, as seen below:

Admin > User Management > Users > User One

User One

General

Groups

Roles

Teams

Secrets

Metadata

Audit

Group Assignment Audit

IP Address Audit

Role Assignment Audit

1 Item

DATE RECORDED	USER	ACTION	IP ADDRESS	NOTES
3/23/2022 4:12 PM	Admin	EDIT	127.0.0.1	DisplayName: [[[User 1]]] to [[[User One]]]; EmailAddress: [[[user1@thycotic.com]]] to [[[userOne@thycotic.com]]];

Obfuscated exports appear as seen in MS Excel below. Note the removed data [PII REMOVED] and the unique hash values for the user and display names:

Date Recorded	User	Action	IP Address	Notes
2022-03-23T20:12:10.483Z	1788267786	EDIT	1638446219	DisplayName: 665120776 to 1077913347; EmailAddress: [PII REMOVED] to [PII REMOVED];

This topic discusses enabling DEBUG mode for distributed engine logs for troubleshooting.

## Overview

You can expand Secret Server logging capability to locate additional information regarding an error or to help with troubleshooting an issue.

## Procedure

How to enable DEBUG logging mode:

1. Log in as an administrator on the distributed engine server.
2. Locate the Thycotic.DistributedEngine.Service.exe.config in the C:\Program Files\Thycotic Software Ltd\Distributed Engine directory.
3. Open the file in a text editor.
4. Run a find (**<Control>+ <F>**) command.
5. Type in log4net and press **<Enter>** to locate that section, which is usually at the top.
6. Locate the two lines that contain "INFO"
7. Replace each INFO with DEBUG.
8. Restart the Delinea Distributed Engine service to apply the log configuration change.
9. After DEBUG mode is enabled in the system log, you can reproduce the issue, investigate the error, or send the updated logs in with your support case.

## Verbose Mode

On occasion, you may be instructed to enable the VERBOSE mode to capture details for troubleshooting. Do this by using the same procedure and replacing "INFO" or "DEBUG" with "VERBOSE" instead.

**Important:** Enabling VERBOSE mode will create very detailed log information with large numbers of log files that can accumulate and quickly consume available resources on the machine. Therefore, you should only enable it during the troubleshooting process and immediately turned off afterward in order to prevent performance issues.

This topic discusses enabling DEBUG mode for application system logs for troubleshooting.

## Overview

You can expand Secret Server logging capability to locate additional information regarding an error or to help with troubleshooting an issue.

**Note:** To enable DEBUG logging for distributed engine log files, see [Enabling Debug Mode in Distributed Engine Log Files](#).

## Procedure

How to enable DEBUG logging mode:

1. Log in as an administrator on the application server.
2. Locate the web-log4net.config file. This file can be found in the web application's root directory. If you cannot locate your web application directory, see [How to: Find the Web Application Root](#). Secret Server is typically located in the "C:\inetpub\wwwroot\" directory; however, this is configurable so the location may be different in your environment.
3. Open the file in a text editor.
4. Run a find (**<Control>+ <F>**) command.
5. Type in log4net and press **<Enter>** to locate that section, which is usually at the top.
6. Locate the commented out `<level value="DEBUG" />` line.
7. Uncomment the line by removing the `<!--` and `-->`.
8. Locate the `<level value="INFO" />` line in the same section.
9. Comment out the entire line by adding a `<!--` and `-->` around it.
10. Restart IIS to apply the log configuration change.

**Note:** This restarts all websites hosted under IIS.

11. After DEBUG mode is enabled in the system log, you can reproduce the issue, investigate the error, or send the updated logs in with your support case.

## Verbose Mode

On occasion, you may be instructed to enable the VERBOSE mode to capture details for troubleshooting. Do this by using the same procedure and replacing "INFO" or "DEBUG" with "VERBOSE" instead.

**Important:** Enabling VERBOSE mode will create very detailed log information with large numbers of log files that can accumulate and quickly consume available resources on the machine. Therefore, you should only enable it during the troubleshooting process and immediately turned off afterward in order to prevent performance issues.



## Overview

*Event pipelines* (EPs) are a named group of triggers, filters, and tasks to manage events and responses to them. Event pipelines themselves can be grouped into EP policies. The Secret Server EP system is essentially a flexible instruction set builder and manager for controlling events and responses.

## Event Pipeline Components

### Definitions

#### Event Pipeline

An EP is a single named group of triggers, filters, and tasks. The same EP can be in multiple EP policies. Changing an EP affects all EP policies that EP is a part of. EPs do nothing if not assigned to an EP policy. There are two types of event pipelines—secret and user. To run an EP, include it in an active EP policy of that same type (secret or user) with set EP policy targets, such as user groups or folders.

#### Event Pipeline Policy

An *EP policy* is a named group of EPs that are run at the same time (in sequential order). Similar to EPs, there are two types of EP policies: *secret* or *user*. Secret EP policies target secret policies or folders and can only contain secret EPs. User EP policies target users in Groups and can only contain user EPs. EP policies must have an assigned EP policy target to work. Similarly, an EP policy with no assigned EPs does nothing.

#### Event Pipeline Filter

*EP Filters* are parameters that limit when an EP task runs. All Filters have settings and can be added to an EP multiple times. The filters are:

#### Secret Policy Filters

The current secret policy filters:

- Custom Variable
- Day of Week
- Event Time
- Event User: Group
- Event User: Has Two Factor
- Event User: Role
- Event User: Role Permission
- Event User: Team
- Event User: User Domain
- Event User: User Last Login
- Event User: User Setting
- IP Address
- Group
- Policy on a Secret
- Role
- Role Permission
- Secret Access Role Permission
- Secret Field
- Secret has Field

- Secret has RPC enabled
- Secret Name
- Secret Setting
- Secret Template
- Site
- Target User: Two Factor Type
- Two Factor Type

## User Policy Filters

The current user policy filters:

- Custom Variable
- Day of Week
- Event Time
- Event User: Group
- Event User: Has Two Factor
- Event User: Role
- Event User: Role Permission
- Event User: Team
- Event User: User Domain
- Event User: User Last Login
- Event User: User Setting
- IP Address
- Multi-Group
- Target User: Group
- Target User: Has Two Factor
- Target User: Multi-Group
- Target User: Role
- Target User: Role Permission
- Target User: Team
- Target User: Two Factor Type
- Target User: User Domain
- Target User: User Setting
- Two Factor Type

Some filters prompt you for additional information when you select them.

## Event Pipeline Policy Target

EP policy *targets* are Secret Server folders, secret policies, or user groups that are the *subject* an EP policy is applied to. For secret EP types, the secrets inside the folders or secrets under the secret policies trigger the EPs in an EP policy. As targets, folders are not recursive—only the secrets directly in the folder can trigger an EP. For user EP types, only users in the selected groups can trigger an EP.

**Note:** EP policy targets are *not* the receivers of task action. Those receivers are usually components of Secret Server. The term *target* is instead used for the *subject* of an EP policy—the policy targets the secret in the policy or folder to trigger the EPs to process.

**Note:** Event users are different than target users: The event user triggers the event. The target user is the recipient of the event.

## Event Pipeline Task

**Important:** Tasks are powerful and can potentially do a lot of damage, so we highly recommend testing EPs in a safe

environment before using them on production secrets.

EP *tasks* are actions that are triggered in an EP, assuming any filtering conditions are met. Tasks can edit secrets, move secrets, change permissions, send notifications, and more.

Tasks run in order of their appearance on the Task tab of the Event Pipeline details page. To change the task running order, hover the mouse pointer over the one you want to move, and use the anchor on the left of its card to drag the task to the order you want it to run. If a task fails, the follow-on tasks will not run.

**Note:** EP targets are *not* the receivers of task action. Those receivers are usually components of Secret Server. The term *target* is instead used for the *subject* of an EP policy—the policy targets the secret in the policy or folder to trigger the EPs to process.

**Note:** To reference the additional secrets in the script's Args field for the update secret with a script task or run script, use \${ADD:1} before the token. For example: \${ADD:1}\$USERNAME to reference additional secret one and \${ADD:2}\$USERNAME to reference additional secret two.)

## Secret Tasks

The secret tasks are:

- Add Custom Audit
- Add Share
- Assign Secret Policy
- Assigning Site to Secret
- Change Password Remotely
- Change Secrets to not require a comment when viewed
- Change Secrets to not require Check Out
- Change Secrets to require Check Out
- Change Secrets to require Comment on View
- Change to Inherit Permissions
- Delete
- Disable Auto Change
- Disable Heartbeat
- Edit Share
- Enable Heartbeat
- Expire Secrets
- Fail with a message
- Hide Launcher Password
- Move to Folder
- Post Slack Message (WebHook)
- Retry with new random password
- Run Heartbeat
- Run Script
- Schedule Pipeline
- Secret: Add Custom Audit
- Secret: Add Share
- Secret: Assign Secret Policy
- Secret: Assigning Site to Secret
- Secret: Change Password Remotely
- Secret: Change Secrets to not require a comment when viewed
- Secret: Change Secrets to not require Check Out
- Secret: Change Secrets to require Check Out
- Secret: Change Secrets to require Comment on View

- Secret: Change to Inherit Permissions
- Secret: Delete
- Secret: Disable Auto Change on Secret
- Secret: Disable Heartbeat
- Secret: Edit Share
- Secret: Enable Auto Change on Secret
- Secret: Enable Heartbeat
- Secret: Expire Secrets
- Secret: Fail with a message
- Secret: Move to Folder
- Secret: Retry with new random password
- Secret: Run Heartbeat
- Secret: Send Email to Owners
- Secret: Set Privileged Account
- Secret: Stop RPC
- Secret: Undelete
- Secret: Update Secret by field
- Secret: Update Secret Name
- Secret: Update Secret with a script
- Secret: Viewing Password Does Not Require Edit
- Secret: Viewing Password Requires Edit
- Send Email to Event User
- Send Email to Group
- Send Email to List
- Send Email to Owners
- Set Custom Variable
- Set Privileged Account
- Stop RPC
- Undelete
- Unhide Launcher Password
- Update Secret by field
- Update Secret Name
- Update Secret with a script
- Update Secrets to automatically change the password

## User Tasks

The user tasks are:

- Post Slack Message (WebHook)
- Run Script
- Schedule Pipeline
- Send Email to Event User
- Send Email to Group
- Send Email to List
- Set Custom Variable
- Target User: Add User to Group
- Target User: Add User to Team
- Target User: Disable Duo Two Factor
- Target User: Disable Email Two Factor
- Target User: Disable FIDO2 Two Factor
- Target User: Disable RADIUS Two Factor

- Target User: Disable TOTP Auth Two Factor
- Target User: Disable Users
- Target User: Enable Duo Two Factor
- Target User: Enable Email Two Factor
- Target User: Enable FIDO2 Two Factor
- Target User: Enable RADIUS Two Factor
- Target User: Enable TOTP Auth Two Factor
- Target User: Enable Users
- Target User: Force Logout
- Target User: Lock User
- Target User: Remove User from Group
- Target User: Remove User from Team
- Target User: Reset FIDO2 Two Factor
- Target User: Reset TOTP Auth Two Factor
- Target User: Send Email to Target User
- Target User: Unlock User

## Event User

An event user is the user making the action. For example: Admin updated user Jane's email. Admin is the event user.

## Event Variable

An event variable is a place holder for a piece of information that will manifest when the event occurs, for example the user initiating the event (`$ByUser`) or whether or not the applicable secret is active (`$secret.active`).

## Target User

A target user is the affected user. Example: Admin updated user Jane's email. Jane is the target user.

## Triggers

EP *triggers* are events in Secret Server that cause the EP to begin processing. All triggers have no settings and can only be added to an EP once.

**Note:** Pipelines are triggered following an action in most cases—pre-checkout being the exception. Therefore, you cannot interrupt an action during an event.

The triggers are:

## Secret Triggers

- Access Approved
- Access Denied
- Cache View
- Check In
- Check Out
- Copy
- Create
- Custom Audit
- Custom Password Requirement Added To Field
- Custom Password Requirement Removed From Field
- Delete

- Dependency Added
- Dependency Deleted
- Dependency Failure
- Edit
- Expired Today
- Expires in 1 Day
- Expires in 15 Days
- Expires in 3 Days
- Expires in 30 Days
- Expires in 45 Days
- Expires in 60 Days
- Expires in 7 Days
- Export
- File Save
- Heartbeat Failure
- Heartbeat Success
- Hook Create
- Hook Delete
- Hook Edit
- Hook Failure
- Hook Success
- Launch
- Password Change
- Password Change Failed
- Password Change Maximum Attempts Reached
- Password Displayed
- Pre-Check In

**Note:** When using the Pre-Check In trigger, we recommend applying a group filter too. That trigger is a blocking call prior to secret check in that runs a script or causes the check in to fail with a warning. A problem arises when Secret Server does the same check-in process for the system "user" in the background at the end of the checkout interval. When the Pre-Check In trigger causes the check in to fail with a warning, the Secret Server background process continues to attempt check in forever, causing Secret Server to disable the pipeline. Applying a group filter ensures the trigger does not apply to the system user.

- Pre-Check Out
- Secret Policy Change
- Session Recording View
- Undelete
- View
- Viewed Secret Edit
- Web Password Fill

## User Triggers

- Added to Group
- Challenge Applied
- Challenge Cleared
- Disable
- Enable
- Lockout
- Login
- Login Failure
- Logout

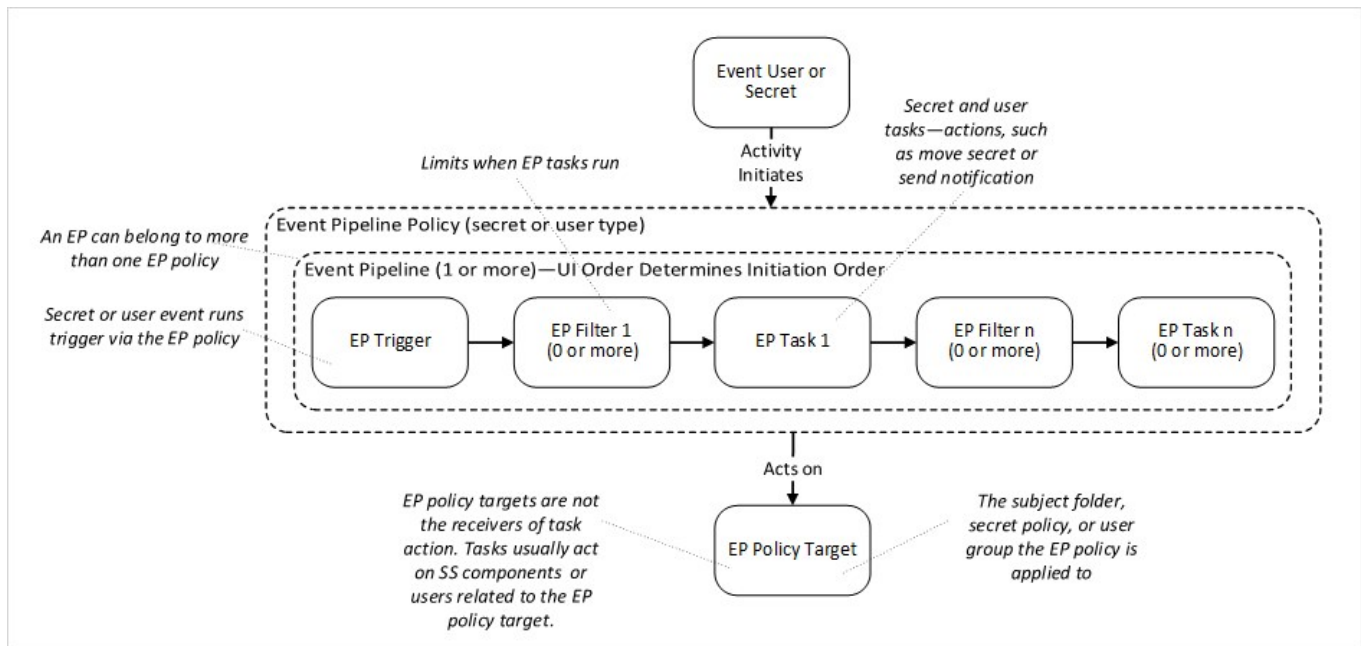
- Owners Modified
- Remove Personally Identifiable Information
- Removed From Group
- Two Factor Changed
- Two Factor Reset Failure
- Two Factor Reset Success
- User: Create
- User: Edit
- User: Password Change

## Component Relationships

The following diagram shows how the components in the Definitions section relate.

**Note:** Please refer to the Definition section when viewing this diagram.

**Figure:** Component Relationships



## Event Variables

Event variables are used in EP filters or tasks. They are:

### Secret Field Tokens

These can be any secret field name in the tbSecretField table that is not a Password (IsPassword=0) or File (IsFile=0) type. For example, for an Active Directory Account (SecretTypeID=6001), these tokens are available: \$Username, \$Domain, or \$Notes.

### Event Setting Tokens

**Table:** Event Setting Tokens with Filter Values

- \$metadata.secret.section.fieldname

- \$metadata.folder.section.fieldname
- \$metadata.user.section.fieldname
- \$metadata.secretfolderuser.section.fieldname

\$ByUser	Username that initiated the event	Text
\$ByUserDisplayName	Display name of user that initiated event	Text
\$ContainerName	Folder name for the event	Text
\$EventAction	Action that occurred on the event entity type. See list of triggers.	Text
\$EventDetails	Event notes. For heartbeats and RPC, this contains the status and any error message.	Text
\$EventUserKnownAs	Username for user that caused the event. If a domain account exists, then this appears as domain\username.	Text
\$ItemId	Secret ID for the event	Text
\$ItemNameForDisplay	Event secret name	Text

[Unexpected Link Text](#)

Secret Setting Tokens

Table: Secret Setting Tokens with Filter Values

\$Secret.Active	Active	Boolean
\$Secret.AutoChangeOnExpiration	Auto change on expiration	Boolean
\$Secret.ChangePasswordNow	Change password now	Boolean
\$Secret.CheckOutChangePassword	Checkout change password	Boolean
\$Secret.CheckOutEnabled	Checkout enabled	Boolean
\$Secret.EnableInheritPermissions	Enable inherit permissions	Boolean
\$Secret.EnableInheritSecretPolicy	Enable inherit secret policy	Boolean



\$Secret.Expired	Expired	Boolean
\$Secret.HideLauncherPassword	Hide launcher password	Boolean
\$Secret.IsDoubleLock	Double lock	Boolean
\$Secret.IsSessionRecordingEnabled	Session recording enabled	Boolean
\$Secret.IsSSHProxyEnabled	SSH proxy enabled	Boolean
\$Secret.LastHeartBeatStatus	Status of last heartbeat	AccessDenied; AccountLockedOut; ArgumentError; Disabled; DnsMismatch; Failed; IncompatibleHost; Pending; Processing; Success; UnableToConnect; UnableToValidateServerPublicKey; UnknownError
\$Secret.PasswordChangeFailed	Password change failed	Boolean
\$Secret.PasswordChangeOutOfSync	Password change out of sync	Boolean
\$Secret.PasswordChangeStatus	Password change status	None; Pending; Processing
\$Secret.PasswordComplianceCode	Password compliance code	Pending; Pass; Fail
\$Secret.RequireApprovalForAccess	Require approval for access	Boolean
\$Secret.RequireApprovalForAccessForEditors	Require approval for access for editors	Boolean
\$Secret.RequireApprovalForAccessForOwnersAndApprovers	Require approval for access for owners and approvers	Boolean
\$Secret.RequireViewComment	Require view comment	Boolean

\$Secret.RestrictSshCommands	Restrict SSH commands	Boolean
\$Secret.RPCAttemptCount	RPC attempt count	Boolean
\$Secret.SecretId	Secret ID	Text
\$Secret.SecretPolicyId	Secret policy ID	Text
\$Secret.SecretTemplateName	Secret template name	Text

[Unexpected Link Text](#)

## Additional Tokens

### Secret

- \$SecretName
- \$SecretId

### Folder

- \$FolderId
- \$FolderName
- \$FolderPath

### Event User

- \$EventUserDomain
- \$EventUserKnownAs
- \$EventUserName
- \$EventUserLastLogin
- \$EventUserId

### Metadata

- \$metadata.folder.section.fieldname (secret event pipelines)
- \$metadata.secret.section.fieldname (secret event pipelines)
- \$metadata.secretfolderuser.section.fieldname (secret event pipelines)
- \$metadata.user.section.fieldname (secret and user event pipelines)
- \$metadata.user.section.fieldname (user event pipelines)

## Target User

- \$TargetUser.DisplayName
- \$TargetUser.IsApplicationAccount
- \$TargetUser.IsSystemUser
- \$TargetUser.UserEmail
- \$TargetUser.UserEnabled
- \$TargetUser.UserName
- \$TargetUserDomain
- \$TargetUserId
- \$TargetUserKnownAs
- \$TargetUserLastLogin
- \$TargetUserName

## Custom Task Variables

These are variables created with the EP task. There are two types, global and item, both of which are referenced in the same way.

**Note:** You must set a custom variable before using it. Thus, you cannot set a variable and use it in the same pipeline. One way around this is to create two pipelines in a policy—the first pipeline sets the variable and the second one uses it. Another way is to first set the variable in Secret Server.

## Global Variable

- \$GlobalVariable.CustomVariableName
- This custom task variable is global, so there should only be one per variable name.

## Item Variable

- \$ItemVariable.CustomVariableName
- This variable is per SecretId (secret pipeline) or UserId (user pipeline).

**Note:** The first time an EP task is invoked, an item variable is not translated, but subsequent invocations have the variable. Global variables are immediately available.

## Permissions

There are three permissions:

- **Administer Pipelines:** Allows the user to create, edit, and remove EPs and EP policies.
- **Assign Pipelines:** Allows the user to assign an EP policy to secret policies, or folders.
- **View Pipelines:** Allows the user to view EP policies and policy activities.

## Procedures

### Event Pipelines

#### Activating or Deactivating Event Pipelines

To control if an EP is available to all EP policies, you can toggle the EP's active status:

1. Go to the **Event Pipelines** page.
2. Click the **Pipelines** tab.

3. Locate the card for the EP you want to activate or deactivate.
4. Click the **Active/Inactive** toggle button. A confirmation popup appears.
5. Click the **OK** button. The EP's status is changed for all EP policies it belongs to.

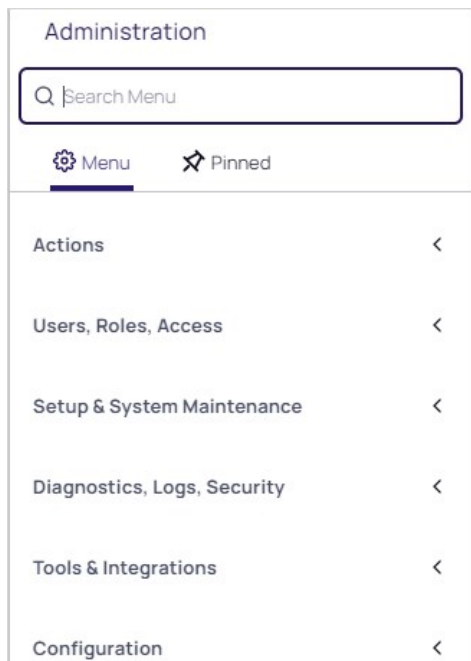
## Creating New Event Pipelines

**Note:** You can create EPs from the Event Pipelines list (shown below) or an EP policy's details view. With the former method, you will have to add the EP to an EP policy separately. With the latter method, the EP is automatically added to the EP policy you are viewing. You can later manually add additional EPs to the policy as desired.

To create a new EP:

### Step One: Create the EP

1. Navigate to **Administration**. The Admin Side Panel appears:



2. Click **Actions** and select **Event Pipeline Policy** in the list. The Event Pipelines: Policies tab of the Event Pipelines page appears:

Admin > Event Pipelines

Event Pipelines

Policies Pipelines Activity Audits

A Secret or User Policy is a collection of the same type of Pipelines (Secret or User). To activate a Policy, you must add Pipelines to it and assign the Policy Targets (groups, folders, etc). Click the Policy name below to add or remove Pipelines from that Policy and select Targets on the Policy details screen.

Active ▾ Search Pipeline Policies

4 items Card View ▾ Sort Name Ascending ▾

ActivatePipel... Secret ACTIVE

AddSharePipel... Secret ACTIVE

SimplePipeline... Secret ACTIVE

UserPipelineP... User ACTIVE

Add Policy

3. Click the **Pipelines** tab:

Admin > Event Pipelines

Event Pipelines

Policies Pipelines Activity Audits

A Secret or User Pipeline is a collection of Triggers, Filters, and Tasks. To run a Pipeline, include it in an active Policy of that same type (Secret or User) with set Targets (groups, folder, etc).

Active ▾ Search Pipelines

4 items Card View ▾ Sort Name Ascending ▾

ActivatePipeline Secret ACTIVE

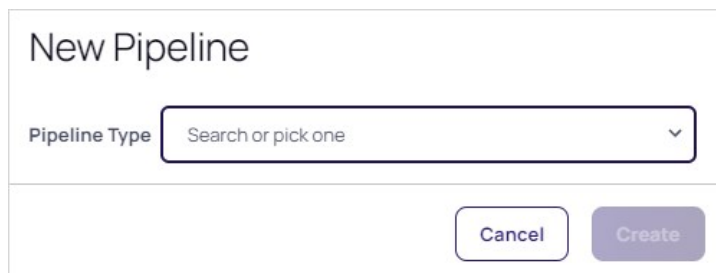
AddSharePipel... Secret ACTIVE

SimplePipeline Secret ACTIVE

UserPipeline User ACTIVE

Add Pipeline

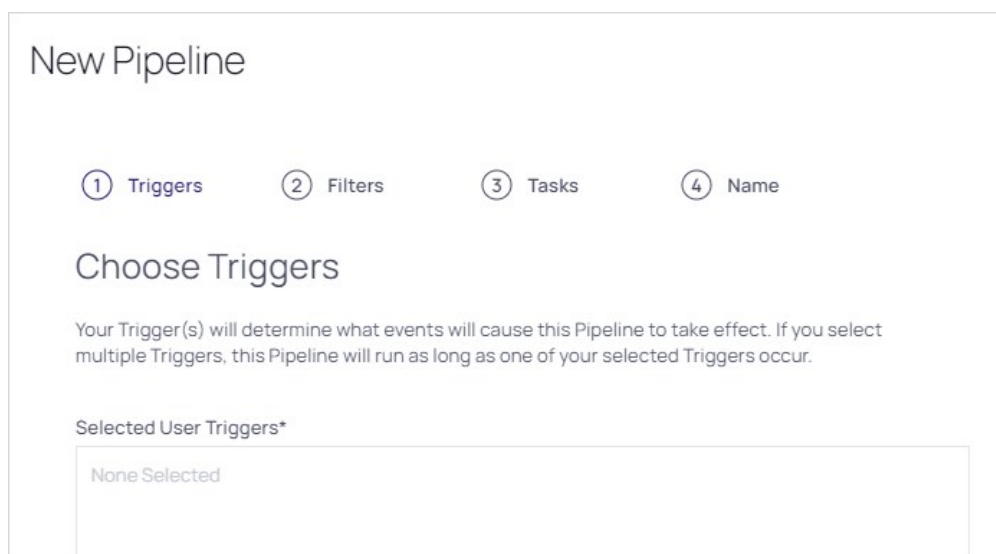
4. Click the **Add Pipeline** button. The New Pipeline popup appears:



New Pipeline

Pipeline Type

- Click the **Pipeline Type** dropdown list to select the EP type: **Secret** or **User**. For this instruction, we chose User. The New
- Click the **Create** button. The New Pipeline wizard appears on the Choose Triggers page:



New Pipeline

① Triggers    ② Filters    ③ Tasks    ④ Name

## Choose Triggers

Your Trigger(s) will determine what events will cause this Pipeline to take effect. If you select multiple Triggers, this Pipeline will run as long as one of your selected Triggers occur.

Selected User Triggers\*

None Selected

### Step Two: Add Triggers

**Note:** When using the pre-check-in trigger, we recommend applying a group filter too. That trigger is a blocking call prior to secret check in that runs a script or causes the check in to fail with a warning. A problem arises when Secret Server does the same check-in process for the system "user" in the background at the end of the checkout interval. When the Pre-Check In trigger causes the check in to fail with a warning, the Secret Server background process continues to attempt check in forever, causing Secret Server to disable the pipeline. Applying a group filter ensures the trigger does not apply to the system user.

- In the **Add Triggers** section, click the **+** button next to the triggers you desire. You can also search for a trigger by typing in the search text box. The selected triggers appear in the Selected Triggers list. Consider the following when selecting triggers:
  - Currently triggers are centralized around events that are linked to a secret.
  - You can add multiple triggers.
  - You can limit when the EP runs by adding filters.
  - Multiple triggers are logically ORed (not XORed) together. Each trigger is considered individually, and only one needs to apply for the EP to run—if concurrent triggers do not apply, it does not matter. If multiple triggers do apply, the EP will only run once per EP policy.

The added trigger appears in the Selected User Triggers box:

Selected User Triggers\*

User: Create

Remove

- Click the **Next** button. The Choose Filters page of the wizard appears:

## New Pipeline

Selected User Filters

No filters have been selected

Add User Filters

- ⊕ Custom Variable
- ⊕ Day of Week
- ⊕ Event Details
- ⊕ Event Time
- ⊕ Event User: Group
- ⊕ Event User: Has Two Factor

Cancel

Next

### Step Three: Add Filters

- Use the exact same method to add filters to the EP. All filters present a popup page for you to provide additional information when you click on them. Consider the following when selecting filters:
  - Whereas triggers focused on secrets, filters can also access secret and user information.
  - Because the same filter can differ by its settings, you can add the same filter multiple times to an EP.

- Filters are logically ANDed together—all filters apply at once and all matter.
- Metadata (MetaData) filters are available for secrets, folders, or user (secret/folder/user hierarchy). Metadata filters can filter for group names.

The selected filters appear in the Selected User Filters section:

Selected User Filters

Day of Week

Day of Week: Monday; Time Zone: ;

Remove Edit

2. Click the **Next** button. The Choose Tasks page of the wizard appears:

New Pipeline

Selected User Tasks\*

No tasks have been selected

Add User Tasks

+

 Post Slack Message (WebHook)
 

+

 Run Script
 

+

 Schedule Pipeline
 

+

 Send Email to Event User
 

+

 Send Email To Group
 

+

 Send Email To List

Cancel

Next

## Step Four: Choose Tasks

1. Use the exact same method to add tasks to the EP. Many tasks present a popup page for you to provide additional information when you



click on them. For example, we chose Send Email to Group:

## Task Settings

### Send Email To Group

This task will send an email to the selected Group. If using a pattern, it means it will accept tokens like \$EventUsername or \$TargetUsername.

Group

All

Search for groups

Email Format

☒ Manual Entry
☐ Email Template

Subject Pattern

Email Body Pattern

High Priority
☐

Cancel

Save

In this instance, you would choose the groups and the email format, either manual or using an email template, which is the same as an inbox template (see [Using Inbox Templates](#)).

**Note:** The email templates for EPs can use the EP tokens in addition to the standard inbox template tokens in the message subject and body. Messages are sent directly to the user's inbox based on the email addresses generated by the send email task, not subscribers from any inbox rule.

2. The selected user tasks appear :

### Selected User Tasks\*

Send Email To Group
Group: 3;Email Format: Email Template;Subject Pattern: ;Email Body Pattern: ;Email Template...

Remove Edit

3. Set the task order if you selected more than one. Tasks run in order of their appearance in the **Task** tab of the **Event Pipeline** page. To change the task running order, hover the mouse pointer over the one you want to move, and use the anchor on the left of its card to drag the task to the order you wish it to run. If a task fails, then the following tasks will not run.

**Warning:** Tasks are very powerful and thus can be dangerous. You can alter Secret Server in dramatic, sometimes irreversible ways. We strongly recommend testing EPs in a safe sandbox environment before applying them to production

Secret Server servers.

4. Click the **Next** button. The Name Pipeline page of the wizard appears:

New Pipeline

Name Pipeline

Give the Event Pipeline a recognizable name, and a helpful description.

Pipeline Name

Pipeline Description

5. Type the EP's name in the **Pipeline Name** text box.
6. Type a description of the EP in the **Pipeline Description** text box.
7. Click the **Save** button.

## Editing Existing Event Pipelines

To create an EP:

1. Go to the **Event Pipeline** page.
2. If necessary, click the **Pipelines** tab. The Event Pipeline Pipelines page appears.
3. Click the title of the card representing the EP you want to edit. The EP wizard appears.
4. See [Creating New Event Pipelines](#) for instructions on using the wizard.

## Viewing Event Pipelines

Because EPs are not directly tied to a single EP policy, they can be viewed through an EP policy or directly from the EP list. The EP list is a tab on the main Event Pipeline Policy page directly after navigating from the Admin page. After selecting an EP policy, its associated EPs are displayed in cards.

## Event Pipeline Policies

### Activating or Deactivating Event Pipeline Policies

To control if an EP policy is available, you can toggle its active status:

1. Go to the **Event Pipelines** page.
2. If necessary, click the **Policies** tab.
3. Locate the card for the EP policy you want to activate or deactivate.
4. Click the eye icon to open the preview panel:

The screenshot shows the 'Event Pipelines' page in the Delinea Admin console. The page has a breadcrumb 'Admin > Event Pipelines' and a search bar. Below the breadcrumb is the 'Event Pipelines' title and tabs for 'Policies', 'Pipelines', 'Activity', and 'Audits'. A descriptive text explains that a Secret or User Policy is a collection of the same type of Pipelines (Secret or User) and provides instructions on how to activate a policy. Below this is a filter section with an 'Active' dropdown, a search bar 'Search Pipeline Policies', and an 'Add Policy' button. The main content area shows 4 items in a card view, sorted by name ascending. The cards are: 'ActivatePipelinePolicy' (Secret, ACTIVE), 'AddSharePipelinePolicy' (Secret, ACTIVE), 'SimplePipelinePolicy' (Secret, ACTIVE), and 'UserPipelinePolicy' (User, ACTIVE). Each card has an eye icon and a dropdown arrow. On the right, a preview panel for 'ActivatePipelinePolicy' is open, showing a toggle switch set to 'Active', the policy name, creation date (1/18/2020 1:00 AM), last modified by (Jonathan Cogley), and buttons for 'Edit Policy', 'View Policy Activity', and 'Export'.

5. Click the **Active/Inactive** toggle button. A confirmation popup appears.
6. Click the **OK** button. The EP policy's status is changed.

**Note:** The EPs belonging to the EP policy remain available to other EP policies.

## Adding an Existing Event Pipeline

**Note:** Adding an existing pipeline enables that pipeline to be used in other policies. Only pipelines of the same type (secret or user) can be added.

**Note:** This does not create a copy of the existing pipeline, it creates a link. Thus, any changes to the pipeline will affect the other policies that use it.

1. Go to the **Event Pipelines** page.
2. If necessary, click the **Policies** tab.
3. Select the EP policy you want to add a pipeline to.
4. Click the **Add Pipeline** button.
5. Click the **Add Existing Pipeline** dropdown list and select the pipeline (only pipelines of the same type will show).
6. Click the **Create** button.

## Assigning Folders and Secret Policies to Event Policy Targets

### Folders

1. Go to the **Event Pipeline** page.
2. If necessary, click the **Policies** tab. The Event Pipeline Policies page appears.
3. Click the title of the EP policy on its card on the **Event Pipeline Policies** page. The page for that EP policy appears.
4. Click the **No Folder Selected** link in the **Targets** section. A destination page appears.
5. Click to select the check boxes for the desired target folders in the tree. Click the tiny arrow next to the check box to expand the tree. Remember, selecting a folder does *not* automatically select its subfolders.
6. Click the **Save** button.

### Secret Policies

1. Click **Admin > Secret Policies**. The Secret Policy page appears.
2. Click the desired secret policy's name in the list. The Secret Policy page for that policy appears.
3. Click the **Edit** button. The list becomes editable.
4. Click the **Event Pipeline Policy** dropdown list in the **Security Setting** section and select **Enforced**.
5. Click the **Save** button. All secrets under that secret policy are now affected by the EP policy.

## Creating, Importing, and Duplicating Event Pipeline Policies

**Note:** Newly added EP policies are deactivated by default.

1. Click **Admin > See All**.
2. Click the **Action** button and select **Event Pipeline Policy**.
3. If you plan to duplicate an existing EP policy, click the card for that policy in the **Event Pipeline Policies** list.
4. Click the **Add Policy** button, and you will be presented with the following options:
  - **Create New Policy:** Click the selection button, and type a name in the **Policy Name** text box, and optionally type a description in the **Policy Description** text box.
  - **Import Policy:** Import an exported EP policy in JSON format. This can be a policy exported from a separate Secret Server instance. Click the selection button, and paste the JSON payload in the **Add Policy** text box, click the **Create** button.
  - **Duplicate Selected Policy:** Copy an existing EP policy. Click the selection button, and then click the **Create** button. The new EP appears in the Event Pipeline Policies list.

### Monitoring Event Pipeline Policies

There are two ways to monitor your EP policy:

- **Audit:** Shows changes to EP policies, targets, and EPs. Click the **Audits** tab on the **Event Pipeline Policies** page.
- **Activity:** Shows the actions each EP policy or single EP took each time it is triggered. This includes failures, skips, and successes. Click the card for the desired EP policy, and then click the **View Policy Activity** button on the right. Alternatively, you can click the title on the card. When the page for the EP policy appears, click the **Activity** tab.

## Ordering Event Pipelines in Event Pipeline Policies

Event Pipelines run in order they appear in the EP policy. Since EPs can be in multiple EP policies, the order is unique to each policy. To change the EP order in the EP policy:

1. Go to the **Event Pipeline Policies** page.
2. Click the name on the card for the EP policy you want to edit. The policy's page appears on the Details tab.
3. Hover the mouse pointer over the EP you want to reorder. An anchor appears on the left of the card.
4. Drag that anchor to the desired position.

**Note:** If an error occurs in a policy's EP, then the following EP still runs.

## Removing Event Pipelines from Event Pipeline Policies

To remove an EP from an EP:

1. Go to the **Event Pipeline Policies** page.
2. Click the name on the card for the EP policy you want to edit. The policy's page appears on the Details tab.
3. Click on an EP in the details of an EP policy. A panel appears on the right of the page.
4. Click the **Remove Pipeline** button.

**Note:** The button removes the EP from the EP policy, but it does not remove it from Secret Server. Other EP policies using the EP still have access to it.

## Advanced Settings and Troubleshooting

### Configuring Advanced Settings

There are a few new advanced settings you can use with EP policies:

- **Event Pipeline Activity Log entries removed after (days):** The EP activity log entries stay in the log for this many days. Default value: 90.
- **Event Pipelines: Allow Confidential Secret Fields to be used in Scripts:** Allows confidential secret fields to be used in EP script, such as \$password. Default value: False.
- **Event Pipelines Infinite Loop Time (Minutes):** If an EP executes the number of times specified in the infinite loop threshold during the Infinite Loop Time period, it is marked as an infinite loop. Default Value: 5 (on premises), 20 (cloud).
- **Event Pipelines Infinite Loop Threshold:** Number of times that an EP can execute within the infinite loop time on an individual item before it is considered to be an infinite loop. Default Value: 5.
- **Event Pipelines Log Skipped Policies:** If true, the the pipeline activity log will log filtered policies runs. Default value: False.
- **Event Pipelines Maximum Script Run Time (Minutes):** Scripts ran by EP tasks are stopped after this many minutes. Default Value: 5 minutes.
- **Heartbeat: Include UnableToConnect as Heartbeat Failure Event:** Adds the ability to trigger EPs on heartbeat UnableToConnect status. When toggled to true, this setting allows the user to include UnableToConnect as part of the heartbeat failure EPs. It defaults to false.

### Infinite Loops

It is possible for EPs to trigger each other over and over in an endless loop. For example:

1. Editing a secret triggers one EP to run a heartbeat on the secret.
2. The heartbeat triggers another EP to edit the secret.
3. Editing the secret triggers the original EP to run another heartbeat, restarting the cycle, creating an infinite feedback loop.

Fortunately, Secret Server detects these loops and automatically deactivates the involved EPs. So, if you have EPs that seem to be deactivating themselves, look for circular logic paths involving the EPs.

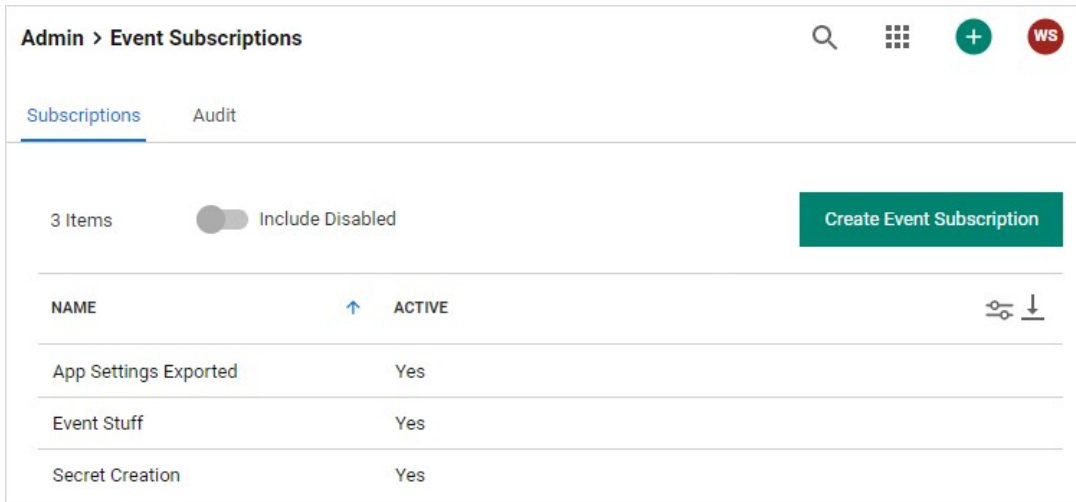
**Note:** By default, pipelines are configured to consider any event that executes five tasks within five minutes from the same trigger as an infinite loop. For example, "secret edit" is selected as a pipeline trigger, and "remote password change" is selected as the task. After the first edit is made on a secret, an RPC is triggered. Every time the RPC completes, a new edit is triggered, which, in turn, triggers another RPC. If this happens five times within five minutes, then an infinite loop is declared. If the RPC is slow, taking more than five minutes for five password changes to occur, then an infinite loop is **not** declared. In this case, use the "configuration advanced" page to change "event pipelines infinite loop time (minutes)" to a longer time.

**Note:** Please click the table of contents on the left to see the sub-pages to this one. Click the table of contents on the right to see headings on this page.

Event subscriptions trigger notifications of defined events within the system. These notifications are sent to the inbox and from there can be sent externally via email or Slack.

**Note:** The notifications are an alert of specific events and not for archived reporting.

Go to **Admin > Event Subscriptions** to view the Event Subscriptions page:



The screenshot shows the 'Admin > Event Subscriptions' page. At the top, there is a breadcrumb 'Admin > Event Subscriptions' and a search icon. Below the breadcrumb, there are two tabs: 'Subscriptions' (active) and 'Audit'. On the left, it says '3 Items' and there is a toggle switch for 'Include Disabled'. On the right, there is a green button labeled 'Create Event Subscription'. Below this is a table with the following data:

NAME	ACTIVE
App Settings Exported	Yes
Event Stuff	Yes
Secret Creation	Yes

Click the name of one of the subscriptions to see its page:

### Event Subscriptions [Edit](#)

Meant to trigger notifications of defined events within the system. These notifications will be sent to the inbox and from there sent externally via email or slack. These notifications are an alert of specific events and not intended to be used for archived reporting.

**Name** Secret Creation

---

**Active** Yes

---

**Inbox Expiration** 7

---

ENTITY	ACTION	CONDIT...	TARGET	
Secret	Create	This f...		

---

### Events [Edit](#)

Any of these events will trigger a notification.

**NAME** [↑](#)

---

### Subscribers [Edit](#)

Users explicitly defined or as a member of a subscribed group will received a notification in their inbox. Communication to external emails or other channels is defined by inbox notification rules.

**NAME** [↑](#)

---

### Associated Rules

These rules target this specific event subscription. They can be updated or reviewed to change the actions, email template, or other communication preferences. Please note that notifications could target conditions and not the specific event subscription and those rules may not appear in this list.

[Secret Creation](#)

The Event Subscription Page includes:

- **Event Subscriptions:** The name of the event subscription, whether it is active, and how long notifications from last in the inbox before expiration.
- **Events:** .
- **Send Email with High Priority:** Sends the email for this subscription with high priority set.
- **Subscribed Events:** List of the events that are contained in this subscription.
- **Subscribed Users:** List of the Secret Server users and groups subscribed to this event.
- **Subscription Name:** Name for the subscription.



## Creating Event Subscriptions

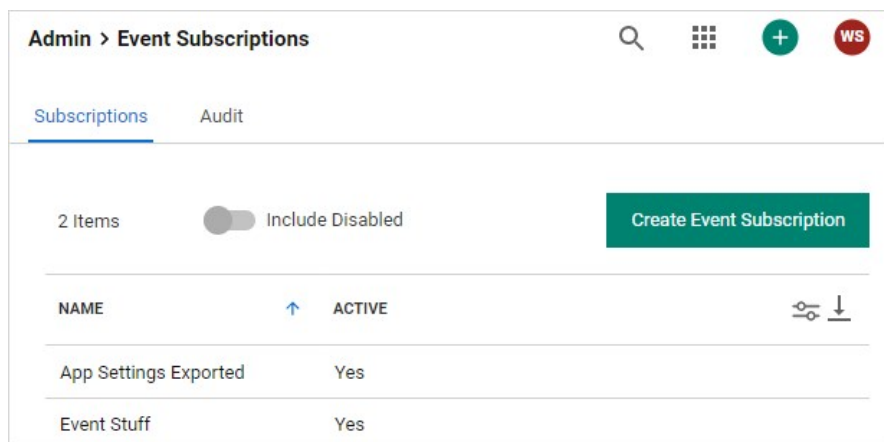
Event subscriptions trigger notifications of defined events within the system. These notifications are sent to the inbox, which may send them externally via email or Slack, depending on your configuration.

**Note:** These notifications are an alert of specific events and not intended to be used for archived reporting.

To add an event subscription:

### Task 1: Creating an Event Subscription

1. Navigate to **Administration > Event Subscriptions**:



2. Click the **Create Event Subscription** button. The Create Event Subscription page appears:

## Create Event Subscription

**Event Subscription Name**

**Send Email**  
☐

**Send Slack**  
☐

**Events**  


Add conditions to this event subscription to indicate which events should trigger a notification.

3. In the **Subscription Name** text box, enter a name for this new event subscription.
4. Click to select the **Send Email** check box if you want to send an email via an inbox notification.
5. Click to select the **Send Slack** check box if you want to send a Slack message via an inbox notification.

## Task 2: Adding Events

Create the events that trigger notifications:

1. Click the **Events** dropdown list to select an event object to trigger a notification.
2. Click the second **Events** dropdown list to select the event for the chosen object. For some events, one or more follow-on dropdown lists may appear. For example, if you chose Secret and then Create, another dropdown list would appear for you to select whether you want all secrets, those in the selected folder or those in the selected folder and its subfolders. Similarly, if you chose those in a folder, a link appears for you to choose the folder.
3. Click the **Add Event** button to add the event. An event table appears:

ENTITY	ACTION	CONDITIONS	TARGET	
Secret	Create	In this folder		<a href="#">Remove</a>

4. Add more events as desired.
5. Click the **Create Event Subscription** button. The event subscription's page appears:

Admin > Event Subscriptions > Secret Creation

Event Subscriptions
Edit

Meant to trigger notifications of defined events within the system. These notifications will be sent to the inbox and from there sent externally via email or slack. These notifications are an alert of specific events and not intended to be used for archived reporting.

**Name**

Secret Creation

---

**Active**

Yes

---

**Inbox Expiration**

7

**Events**
Edit

Any of these events will trigger a notification.

---

ENTITY	ACTION	CONDITIONS	TARGET	
Secret	Create	This folder Only		

6. If you want to change the status from active to inactive or adjust the number of days before an event notification expires, click the **Edit** link next to **Event Subscriptions** and make changes.

### Task 3: Adding Subscribers

Subscribers are users that are explicitly defined or are a subscribed group member. They receive a notification in their inbox when this event subscription is triggered.

**Note:** Communication to external emails or other channels is defined by inbox notification rules.

1. Scroll down the the **Subscribers** section:

## Subscribers [Edit](#)

Users explicitly defined or as a member of a subscribed group will received a notification in their inbox. Communication to external emails or other channels is defined by inbox notification rules.

2. Click the **Edit** link. Three buttons appear.
3. Click the **Add** button. The Users & Groups popup page appears:

### Users & Groups

[All](#) [Users & Groups](#)

☐

Access Control Assistance Operators (*gamma.thycotic.com*)

☐

Account Operators (*gamma.thycotic.com*)

☐

Administrators (*gamma.thycotic.com*)

☐

Administrators (*testparent.thycotic.com*)

☐

Allowed RODC Password Replication Group (*gamma.thycotic.com*)

☐

Auditors

☐

Backup Operators (*gamma.thycotic.com*)

☐

Cert Publishers (*gamma.thycotic.com*)

☐

Certificate Service DCOM Access (*gamma.thycotic.com*)

Cancel

Add

4. Type the name of the user or group you want to add in the **Search** text box.
5. Click to select the check box next to the user or group that remains.
6. Repeat the process for additional users or groups.
7. Click the **Add** button. The new subscriber appears in a table in the section.

## Task 4: Associating Inbox Rules

Inbox rules filter a specified event subscription (or other alerts)—in this case, the one you just created. When you create an event subscription, an inbox rule based on the event subscription system rule is automatically created. It can be updated or reviewed to change the actions, email template, or other communication preferences.

The event subscription subscribers defines who *potentially* receives the event alert. The associated inbox rules filters which events are shared with those subscribers via Slack or email messages. Inbox rules search for specified text strings in specified locations in the incoming notification.

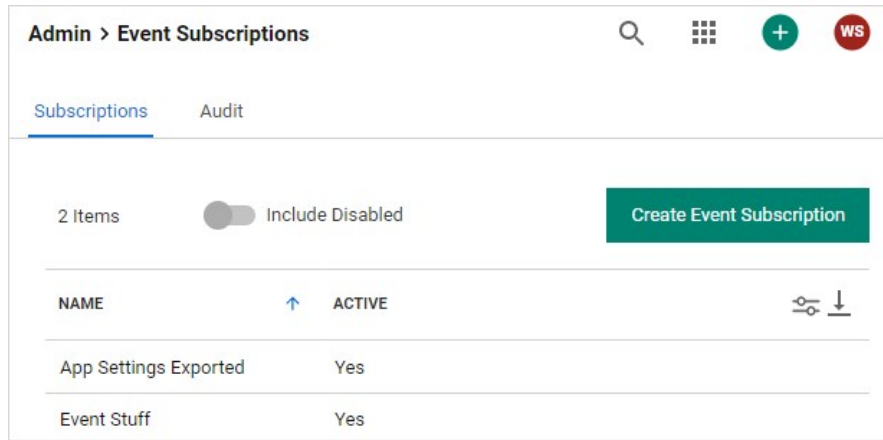
**Note:** Notifications can be triggered by defined conditions and not a specific event subscription. Those rules may not appear in this list.

1. Scroll down to the **Associated Rules** section. Note that a link to your new event subscription inbox rule already appears at the bottom.
2. If you want to edit the rule, click the link for the inbox rule. See [Using Inbox Rules](#).

## Deleting an Event Subscription

To delete an event subscription:

1. Navigate to **Administration > Event Subscriptions**:



2. Click the subscription name link.
3. Click **Delete** on the following page.

## Editing an Event Subscription

To edit an event subscription:

1. Navigate to **Administration > Event Subscriptions**, click the subscription name, and then **Edit**.
2. To remove a subscribed user, group, or event, click the button next to the entry in the appropriate list.
3. To add entries to either list, see [Creating Event Subscriptions](#).
4. Click **Save** to save all changes.

Event List

The following events are available:

Table: Folder Events

Create	All, In this Folder
Delete	All, For this Folder, In this Folder
Edit Permissions	All, For this Folder, In this Folder
Secret Policy Change	All, For this Folder, In this Folder

Table: Secret Events

Access Approved	All, For this Secret, In this Folder
Access Denied	All, For this Secret, In this Folder
Cache View	All, For this Secret, In this Folder
Check In	All, For this Secret, In this Folder
Check Out	All, For this Secret, In this Folder
Copy	All, For this Secret, In this Folder
Create	All, In this Folder
Custom Audit	All, For this Secret, In this Folder
Custom Password Requirement Added to Field	All, For this Secret, In this Folder
Custom Password Requirement Removed from Field	All, For this Secret, In this Folder
Delete	All, For this Secret, In this Folder
Dependency Added	All, For this Secret, In this Folder
Dependency Deleted	All, For this Secret, In this Folder
Dependency Failure	All, For this Secret, In this Folder
Edit	All, For this Secret, In this Folder
Expired Today	All, For this Secret, In this Folder



Expires in 1 Day	All, For this Secret, In this Folder
Expires in 3 Days	All, For this Secret, In this Folder
Expires in 7 Days	All, For this Secret, In this Folder
Expires in 15 Days	All, For this Secret, In this Folder
Expires in 30 Days	All, For this Secret, In this Folder
Expires in 45 Days	All, For this Secret, In this Folder
Expires in 60 Days	All, For this Secret, In this Folder
Export	All, For this Secret, In this Folder
File Save	All, For this Secret, In this Folder
Heartbeat Failure	All, For this Secret, In this Folder
Heartbeat Success	All, For this Secret, In this Folder
Hook Create	All, For this Secret, In this Folder
Hook Delete	All, For this Secret, In this Folder
Hook Edit	All, For this Secret, In this Folder
Hook Failure	All, For this Secret, In this Folder
Hook Success	All, For this Secret, In this Folder
Launch	All, For this Secret, In this Folder
Password Change Maximum Attempts Reached	All, For this Secret, In this Folder
Password Copied to Clipboard	All, For this Secret, In this Folder
Password Displayed	All, For this Secret, In this Folder
Password Change	All, For this Secret, In this Folder
Secret Policy Change	All, For this Secret, In this Folder
Session Recording View	All, For this Secret, In this Folder
Undelete	All, For this Secret, In this Folder
View	All, For this Secret, In this Folder

View Secret Edit	All, For this Secret, In this Folder
Web Password Fill	All, For this Secret, In this Folder

**Table:** User Events

Added to Group	All, For this User, For this Group
Challenge Applied	All, For this User
Challenge Cleared	All, For this User
Create	-
Disabled	All, For this User
Edit	All, For this User
Enable	All, For this User
Lockout	All, For this User
Login	All, For this User
Login Failure	All, For this User
Logout	All, For this User
Owners Modified	All, For this User
Password Change	All, For this User
Removed From Group	All, For this User, For this Group
Two Factor Changed	All, For this User

**Table:** Other Events

Automatic Export	Download, Edit, Export, Run Export
Configuration	Edit
Dual Controls	Create, Delete, Edit

Encryption	HSM Disable, HSM Enable, Rotate Secret Keys, Rotate Secret Keys Cancel Requested, Rotate Secret Keys Failure, Rotate Secret Keys Success
Engine	Engine Activated, Create, Deactivate, Delete, Offline, Online
Export Secrets	Exported
Group	Owner Modified
Import Secrets	Imported
IP Address Range	Create, Delete, Group Assigned, Group Unassigned, Edit, User Assigned, User Unassigned
Licenses	Expires in 30 Days
Role	Assigned User or Group, Create, Edit, Role Disabled, Role Enabled, Unassigned User or Group
Role Permission	Added to Role, Removed From Role
Script - PowerShell	Create, Deactivate, Edit, Reactivate, View
Script - SQL	Create, Deactivate, Edit, Reactivate, View
Script - SSH	Create, Deactivate, Edit, Reactivate, View
Secret Policy	Create, Edit
Secret Template	Create, Create Secret Access Changed, Edit, Field Encrypted, Field Exposed, Owners Modified, Copy
Privileged Behavior Analytics Configuration	Edit
Site	Engine Added, Domain Assigned to Site, Create, Disable, Edit, Enable, Engine Downloaded, Engine Offline, Engine Online, Domain Removed from Site, Engine Removed
Site Connector	Create, Credential View, Disable, Edit, Enable
Unlimited Administrator	Disable, Enable
User Audit	Expire Now

## Overview

When the database becomes inaccessible, Secret Server will try to log errors to the Windows event log. By default, network service and standard service accounts will not have permissions to the event log. Permissions must be added to specific event log registry keys.

## Applying Windows Event Log Permissions

1. Determine the account that is running Secret Server:
  1. Log on Secret Server.
  2. Go to **Admin > Diagnostics**.
  3. Look for any of the **Thread Identity** labels. These contain the identity of Secret Server (often NT AUTHORITY\NETWORK SERVICE or IIS APPPOOL\SecretServer or the service account set up for IWA. See [Running the IIS Application Pool As a Service Account](#).

**Note:** You can also determine the identity by logging in and navigating to <http://yoursecretserverurl/Installer.aspx>. The first step of this page will tell you the application pool identity.
2. Open the Windows registry editor on the machine running Secret Server (regedit at the command prompt or Window search text box).
3. On the left, navigate to **HKEY\_LOCAL\_MACHINE > SYSTEM > CurrentControlSet > Services > EventLog**.
4. Right click the **EventLog** folder in your registry editor and select **Permissions**. A permissions dialog box appears.
5. Click the **Advanced** button.
6. On the **Permissions** tab, Click the **Add** button. A Permission Entry dialog appears.
7. Click the **Select a principal** link. The Select User, Computer... dialog box appears.
8. Find the account running Secret Server, such as Thycotic\_Service (svc\_thycotic@test.com).
9. Click the **OK** button. The dialog box closes.
10. In the **Basic Permissions** section of the **Permission Entry** dialog, click to select the **Read** check box.
11. Click the **Show advanced permissions** link. The pane switches.
12. Click to select the **Set Value** and **Create Subkey** check boxes in the **Advanced Permissions** section.
13. Click **OK** buttons on the remaining dialogs to apply the permissions. You are returned to the main registry editor window.
14. Navigate to **HKEY\_LOCAL\_MACHINE > SYSTEM > CurrentControlSet > Services > EventLog > Security**, right-click and select "**Permissions...**"
15. Right click **Security** folder and select **Permissions**. A permissions dialog box appears.
16. Click the **Add** button.
17. Find the account running Secret Server.
18. Click the **OK** button.
19. Click to select the **Read** check box in the Allow column.

20. Click the **OK** button to apply the permission.

21. If you are running Windows Server 2019, use the same procedure to add Read permission to **HKEY\_LOCAL\_MACHINE > SYSTEM > CurrentControlSet > Services > EventLog > State**.

## Required Registry Permissions

After setup, the following permissions appear in the registry:

### **HKEY\_LOCAL\_MACHINE > SYSTEM > CurrentControlSet > Services > EventLog**

Applies to key and subkeys

- Read permissions:
  - Query Value
  - Enumerate Subkeys
  - Notify
  - Read Control
- Set Value permission
- Create Subkey permission

### **HKEY\_LOCAL\_MACHINE > SYSTEM > CurrentControlSet > Services > EventLog > Security**

Applies to key and subkeys

Read permissions:

- Query Value
- Enumerate Subkeys
- Notify
- Read Control

### **HKEY\_LOCAL\_MACHINE > SYSTEM > CurrentControlSet > Services > EventLog > State**

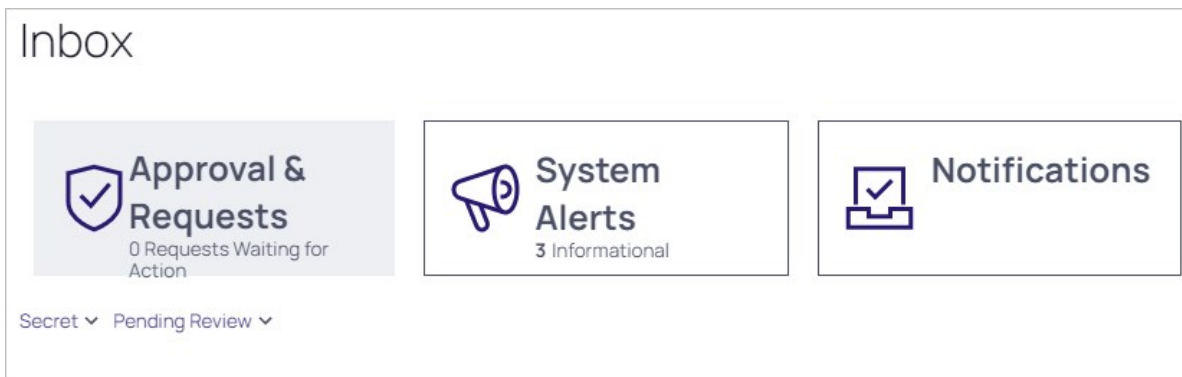
Applies to key and subkeys. Only applies to Windows Server 2019.

Read permissions:

- Query Value
- Enumerate Subkeys
- Notify
- Read Control

The *Inbox* page shows notifications such as event subscription alerts, access requests and approvals, and other configuration alerts in a single interface. In addition to viewing notifications in the inbox, you can configure the inbox to forward them via email or Slack, subject to numerous configurable criteria. You can also customize the format of the email messages. You access the inbox by clicking the **Inbox** button on the main menu. See the subordinate topics for details.

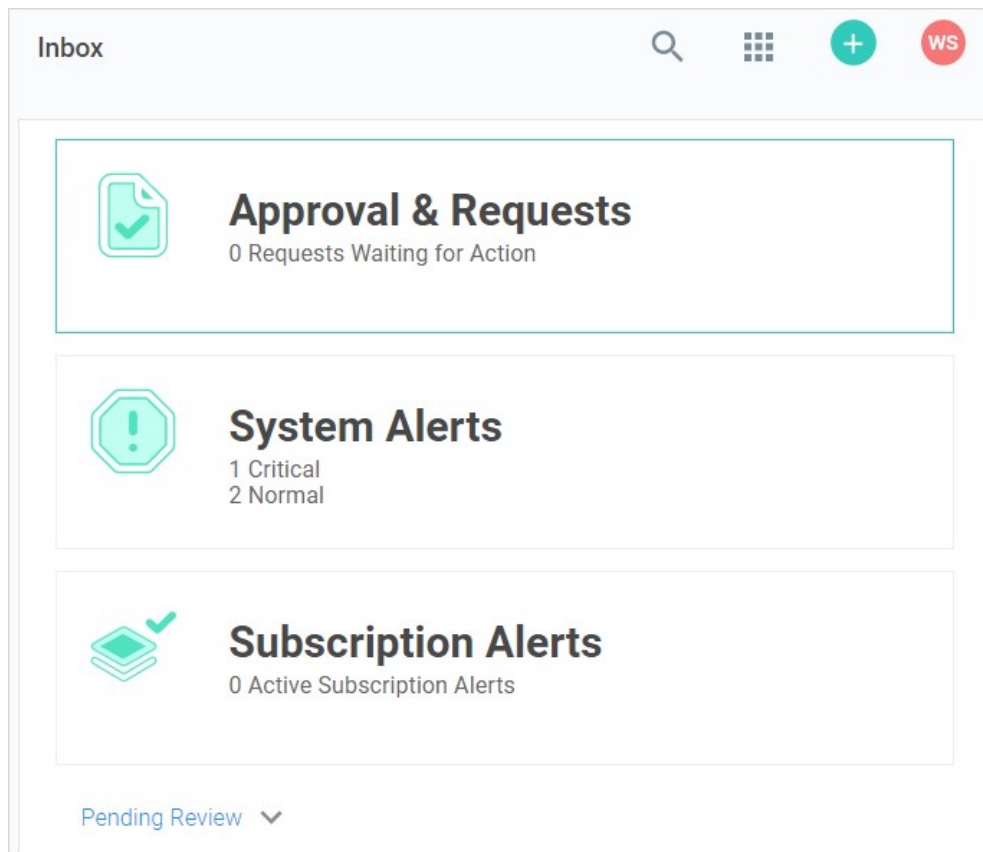
**Note:** The Inbox was also called the *Alert Notification Center* in earlier Secret Server versions.



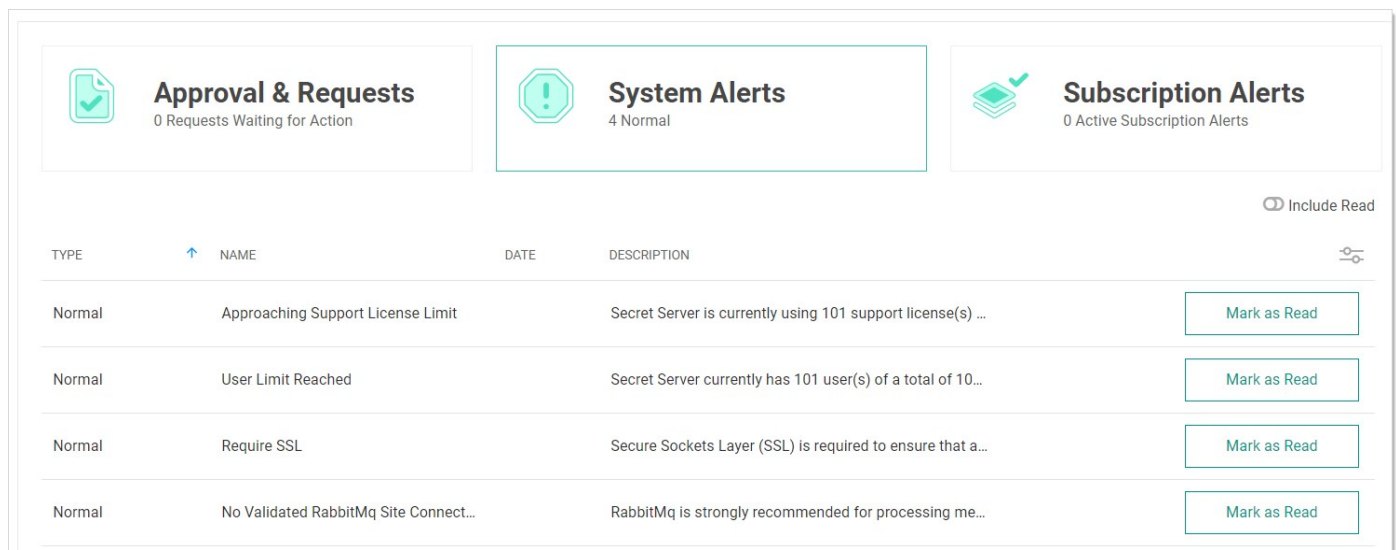
Event subscriptions disappear from the notification center after you view them. System alerts and access requests stay active until resolved.

## Marking Alerts as Viewed

1. Access the alert notification center by clicking the **Inbox** button on the main menu. The Inbox appears:



2. Click the **System Alerts** button. The System Alerts page appears:



3. Click the **Mark as Read** button for the each alert you no longer wish to view. The alert disappears, but you can still see it if you click the **Include Read** toggle button.



## Using Inbox Rules

### Overview

An inbox rule (notification rule) triggers on notifications and sends either an email or a Slack message to a specified group of users. First, we discuss an inbox rule's components. Second, we show how to create an inbox rule from scratch and based on an existing notification.

**Note:** There are some emails types that Secret Server sends that do not go through the inbox. For example, the test email button on the email configuration page sends a plain-text email directly. There are also some diagnostic emails that are directly sent. For example, discovery can directly send a detailed log which is essentially a text dump. Inbox rules are primarily for non-admin end-user communications and event subscriptions.

**Note:** You can still send legacy emails (earlier email notifications that did not go through the inbox) if desired. Go to **Admin > Configuration > Email Tab > Enable Legacy Email** to set this up.

### Inbox Rule Components

Inbox rules have the following components:

#### Message (Notification) Types

This is the notification message (alert) types that the rule responds to. These include:

- Dependency Failure
- Event Subscription
- Inbox Test Message
- Password Reset
- Secret Access Approved
- Secret Access Cancel Request
- Secret Access Deny Request
- Secret Access Request
- Secret Changed
- Secret Heartbeat Failed
- Secret View
- Workflow Access Approval Request
- Workflow Access Request Expired
- Workflow Access Request Incomplete
- Workflow Access Request Next Step
- Workflow Access Step Approved

### Rule Conditions

Rule conditions are filters that define who receives the email or Slack message when a notification arrives. Conditions are matched with text string matching: equals, not equals, or regex. If no condition exists, the rule triggers for every message of the defined types. Condition types include:

- **ActionType:** Specific entities via text matching of the action's value or display value. Actions types vary by inbox message type. For example, "EXPORTED."

**Note:** In the case of an event subscription notification, these are the same as the event subscription events. Other notification types have different action types.

- **Container:** Specific containers via text matching of the container name. Containers include folders (secret containers) and roles (quasi user containers).

- **Details:** Specific text string in the details section. The Details type serves as a summary of the message for display in the inbox. Sometimes it contains information that is from other condition types. For example: "App Settings Exported - SECRETSERVERSETTINGS - EXPORTED."
- **EntityType:** Specific entities via text matching of the entity name or value. Entities are what is having the action done to it, for example, "SECRETSERVERSETTINGS." These are the same as the event subscription entities.
- **EventDetails:** Specific text string in the Event Details section. For example: "Application Settings," "Launcher Settings," and "Protocol Handler Settings."
- **ItemName:** The source item. Specific items via text matching of the item's value or display value. The "item" varies by message. For an event subscription secret action it contains the secret name. For an event subscription folder action, it contains the folder name.
- **SubscriptionName:** The source event subscription. Specific subscriptions via text matching of the subscription's value or display value.
- **User:** The user that created the rule. Specific users via text matching of the username's value or display value.
- **Rule Subscribers:** What users receive the action result (an email or Slack message).
- **Rule Actions:** What actions the rule performs:
  - Send to an email address using a specific HTML template, which the user defines.
  - Send to Slack using a specific markdown template, which the user defines.

## Predefined System Rules

Secret Server ships with several predefined system rules in inbox templates. These rules can only be disabled or enabled. However, you can copy a system template to your own custom template and edit that. This allows us to upgrade system rules without interfering with your customizations. The predefined system rules are:

- Dependency Failure
- Inbox Test Message
- Password Reset
- Secret Access Deny Request
- Secret Access Request
- Secret Changed
- Secret Heartbeat Failed
- Workflow Access Approval Request

## Example Rule Diagram

**Note:** This example diagram is specific to event subscription notifications. There are many other types that differ slightly, especially in content.

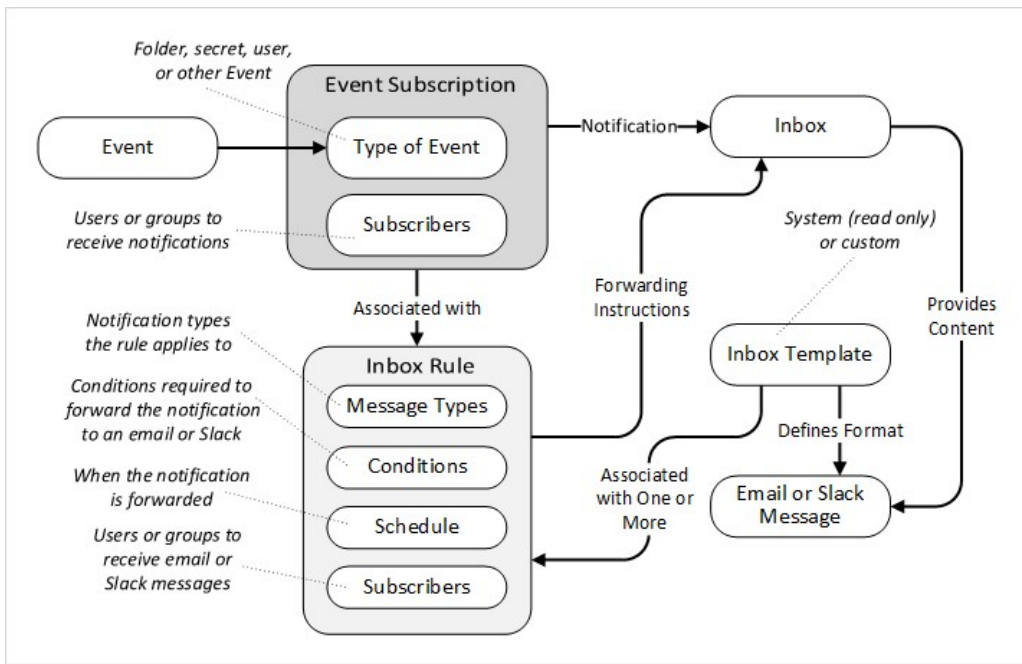
In the following diagram:

1. A secret triggers an event matching an event subscription.
2. Secret Server notifies the users and groups on the event subscription subscribers list. The notifications appear in their inboxes.
3. The inbox rule associated with the event subscription evaluates the conditions for forwarding the notification via email or Slack.
4. The inbox rule checks its schedule to determine when to forward the message.
5. The inbox rule checks its subscribers list to determine who to forward the message to.

**Note:** Remember, arriving notifications may have already been filtered by whose inbox gets the notification in the first place. Thus, the inbox rule could be set to sent to everybody but only those who receive the notification in their inbox will receive the email or Slack message.

6. The inbox rule references the message type's inbox template to format and populate the message's variables.
7. When the scheduled time arrives, which can be immediately, Secret Server sends the messages to the subscribers.

**Figure:** Event Subscription Using an Inbox Rule to Forward a Notification via the Inbox



## Procedures

### Creating a Rule from Scratch

Let us say we want to be notified when anybody tries to edit the permissions on the "No-Go Secrets" folder. This is an event, so the notification type will be an event subscription.

#### Task 1: Create the Inbox Rule

1. Go to **Admin > See All**.
2. Click the **Notification Rules and Templates** link. The Notification Settings page appears:

Inbox > Notification Settings

Rules Templates Resources

Send Test Notification

18 Items ☐ Include Inactive Create Rule

RULE NAME	ACTIVE	DIGEST	SYSTEM	USAGE (L...	NOTIFICATION TYPES
App Settings Exported	Yes	No	No	0	Event Subscription
Dependency Failure	Yes	No	Yes	0	Dependency Failure
Event Subscription	Yes	No	Yes	13	Event Subscription

3. Click the **Create Rule** Button. The Create Rule popup appears:

Create Rule

Rule Name \*

Message Types \*

- ☐ Dependency Failure
- ☐ Event Subscription
- ☐ Inbox Test Message
- ☐ Password Reset
- ☐ Secret Access Cancel Request
- ☐ Secret Access Deny Request
- ☐ Secret Access Request
- ☐ Secret Changed
- ☐ Secret Heartbeat Failed
- ☐ Workflow Access Approval Request
- ☐ Workflow Access Request Next Step
- ☐ Secret Access Approved
- ☐ Secret View
- ☐ Workflow Access Request Expired
- ☐ Workflow Access Request Incomplete
- ☐ Workflow Step Approved

Active ☒

Action ☒ Email

Cancel Create Rule

4. Type the new rule's name in the **Rule Name** text box.
5. Click to select the **Message Types** check box for the message types you wish to apply the new rule to.
6. Ensure the **Active** check box is selected if you want to use the rule right away.
7. Click to select the **Action** selection button for the type of notification.
8. If necessary, scroll down to the bottom of the popup.
9. Click the **Template** dropdown list to select the desired inbox template to associate the rule with.
10. Click the **Create Rule** button. The configuration page for the new rule appears:

Inbox > Notification Settings > Rules > My Notification Rule

+

WS

General
Subscribers
Log

Copy Rule

Rule Details Edit

An inbox rule is a set of conditions that trigger based on inbox message data. The result of the rule allows the message to be delivered based on defined rule conditions either immediately or on a schedule. This rule will apply to any inbox message type selected.

Rule Name \*

My Notification Rule

Active

Yes

Message Types \*

Event Subscription

Conditions Edit

These conditions must all be met for this rule to run.

This rule currently does not have any conditions defined. This means it will trigger for every message type defined above.

Schedule Edit

Define when this rule is evaluated. Immediate rules will run for a single message as soon as it is delivered to the inbox. Scheduled messages can be defined as a digest of all messages that meet the rule conditions during the time frame defined by the schedule or can still be single detailed messages.

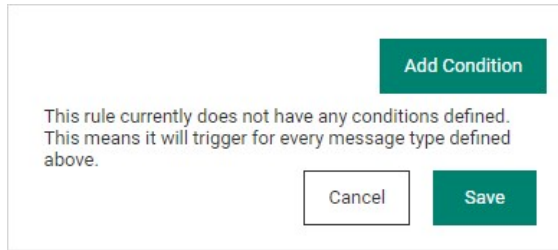
Immediate

Yes

## Task 2: Add Rule Conditions

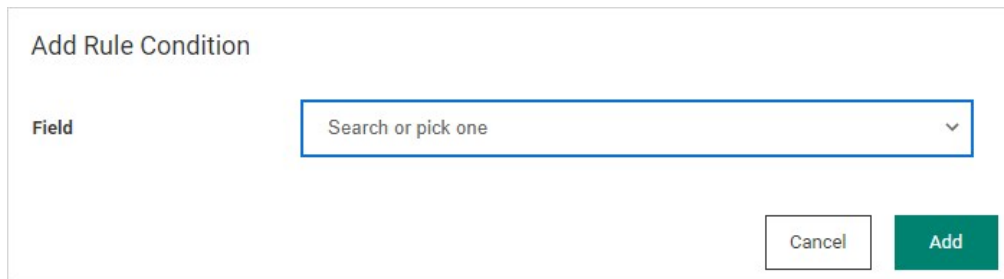
1. Click the **Edit** link for the **Conditions** section to add conditions.

**Note:** If you do not add any conditions, the rule will apply to all messages of the types you chose. New buttons appear:



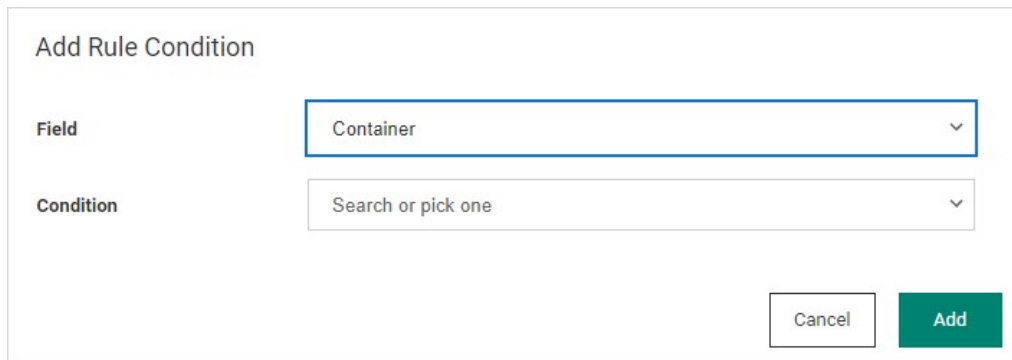
A modal dialog box titled "Add Condition". It contains a green button labeled "Add Condition" at the top right. Below it, text reads: "This rule currently does not have any conditions defined. This means it will trigger for every message type defined above." At the bottom, there are two buttons: "Cancel" and "Save".

2. Click the **Add Condition** button. The Add Rule Condition popup appears:



A modal dialog box titled "Add Rule Condition". It has a label "Field" on the left and a dropdown menu on the right with the placeholder text "Search or pick one". At the bottom right, there are two buttons: "Cancel" and "Add".

3. Click the **Field** dropdown list to select the type of rule condition. For this instruction, we chose Container (a folder). A Condition dropdown list appears:



A modal dialog box titled "Add Rule Condition". It has a label "Field" on the left and a dropdown menu on the right with "Container" selected. Below it, there is a label "Condition" on the left and another dropdown menu on the right with the placeholder text "Search or pick one". At the bottom right, there are two buttons: "Cancel" and "Add".

4. Click the **Condition** dropdown list to select how the value (added next) is compared to the message. Choose "Value RegEx" if you want to create a regular expression to further refine the condition. We chose Value Equals. The Value text box appears:

### Add Rule Condition

Field

Container

Condition

Value Equals

Value

Cancel

Add

5. Type the string you want to test for in the **Value** text box.

6. Click the **Add** button. The new condition appears:

Add Rule

Container

Equals

No-Go Secrets

Edit

Delete

Cancel

Save

It tells us the rule is triggered if there is an associated event.

7. Click the **Save** button.

8. Click the **Edit** link in the **Schedule** section. The section becomes editable:

### Schedule

Define when this rule is evaluated.

Immediate rules will run for a single message as soon as it is delivered to the inbox. Scheduled messages can be defined as a digest of all messages that meet the rule conditions during the time frame defined by the schedule or can still be single detailed messages.

Immediate

☒

Cancel

Save

**Note:** Any schedule choice other than *Immediate* produces a digest (summary) of notifications. Users receiving a digest can click on individual entries to see the notification. The following instructions show how to set up a digest.

9. If you want to send one email per notification, ensure the Immediate check box is selected, and skip to Task 4.

### Task 3: Set up an Email Digest

1. If you do not want the notifications sent immediately, click to deselect the Immediate check box. A time setting section appears:

Immediate ☐

Timezone (UTC-05:00) Eastern Tim... ▾

Time \*  [Add Another Time](#)

09:00 AM [Remove](#)

Recurs \* Daily ▾

Every \* 1 Days

Starting \* 7/7/2021

[Cancel](#) [Save](#)

2. Click the **Timezone** dropdown list to select a time zone for the scheduled notification.

3. Click the clock icon to select a time to add. A time setting table appears:

12	00	AM
	30	PM
<a href="#">OK</a>		

4. Hover the mouse over the one of the columns for a scrollbar appears. Click or drag to select the hour, half hour, or AM/PM.

**Note:** You also can simply type the time prior to clicking the clock icon in the format hh:mm AM/PM. If you choose minutes other than 00 or 30, it will be converted to the nearest 00 or 30 when you input it.

5. Click the **OK** button. The time appears in the text box.

6. Click the **Add Another Time** link to commit the time.

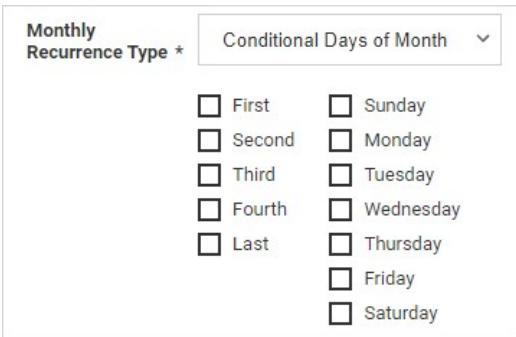
7. Add more times as desired.

8. Click the **Recurs** dropdown list to choose the frequency. The Every section will change, depending on what you chose:

- Daily: Type the number of days that pass between notifications in the **Days** text box.
- Weekly: Type the number of weeks that pass between notifications in the **Weeks** text box. Click to select the days of the week check box to select which days to send the notifications.



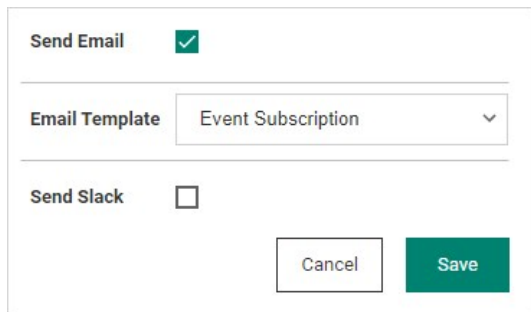
- Monthly: Click the **Monthly Recurrence Type** dropdown list to select either specific or conditional days of the month. The former provides a calendar to choose which days. The latter provides check boxes for selecting relative days where you choose the day of the week and the position in the month, for example, Last and Friday.



The screenshot shows a dropdown menu titled "Monthly Recurrence Type \*". The selected option is "Conditional Days of Month". Below the dropdown, there are two columns of checkboxes for selecting specific days of the month:

<input type="checkbox"/> First	<input type="checkbox"/> Sunday
<input type="checkbox"/> Second	<input type="checkbox"/> Monday
<input type="checkbox"/> Third	<input type="checkbox"/> Tuesday
<input type="checkbox"/> Fourth	<input type="checkbox"/> Wednesday
<input type="checkbox"/> Last	<input type="checkbox"/> Thursday
	<input type="checkbox"/> Friday
	<input type="checkbox"/> Saturday

- Click the **Starting** calendar icon to select the date when you want to start the notification schedule.
- Click the **Save** button to commit your choices.
- Scroll down to the **Actions** section.
- Click the **Edit** link next to **Actions**. The section becomes editable:



The screenshot shows the "Actions" section with the following options:

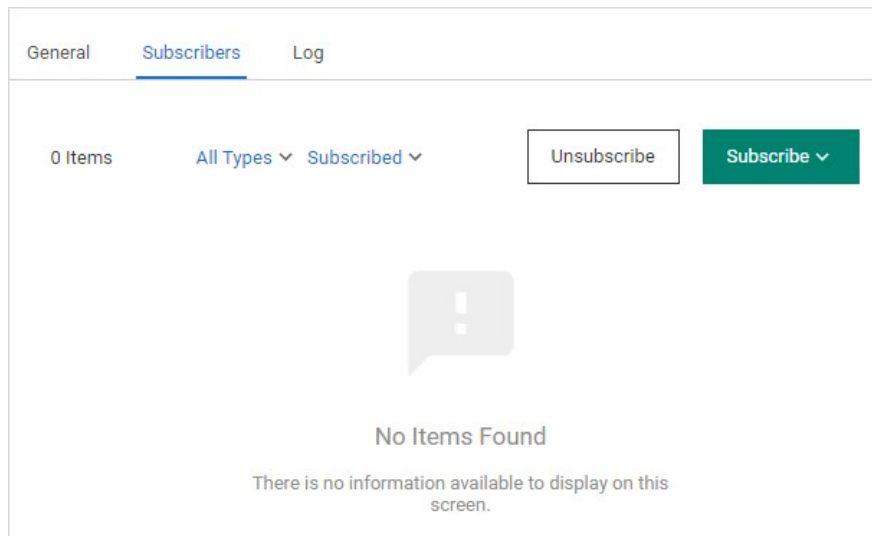
- Send Email**: ☒ (checked)
- Email Template**: A dropdown menu showing "Event Subscription".
- Send Slack**: ☐ (unchecked)

At the bottom of the section are two buttons: "Cancel" and "Save".

- Click to select either the **Send Email** or **Send Slack** check box (or both).
- If you chose to send email, click the **Email Template** dropdown list to choose the email format (inbox template). There are several standard ones, and you can customize your own. For this instruction, we choose **Standard Email** if did not create a digest and **Standard Email Digest** if we did. See [Using Inbox Templates](#) for details.
- Click the **Save** button


#### Task 4: Add Subscribers to the Email or Slack Message

- Click the **Subscribers** tab:



2. Click the Subscribe button and select **Users**, **Groups**, or **External Emails**. Users provides a list of users for you to select from. Groups provides a list of groups for selection. External Emails provides a text box to enter a specific email to somebody without a Secret Server account. For this instruction, we added one of each:

**Note:** External emails get sent without regard to whether somebody has a notification in their inbox because external "users" do not have an inbox.

3 Items	All Types ▾	Subscribed ▾	Unsubscribe	Subscribe ▾
NAME	↑	TYPE	STATUS	⚙️ ↓
Backup Operators		Group	Subscribed	<a href="#">Remove</a>
mister_jones@email...		External Email	Subscribed	<a href="#">Remove</a>
 [Name]		User	Subscribed	<a href="#">Remove</a>

3. You can return to this page at a later date to edit this list. You can also unsubscribe users that are members of a subscribed group without actually removing them from the list for ease of subscribing them later.

## Creating an Inbox Rule from a Notification

If a inbox notification is what you want to forward to an email or Slack message from here on out, we provide a shortcut feature that allows you to quickly build an inbox rule from the notification. To create the inbox rule:

1. Click a notification in the inbox. A details popup appears. For instance:

Event Subscription

Details

Notification Rules

Created Date	7/6/2021 04:51 PM
SubscriptionName	App Settings Exported
EntityType	SECRETSERVERSETTINGS
ActionType	EXPORTED
User	...
EventDetails	Application Settings, Launcher Settings, Protocol Handler Settings (Install-Time), Permission Options, User Interface, User Experience, Advanced Settings, Folder Settings, Local User Passwords, Email, Security, Ticket System, Session Recording, Login, SAML, Licenses
Details	App Settings Exported - SECRETSERVERSETTINGS - EXPORTED

Quick Create Rule

Close

- If you desire an inbox rule to react to that sort of message, click the **Quick Create Rule** button. A very similar, editable page appears:

Event Subscription

Details

Notification Rules

Rule Name *	<input type="text"/>	
Active *	<input checked="" type="checkbox"/>	
Created Date	7/6/2021 04:51 PM	
SubscriptionName	App Settings Exported	<input type="checkbox"/>
EntityType	SECRETSERVERSETTINGS	<input type="checkbox"/>
ActionType	EXPORTED	<input type="checkbox"/>
User	appsettings-exported	<input type="checkbox"/>
EventDetails	Application Settings, Launcher Settings, Protocol Handler Settings (Install-Time), Permission Options, User Interface, User Experience, Advanced Settings, Folder Settings, Local User Passwords, Email, Security, Ticket System, Session Recording, Login, SAML, Licenses	<input type="checkbox"/>
Details	App Settings Exported - SECRETSERVERSETTINGS - EXPORTED	<input type="checkbox"/>

Email

Cancel

Add Rule

- Type the new rule's name in the **Rule Name** text box.
- Click to select the check box for each rule component you want to include.
- Click to select the **Action** selection button for the type of notification.
- If necessary, scroll down to the bottom of the popup.
- Click the **Template** dropdown list to select the desired inbox template to associate the rule with.
- Click the **Add Rule** button. The configuration page for the new rule appears:

Inbox > Notification Settings > Rules > Exported Settings Inbox Rule

WS

General
Subscribers
Log

Copy Rule

Rule Details Edit

An inbox rule is a set of conditions that trigger based on inbox message data. The result of the rule allows the message to be delivered based on defined rule conditions either immediately or on a schedule. This rule will apply to any inbox message type selected.

Rule Name \*

Exported Settings Inbox Rule

Active

Yes

Message Types \*

Event Subscription

SubscriptionName

Equals App Settings Exported 2


EntityType

Equals SECRETSERVERSETTINGS 10024

ActionType

Equals EXPORTED

User

Equals 

EventDetails

Equals Application Settings, Launcher Settings, Protocol Handler Settings (Install-Time), Permission Options, User Interface, User Experience, Advanced Settings, Folder Settings, Local User Passwords, Email, Security, Ticket System, Session Recording, Login, SAML, Licenses

Details

Equals App Settings Exported - SECRETSERVERSETTINGS - EXPORTED

Conditions Edit

These conditions must all be met for this rule to run.

9. Edit the rule as desired. See [Creating a Rule from Scratch](#).

## Using Inbox Templates

### Overview

**Note:** Inbox templates are also used by [event pipelines](#). When used for event pipelines, the templates can use event pipeline tokens in addition to the standard inbox template tokens in the message subject and body. Event pipeline messages are sent directly to the user's inbox based on the email addresses generated by the send email event pipeline task, not subscribers from any inbox rule.

First, let us open a system inbox template to look at:

1. Go to **Admin > All**.
2. If necessary, click the view link to switch to **Alphabetized View**.
3. Click the **Notification Rules and Templates** link. The Notification Settings page appears:

Inbox > Notification Settings

Rules

Templates

Resources

Send Test Notification

14 Items

☐ Include Inactive

Create Rule

RULE NAME	ACTIVE	DIGEST	SYSTEM	USAGE (L...	NOTIFICATION TYPES
App Settings Exported	Yes	No	No	0	Event Subscription
Dependency Failure	Yes	No	Yes	0	Dependency Failure
Event Subscription	Yes	No	Yes	6	Event Subscription
Event Subscription: Eve...	Yes	No	No	6	Event Subscription
Inbox Test Message	Yes	No	Yes	0	Inbox Test Message
Password Reset	Yes	No	Yes	0	Password Reset
Secret Access Approved	Yes	No	Yes	0	Secret Access Approved
Secret Access Cancel ...	Yes	No	Yes	0	Secret Access Cancel Request
Secret Access Deny Re...	Yes	No	Yes	0	Secret Access Deny Request
Secret Access Request	Yes	No	Yes	0	Secret Access Request
Secret Changed	Yes	No	Yes	0	Secret Changed
Secret Creation	Yes	No	No	0	Event Subscription, Secret Changed
Secret Heartbeat Failed	Yes	No	Yes	0	Secret Heartbeat Failed
Workflow Access Appr...	Yes	No	Yes	0	Workflow Access Approval Request,

4. Click the **Templates** tab:

Inbox > Notification Settings

Rules

Templates

Resources

Send Test Notification

8 Items

All Types

Create Template

TEMPLATE NAME	SYSTEM	TYPE	RULES LEVERAGED
Event Subscription	Yes	Email	App Settings Expor...
Password Reset	Yes	Email	Password Reset
Secret Access Appr...	Yes	Email	Secret Access App...
Secret Access Req...	Yes	Email	Secret Access Req...
Standard Email	Yes	Email	Dependency Failur...
Standard Email Dig...	Yes	Email	
Standard Slack	Yes	Slack	
Workflow Access A...	Yes	Email	Workflow Access A...

- Note that most, if not all, of the inbox templates are system templates. These are **read-only** templates that you can clone to create custom templates. That is, system templates are templates for your templates. Most of the templates are email templates, and one is a Slack template.
- Click the Template Name for the Event Subscription template. The template's page appears:

Inbox > Notification Settings > Templates > Event Subscription

System templates cannot be modified.

Copy Template

**Template Details**

Templates are used when an inbox rule sends a message.

Template Name \*

Event Subscription

System

Yes

Template Type \*

Email

**Template Body**

Define the message text and layout including languages and merging message data.

Language

English (English)

Subject \*

\$Details

Body \*

<!DOCTYPE html>
<html lang="en">
<head>
<title>Message Type</title>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1, maximum-scale=1" />
<style>
body, td {
font-family: Roboto, Helvetica, Arial;
font-size: 16px;
}
table {border-collapse: separate;}

7. Note that each template has:

- A details section that contains the name, a system template flag, and a template type (email or Slack).
- A body section that defines the subject, language used, and the canned text for the message. The message contains variables that are drawn from the alert or event. The body is read only in system templates and is editable in custom templates cloned (copied) from system templates.
- Zero or more associated inbox rules. These are the inbox rule types that use this inbox template (message type). Rules define filters for the alerts or events (what characteristics trigger the rule) and who gets externally notified via email or Slack (the subscribed users or groups). The following table lists the system templates and their associated inbox rules that use them.
- Zero or more resources. These are items, such as images, that go along with any email based on the template.

**Table:** System Inbox Rules by Inbox Template

Event Subscription	Email	App Settings Exported Event Subscription
--------------------	-------	---------------------------------------------



Standard Email	Email	Standard Email
Standard Email Digest	Email	Standard Email Digest
Standard Slack	Slack	Standard Slack
Workflow Access Approval Request	Email	Workflow Access Approval Request
Secret Access Request	Email	Secret Access Request
Secret Access Approved	Email	Secret Access Approved
Password Reset	Email	Password Reset
Standard Email	Email	Dependency Failure Inbox Test Message Secret Access Cancel Request Secret Access Deny Request Secret Changed Secret Heartbeat Failed

8. Note the Body section is HTML for emails and Slack template text. For the Event Subscription template it looks like this:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <title>Message Type</title>
  <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1, maximum-scale=1" />
  <style>
    body, td {
      font-family: Roboto, Helvetica, Arial;
      font-size: 16px;
    }
    table {border-collapse: separate;}
    a, a:link, a:visited {text-decoration: none; color: #1071D4;}
    a:hover {text-decoration: underline;}
    h2, h2 a, h2 a:visited, h3, h3 a, h3 a:visited, h4, h5, h6, .t_cht {color: #000 !important;}
    .ExternalClass p, .ExternalClass span, .ExternalClass font, .ExternalClass td {line-height: 100%;}
    .ExternalClass {width: 100%;}
    h1 { color: #121212; font-family: Roboto, Helvetica, Arial; font-style: normal; font-weight: bold; font-size: 32px; }
  </style>
</head>
<body style="background-color: #F7F7F7;">

  <table width="100%" border="0" cellspacing="0" cellpadding="0"><tr><td align="center">

<table cellspacing="0" cellpadding="0" border="0" width="100%" style="max-width: 640px; ">
<tr>
<td style="background-color: #121212; width: 80%; height: 48px; color: #ffffff; padding-left: 32px;">
  $SystemLogo
  </td>
</tr>
<tr>
<td style="background-color: #ffffff">

  <table cellpadding="16" width="100%">
    <tr>
      <td width="24">&nbsp;</td>
      <td align="center" style="padding-top: 42px; color: #121212; font-family: Roboto, Helvetica, Arial; font-style: normal; font-weight: bold; font-size: 32px; text-align: center;">
        $InboxMessageTypeName - $SubscriptionName
        </td>
      <td width="24">&nbsp;</td>
    </tr>
  </table>

```

```

        < / t r >
        < t r >
        < t d > & n b s p ; < / t d >
<td style="font-family: Roboto, Helvetica, Arial; font-weight: normal; font-size: 16px; color: #323232;">
        & n b s p ;

        < / t d >
        < t d > & n b s p ; < / t d >
        < / t r >

        < t r >
        < t d > & n b s p ; < / t d >
<td style="background-color: #F7F7F7; font-family: Roboto, Helvetica, Arial; font-weight: normal; font-size: 16px; color: #323232; padding: 0px">
        $ M e s s a g e D a t a T a b l e

        < / t d >
        < t d > & n b s p ; < / t d >
        < / t r >

        < t r >
        < t d > & n b s p ; < / t d >
<td style="font-family: Roboto, Helvetica, Arial; font-weight: normal; font-size: 16px; color: #323232; padding: 16px" align="center">
        < p >
        <a href="$ApplicationUrl/app/#/inbox/view/notifications?messageId=$MessageId" style="text-decoration: none; display: inline-block;
background-color: #008270; width: 400px; height: 40px; line-height: 40px; color: #ffffff; text-align: center">
        V i e w   t h i s   i t e m
        < / a >
        < / p >
        < p >
        <a href="$ApplicationUrl/app/#/inbox/view/notifications?messageId=$MessageId&unsubscribe=true">
        U n s u b s c r i b e
        < / a >
        < / p >

        < / t d >
        < t d > & n b s p ; < / t d >
        < / t r >

        < t r >
        < t d > & n b s p ; < / t d >
<td style="font-family: Roboto, Helvetica, Arial; font-weight: normal; font-size: 11px; color: #646464" align="center">
        T h i s   m e s s a g e   w a s   s e n t   b y   t h e   i n b o x   r u l e   $ I n b o x R u l e N a m e

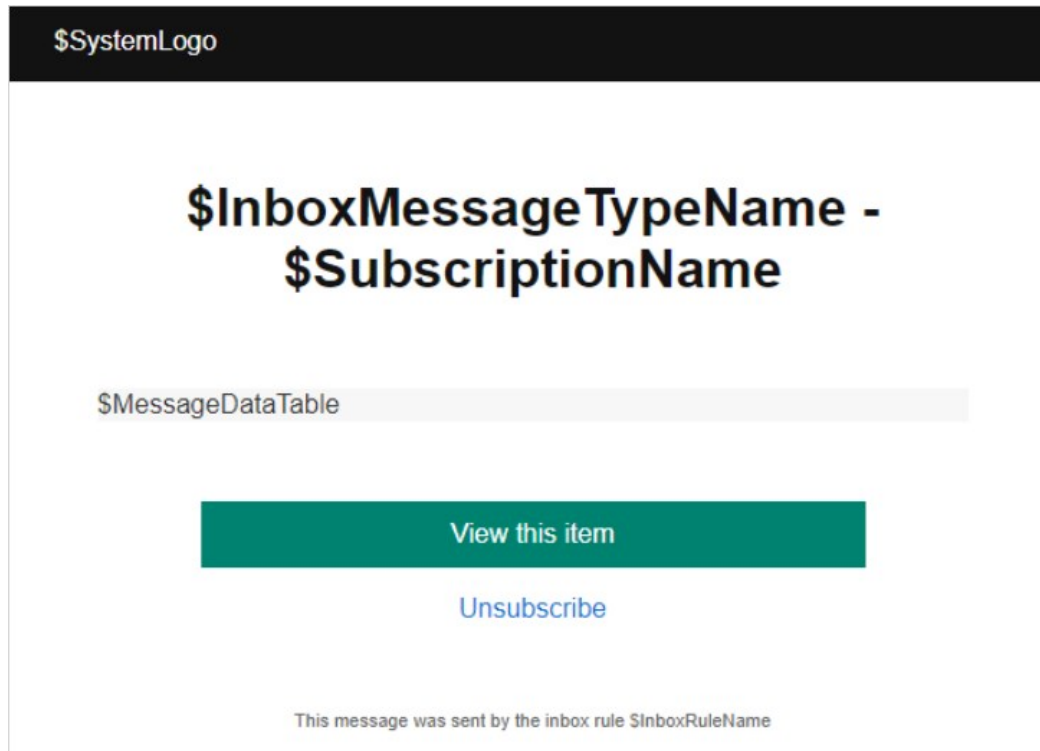
        < / t d >
        < t d > & n b s p ; < / t d >
        < / t r >

< / t a b l e >

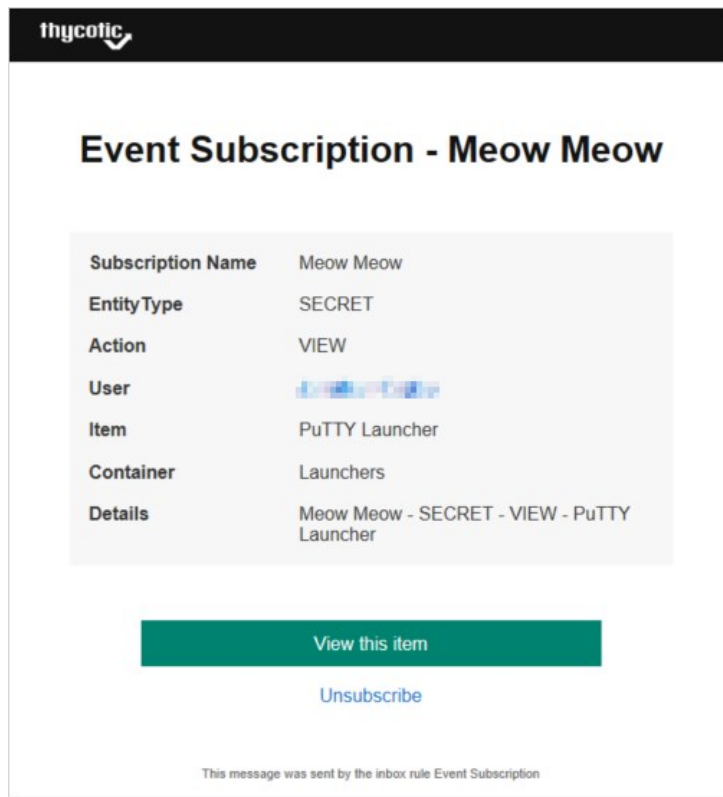
< / t d >
</table>
</td></tr></table>
</body>
</html>

```

9. Rendered, the body looks like this:



Note the variables starting with \$ that are in the message. These are replaced by Secret Server when it sends the message. For example:



10. The variables here include:

- \$InboxMessageType was replaced by the inbox template type.
- \$InboxRuleName was replaced by the inbox rule that sent the message. In this case, it is the same name as the inbox template type—Event Subscription.
- \$MessageDataTable was replaced by an entire table that summarized the message.
- \$SubscriptionName was replaced by the event subscription name.
- \$SystemLogo was replaced by the image resource containing the Delinea logo.

**Note:** For a complete list of variables for the template, go to the template editor (see below).

11. Nearly the entire template HTML is customizable once you make a customized clone of the system template. To clone the template click the **Copy Template** button at the top. The Copy Template popup appears:

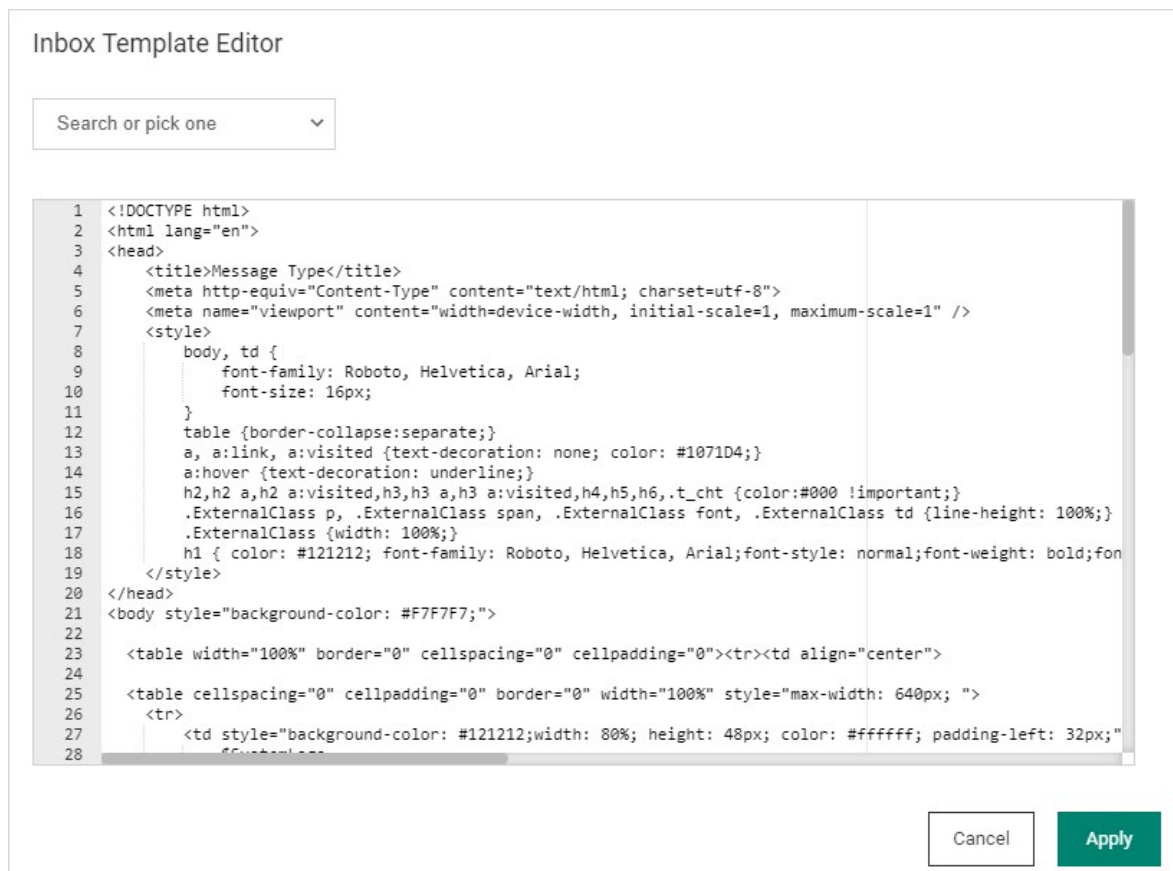
The 'Copy Template' popup has a title bar 'Copy Template'. Below it is a label 'New Template Name \*' followed by a text input field. At the bottom right are two buttons: 'Cancel' and 'Copy Template'.

12. Type the name of the new template in the **New Template Name** text box.
13. Click the **Copy Template** button. The template page reappears, but this time it is editable and named differently.
14. Click the **Edit** link next to **Template Body**. The section becomes editable:

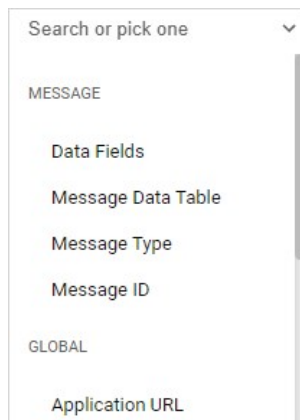
The screenshot shows a web form for editing a template. It has three main sections: Language, Subject, and Body. The Language section has a dropdown menu set to 'English (English)'. The Subject section has a text box containing '\$Details'. The Body section has a text box containing HTML code. A 'Template Editor' popup is open over the Body text box, showing the same HTML code. At the bottom of the form are 'Cancel' and 'Save' buttons.

Language	English (English) ▼
Subject *	\$Details
Body *	<div>Template Editor</div> <pre>&lt;!DOCTYPE html&gt; &lt;html lang="en"&gt; &lt;head&gt;   &lt;title&gt;Message Type&lt;/title&gt;   &lt;meta http-equiv="Content-Type" content="text/html; charset=utf-8"&gt;   &lt;meta name="viewport" content="width=device- width, initial-scale=1, maximum-scale=1" /&gt;   &lt;style&gt;</pre> <div>Cancel Save</div>

15. You can directly edit the HTML, but if you intend to add variables for Secret Server to fill in, click the **Template Editor** link. The Inbox Template Editor popup appears:

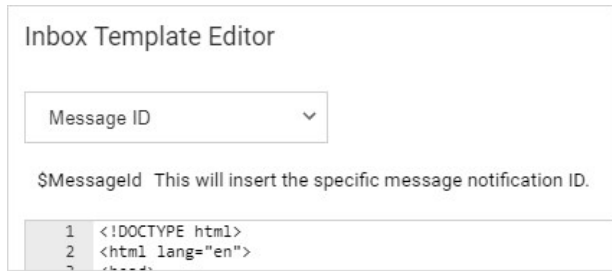


16. In addition to directly editing the HTML, you can insert variables by clicking the **Search or pick one** dropdown list:



17. You have three categories of variables: message, global, and digest.

18. Click the desired variable. The dropdown changes to show your choice:



19. The variable appears immediately below the dropdown list, as well as a description of the variable.
20. Copy or type the variable in the desired location in the HTML.
21. Edit and insert more variables as desired.
22. Click the **Apply** button. The popup disappears.
23. Click the **Save** button.

SQL Server maintains a history of all operations in a transaction log. If this transaction log becomes full, you may receive one or more of the following errors:

System.ArgumentException: Cannot add two background tasks with the same name.

Thycotic.Data.DataAccessorException: The transaction log for database '{database}' is full. To find out why space in the log cannot be reused, see the log\_reuse\_wait\_desc column in sys.databases

By default, a transaction log can grow to an unrestricted size, but some may become full in the following circumstances:

- The drive where the transaction log file is kept is out of disk space.
- The transaction log file hits its growth limit.

## Potential Solutions

- Back up the log.
- Free up disk space so that the log can grow automatically.
- Move the log file to a disk drive with sufficient space.
- Increase the size of the log file.
- Add a log file on a different disk.
- Complete or kill a long-running transaction.
- Switch to simple recovery mode and truncate the log.

For more detailed information on transaction logs in SQL, see [Understanding and Managing Transaction Logs](#).



In addition to the user audit and individual secret audit, the reporting feature provides a series of activity, user, and secret reports. See [Built-in Reports](#) for the most up-to-date list of reports included.

**Note:** Users can also create their own, custom reports. See [Creating and Editing Reports](#).

The audit log for a secret can be accessed by clicking the **View Audit** button on the **Secret View** page or navigating from the User Audit report. The log shows the date, the username, the action, and any other details about the event. Secret auditing provides a detailed view of each change or view on a secret.

**Note:** Audit logs are visible to anyone with the "list" permission. Thus, anybody with that permission can view permission changes, users whose permissions were changed, secret dependency information, and the machine.

Secret audits are taken for the following user actions:

- Adding, updating and removing secret dependencies
- Check out
- Editing permissions
- Forced expiration
- Hide launcher password changes
- Set for check-in
- Update
- View

For certain audit items, action notes are added providing additional details. For example, if permissions are edited, an audit record is generated detailing which users or groups gained or lost permissions. Detailed audit records add accountability to sensitive secrets where auditors or administrators need to know exactly what was modified.

Below the audit records is a **Display Password Change Log** check box. Clicking to select this check box displays logs for Heartbeat and Remote Password Changing amongst the audit items

## Secret Server Logs

### SS log

The Secret Server system log is a top-level IIS log that reports when roles start and stop and any activity occurring on the site, as well as any legacy monitors.

Location: C:\inetpub\wwwroot\SecretServer\log

See [Enabling Debug Mode in System Log Files](#) for more on using this log.

### SS-BSSR log

The *background scheduler server role log* is responsible for jobs that fire upon a trigger. Currently, we have some monitors that schedule work from the website but will transition to trigger jobs in the scheduler.

Location: C:\inetpub\wwwroot\SecretServer\log

### SS-BWSR log

The *background worker server role log* is responsible for logging work triggered by the background scheduler and legacy monitors. Work includes heartbeat, password changing, discovery, event pipelines, and others.

Location: C:\inetpub\wwwroot\SecretServer\log

### SS-EWSR log

The *engine worker server role log* is responsible for processing all responses from distributed engines, such as discovery and heartbeat.

Location: C:\inetpub\wwwroot\SecretServer\log

### SS-MMSR log

The *MemoryMq server role log* records internal site connector activity when RabbitMq is not installed or used.

Location: C:\inetpub\wwwroot\SecretServer\log

### SS-SRWSR log

The *session recording worker server role log* is responsible for processing session recordings from Secret Server.

Location: C:\inetpub\wwwroot\SecretServer\log

## Protocol Handler Log

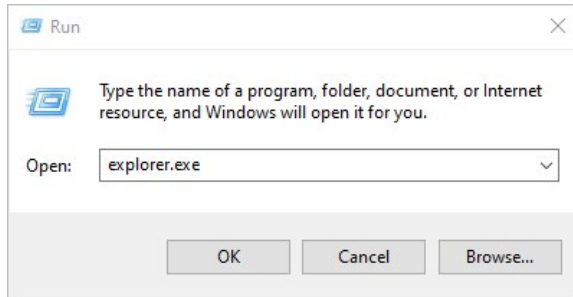
### SS-RDPWin log

The Remote Desktop Protocol (RDP) for Windows log records protocol handler activity. It is located at C:\Users\Administrator\AppData\Roaming\Thycotic\log

**Note:** Despite the name, the log covers more than just RDP.

To access the log:

1. Type Run in the Windows start menu search text box to launch the Run Command application. The Run popup appears:



2. Type %AppData%\Thycotic\log into the **Open** text box.
3. Click the **OK** button. The folder containing the file appears.

## Enabling Debug Logging for the Protocol Handler Log

This section explains how to enable verbose debug logging for protocol handler.

1. Navigate to C:\Program Files\Thycotic Software Ltd\Secret Server Protocol Handler.
2. Open the log4net-rdp.config configuration file in a text editor as an administrator:

```
<?xml version="1.0" encoding="utf-8"?>
<log4net>
  <root>
    <!-- Troubleshooting: detailed log information (large number of log files can accumulate) -->
    <!--<level value="DEBUG" />-->

    <!-- Troubleshooting: very detailed log information (large number of log files can accumulate) -->
    <!--<level value="VERBOSE" />-->

    <!-- Logging: off -->
    <!--<level value="OFF" />-->

    <level value="INFO" />
    <appender-ref ref="Thycotic.LogFileAppender" />
  </root>

  <appender name="Thycotic.LogFileAppender" type="log4net.Appender.RollingFileAppender">
    <!--<file value="C:\LogFiles\Thycotic\SS-RDPWin.log" />-->
    <file value="{AppData}\Thycotic\log\SS-RDPWin.log" />
    <rollingStyle value="Size" />
    <maxSizeRollBackups value="34" />
    <maximumFileSize value="10MB" />
    <lockingModel type="log4net.Appender.FileAppender+MinimalLock" />
    <layout type="log4net.Layout.PatternLayout">
      <conversionPattern value="%utcdate [CID:%property{Correlation}] [C:%property{Context}] [TID:%thread] %-5level %logger - %message%newline" />
    </layout>
  </appender>
</log4net>
```

3. Comment out <!--<level value="INFO" />.
4. Remove the comment out of <level value="DEBUG" />.
5. Re-create the original issue a couple of times with DEBUG enabled.
6. Navigate to ~\AppData\Roaming\Thycotic\log" on the machine you are launching protocol handler from. Copy and save the SS-RDPWin log file.
7. Return log4net-rdp.config to its original state by removing the comment out of <!--<level value="INFO" /> and commenting out <level value="DEBUG" />

## Distributed Engine Log

### SSDE log

The *Secret Server distributed engine log* is responsible for recording distributed engine activity.

Location: C:\Program Files\Thycotic Software Ltd\Distributed Engine\log

To configure the DE log:

1. Log in as an administrator on the distributed engine server.
2. Locate the Thycotic.DistributedEngine.Service.exe.config in the C:\Program Files\Thycotic Software Ltd\Distributed Engine directory.
3. Open the file in a text editor to change it as desired.

### Enabling Debug Mode in Distributed Engine Log Files

Please see [Enabling Debug Mode in Distributed Engine Log Files](#).

### Enabling Discovery Logging

To enable discovery logging, change the Thycotic.DistributedEngine.Service.exe.config configuration file as follows:

```
<logger name="Thycotic.Discovery">  
  <level value="VERBOSE" />  
</logger>
```

## RabbitMQ Log

Access the RabbitMQ logs at C:\RabbitMq\log.

## Overview

Syslog and CEF are two widely used standards for logging and event management in the field of IT and network security.

Syslog is a standard protocol used for sending and receiving log and event messages between network devices, servers, and applications. It provides a structured and standardized way of capturing and forwarding system messages, allowing IT administrators to monitor and troubleshoot network and system issues more effectively. Syslog messages can contain various types of information, including system events, errors, and warnings, as well as user activity and other operational data.

CEF (Common Event Format) is a standardized log format for capturing and transmitting security-related events across various systems and devices. CEF provides a common language and format for security information and event management (SIEM) systems, allowing for more efficient and effective analysis of security events and threats.

**Note:** See the [Syslog Event List](#) for a complete list of events.

## Secret Server and Syslog or CEF Logging

Secret Server can send a copy of important log messages to an external syslog server for added security using the following protocols:

**Note:** Common Event Format (CEF) is an industry-standard format on top of syslog messages that ensures event interoperability between different platforms.

**Table:** Syslog Transportation Protocols

UDP	No	Least reliable. User Datagram Protocol (UDP) traffic is fire-and-forget with no assurance messages are delivered and no error checking.
TCP	No	More reliable. Transmission Control Protocol (TCP) ensures messages arrive in order, missing messages are resent, and has built in error checking.
Secure TCP	Yes	Establishes a secure connection — Transport Layer Security (TLS) 1.1 or 1.2 only. Syslog Server's certificate is validated by Windows to ensure it is trusted and not revoked. Can be used with or without client certificates (configured in <b>Configuration &gt; Security tab &gt; TLS Auditing &gt; Advanced</b> ).

[Unexpected Link Text](#)

Due to the sensitive nature of Secret Server logs, we strongly recommend using Secure TCP.

## Configuring a Secure TCP Syslog or CEF External Audit Server in Secret Server

### Compatible Audit Servers

- syslog-ng
- Any Audit server that accepts TLS encrypted messages using the BSD syslog protocol

### Special Characters in Syslogs

Secret Server uses UTF-8 encoding for syslog messages, which supports non-ASCII characters. Some syslog servers may only support ASCII. If you cannot change your server to UTF-8, your syslog messages may include error characters (often question marks) where non-ASCII

characters appear.

## Configuring an External Audit Server

1. Navigate to **Admin > Configuration**.
2. Click **Application** in the **General** section. The Application page appears.
3. Click the **Edit** button at the top of the page.
4. Go to the **Application Settings** section.
5. Click to select the **Enable Syslog/CEF Logging** check box. A syslog/CEF section appears.

**Note:** syslog/CEF may require an additional license key. To install licenses, navigate to **Admin > Licenses > Install New License**. Once installed, the license requires activation. Contact your Delinea Sales Representative with any questions.

6. Type IP address or name for the IIS server hosting the syslog/CEF server in the **Syslog/CEF Server** text box.

**Note:** You can add multiple entries, separating each with a semicolon.

7. Type the port number where the logging information will be passed (6514 is the default port for secure TCP syslog) in the **Syslog/CEF Port** text box.

**Note:** Secret Server requires outbound access to this server and port so communication can pass freely.

8. Click the **Syslog/CEF Protocol** dropdown list and select **Secure TCP**. Secure TCP means either TLS v1.2 or v1.1 because other versions of SSL, such as SSL v3 and TLS v1.0, have known weaknesses.
9. Click to select **Syslog/CEF Time Zone** list box to **UTC Time** or **Server Time**, depending on your preference.
10. Click the **Syslog/CEF DateTime Format** dropdown to format Syslog timestamps. The standard for Syslog is ISO timestamps; however, some still use the legacy format. Syslog is the default for upgrades to allow current configurations to retain their behavior, and ISO format is the default in new instances. Syslog format: Jun 23 2022 11:22:33. ISO 8601 format: 2022-06-23T11:22:33.000. You must enable the configuration preview to modify this setting.
11. Click to select the **Write Syslogs As Windows Events** check box to write audits and event subscriptions to the Windows Event Log of the server.
12. Click the **Save** button.

## Caching Syslog Audits

If the connection between the external syslog server and Secret Server breaks once secure syslog logging is enabled in Secret Server, syslog failure notification messages is cached in the Secret Server database and re-sent at regular intervals until the connection between the syslog server and Secret Server is reestablished.

## Configure Auditing for TLS Connections

To track problems with TLS connections (including whenever the connection fails), enable the TLS certificate chain policy and error auditing in Secret Server:

1. Navigate to **Admin > Configuration**.
2. Click the **Security** tab.
3. Click the **Edit** button at the bottom of the page.

4. Scroll to the **TLS Auditing** section.
5. Ensure the **Apply TLS Certificate Chain Policy and Error Auditing** check box is enabled. If not, you cannot use client certificates.

**Note:** If secure TCP is used for the syslog/CEF protocol and there are one or more client certificate thumbprints entered, Secret Server checks the local computer's Web hosting and personal certificate store and uses the first one it finds.

## Adding Client Certificate Thumbprints

1. Navigate to **Admin > Configuration**.
2. Click the **Security** tab.
3. Click the **Edit** button at the bottom of the page.
4. Scroll to the **TLS Auditing** section.
5. Click the **Advances (not required)** link. A client certificate thumbprint section appears.
6. Copy and paste a list of SHA1 SSL certificate thumbprints into the **Client Certificate Thumbprints(s)** text box. Separate each thumbprint (40 characters each) with a semicolon. Up to ten are allowed.

**Note:** Secret Server's IIS application pool must be granted permission to use the client certificates, using the Windows HTTP Services Certificate Configuration Tool (WinHttpCertCfg.exe). See [Compatibility Notes for Client Certificates](#).

## Determining the Status of a Remote Audit Server

To view the logs for any TLS-Connection related errors, perform the following:

1. Open the **Microsoft SQL Server Management Studio**.
2. Navigate to your SecretServer database at **<DB Machine Name> > Databases > SecretServer**.
3. Set up a new query.
4. Type and enter `select from tbSecurityAuditLog` to view the events from the TLS audit.

**Note:** For more detailed troubleshooting reporting, reference the logs on the Secret Server Web server at `C:\inetpub\wwwroot\SecretServer\log`. View the `SS.log`, `SS-BSSR.log` (background scheduler), and `SS-BSWR.log` (background worker) for any errors.

## Compatibility Notes for Client Certificates

### IIS Application Pool Certificate Permissions

Secret Server's IIS application pool must be granted permission to use the client certificates, using the Windows HTTP Services Certificate Configuration Tool (WinHttpCertCfg.exe).

For example: `winhttpcertcfg.exe -g -c LOCAL_MACHINEMY -s "Certificate Subject" -a "HOSTNAME\IIS APPPOOL\SecretServer"`

You can download the tool at:

[Windows HTTP Services Certificate Configuration Tool \(WinHttpCertCfg.exe\)](#)

You can view the documentation at:



## [WinHttpCertCfg.exe, a Certificate Configuration Tool](#)

Otherwise, if Secret Server is configured to use a client certificate, and IIS does not have permission, errors like this may appear in the logs:

**TLS Error Detected (Authentication Error connecting to IP:PORT) - The credentials supplied to the package were not recognized.**

If you are using a client certificate, and a syslog-ng logging server, the following message may occasionally appear in the main syslog-NG log file:

**SSL error while reading stream; tls\_error='SSL routines:ssl\_get\_prev\_session:session id context uninitialized'**

On the Secret Server side, this appears:

**TLS Error Detected (Authentication Error connecting to IP:PORT) - Authentication failed because the remote party has closed the transport stream.**

This is caused by Windows trying to cache secure connections when client certificates are used, but because syslog-ng has not configured the OpenSSL "session id context", OpenSSL displays this error when it tries to resume a previous session.

Secret Server automatically reconnects and resends any missed messages, so the errors should not have an impact. However, you can disable Window's secure connection caching by adding the [ClientCacheTime](#) setting set to 0 in the Registry and then rebooting. This did not cause any significant performance impact in internal testing.

**Note:** If changing back to a previous syslog IP address and port, you will receive a closed connection TLS error on the first attempted syslog connection after making the change. A subsequent call will succeed as the first failure will clear the cached connection on Windows. This is due to the issue with syslog-ng.

**Note:** If syslog-ng configures their OpenSSL session id context, this error message correction is no longer needed.

## AlienVault

It is common for people to incorrectly use the client certificate thumbprints feature when setting up secure AlienVault for syslog. This can cause Secret Server to try to connect to LDAPS with the AlienVault certificate, which can break LDAPS. Users should not use the Secret Server client certificates thumbprint for specifying one certificate for syslog and another for LDAP. The certificate list is intended for each Secret Server or DE to have its own, unique certificate.

## Overview

Secret Server Web nodes and distributed engines log levels are remotely configurable and collectable. This feature is especially useful for large systems with many nodes and engines.

Configuration for the web nodes is found on the Server Nodes configuration page, alongside role settings. Configuration for distributed engines is found in the Distributed Engine configuration page. Log levels include: All, Debug, Info, Warn, Error, Off, and Not Set (the default). Previously, manual configuration file changes were required. "Not Set" relies on the configuration files for the logging level, which was the previous default behavior.

The diagnostic feature for collecting logs is improved and now gathers logs from all nodes and engines.


This feature is at Admin > Server Nodes and Admin >

## Setting the Logging Level

### Secret Server Web Servers

For Web servers, you can set the log Level for web server nodes from the Server Nodes page:

1. Go to **Admin > See All**. A list of admin settings appears.
2. Click the **Server Nodes** link. The Server Nodes page appears:

Server Nodes										
MACHINE NAME (ID)	BINARY VERSION	DATABASE	ERROR MESSAGE	LAST CONNECTED	IN CLUSTER	BACKGROUND WORKER	ENGINE WORKER	SESSION RECORDING WORKER	MAINTENANCE MODE	LOG LEVEL
THY-01-0662-LT (1) (Current Node)	11.0.000042	ss_qa		11/5/2021 10:07:14 PM	Yes	Enabled	Enabled	Enabled	Disabled	Info 

3. Click the edit icon next to the server you want to change. The settings become editable.
4. Click the **Log Level** dropdown list to select the desired level.
5. Click the save icon on the far right to save the change.

### Distributed Engines

Similarly, for distribution engines:

1. Go to **Admin > Distributed Engine**. The Distributed Engine page appears:

2. Hover the mouse pointer over the desired engine. Three dots appear on the far right.
3. Click the dots icon and select **Show Settings**. The Engine Settings popup page appears:

Engine Settings

Settings to allow separate engine functionality within a Site to a set of Engines; There is no requirement to make changes and it is recommended to not change settings unless necessary

Directory Services
☒

Advanced Auditing
☒

Local Account Discovery
☒

Password Changing
☒

Secret Workflow
☒

Service Account Management
☒

SSH Proxy
☒

SSH Terminal
☒

Log Level

< Not Set >

OK

4. Click the **Log Level** dropdown list to select the desired level.

5. Click the **OK** button to save the change.

**Table:** Syslog Event List

AUTOEXPORT		DOWNLOADEXPORT	10164	Autoexported has been downloaded
AUTOEXPORT		EDIT	10161	Autoexport was edit
AUTOEXPORT		EXPORT	10162	Autoexport was exported
AUTOEXPORT		RUNEXPORT	10163	Run Autoexport
BACKUPCONFIGURATION	10023	EDIT	10143	The back configuration was edited
CHARACTERSET	10020	CREATE	10132	A character set was created
CHARACTERSET	10020	DISABLE	10135	A character set was disabled
CHARACTERSET	10020	EDIT	10133	A character set was edited
CHARACTERSET	10020	ENABLE	10134	A character set was enabled
CONFIGURATION	5	BACKUP	10144	Database was backed up
CONFIGURATION	5	DATABASE EDIT	10122	Database configuration was edited
CONFIGURATION	5	EDIT	15	Configuration was edited
CONFIGURATION	5	UPGRADE	10121	An updated was started or completed
DISASTERRECOVERY		DATAREPLICATION	10191	Data replication started for disaster recovery
DISASTERRECOVERY		EDIT	10190	Disaster recovery was edited
DISASTERRECOVERY		RUNDATAREPLICATION	10192	Run Data replication for disaster recovery
DOMAIN	10022	CREATE	10138	A domain was created
DOMAIN	10022	EDIT	10139	A domain was edited

DOMAIN	10022	SYNCHRONIZE	10145	A domain's users were synchronized
DUALCONTROL	10017	CREATE	10104	A dual control was created
DUALCONTROL	10017	DELETE	10106	A dual control was deleted
DUALCONTROL	10017	UPDATE	10105	A dual control was updated
ENCRYPTION	10012	HSM DISABLE	10067	HSM was disabled
ENCRYPTION	10012	HSM ENABLE	10066	HSM was enabled
ENCRYPTION		HSM ROTATE	10157	
ENCRYPTION	10012	KEY MANAGEMENT DISABLE	10148	Key management was disabled
ENCRYPTION	10012	KEY MANAGEMENT EDIT	10147	Key management was edited
ENCRYPTION	10012	KEY MANAGEMENT ENABLE	10146	Key management was enabled
ENCRYPTION	10012	ROTATE MASTER ENCRYPTION KEY	10167	
ENCRYPTION	10012	ROTATE MASTER ENCRYPTION KEY FAILURE	10170	
ENCRYPTION	10012	ROTATE MASTER ENCRYPTION KEY RETRY	10168	
ENCRYPTION	10012	ROTATE MASTER ENCRYPTION KEY SUCCESS	10169	
ENCRYPTION	10012	ROTATE SECRET KEYS	10069	Rotate secret keys was requested
ENCRYPTION	10012	ROTATE SECRET KEYS CANCEL REQUESTED	10070	Rotate secret keys was canceled
ENCRYPTION	10012	ROTATE SECRET KEYS FAILURE	10072	Rotate secret keys failed
ENCRYPTION	10012	ROTATE SECRET KEYS SUCCESS	10071	Rotate secret keys succeeded
ENGINE	10014	ACTIVATE	10083	An engine was activated
ENGINE	10014	CREATE	10082	An engine was created

ENGINE	10014	DEACTIVATE	10084	An engine was deactivated
ENGINE	10014	DELETE	10085	An engine was deleted
ENGINE	10014	OFFLINE	10151	An engine was taken offline
ENGINE	10014	ONLINE	10152	An engine was brought online
ENGINE		PROXYENDPOINTCHANGED	10180	Proxy endpoint was changed for node
EXPORTSECRETS	10003	EXPORTED	10016	Secrets have been exported from Secret Server
FOLDER	2	CREATE	7	A folder has been created
FOLDER	2	DELETE	8	A folder has been deleted
FOLDER	2	EDITPERMISSIONS	14	A folder's permissions have been changed
FOLDER	2	SECRETPOLICYCHANGE	10053	A folder's secret policy was changed
GROUP	6	CREATE	10140	A group was created
GROUP	6	EDIT	10141	A group was edited
IMPORTSECRETS	10004	IMPORTED	10017	Secrets have been imported to Secret Server
IPADDRESSRANGE	7	CREATE	10109	An ip range was created
IPADDRESSRANGE	7	DELETE	10111	An ip range was deleted
IPADDRESSRANGE	7	GROUP ASSIGN	10114	A group was assigned to an ip range
IPADDRESSRANGE	7	GROUP UNASSIGN	10115	A group was removed from an ip range
IPADDRESSRANGE	7	UPDATE	10110	An ip range was updated
IPADDRESSRANGE	7	USER ASSIGN	10112	A user was assigned to an ip range

IPADDRESSRANGE	7	USER UNASSIGN	10113	A user was removed from an ip range
LICENSES	10007	ADD	10119	A license was added
LICENSES	10007	DELETE	10120	A license was removed
NODE	PROXYENDPOINTCHANGED		10181	Proxy endpoint was changed for a Secret
PASSWORDCHANGER	10019	AUTHEDIT	10130	The password changer's authentication method was edited
PASSWORDCHANGER	10019	COMMANDCREATE	10128	A command in a password changer was created
PASSWORDCHANGER	10019	COMMANDDELETE	10129	A command in a password changer was deleted
PASSWORDCHANGER	10019	COMMANDEDIT	10127	A command in a password changer was edited
PASSWORDCHANGER	10019	CREATE	10123	A password changer was created
PASSWORDCHANGER	10019	DISABLE	10126	A password changer was disabled
PASSWORDCHANGER	10019	EDIT	10124	A password changer was edited
PASSWORDCHANGER	10019	ENABLE	10125	A password changer was enabled
PASSWORDCHANGER	10019	SCANFIELDEDIT	10131	The fields the password changer uses from the secret was edited
PASSWORDREQUIREMENT	10021	CREATE	10136	A password requirement was created
PASSWORDREQUIREMENT	10021	EDIT	10137	A password requirement was edited
RDPProxy	DISABLED		10174	RDP Proxy was disabled
RDPProxy	ENABLED		10173	RDP Proxy was enabled



ROLE	3	ASSIGNUSERORGROUP	10	A user or group was assigned to a role
ROLE	3	CREATE	9	A role was created
ROLE	3	DISABLEROLE	21	A role was disabled
ROLE	3	EDIT	10142	A role was edited
ROLE	3	ENABLEROLE	20	A role was enabled
ROLE	3	UNASSIGNUSERORGROUP	11	A user or group was unassigned from a role
ROLEPERMISSION	4	ADDEDTOROLE	12	A permission was added to a role
ROLEPERMISSION	4	REMOVEDFROMROLE	13	A permission was removed from a role
SCRIPTPOWERSHELL	10008	CREATE	10027	A powershell script was created
SCRIPTPOWERSHELL	10008	DEACTIVATE	10028	A powershell script was deactivated
SCRIPTPOWERSHELL	10008	EDIT	10029	A powershell script was edited
SCRIPTPOWERSHELL	10008	REACTIVATE	10030	A powershell script was reactivated
SCRIPTPOWERSHELL	10008	VIEW	10031	A powershell script was viewed
SCRIPTSQL	10011	CREATE	10061	A SQL script was created
SCRIPTSQL	10011	DEACTIVATE	10062	A SQL script was deactivated
SCRIPTSQL	10011	EDIT	10063	A SQL script was edited
SCRIPTSQL	10011	REACTIVATE	10064	A SQL script was reactivated
SCRIPTSQL	10011	VIEW	10065	A SQL script was viewed
SCRIPTSSH	10010	CREATE	10056	An ssh script was created

SCRIPTSSH	10010	DEACTIVATE	10057	An ssh script was deactivated
SCRIPTSSH	10010	EDIT	10058	An ssh script was edited
SCRIPTSSH	10010	REACTIVATE	10059	An ssh script was reactivated
SCRIPTSSH	10010	VIEW	10060	An ssh script was viewed
SECRET	10001	ACCESS_APPROVED	10044	A secret's access request was approved
SECRET	10001	ACCESS_DENIED	10045	A secret's access request was denied
SECRET	10001	CACHEVIEW	10103	A secret has been viewed, but cached data was presented
SECRET	10001	CHECKIN	10025	A secret was checked in
SECRET	10001	CHECKOUT	10026	A secret was checked out
SECRET	10001	COPY	10020	A secret was copied
SECRET	10001	CREATE	10001	A secret has been created
SECRET	10001	CUSTOM_AUDIT	10038	A custom audit has been created
SECRET	10001	CUSTOM_PASSWORD_REQUIREMENT_ADDED	10046	A custom password requirement was added to a secret
SECRET	10001	CUSTOM_PASSWORD_REQUIREMENT_REMOVED	10047	A custom password requirement was removed from a secret
SECRET	10001	DELETE	10002	A secret has been deleted
SECRET	10001	DEPENDENCY_ADDED	10049	A dependency was added to a secret
SECRET	10001	DEPENDENCY_DELETED	10048	A dependency was removed from a secret
SECRET	10001	DEPENDENCYFAILURE	10008	A secret's dependency failed

SECRET	10001	EDIT	10005	A secret was edited
SECRET	10001	ERASE_COMPLETED	10166	A secret erased completed
SECRET	10001	ERASE_REQUESTED	10165	A secret erased request has been made
SECRET	10001	EXPIREDTODAY	10009	A secret is expiring today
SECRET	10001	EXPIRES01DAY	10010	A secret is expiring in one day
SECRET	10001	EXPIRES03DAYS	10013	A secret is expiring in three days
SECRET	10001	EXPIRES07DAYS	10011	A secret is expiring in seven days
SECRET	10001	EXPIRES15DAYS	10012	A secret is expiring in fifteen days
SECRET	10001	EXPIRES30DAYS	10094	A secret is expiring in thirty days
SECRET	10001	EXPIRES45DAYS	10095	A secret is expiring in forty-five days
SECRET	10001	EXPIRES60DAYS	10096	A secret is expiring in sixty days
SECRET	10001	EXPIRES90DAYS	10182	Secret is expiring in 90 Days
SECRET	10001	EXPORTSECRET	10093	A secret was exported
SECRET	10001	FILESAVE	10102	A file was saved to a secret
SECRET	10001	HEARTBEATFAILURE	10007	A secret's heartbeat failed
SECRET	10001	HEARTBEATSUCCESS	10032	A secret's heartbeat succeeded
SECRET	10001	HOOKCREATE	10035	A hook has been created
SECRET	10001	HOOKDELETE	10037	A hook has been deleted

SECRET	10001	HOOKEDIT	10036	A hook has been edited
SECRET	10001	HOOKFAILURE	10033	A hook has failed to initialise a PowerShell script
SECRET	10001	HOOKSUCCESS	10034	A hook has successfully initialised a PowerShell script
SECRET	10001	LAUNCH	10006	A secret was launched
SECRET	10001	PASSWORD CHANGE MAX ATTEMPTS REACHED	10068	A secret has reached the max amount of attempts to change its password
SECRET	10001	PASSWORD_COPIED_TO_CLIPBOARD	10040	A secret's password was copied to the clipboard
SECRET	10001	PASSWORD_DISPLAYED	10039	A secret's password was displayed
SECRET	10001	PRECHECKIN	10158	A secret was pre checked in
SECRET	10001	PRECHECKOUT	10154	A secret was pre checked out
SECRET	10001	SECRETPASSWORDCHANGE	10055	A secret's password was changed
SECRET	10001	SECRETPASSWORDCHANGEFAILURE	10155	A secret password change failed
SECRET	10001	SECRETPOLICYCHANGE	10054	A secret's policy was changed
SECRET	10001	SESSION RECORDING VIEW	10019	A session recording of a launched secret was viewed
SECRET	10001	UNDELETE	10003	A secret has been undeleted
SECRET	10001	VIEW	10004	A secret has been viewed
SECRET	10001	VIEWED_EDIT	10041	The secret's view option was edited

SECRET	10001	WEBPASSWORDFILL	10099	A secret was used to fill a web form
SECRETPOLICY	10009	CREATE	10051	A secret policy was created
SECRETPOLICY	10009	EDIT	10052	A secret policy was edited
SECRETSERVERSETTING		EXPORTED	10159	Secret Server setting was exported
SECRETSERVERSETTING		IMPORTED	10160	Secret Server setting was imported
SECRETTEMPLATE	10006	CREATE	10021	A secret template was created
SECRETTEMPLATE	10006	CREATE SECRET ACCESS CHANGED	10108	Users that have access to create a secret of a template were changed
SECRETTEMPLATE	10006	EDIT	10022	A secret template was edited
SECRETTEMPLATE	10006	FIELD ENCRYPTED	10042	A field in a secret template was marked to be encrypted
SECRETTEMPLATE	10006	FIELD EXPOSED	10043	A field in a secret template was marked to be exposed
SECRETTEMPLATE	10006	OWNERS_MODIFIED	10107	The owners of a secret template were changed
SECRETTEMPLATE	10006	TEMPLATE COPIED FROM	10023	A secret template was copied
SECURITYANALYTICSCONFIGURATION	10016	EDIT	10098	Privileged Behavior Analytic settings were edited
SITE	10013	ADDENGINE	10077	An engine was added to a site
SITE	10013	ASSIGNEDDOMAIN	10091	A site was assigned to a domain
SITE	10013	CREATE	10073	A site was created

SITE	10013	DISABLE	10076	A site was disabled
SITE	10013	DISABLERDPPROXY	10178	RDP Proxy was disabled for Site
SITE	10013	DISABLESSHProxy	10176	SSH Proxy was disabled for Site
SITE	10013	EDIT	10074	A site was edited
SITE	10013	ENABLE	10075	A site was enabled
SITE	10013	ENABLERDPPROXY	10177	RDP Proxy was enabled for Site
SITE	10013	ENABLESSHProxy	10175	SSH Proxy was enabled for Site
SITE	10013	ENGINEDOWNLOAD	10081	An engine was downloaded for a site
SITE	10013	ENGINEOFFLINE	10080	An engine was taken offline
SITE	10013	ENGINEONLINE	10079	An engine was brought online
SITE	10013	PROXYENDPOINTCHANGED	10179	Proxy endpoint was changed for a Site
SITE	10013	REMOVEDOMAIN	10092	A site was removed from a domain
SITE	10013	REMOVEENGINE	10078	An engine was removed from a site
SITECONNECTOR	10015	CREATE	10086	A site connector was created
SITECONNECTOR	10015	CREDENTIALVIEW	10090	A site connector's credentials were viewed
SITECONNECTOR	10015	DISABLE	10089	A site connector was disabled
SITECONNECTOR	10015	EDIT	10087	A site connector was edited

SITECONNECTOR	10015	ENABLE	10088	A site connector was enabled
SSHPROXY		DISABLED	10172	SSH Proxy was disabled
SSHPROXY		ENABLED	10171	SSH Proxy was enabled
System Log	500	System Log	500	
TLS	10018	FAIL	10118	A TLS error occurred while connecting to a remote server
UNLIMITEDADMIN	10002	DISABLE	10015	Unlimited admin mode was disabled
UNLIMITEDADMIN	10002	ENABLE	10014	Unlimited admin mode was enabled
USER	1	ADDEDTOGROUP	5	A user was added to a group
USER	1	CHALLENGE_APPLIED	10116	A PBA challenge was applied to a user
USER	1	CHALLENGE_CLEARED	10117	A PBA challenge was cleared from a user
USER	1	CREATE	1	A user was created
USER	1	DISABLE	2	A user was disabled
USER	1	EDIT	10100	A user was edited
USER	1	ENABLE	3	A user was enabled
USER	1	LOCKOUT	4	A user was locked out
USER	1	LOGIN	16	A user logged in
USER	1	LOGINFAILURE	18	A user failed to log in
USER	1	LOGOUT	17	A user logged out
USER	1	OWNERS_MODIFIED	10097	A user's owner was modified
USER	1	PASSWORDCHANGE	19	A user's password was changed

USER	1	REMOVEDFROMGROUP	6	A user was removed from a group
USER	1	REMOVEPERSONALLYIDENTIFIABLEINFORMATION	10153	Users personal identifiable information was removed
USER	1	TWO FACTOR UPDATED	10101	A user's two factor settings were updated
USER	1	TWOFACITORRESET	10149	A user's two factor was reset
USER	1	TWOFACITORRESETFAILED	10150	A user's two factor authentication failed
USERAUDIT	10005	EXPIRENOW	10018	Secrets have been manually expired



To view a user audit report:

1. From the **Reports** page, click the **User Audit** tab.
2. From the dialog on the tab, select a user and a date range to view.
3. Click **Search History** to view the user's audit trail.

The audit search displays results for all the secrets the selected user has viewed or edited during the selected time period. The administrator has the option of expiring all the viewed secrets, to notify users to change sensitive information, or to force password changing (if the RPC is configured).

To get a full view of the actions taken on a secret, select that secret from the results list. The secret audit displays the specific user actions for a secret.

The System Log is used to communicate the different events that are occurring while Secret Server is executing. It can be helpful in troubleshooting unexpected behavior. The system log can be enabled by clicking **Edit** and checking the **Enable System Log** check box on the **Administration > System Log** page.

**Note:** See the [Syslog Event List](#) for a list of system events.

System log parameters include:

- **Maximum Log Length:** This is the maximum number of rows to keep in the system log table in the SQL database. When it reaches that amount, it is reduced by 25%.
- **Notify Administrators when System Log is Shrunk:** This setting is used to send an email to all system log administrators when the system log has been truncated. A system log administrator is any user in a role with the Administer System Log permission included.

To clear the system log of all its records, click **Clear**.

To view the events that have been triggered in a subscription, navigate to **Administration > Event Subscriptions** and click **View Audit**. In the Event Subscription Activity list, the most recent events to have been triggered are on top of the list. To select a specific time frame, click the ... buttons and select start and end dates at the top of the page. Click **Update Report** to return the corresponding log entries.

**Note:** It may take a few seconds for the events to make it into the log.

## Folders

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret folders allow you to create containers of secrets based on your needs. They help organize your customers, computers, regions, and branch offices, to name a few. Folders can be nested within other folders to create sub-categories for each set of classifications. Secrets can be assigned to these folders and sub-folders. Folders allow you to customize permissions at the folder level, and all secrets within can inherit the folder's permissions. Setting permissions at the folder level ensures future secrets placed in that folder have the same permissions, simplifying management across users and groups.

**Note:** You can "favorite" a folder in the main menu by right clicking it.

If the new folder is a subfolder, you can have it use the sharing settings of its parent folder by enabling the "inherit permissions from parent" setting for the folder.

Folders can apply one the following permissions to users or groups in the folder's Permissions table:

- **View:** Allows the user to see the folder and secrets in that folder that are inheriting permissions from their folder.
- **Edit:** Allows the user to create new folders in that folder, which forces the "Inherit Permissions from Parent" permission on the new folder, move secrets into that folder, and add new secrets into that folder.
- **Add Secret:** Allows the user to add a secret in that folder. Does not grant access to the added secret.
- **Owner:** Allows the user to create new folders in that folder without forcing inheritance, move the folder, delete the folder, rename the folder, and change the permissions and inheritance settings on the folder.

Depending on your configuration, these settings could affect the permissions of subfolders and secrets contained in this folder. Folders are not visible to users that do not have at least View permission. This allows users to create and manage their own folders without making them visible to all users.

## Personal Folders

In Secret Server, a *personal folder* is a folder that one (and only one) individual has owner access to. No user can modify sharing permissions on these folders. User's can add subfolders to their personal folder. The purpose of this folder is to allow a user to securely store work-related secrets that other users do not require access to. Note that when in break-the-glass mode, an unlimited admin can access a user's personal folder in order to recover secrets if needed.

## Required Role Permissions for Managing Folders

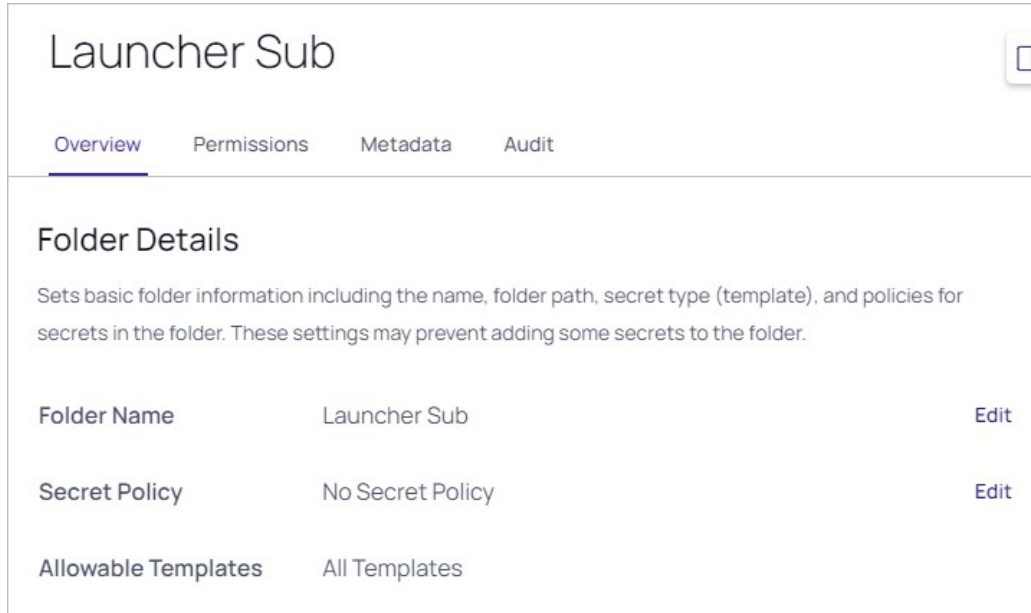
Folder management is subject to these role permissions:

- The Administer Folders role permission allows a user to create new folders and manage folders, but specific folder permissions still apply.
- Any user with the Administer Folders role permission can create new folders; however, to create folders at the root level, the user also needs the Create Root Folders permission. They also can add new folders to any folders where they have Edit or Owner permission on that folder.
- They must have Owner permission to delete a folder.
- Users can also move folders where they have Owner permission on the source folder and Edit or Owner permission on the target folder (where they are moving it). The folder automatically inherits Permissions from its parent when it is moved, which is the same as when secrets are moved.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Assigning Secret Policies to Folders

1. Navigate to the folder containing the secret you want to assign a policy to.
2. Right-click the folder and select Edit Folder. The Folder Details page appears:



Launcher Sub

Overview Permissions Metadata Audit

### Folder Details

Sets basic folder information including the name, folder path, secret type (template), and policies for secrets in the folder. These settings may prevent adding some secrets to the folder.

Folder Name	Launcher Sub	Edit
Secret Policy	No Secret Policy	Edit
Allowable Templates	All Templates	

3. Click the **Secret Policy Edit** link. The Edit Folder popup appears:



### Edit Folder

Secret Policy

No Secret Policy

Cancel Save

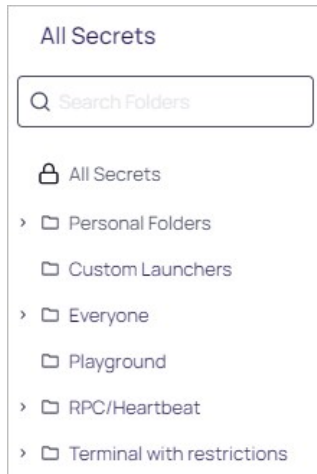
4. Click to select the desired policy in the **Secret Policy** dropdown list.
5. Click the **Save** button.

## Creating Folders

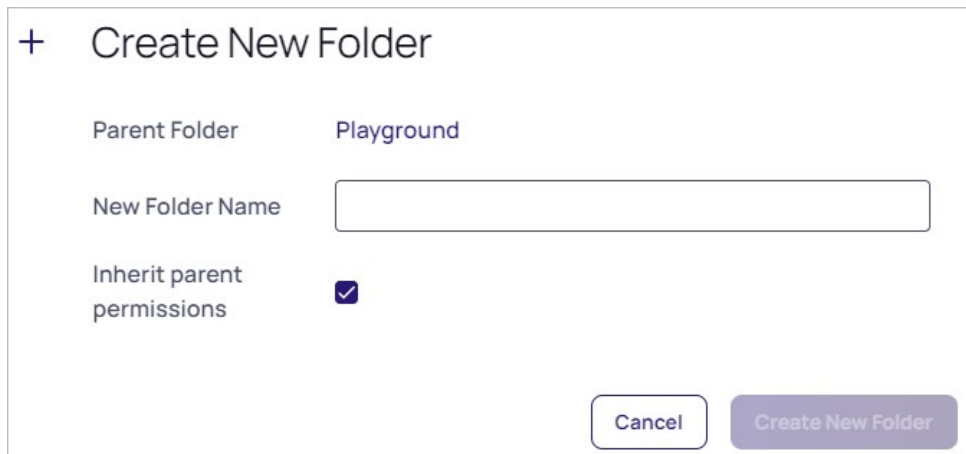
To create a folder:

**Note:** To create folders, you must have a role with the "administer folder" permission. You also must have edit or owner permission for the parent folder.

1. Click > > on the **Secrets** menu item to view the Secret Folder-Tree Panel.



2. Drill down and click the folder you wish to add a subfolder to. We chose the Playground folder.
3. Right click the folder and select **Add Subfolder**. The Create New Folder popup appears:

A screenshot of the 'Create New Folder' popup form. The title is '+ Create New Folder'. Below the title, there are two fields: 'Parent Folder' with the value 'Playground' and 'New Folder Name' with an empty text box. Below these fields, there is a checkbox labeled 'Inherit parent permissions' which is checked. At the bottom right, there are two buttons: 'Cancel' and 'Create New Folder'.

4. Type the new folder's name in the **New Folder Name** text box.
5. If desired, click to toggle the **Inherit Parent Permissions** check box.
6. Proceed to [Editing Folder Permissions](#) to customize permissions for the new folder.



## Deleting Folders

To delete a folder:

**Note:** To delete folders, you must have a role with the "administer folder" permission. You also must have edit or owner permission for the parent folder.

1. Navigate to the folder in the folder tree on the main menu.
2. Right click the folder and select **Delete Folder**. The Delete Folder pop-up page appears:

### Delete Folder

This action will permanently remove the folder **Example**.

All Secrets inside of this folder will no longer be associated with a folder and will only be accessible when viewing all Secrets.

CancelDelete Folder

3. Click the **Delete Folder** button.

## Editing Folder Permissions

To edit folder permissions:

**Note:** To edit folder permissions, you must have a role with the "administer folder" permission. You also must have edit or owner permission for the parent folder.

1. Navigate to the folder to edit.
2. Right-click the folder and select Edit Folder. The Folder Details page appears:

Launcher Sub

[Overview](#)
[Permissions](#)
[Metadata](#)
[Audit](#)

### Folder Details

Sets basic folder information including the name, folder path, secret type (template), and policies for secrets in the folder. These settings may prevent adding some secrets to the folder.

Folder Name	Launcher Sub	Edit
Secret Policy	No Secret Policy	Edit
Allowable Templates	All Templates	

3. Click the Permissions tab:

Launcher Sub

[Overview](#)
[Permissions](#)
[Metadata](#)
[Audit](#)

1 item

☒ Inherit Permissions
 [Edit](#)

USER OR GROUP	FOLDER PERMISSIONS	SECRET PERMISSIONS	
Everyone	Owner	Owner	

4. Click the **Edit** button. The Folder Permissions section becomes editable. It is currently set to the default, which is Inherit Permissions, so the Inherit Permissions check box is selected and the selected groups are not editable:

Launcher Sub

Overview **Permissions** Metadata Audit

1 item ☒ Inherit Permissions Cancel Save

USER OR GROUP	FOLDER PERMISSIONS	SECRET PERMISSIONS	
Everyone	Owner	Owner	↓

- Click to deselect the **Inherit Permissions** checkbox. The permissions section becomes editable and the Add Users and Groups popup appears:

Launcher Sub

Overview **Permissions** Met :

1 item ☐ Inherit Permissions Cancel Save

USER OR GROUP	FOLDER PERMISSIONS	SECRET PERMISSIONS	
Everyone			

Drag and drop one or multiple items to add

Add Users and Groups

Select multiple items and drag, or click add.

Search...

Select Visible All

- (lol) (testparent.thycotic.com)
- Access Control Assistance Operators (gamma.thycotic.com)
- Account Operators (gamma.thycotic.com)
- Administrators (gamma.thycotic.com)
- Administrators (testparent.thycotic.com)
- Allowed RODC Password Replication Group (gamma.thycotic.com)

30 items Add

- Drag and drop any desired users or groups from the popup into the table. Ctrl+click to select multiple items before dragging and dropping. You can also select items and click the **Add** button instead.
- Click the **X** button on the popup to close it. The added users and groups appear:

Launcher Sub

Overview

Permissions

Metadata

Audit

4 items

☐ Inherit Permissions

Cancel

Save

USER OR GROUP	FOLDER PERMISSIONS	SECRET PERMISSIONS	
Everyone	Owner	Owner	
Administrators	View	View	
Account Operators	View	View	
Auditors	View	View	

**Note:** This image is for demonstration. Normally, adding users or groups to a folder that already has the Everyone group is redundant.

- To delete any user or group, hover the mouse pointer over its row and click the trashcan icon.
- For each user or group, click the **Folder Permission** dropdown list for the desired user of group to select the desired maximum permission available to them for the folder: **View** (folder), **Add Secret** (to folder), **Edit** (folder), or **Owner** (of folder).
- Similarly, click the **Secret Permissions** dropdown list for the desired user of group to select the desired maximum permission available to them for secrets in the folder: List (secrets in folder), View (secrets in folder), Edit (secrets in folder), or Owner (of secrets in folder).
- Click the **Save** button.

## Enabling Personal Folders

To use personal folders, you must first enable them:

1. Click **Admin > Configuration**.
2. Click the **Folders** tab:

### Configuration

[General](#)
[Login](#)
[SAML](#)
[Folders](#)
[Local User Passwords](#)
[Security](#)
[Ticket System](#)
[Email](#)
[Session Recording](#)
[HSM](#)

Require View Permission on Specific Folder for Visibility	Yes
Enable Personal Folders	Yes
Personal Folder Name	Personal Folders
Should the warning message be displayed to the user when creating Secrets?	Yes
Warning message text	This folder is for work related Secrets only. Do not store personal non-work Secrets, such as your Online Banking password, in this folder.
Personal Folder Display Name	Display Name

Back

Edit

3. Click the **Edit** button:

## Configuration

General
Login
SAML
**Folders**
Local User Passwords
Security
Ticket System
Email
Session Recording
HSM

Require View Permission on Specific Folder for Visibility

☒

Enable Personal Folders

☒

Personal Folder Name

Personal Folders

Should the warning message be displayed to the user when creating Secrets?

☒

Warning message text

This folder is for work related Secrets only. Do not store personal non-work Secrets, such as your Online Banking password, in this folder.

Personal Folder Display Name

Display Name

Save

Cancel

4. Click to select the **Enable Personal Folders** check box.
5. (Optional) Type a new folder name in the **Personal Folder name** text box to customize the root-level folder that contains all personal folders.
6. (Optional) If you want to display a warning message to users when placing secrets in their personal folders:
  1. Click to select the **Should the warning message be displayed to the user when creating Secrets?** check box.
  2. (Optional) Edit the **Warning message text** box.
7. (Optional) Click the **Personal Folder Display Name** dropdown list to choose whether to display the personal folder display name or the username and domain.
8. Click the **Save** button. A personal folder for each user is now created in a root-level folder with the personal folder name specified.

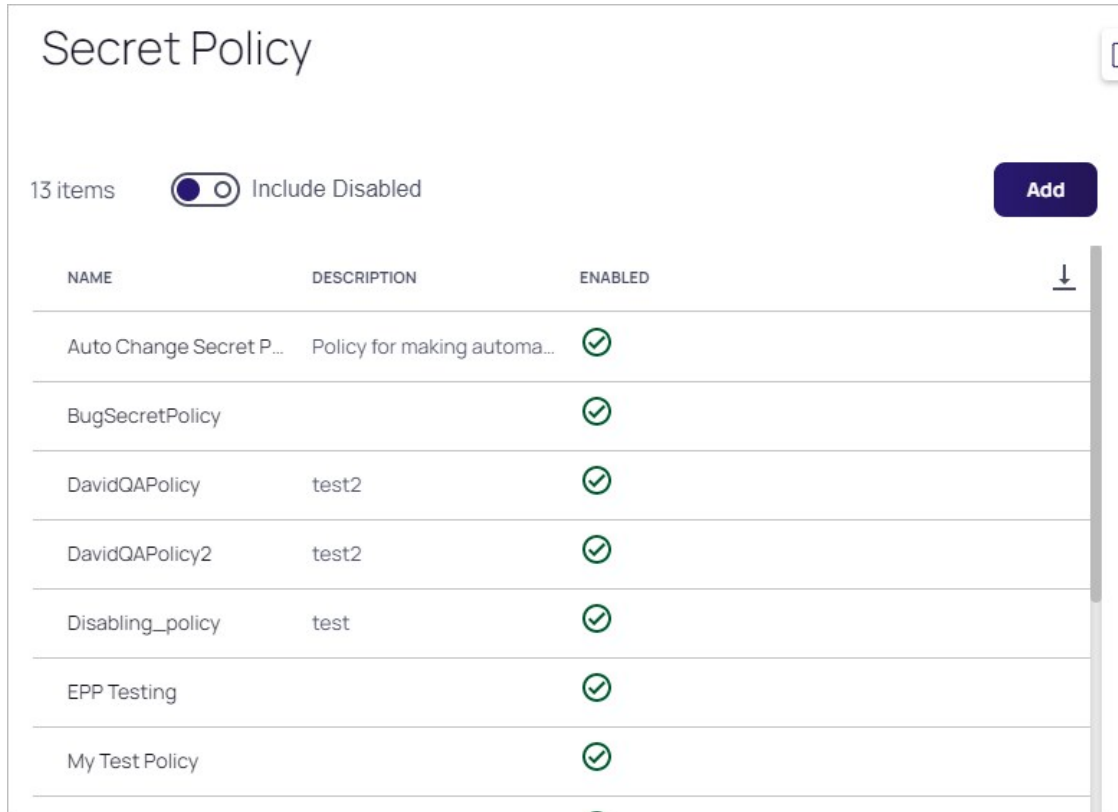
**Note:** When personal folders are enabled, a user requires the Personal Folders role permission in their role to be able to view and use their own personal folder.

## Modifying Folders with Secret Policies

You can configure secret policies to apply RPC and security settings to an entire folder of secrets.

To create a new secret policy:

1. Click **Admin > Secret Policy**. A Secret Policy page appears:



Secret Policy

13 items ☒ Include Disabled Add

NAME	DESCRIPTION	ENABLED
Auto Change Secret P...	Policy for making automa...	✓
BugSecretPolicy		✓
DavidQAPolicy	test2	✓
DavidQAPolicy2	test2	✓
Disabling_policy	test	✓
EPP Testing		✓
My Test Policy		✓

2. Click the **Add** button. The (new) Secret Policy page appears:

+

Secret Policy

Name \*

Description

Enabled

☒

Cancel

Save

3. Type a name for the new secret policy in the **Name** text box.

4. (Optional) Type a description in the **Description** text box.

5. Ensure the **Enabled** check box is selected.

**Note:** To deactivate a policy that you no longer want, edit the policy and deselect the **Enabled** check box. For information about applying a secret policy to a folder, see [Editing Folder Permissions](#).



## Moving Folders

To move a folder:

1. Ensure that you have edit permission for both the source and destination folders.
2. Expand the folder tree to make both folders visible.
3. Drag the source folder and drop it on the destination folder. The Move Folder page appears:

### Move Folder

Please press the 'Confirm Move Folder' button to move the folder **Example 2** to **Example**.

Select a different folder

Inherit Policy

Inherit parent policy - No Secret Policy ▼

Inherit Permissions

Inherit parent permissions ▼

Cancel

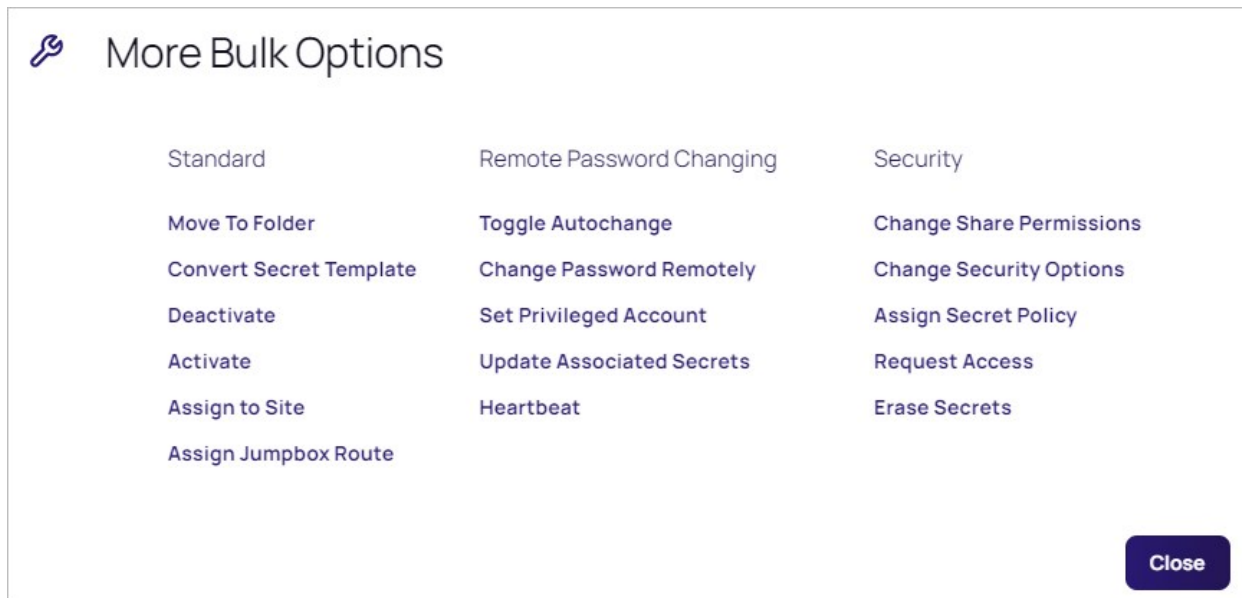
Confirm Move Folder

4. Click the **Inherit Policy** dropdown list to select how you want policy inheritance to work for the folder in the new location.
5. Click the **Inherit Permissions** dropdown list to select how you want permission inheritance to work for the folder in the new location.
6. Click the **Confirm Move Folder** button.

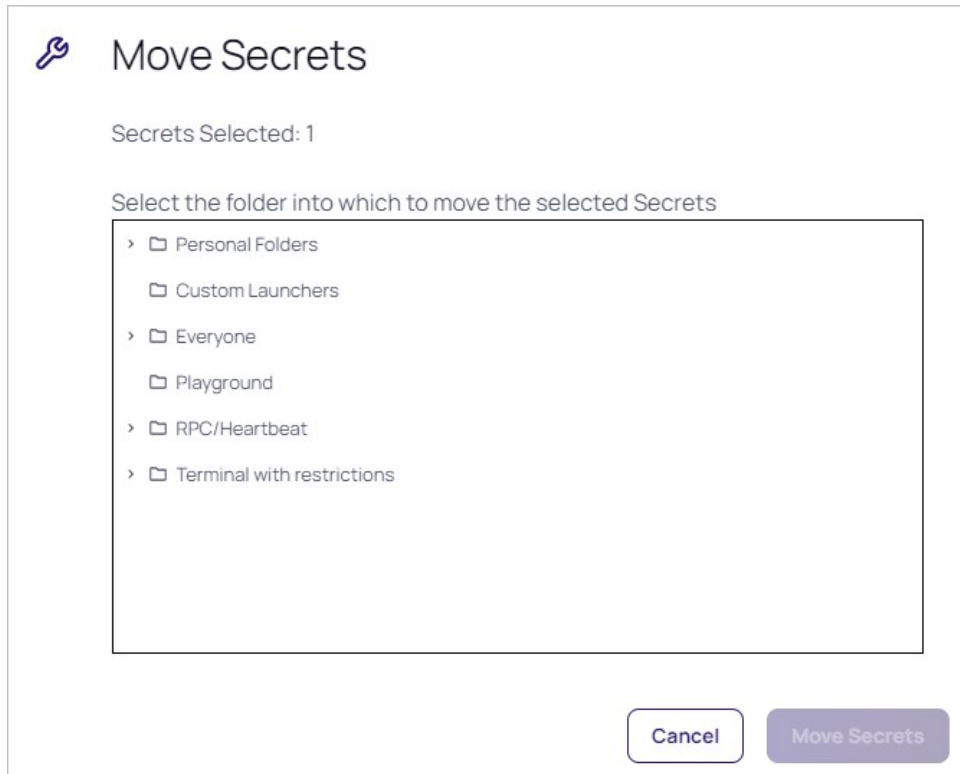
**Note:** You can also right click the source folder and select **Move** to see an alternative method of moving folders where you are prompted to select the destination folder.

## Moving Secrets Between Folders

1. Consider the following before moving a secret between folders:
  - To add or move a secret to a folder, you must have edit permission on that folder (either direct or through inheritance).
  - To move a secret from a folder, you must have edit permission on that secret. If the secret has the "Inherit Permissions from folder" setting enabled, then you must have owner permission to move that secret to a new folder.
  - When a secret is moved to a folder, it automatically gets the "Inherit Permissions from folder" setting even if it had specific permissions before the move.
2. Navigate to the folder containing the secret or secrets you want to move.
3. Click to select the check box on the left for all the secret you want to move. The Bulk Actions button appears at the bottom of the page.
4. Click the **Bulk Actions** button. A popup appears:



5. Click the **Move to Folder** link. The Move Secrets pop-up page appears:



6. Navigate to and select the target folder for the secret or secrets.
7. Click the **Move Secrets** button. The Bulk Progress popup appears.
8. The secret moves to the selected folder.

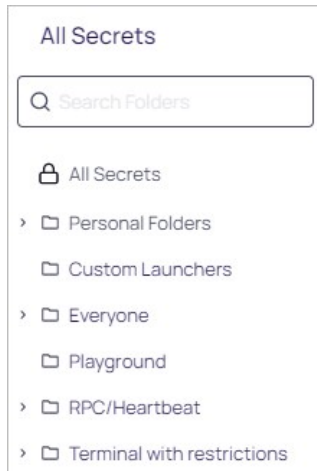
## Pinning Folders

You can pin a folder, limiting the folder tree to showing the contents of that pinned folder. Applying filters to the table in one pinned folder will not affect others, and settings are remembered upon returning to that pinned folder.

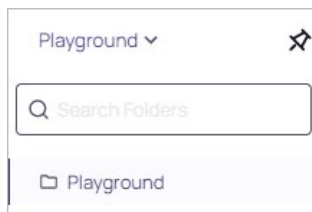
### Pinning Folders

To pin a folder:

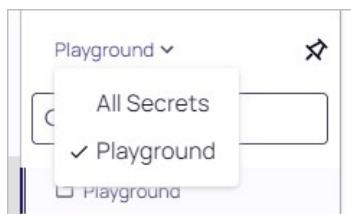
1. Click > > on the **Secrets** menu item to view the Secret Folder-Tree Panel.



2. Drill down and click the folder you wish to pin. We chose the Playground folder.
3. Right click the folder and select **Pin**. The chosen folder appears alone on the panel with a thumbtack icon next to it:



4. Now, when click the folder dropdown list at the top you have a choice of pinned folders to choose from. All Secrets is permanently pinned.



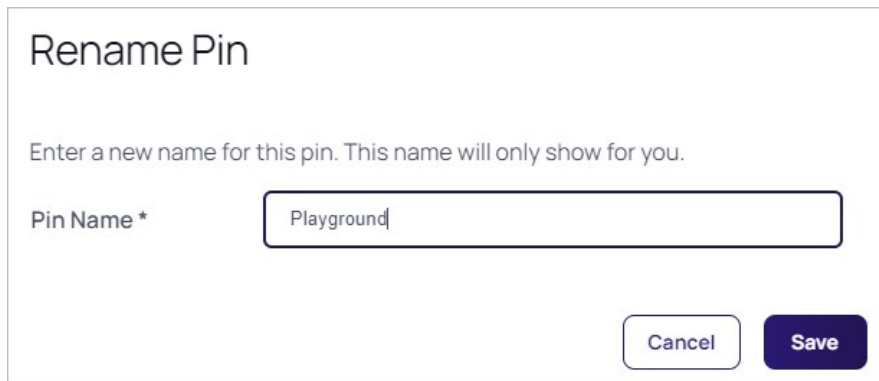
### Unpinning Folders

1. Click > > on the **Secrets** menu item to view the Secret Folder-Tree Panel.
2. Select the folder in the folders dropdown list. The panel shows only that pinned folder.
3. Click the thumbtack icon and select **Unpin**.

## Custom Naming Pinned Folders

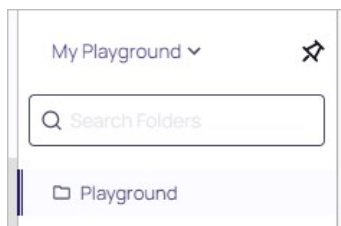
You do not have to use the default name of the top folder as the pin's name. To change it:

1. Click > > on the **Secrets** menu item to view the Secret Folder-Tree Panel.
2. Select the folder in the folders dropdown list. The panel shows only that pinned folder.
3. Click the thumbtack icon and select **Rename**. A Rename Pin popup appears:



A dialog box titled "Rename Pin" with a subtitle "Enter a new name for this pin. This name will only show for you." It contains a text input field labeled "Pin Name \*" with the text "Playground" inside. At the bottom right are two buttons: "Cancel" and "Save".

4. Type the new name in the **Pin Name** text box.
5. Click the **Save** button. The Folder dropdown list now displays a different name than the top folder in the pin (we chose My Playground):



A dropdown menu showing "My Playground" with a downward arrow and a star icon. Below it is a search bar labeled "Search Folders". At the bottom, there is a folder icon and the text "Playground".

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

The secrets menu item in the new UI has a collapsible secret folder-tree panel that occupies the full height of the page. This replaces the legacy folder tree at the bottom of the left navigation bar and delivers a significantly improved folder browsing experience. To view the panel, click the >> icon on the **Secrets** menu item.

## Mobile Computing

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

This section addresses issues related to Secret Server's interaction with mobile devices, such as smart phones.

## Overview

The **Maximum Time for Offline Access on Mobile Devices** setting in Secret Server determines how long to cache secret data on the mobile device. Once the device is not in contact with the server for longer than the specified amount of time, the device removes its cache of the stored secrets. The only way to view secrets on the device once the cache is cleared is to connect to Secret Server again so that the secrets can be re-downloaded and cached.

## Procedure

To set the maximum time:

1. In Secret Server dashboard, click **Admin > Configuration**. The Edit Configuration page appears:

### Configuration

[General](#)
[Login](#)
[SAML](#)
[Folders](#)
[Local User Passwords](#)
[Security](#)
[Ticket System](#)
[Email](#)
[Session Recording](#)
[HSM](#)

#### APPLICATION SETTINGS

Allow Automatic Checks for Software Updates	Yes
<a href="#">Anonymized System Metrics Information</a>	
Send Anonymized System Metrics to Thycotic	Yes <a href="#">View Metric Data</a>
<a href="#">View Webservices</a>	
Enable Webservices	Yes
Maximum Time for Offline Access on Mobile Devices	30 days
Session Timeout for Webservices	20 minutes
Enable Refresh Tokens for Web Services	No
Prevent Application from Sleeping When Idle	Yes

2. On the **General** tab, click the **Edit** button at the bottom of the page.
3. Click to select the **Enable Webservices** check box in the **Application Settings** section:



[View Webservices](#)

**Enable Webservices** ☒

[Maximum Time Offline Explanation](#)

**Maximum Time for Offline Access on Mobile Devices**

**Days**

**Hours**

**Session Timeout for Webservices**

☐ Unlimited

**Days**

**Hours**

**Minutes**

**Enable Refresh Tokens for Web Services** ☐

4. Type your preferred interval in the **Days** and **Hours** text boxes in the **Maximum Time for Offline Access on Mobile Devices** section.

**Note:** Setting the Maximum Time Offline to less than hour prevent the device from caching as the cache window is too small.

**Note:** Because caching all secrets creates an audit record in the database for each secret, we recommend not setting the window too short so that users constantly need to cache all secrets.

5. Click the **Save** button at the bottom of the page.

## Example

An example of a cache window:

If Maximum Offline Time is set to 7 days, a iPhone user can cache secrets. If the iPhone has connectivity every hour the iPhone is used, it will check in with the server. Each time the iPhone checks in the 7 days, the cache window is extended. Thus, if the user uses the app once every 7 days, the app cache will remain. If the user does not have connectivity (such as in Airplane Mode) or does not turn on the app for longer than 7 days, then the next time the app is used the cache will be cleared because the maximum allowed time offline has been surpassed.

## Secret Server Networking

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

**Note:** As of SQL Server 2008 R2, Microsoft no longer recommends changing the password of the SQL service via the services console. According to Microsoft Documentation for SQL Server 2008 R2 and above: *Changing a SQL Server service by using the Windows Service Control Manager (services.msc) application does not always change all of the necessary settings and might prevent the service from functioning properly. However, in a clustered environment, after changing the password on the active node by using SQL Server Configuration Manager, you must change the password on the passive node by using the Service Control Manager.*

## Requirements

- a PowerShell script that you will create
- a SQL dependency changer that you will create
- a secret that contains the AD credentials of the SQL instances
- a secret that contains the AD administrative credentials for PowerShell to run with
- SQL services imported via discovery

## Create a PowerShell Script in Secret Server

**Note:** You must have administrative permission to add the script in Secret Server.

1. In Secret Server, go to **Admin > Scripts > PowerShell > Create New**.
2. In the **New PowerShell Script** dialog, fill in the following values:
  - **Name:** SQL Service Password Changer
  - **Description:** Changes SQL service account's password without disrupting the Services



**New PowerShell Script**

Name: SQL Service Password C \*

Description: Changes SQL service account's password without disrupting the Services \*

Category: Dependency

Script:

```

1 $TargetComputer = $args[0]
2 Write-Debug $TargetComputer
3 $domain= $args[1]
4 Write-Debug $domain
5 $UName= $args[2]
6 Write-Debug $uname
7 $PWord= $args[3]
8 Write-Debug $PWord
9 $SQLService=$args[4]
10 Write-Debug $SQLService
11 $SvcAcctUsr=$args[5]
12 Write-Debug $SvcAcctUsr
13 $SvcAcctPWD=$args[6]
14 Write-Debug $SvcAcctPWD
15
16 $Spassword = ConvertTo-SecureString $Pword -AsPlainText -Force #Secure PW
17 $creds = New-Object System.Management.Automation.PSCredential ("$domain\$UName", $Sp
18
19 $ScriptBlock= {
20 param($SQLService,$TargetComputer,$domain,$username,$password)
21 "SQL Service: $TargetComputer, $domain, $username, $password" | Out-Null
22

```

OK Cancel

3. In the **Script** field, paste in the script below:

```
$TargetComputer = $args[0]
Write-Debug $TargetComputer
$domain= $args[1]
Write-Debug $domain
$UName= $args[2]
Write-Debug $uname
$PWord= $args[3]
Write-Debug $PWord
$SQLService=$args[4]
Write-Debug $SQLService
$SvcAcctUsr=$args[5]
Write-Debug $SvcAcctUsr
$SvcAcctPWD=$args[6]
Write-Debug $SvcAcctPWD

$Spasword = ConvertTo-SecureString $Pword -AsPlainText -Force #Secure PW
$creds = New-Object System.Management.Automation.PSCredential ("{$domain}\$UName", $Spasword) #Set credentials for PSCredential logon

$ScriptBlock= {
param($SQLService,$TargetComputer,$domain,$username,$pword)
"$SQLService,$TargetComputer,$domain,$username,$pword" | out-file test.txt -Append
[System.Reflection.Assembly]::LoadWithPartialName("Microsoft.SqlServer.SqlWmiManagement") | out-null
$SMOWmiserver = New-Object ('Microsoft.SqlServer.Management.Smo.Wmi.ManagedComputer') # $TargetComputer
try
{
#Specify the "Name" (from the query above) of the one service whose Service Account you want to change.
$domainuser="{$domain}\$username"
$ChangeService=$SMOWmiserver.Services | where {$_displayname -eq $SQLService -or $_.name -eq $SQLService } #Make sure this is what you want changed!
#$ChangeService | out-file c:\temp\test.txt -append # Remove this line for production for debugging and development only. Requires you create a temp directory on the
targetmachine.
$ChangeService.ChangePassword("$OLDpword", "$CURRENTpword")
$ChangeService.Alter()
}
catch
{
$ErrorMessage = $_.Exception.Message
$FailedItem = $_.Exception.ItemName
throw "Error $ErrorMessage : $FailedItem while setting $sqlservice on $targetComputer with $domainuser"
}
}
```

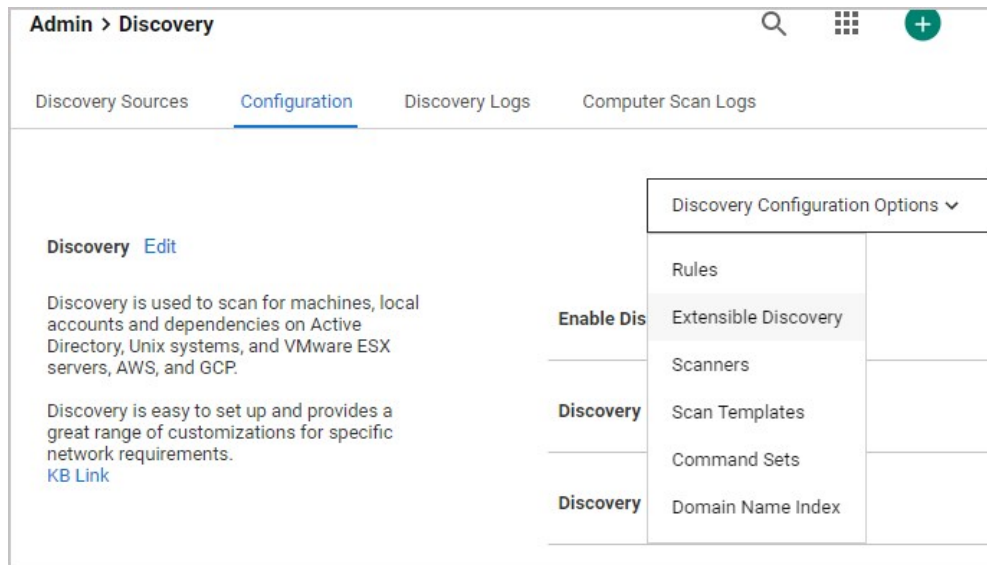
4. Create secure credentials to access the SQL box using a modified invoke-command. Add \$domain, \$SvcAcctUsr, and \$SvcAcctPWD for the domain, username, and password, respectively. For example:

```
Invoke-Command
-Authentication Default
-ComputerName $TargetComputer
-ScriptBlock $ScriptBlock
-ArgumentList $SQLService,$TargetComputer,$domain,$SvcAcctUsr,$SvcAcctPWD
-Credential $creds
```

**Note:** You might want to test the Script in PowerShell ISE. If the script succeeds, the SQL password has changed. You can test out on a SQLEXPRESS.

## Create a New Dependency Changer

1. Got to **Admin > Discovery**.
2. Click the **Configuration** tab.



3. Click **Discovery Configuration Options**.
4. From the drop-down menu, click **Extensible Discovery**.
5. Click **Configure Dependency Changers**.
6. Click **Create New Dependency Changer**.
7. On the **Basic** tab, enter the following:
  - **Type:** PowerShell Script
  - **Scan Template:** Windows Service
  - **Name:** SQL Service Dependency Changer
  - **Description:** SQL Service Dependency Changer

New Dependency Changer

Basic

Scripts

Explain

Type

Powershell Script

Scan Template

Windows Service

Name

SQL Service Dependency Changer

Description

Port

Wait (s)

0

Enabled

☒

Create Template

☒

Save

Cancel

8. On the **Scripts** tab, enter the following:

- **Script:** (Select the script you just created).
- **Arguments:** \$MACHINE \$DOMAIN \${1}\$USERNAME \${1}\$PASSWORD \$SERVICENAME \$USERNAME \$PASSWORD

New Dependency Changer

Basic

Scripts

Explain

☐ Use advanced scripts

Change Script

SQL Service Password Changer

Script

SQL Service Password Changer

Arguments

\$MACHINE \$DOMAIN \${1}\$USERNAME  
\${1}\$PASSWORD \$SERVICENAME  
\$USERNAME \$PASSWORD

Save

Cancel

9. Click **Save**.

## Discovery and Importing to the Right Template

When discovery finds your SQL services and you start importing them, you'll be able to choose the template you just created as well as your privileged account, which will be running PowerShell. Once the import is finished, associate a Secret on the **Remote Password Changing** tab, which is the same as the privileged account used during the import process. Your SQL dependencies will use the SQL PowerShell changer you created, and the passwords will be changed *without* restarting SQL.

**Note:** This is for Secret Server version 7.1 and later.

Once Secret Server is installed, it may be necessary to change the connection string that Secret Server uses to connect to its database. You must be authenticated to access Secret Server and have the Administer Configuration role permission.

1. Click **Admin** > **See All**.
2. Type **Database** in the search text box and select **Database** in the dropdown list. The Database Configuration page appears:

## Help

Secret Server supports Microsoft SQL Server versions 2012, 2014, 2016, 2017, and Express.

View [Collation Requirements](#). Need help installing or configuring SQL Server? View [Installing and Configuring SQL KB Article](#).

### Database Configuration

#### SQL SERVER LOCATION

Server Name	QA-CUST-SQL-01
Database	SS_Playground

#### SQL AUTHENTICATION

☒ Windows Authentication using Application Identity (GAMMA\ss\_iis\_svc) - **Recommended**  
(Advanced Setting. Windows Authentication requires a Service Account and advanced IIS setup. Detailed in [Windows Authentication KB](#).)

☐ SQL Server Authentication (SQL Authentication requires Mixed Mode. See setup in [SQL Authentication KB](#).)

#### [+] ADVANCED (NOT REQUIRED)

Edit

View Audit

3. Click the **Edit** button. The page enters edit mode:



## Help

Secret Server supports Microsoft SQL Server versions 2012, 2014, 2016, 2017, and Express.

View [Collation Requirements](#). Need help installing or configuring SQL Server? View [Installing and Configuring SQL KB Article](#).

### Database Configuration



This page modifies the Secret Server database connection settings, which are stored in C:\inetpub\wwwroot\Playground\database.config. This file can be backed up to revert or simply return to this page to reset the connection again. If you need to modify TMS database settings navigate to /setup/database/connectdatabase in the TMS web site.

#### SQL SERVER LOCATION

Server Name \* QA-CUST-SQL-01

**For example:**

localhost

(local)

MYDBSERVER

localhost\SQLEXPRESS

Database \* SS\_Playground

#### SQL AUTHENTICATION

☒ Windows Authentication using Application Identity (GAMMA\ss\_iis\_svc) - **Recommended**

(Advanced Setting. Windows Authentication requires a Service Account and advanced IIS setup. Detailed in [Windows Authentication KB](#).)

☐ SQL Server Authentication (SQL Authentication requires Mixed Mode. See setup in [SQL Authentication KB](#).)

#### [+] ADVANCED (NOT REQUIRED)



Save Database Connection Settings



Cancel

- Edit the parameters as desired.
- Click the **Save Database Connection Settings** button. A confirmation message appears. Secret Server recycles its application pool (needed to clear the connection string cache), and then returns you to the Secret Server dashboard.

To query Secret Server status without authentication for basic latency check, follow the steps below.

1. In a web browser, go to <https://yoursecretserverurl/healthcheck.aspx>
2. Compare the information displayed in your browser to the information below:

```
{"healthy":true,"now":"2019-04-08T12:59:06.0455458-04:00","utcNow":"2019-04-08T16:59:06.0455458Z"}
```

- If your information is similar, your Secret Server should be operational.
- If your information displays other text such as **timed out** or **service unavailable**, there may be issues with the web site where the application is installed.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

**Note:** Distributed engine configurations for Secret Server On-Premises and Secret Server Cloud are not 100% equivalent. To view the differences, please refer to our [reference architectures](#) for Secret Server. They are, at minimum, refreshed every year and are created by our Professional Services Solutions Architect team.

**Note:** Distributed engine upgrades are no longer mandatory for every release. The Distributed Engine Configuration page can set the minimum required engine version. Modifying this triggers an automatic update for any engine below this version.

In the action menu for an engine on the Sites page, you can start a manual upgrade for individual engines below the latest version, which prompts the engine to update when it next calls in.

When changes are made needing an upgrade, the minimum required version is updated during the update process, and all engines update immediately.

## Overview

Out of the box, Secret Server performs all functions from the Web server it is installed on; however, specific features can be routed through a distributed engine for enhanced performance. For example, synchronize and authenticate AD users can be done in Secret Server via your local site or from a distributed engine (DE).

You can install a DE in a remote site and allow it to operate many functions. Communication with Secret Server Cloud also requires the distributed engine to be installed.

## Architecture and Workflow

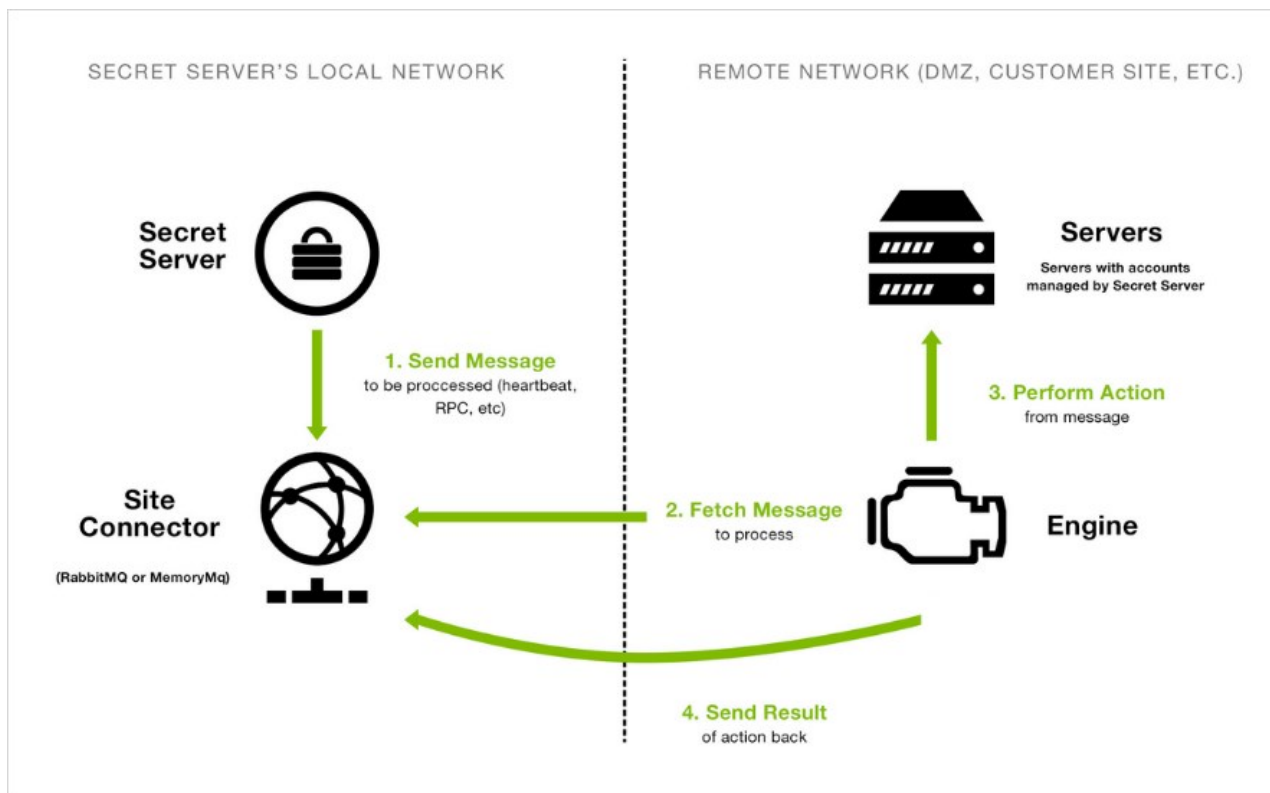
### Main Components

DEs support heartbeat, Remote Password Changing (RPC), and discovery. A DE is composed of site connectors, sites, and engines:

- A **distributed engine** is a Windows service that does the actual work, such as password changing, heartbeat, discovery, and more. Each engine belongs to a site.
- A **site** can be thought of as a bucket of work items for a particular network area. Each engine is assigned to a single site, but each site can include multiple engines, significantly increasing throughput.
- A **site connector** is a Windows service that holds the work items for a number of sites. The site connector can be either [RabbitMQ](#) or MemoryMQ (a built-in service developed by Delinea). Each site can only be assigned to a single site connector, but you can have multiple site connectors running on separate machines, each storing work items for multiple sites. Those sites, in turn, distribute the work items among multiple engines. The ability to add new Site Connectors, Sites, and Engines as needed makes Distributed Engine a highly-scalable solution.

**Note:** For the highest scalability and reliability, Delinea recommends using RabbitMQ. MemoryMQ is an easier but less capable alternative and can be used for trials and proof of concepts but **should not** be used for production environments.

**Figure:** Distributed Engine Components



**Note:** The above diagram is a simplified, conceptual one, not a network diagram. It does not show a callback port from the DE to Secret Server. DEs require either an HTTPS or TCP port to communicate with Secret Server for initial activation, updates, and continuous periodic check of site and site connector settings.

## Ports

DEs have two configurable ports: one for connecting to the site connector, and one for the engine to retrieve configuration information from Secret Server at regular intervals. The callback port from an engine to Secret Server can be configured to contact the website directly over HTTP, HTTPS, or TCP. HTTP and HTTPS connections use the existing IIS port bindings. All connections are outbound—no inbound connections are made from Secret Server or the site connectors to the remote networks.

**Note:** If using Secret Server Cloud, port 9354 must also be opened for outbound messages.

Default ports:

- RabbitMQ: 5672 (non-SSL), 5671 (SSL)
- MemoryMQ: 8672 (non-SSL), 8671 (SSL)
- Secret Server: existing IP address bindings or custom port over TCP. We reserve one port for legacy upgrades, usually port 9999.
- Secret Server Cloud:
  - 443 (Web sockets—the default)
  - 5671 and 5672 (AMQP)

**Note:** These ports are used for outbound traffic for engines to communicate with SSC instances. They are set by the "Azure ServiceBus Transport Type" global engine setting.

## Security

Distributed engines have multiple security layers:

- Engines must be approved within Secret Server before they will be given access to a site.
- Work items are encrypted with a site-specific symmetric key prior to sending them to the site connector.
- Communication to the site connector supports SSL and TLS.
- Direct communication from engine to Secret Server uses a public-private key exchange.
- The engine configuration file is DPAPI encrypted.

For more information about DE security, see the [Distributed Engine Security Guide](#).

## Engine Workflow

When an engine Windows service starts, the following steps occur:

1. The service contacts Secret Server directly using the engine callback port.
2. The service receives configuration information for the site connector to connect to and what site to process work items for.
3. The service connects to the site connector and registers with the site for work item processing.
4. The service fetches a work item from the site.
5. The service processes the work item.
6. The service gives the site the result of the processing, such as heartbeat success or discovery results.
7. The service fetches another work item, and the process continues.

## Configuring Distributed Engines

Below is a summary of the steps required to configure DEs:

1. Enable the DE and specify the engine callback settings.
2. Configure and Install the site connector.
  - If you plan to use RabbitMQ (recommended), please see [Installing RabbitMQ](#). You can find general information on using RabbitMQ Helper to install RabbitMQ can be found in [Delinea's GitHub Repository](#)
  - If you plan to use MemoryMQ, create the site connector record within Secret Server then click the **Download Site Connector Installer** button to get the MSI. Run the MSI on the desired host.
3. Setup sites.
4. Install engines.
5. Assign secrets to sites. Secrets can be assigned to a site through their Remote Password Changing tab or via a bulk operation on the Secret Server dashboard. Once assigned to a site, all heartbeat or password changing operations take place through that site.
6. Assign discovery sources to sites. To run discovery through a site, edit the discovery source and assign the site. Once assigned, all discovery operations for that discovery source take place through that site.

## FAQ

**What happens if Secret Server sends work items to the site connector, but no engines are running to consume them?**

Work items continue to build up in the site connector until a limit is reached. Heartbeat work items have a Time To Live (TTL) of 5 minutes, Password Changing work items have a TTL of 20 minutes. Expired work items are thrown away and will not be processed. Once a heartbeat or password changing work item is sent to the site connector, Secret Server will not send the same work item to the queue until 5 minutes after the TTL is up (10 and 25 minutes for heartbeat and password changing, respectively). This prevents multiple pending heartbeat or password changing work items for the same secret at the same time.

## **How many Sites can a Site Connector hold?**

MemoryMQ supports up to 100. RabbitMQ supports up to 200.

## **Can I cluster Site Connectors?**

RabbitMQ supports clustering, MemoryMQ does not.

## **Can I use both RabbitMQ and MemoryMQ?**

Yes. You can have as many site connectors, of either type, installed as needed. Note that while you can have both RabbitMQ and MemoryMQ installed on a single machine, you cannot have two RabbitMQ instances or two MemoryMQ instances on the same machine.

## **Can I convert a site connector from MemoryMQ to RabbitMQ or vice versa?**

Yes. You can install the new site connector, swap the sites over to the new service, and then decommission the old site connector.

## Configuration and Sizing

### Requirements

#### Windows Server 2012

Starting in Secret Server version 8.9.000000, DEs require that one of following two server features be installed when the Secret Server website is running on a Windows Server 2012. This depends on which protocol is selected in the engine's callback settings. If HTTPS is selected, the HTTP activation is required. If TCP is selected, then TCP activation is required. This accomplished by going to one of the following in Windows Server 2012:

- **.NET Framework 4.5 Features > WCF Services > HTTP Activation**
- **.NET Framework 4.5 Features > WCF Services > TCP Activation**

If the feature is not installed, there will be an error message in the DE logs: (405) Method Not Allowed. ---> System.Net.WebException: The remote server returned an error: (405) Method Not Allowed.

## **Distributed Engine Offline and Online Events**

As of version 10.7.000059, Delinea updated the definition of distributed engines' offline status to be the configured heartbeat interval times three. For instance, if your heartbeat interval is configured at 5 minutes, the engine will report offline if Secret Server and the engine do not successfully communicate within a 15-minute time period. Engine online and offline states were also added to subscription actions to allow notification to admins when engine states change.



## Internal Site Connector

Starting in Secret Server 10.2 it became possible to change how Secret Server processes messages by navigating to:

<Your Secret Server URL>/AdminBackboneBusConfigurationView.aspx

These messages are generated and placed on the internal site connector, or backbone bus, every time a background operation is triggered whether by a schedule or on-demand.

The internal site connector receives and processes messages as a result of numerous actions:

- Bulk Operations
- Generate Password
- Secret Import (CSV and XML)
- Run Heartbeat Now
- Run Heartbeat (Scheduled)
- Run Password Change Now
- Run Password Change (Scheduled)
- Run Discovery Now
- Run Discovery (Scheduled)
- Run AD Sync Now
- Run AD Sync (Scheduled)
- Elements of Session Recording

The internal site connector, using the internal hosted bus, is adequate for bulk operations, heartbeat, discovery, and the like, but some Secret Server features, such as a clustered Web server node configuration or session recording, require a scalable messaging solution to boost processing performance. Our choice is [RabbitMQ](#), which is an intermediary messaging broker that can handle large-scale message processing.

The following is a typical internal hosted bus operation (for a bulk operation):

1. A Secret Server user triggers the a bulk operation.
2. A message is formed and sent over a TCP connection to the internal hosted bus.
3. Secret Server (on the same machine) receives the message.
4. Secret Server (on the same machine) processes the message.

We continually improve the internal hosted bus but still recommend RabbitMQ for a scalable performance boost. See [Installing RabbitMQ](#) for more information.

## RabbitMQ Durable Exchanges

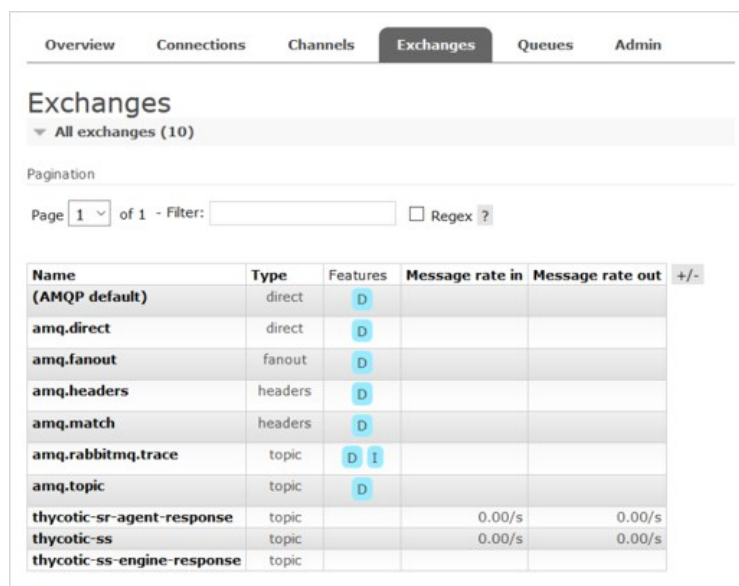
### Overview

As of Secret Server 10.7.59, the Secret Server MessageQueue Client attempts to create RabbitMQ durable exchanges, logging the activity. A durable exchange is normally automatically re-created if RabbitMQ restarts for any reason. Any legacy non-durable exchanges disappear when RabbitMQ goes down and can only be manually recreated.

If the MessageQueue client detects that creating a durable exchange failed, it will log an error and attempt to create a non-durable one.

**Important:** Any existing non-durable exchanges, from previous versions of Secret Server, will also cause durable exchange creation to fail. See [Manually Creating Durable RabbitMQ Exchanges](#).

Non-durable RabbitMQ exchanges for Secret Server would look similar to this, whether created by an earlier Secret Server version or by a durable-version-creation failure:



The screenshot shows the 'Exchanges' tab in a management console. It lists 10 exchanges. The first seven are standard AMQP exchanges, all marked as non-durable (no 'D' in the Features column). The last three are custom exchanges created by Secret Server, also marked as non-durable. The table includes columns for Name, Type, Features, Message rate in, Message rate out, and a +/- toggle.

Name	Type	Features	Message rate in	Message rate out	+/-
(AMQP default)	direct	D			
amq.direct	direct	D			
amq.fanout	fanout	D			
amq.headers	headers	D			
amq.match	headers	D			
amq.rabbitmq.trace	topic	D I			
amq.topic	topic	D			
thycotic-sr-agent-response	topic		0.00/s	0.00/s	
thycotic-ss	topic		0.00/s	0.00/s	
thycotic-ss-engine-response	topic				

Note the absence of a 'D' in the Features column, meaning that exchange is not durable. Durable exchanges, created by the current Secret Server version (10.7.59+), look like this:

The screenshot shows the 'Exchanges' tab in the RabbitMQ management interface. It displays a table of 11 exchanges. The table has columns for Name, Type, Features, Message rate in, Message rate out, and a +/- button. The exchanges listed are: (AMQP default), amq.direct, amq.fanout, amq.headers, amq.match, amq.rabbitmq.trace, amq.topic, thycotic-sessionrec, thycotic-sr-agent-response, thycotic-ss, and thycotic-ss-engine-response. The 'thycotic-ss' exchange shows a message rate of 0.20/s in and out.

Name	Type	Features	Message rate in	Message rate out	+/-
(AMQP default)	direct	D			
amq.direct	direct	D			
amq.fanout	fanout	D			
amq.headers	headers	D			
amq.match	headers	D			
amq.rabbitmq.trace	topic	D I			
amq.topic	topic	D			
thycotic-sessionrec	topic	D	0.00/s	0.00/s	
thycotic-sr-agent-response	topic				
thycotic-ss	topic	D	0.20/s	0.20/s	
thycotic-ss-engine-response	topic	D			

Earlier versions of Secret Server (before 10.7.59) created non-durable RabbitMQ exchanges during a Secret Server server or IIS restart. If the environment is clustered, the same is true of every node in that cluster. The current durable exchanges persist during any IIS restart, eliminating the need to restart Secret Server or recreate the exchanges.

However, any existing non-durable exchanges prevent the creation of the newer durable ones. To remedy that, you need to restart all of the RabbitMQ servers in the cluster at the same time or manually delete the non-durable exchanges.

## Manually Creating Durable RabbitMQ Exchanges

To enjoy the benefits of the durable exchanges, you must first eliminate any legacy non-durable exchanges from your RabbitMQ server or servers. There are two ways to do this:

- Restart the RabbitMQ server or all of the RabbitMQ servers in the cluster at the same time. You can also stop the RabbitMQ service in services.msc.

**Note:** Customers usually reset or turn off all servers via third party tools, but some prefer to shut off the service via services.msc because of their system configuration.

- Delete the exchanges manually:
  - Click to select each Secret Server non-durable exchange, including distributed engine ones.
  - Scroll to the bottom of the window.
  - Click the **Delete** button.
  - Restart all of the Secret Server instances and distributed engines to recreate the exchanges and connections.

## Creating Durable RabbitMQ Exchanges with a PowerShell Script

### Using the Script

```
powershell.exe -file exchangedurability.ps1 -username "guest" -password "guest" -computerName "localhost" -port "15672"
```

The user has access to the RabbitMQ admin interface. The computername and port is where the admin interface is located.

The script:

1. Removes all of the exchanges that are not durable and any that are not the `thycotic-sr` ones for legacy ASRAs.
2. Kills all of the connections. This forces the distributed engines and Secret Server to reconnect to the durable exchanges.

## Script

```
param([string] $computerName = "",
      [string] $userName = "",
      [string] $password = "",
      [string] $port = ""
)

$defaultComputerName = if ($computerName -eq "") { "localhost" } else { $computerName }
$defaultVirtualHost = "/"
$defaultUserName = if ($userName -eq "") { "guest" } else { $userName }
$defaultPassword = if ($password -eq "") { "guest" } else { $password }
$defaultPort = if ($port -eq "") { "15672" } else { $port }
$defaultHttp = "http" #Use https if ssl

$defaultCredentials = New-Object System.Management.Automation.PSCredential ($defaultUserName, $(ConvertTo-SecureString $defaultPassword -AsPlainText -Force))

#LICENSE FOR LINKS - All the RabbitMQ PowerShell calls are based on this:
#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/LICENSE
#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/GetConnection.ps1

function Get-RabbitMQConnection
{
    [CmdletBinding(DefaultParameterSetName='defaultLogin', SupportsShouldProcess=$true, ConfirmImpact='None')]
    Param
    (
        # Name of RabbitMQ Connection.
        [parameter(ValueFromPipeline=$true, ValueFromPipelineByPropertyName=$true)]
        [Alias("Connection", "ConnectionName")]
        [string[]]$Name = "",

        # Name of the computer hosting RabbitMQ server. Default value is localhost.
        [parameter(ValueFromPipelineByPropertyName=$true)]
        [Alias("HostName", "hn", "cn")]
        [string]$ComputerName = $defaultComputerName,

        # Username to use when logging to RabbitMQ server.
        [Parameter(Mandatory=$true, ParameterSetName='login')]
        [string]$UserName,

        # Password to use when logging to RabbitMQ server.
        [Parameter(Mandatory=$true, ParameterSetName='login')]
        [string]$Password,

        # Credentials to use when logging to RabbitMQ server.
        [Parameter(Mandatory=$true, ParameterSetName='cred')]
        [PSCredential]$Credentials
    )

    Begin
    {
        $Credentials = NormaliseCredentials
    }
    Process
    {
        if ($Pscmdlet.ShouldProcess("server $ComputerName", "Get connection(s): $(NamesToString $Name 'all)'))
        {
            $result = GetItemsFromRabbitMQApi -ComputerName $ComputerName $Credentials "connections"

            $result = ApplyFilter $result 'name' $Name

            $result | Add-Member -NotePropertyName "ComputerName" -NotePropertyValue $ComputerName

            SendItemsToOutput $result "RabbitMQ.Connection"
        }
    }
}
```

```

    }
    End
    {
    }
}

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/PreventUnEscapeDotsAndSlashesOnUri.ps1
if (-not $UnEscapeDotsAndSlashes) { Set-Variable -Scope Script -name UnEscapeDotsAndSlashes -value 0x2000000 }
function GetUriParserFlags {

    $getSyntax = [System.UriParser].GetMethod("GetSyntax", 40)
    $flags = [System.UriParser].GetField("m_Flags", 36)

    $parser = $getSyntax.Invoke($null, "http")
    return $flags.GetValue($parser)
}

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/PreventUnEscapeDotsAndSlashesOnUri.ps1
function SetUriParserFlags([int]$newValue) {
    $getSyntax = [System.UriParser].GetMethod("GetSyntax", 40)
    $flags = [System.UriParser].GetField("m_Flags", 36)

    $parser = $getSyntax.Invoke($null, "http")
    $flags.SetValue($parser, $newValue)
}

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/PreventUnEscapeDotsAndSlashesOnUri.ps1
function PreventUnEscapeDotsAndSlashesOnUri {
    if (-not $UriUnEscapesDotsAndSlashes) { return }

    Write-Verbose "Switching off UnEscapesDotsAndSlashes flag on UriParser."

    $newValue = $defaultUriParserFlagsValue -bxor $UnEscapeDotsAndSlashes

    SetUriParserFlags $newValue
}

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/PreventUnEscapeDotsAndSlashesOnUri.ps1
function RestoreUriParserFlags {
    if (-not $UriUnEscapesDotsAndSlashes) { return }

    Write-Verbose "Restoring UriParser flags - switching on UnEscapesDotsAndSlashes flag."

    try {
        SetUriParserFlags $defaultUriParserFlagsValue
    }
    catch [System.Exception] {
        Write-Error "Failed to restore UriParser flags. This may cause your scripts to behave unexpectedly. You can find more at get-help about_UnEscapingDotsAndSlashes."
        throw
    }
}

if (-not $defaultUriParserFlagsValue) { Set-Variable -Scope Script -name defaultUriParserFlagsValue -value (GetUriParserFlags) }
if (-not $UriUnEscapesDotsAndSlashes) { Set-Variable -Scope Script -name uriUnEscapesDotsAndSlashes -value (($defaultUriParserFlagsValue -band $UnEscapeDotsAndSlashes) -eq $UnEscapeDotsAndSlashes) }

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/Invoke_RestMethodProxy.ps1
function Invoke-RestMethod {
    [CmdletBinding(HelpUri = 'http://go.microsoft.com/fwlink/?LinkID=217034')]
    param(
        [Microsoft.PowerShell.Commands.WebRequestMethod]
        ${Method},

        [Parameter(Mandatory = $true, Position = 0)]
        [ValidateNotNullOrEmpty()]
        [uri]
        ${Uri},

        [Microsoft.PowerShell.Commands.WebRequestSession]
        ${WebSession},

        [Alias('SV')]
        [string]
        ${SessionVariable},

```

```

[pscredential]
${Credential},

[switch]
${UseDefaultCredentials},

[ValidateNotNullOrEmpty()]
[string]
${CertificateThumbprint},

[ValidateNotNull()]
[System.Security.Cryptography.X509Certificates.X509Certificate]
${Certificate},

[string]
${UserAgent},

[switch]
${DisableKeepAlive},

[int]
${TimeoutSec},

[System.Collections.IDictionary]
${Headers},

[ValidateRange(0, 2147483647)]
[int]
${MaximumRedirection},

[uri]
${Proxy},

[pscredential]
${ProxyCredential},

[switch]
${ProxyUseDefaultCredentials},

[Parameter(ValueFromPipeline = $true)]
[System.Object]
${Body},

[string]
${ContentType},

[ValidateSet('chunked', 'compress', 'deflate', 'gzip', 'identity')]
[string]
${TransferEncoding},

[string]
${InFile},

[string]
${OutFile},

[switch]
${PassThru},

[switch]
${AllowEscapedDotsAndSlashes})

begin {
    try {
        $outBuffer = $null
        if ($PSBoundParameters.TryGetValue('OutBuffer', [ref]$outBuffer)) {
            $PSBoundParameters['OutBuffer'] = 1
        }

        $wrappedCmd = $ExecutionContext.InvokeCommand.GetCommand('Microsoft.PowerShell.Utility\Invoke-RestMethod',
[System.Management.Automation.CommandTypes]::Cmdlet)

        # check whether need to disable UnEscapingDotsAndSlashes on UriParser
        $requiresDisableUnEscapingDotsAndSlashes = ($AllowEscapedDotsAndSlashes -and $Uri.OriginalString -match '%2f')

        # remove additional proxy parameter to prevent original function from failing
    }
}

```

```

        if ($PSBoundParameters['AllowEscapedDotsAndSlashes']) { $null = $PSBoundParameters.Remove('AllowEscapedDotsAndSlashes') }

        $scriptCmd = { & $wrappedCmd @PSBoundParameters }
        $steppablePipeline = $scriptCmd.GetSteppablePipeline($myInvocation.CommandOrigin)
        $steppablePipeline.Begin($PSCmdlet)
    }
    catch {
        throw
    }
}

process {
    try {
        # Disable UnEscapingDotsAndSlashes on UriParser when necessary
        if ($requiresDisableUnEscapingDotsAndSlashes) {
            PreventUnEscapeDotsAndSlashesOnUri
        }

        $steppablePipeline.Process($_)
    }
    finally {
        # Restore UnEscapingDotsAndSlashes on UriParser when necessary
        if ($requiresDisableUnEscapingDotsAndSlashes) {
            RestoreUriParserFlags
        }
    }
}

end {
    try {
        $steppablePipeline.End()
    }
    catch {
        throw
    }
}
}
<#
.FowardHelpTargetName Invoke-RestMethod
.FowardHelpCategory Cmdlet
#>

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/GetRabbitMQCredentials.ps1
function GetRabbitMQCredentials {
    Param
    (
        [parameter(Mandatory = $true)]
        [string]$userName,

        [parameter(Mandatory = $true)]
        [string]$password
    )

    $secpasswd = ConvertTo-SecureString $password -AsPlainText -Force
    return New-Object System.Management.Automation.PSCredential ($userName, $secpasswd)
}

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/NamesToString.ps1
function NamesToString {
    Param
    (
        [string[]]$name,
        [string]$saltText = ""
    )

    if (-not $name) { return $saltText }

    return $name -join ','
}

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/ApplyFilter.ps1
function ApplyFilter {
    Param (
        [parameter()]
        [PSObject[]]$items,

```

```
[parameter(Mandatory = $true)]
[string]$prop,

[string[]]$name
)

if (-not $name) { return $items }

# apply property filter
$filter = @()
foreach ($n in $name) { $filter += '$_' + $prop + '-like "' + $n + '"' }

$sb = [scriptblock]::create($filter -join ' -or ')
return $items | ? $sb
}

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/NormaliseCredentials.ps1
function NormaliseCredentials() {
    switch ($PsCmdlet.ParameterSetName) {
        "defaultLogin" { return GetRabbitMqCredentials $defaultUserName $defaultPassword }
        "login" { return GetRabbitMqCredentials $UserName $Password }
        "cred" { return $Credentials }
    }
}

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/SendItemsToOutput.ps1
function SendItemsToOutput {
    Param
    (
        [parameter()]
        [PSObject[]]$items,

        [parameter(Mandatory = $true)]
        [string[]]$typeName
    )

    foreach ($i in $items) {
        $i.PSObject.TypeNames.Insert(0, $typeName)
        Write-Output $i
    }
}

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/GetItemsFromRabbitMQApi.ps1
function GetItemsFromRabbitMQApi {
    [CmdletBinding(DefaultParameterSetName = 'login')]
    Param
    (
        [parameter(Mandatory = $true, ParameterSetName = 'login', Position = 0)]
        [string]$cn,

        [parameter(Mandatory = $true, ParameterSetName = 'login', Position = 1)]
        [string]$userName,

        [parameter(Mandatory = $true, ParameterSetName = 'login', Position = 2)]
        [string]$password,

        [parameter(Mandatory = $true, ParameterSetName = 'login', Position = 3)]
        [string]$fn,

        [parameter(Mandatory = $true, ParameterSetName = 'cred', Position = 0)]
        [string]$computerName,

        [parameter(Mandatory = $true, ParameterSetName = 'cred', Position = 1)]
        [PSCredential]$cred,

        [parameter(Mandatory = $true, ParameterSetName = 'cred', Position = 2)]
        [string]$function
    )

    Add-Type -AssemblyName System.Web
    #Add-Type -AssemblyName System.Net

    if ($PsCmdlet.ParameterSetName -eq "login") {
```



```

$computerName = $cn
$cred = GetRabbitMqCredentials $userName $password
$function = $fn
}
Write-Output $computerName
$url = $defaultHttp + "://" + ([System.Web.HttpUtility]::UrlEncode($computerName)):$defaultPort/api/$function"
Write-Verbose "Invoking REST API: $url"

return Invoke-RestMethod $url -Credential $cred -DisableKeepAlive -AllowEscapedDotsAndSlashes
}

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/GetExchange.ps1
function Get-RabbitMQExchange {
    [CmdletBinding(DefaultParameterSetName = 'defaultLogin', SupportsShouldProcess = $true, ConfirmImpact = 'None')]
    Param
    (
        # Name of RabbitMQ Exchange.
        [parameter(ValueFromPipeline = $true, ValueFromPipelineByPropertyName = $true)]
        [Alias("ex", "Exchange", "ExchangeName")]
        [string[]]$Name = "",

        # Name of RabbitMQ Virtual Host.
        [parameter(ValueFromPipelineByPropertyName = $true)]
        [Alias("vh")]
        [string]$VirtualHost = "",

        # Name of the computer hosting RabbitMQ server. Default value is localhost.
        [parameter(ValueFromPipelineByPropertyName = $true)]
        [Alias("HostName", "hn", "cn")]
        [string]$ComputerName = $defaultComputerName,

        # Username to use when logging to RabbitMQ server.
        [Parameter(Mandatory = $true, ParameterSetName = 'login')]
        [string]$UserName,

        # Password to use when logging to RabbitMQ server.
        [Parameter(Mandatory = $true, ParameterSetName = 'login')]
        [string]$Password,

        # Credentials to use when logging to RabbitMQ server.
        [Parameter(Mandatory = $true, ParameterSetName = 'cred')]
        [PSCredential]$Credentials
    )

    Begin {
        $Credentials = NormaliseCredentials
    }
    Process {
        if ($?pscmdlet.ShouldProcess("server $ComputerName", "Get exchange(s): $(NamesToString $Name '(all)')")) {
            $exchanges = GetItemsFromRabbitMQApi -ComputerName $ComputerName $Credentials "exchanges"

            $result = ApplyFilter $exchanges 'vhost' $VirtualHost
            $result = ApplyFilter $result 'name' $Name

            $result | Add-Member -NotePropertyName "ComputerName" -NotePropertyValue $ComputerName

            SendItemsToOutput $result "RabbitMQ.Exchange"
        }
    }
    End {
    }
}

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/RemoveExchange.ps1
function Remove-RabbitMQExchange {
    [CmdletBinding(DefaultParameterSetName = 'defaultLogin', SupportsShouldProcess = $true, ConfirmImpact = "High")]
    Param
    (
        # Name of RabbitMQ Exchange.
        [parameter(Mandatory = $true, ValueFromPipeline = $true, ValueFromPipelineByPropertyName = $true, Position = 0)]
        [Alias("Exchange", "ExchangeName")]
        [string[]]$Name,

        # Name of RabbitMQ Virtual Host.
        [parameter(ValueFromPipelineByPropertyName = $true)]

```

```
[Alias("vh", "vhost")]
[string]$VirtualHost = $defaultVirtualhost,

# Name of the computer hosting RabbitMQ server. Defalut value is localhost.
[parameter(ValueFromPipelineByPropertyName = $true)]
[Alias("HostName", "hn", "cn")]
[string]$ComputerName = $defaultComputerName,

# Username to use when logging to RabbitMq server.
[Parameter(Mandatory = $true, ParameterSetName = 'login')]
[string]$UserName,

# Password to use when logging to RabbitMq server.
[Parameter(Mandatory = $true, ParameterSetName = 'login')]
[string]$Password,

# Credentials to use when logging to RabbitMQ server.
[Parameter(Mandatory = $true, ParameterSetName = 'cred')]
[PSCredential]$Credentials
)

Begin {
    $Credentials = NormaliseCredentials
    $cnt = 0
}
Process {
    if ($pscmdlet.ShouldProcess("server: $ComputerName, vhost: $VirtualHost", "Remove exchange(s): $(NamesToString $Name '(all)')")) {
        foreach ($n in $Name) {
            $url = $defaultHttp +
                "://$([System.Web.HttpUtility]::UrlEncode($ComputerName)):$defaultPort/api/exchanges/$([System.Web.HttpUtility]::UrlEncode($VirtualHost))/$([System.Web.HttpUtility]::UrlEncode($n))"
            Write-Output $url
            $result = Invoke-RestMethod $url -Credential $Credentials -AllowEscapedDotsAndSlashes -DisableKeepAlive -ErrorAction Continue -Method Delete

            Write-Verbose "Deleted Exchange $n on server $ComputerName, Virtual Host $VirtualHost"
            $cnt++
        }
    }
}
End {
    if ($cnt -gt 1) { Write-Verbose "Deleted $cnt Exchange(s)." }
}

#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/AddExchange.ps1
function Add-RabbitMQExchange {
    [CmdletBinding(DefaultParameterSetName = 'defaultLogin', SupportsShouldProcess = $true, ConfirmImpact = "Medium")]
    Param
    (
        # Name of RabbitMQ Exchange.
        [parameter(Mandatory = $true, ValueFromPipeline = $true, ValueFromPipelineByPropertyName = $true, Position = 0)]
        [Alias("Exchange", "ExchangeName")]
        [string[]]$Name,

        # Type of the Exchange to create.
        [parameter(Mandatory = $true, ValueFromPipelineByPropertyName = $true)]
        [ValidateSet("topic", "fanout", "direct", "headers")]
        [string]$Type,

        # Determines whether the exchange should be Durable.
        [parameter(ValueFromPipelineByPropertyName = $true)]
        [switch]$Durable,

        # Determines whether the exchange will be deleted once all queues have finished using it.
        [parameter(ValueFromPipelineByPropertyName = $true)]
        [switch]$AutoDelete,

        # Determines whether the exchange should be Internal.
        [parameter(ValueFromPipelineByPropertyName = $true)]
        [switch]$Internal,

        # Allows to set alternate exchange to which all messages which cannot be routed will be send.
        [parameter(ValueFromPipelineByPropertyName = $true)]
        [Alias("alt")]
        [string]$AlternateExchange,
    )
}
```

```

# Name of RabbitMQ Virtual Host.
[parameter(ValueFromPipelineByPropertyName = $true)]
[Alias("vh", "vhost")]
[string]$VirtualHost = $defaultVirtualHost,

# Name of the computer hosting RabbitMQ server. Defalut value is localhost.
[parameter(ValueFromPipelineByPropertyName = $true)]
[Alias("HostName", "hn", "cn")]
[string]$ComputerName = $defaultComputerName,

# UserName to use when logging to RabbitMq server.
[Parameter(Mandatory = $true, ParameterSetName = 'login')]
[string]$UserName,

# Password to use when logging to RabbitMq server.
[Parameter(Mandatory = $true, ParameterSetName = 'login')]
[string]$Password,

# Credentials to use when logging to RabbitMQ server.
[Parameter(Mandatory = $true, ParameterSetName = 'cred')]
[PSCredential]$Credentials
)

Begin {
    $Credentials = NormaliseCredentials
}
Process {
    if ($pscmdlet.ShouldProcess("server: $ComputerName, vhost: $VirtualHost", "Add exchange(s): $(NamesToString $Name '(all)')")) {

        $body = @({
            type = "$Type"
        })

        if ($Durable) { $body.Add("durable", $true) }
        if ($AutoDelete) { $body.Add("auto_delete", $true) }
        if ($Internal) { $body.Add("internal", $true) }
        if ($AlternateExchange) { $body.Add("arguments", @{ "alternate-exchange" = $AlternateExchange }) }

        $bodyJson = $body | ConvertTo-Json

        foreach ($n in $Name) {
            $url =
$defaultHttp+":"/{([System.Web.HttpUtility]::UrlEncode($ComputerName))}:$defaultPort/api/exchanges/{([System.Web.HttpUtility]::UrlEncode($VirtualHost))}/{([System.Web.H
ttpUtility]::UrlEncode($n))}"
            Write-Verbose "Invoking REST API: $url"

            $result = Invoke-RestMethod $url -Credential $Credentials -AllowEscapedDotsAndSlashes -DisableKeepAlive -ErrorAction Continue -Method Put -ContentType
"application/json" -Body $bodyJson

            Write-Verbose "Created Exchange $n on server $ComputerName, Virtual Host $VirtualHost"
            $cnt++
        }
    }
}
End {
    if ($cnt -gt 1) { Write-Verbose "Created $cnt Exchange(s)." }
}
}

#Modified to allow + in url.
#https://github.com/mariuszwojcik/RabbitMQTools/blob/master/RemoveQueue.ps1
function Remove-RabbitMQConnection {
    Param
    (
        # Name of RabbitMQ connection.
        [parameter(Mandatory = $true, ValueFromPipeline = $true, ValueFromPipelineByPropertyName = $true, Position = 0)]
        [Alias("ConnectionName")]
        [string] $Name = "",

        # Name of the computer hosting RabbitMQ server. Defalut value is localhost.
        [parameter(ValueFromPipelineByPropertyName = $true)]
        [Alias("HostName", "hn", "cn")]
        [string]$ComputerName = $defaultComputerName,

        # Credentials to use when logging to RabbitMQ server.

```

```

[Parameter(Mandatory = $false)]
[PSCredential]$Credentials = $defaultCredentials
)

$Url = $defaultHttp + "://" + ([System.Web.HttpUtility]::UrlEncode($ComputerName)):$defaultPort/api/connections/([System.Web.HttpUtility]::UrlEncode($Name))"
$Url = $Url.Replace("+", "%20")
Write-Output $Url
$headers = New-Object "System.Collections.Generic.Dictionary[[String],[String]]"
$headers.Add("X-Reason", "Removing To Create Durable Exchanges")
$result = Invoke-RestMethod $Url -Credential $Credentials -Headers $headers -DisableKeepAlive:$InvokeRestMethodKeepAlive -ErrorAction Continue -Method Delete
Write-Output "Url closed."

Write-Verbose "Closed connection $n to server $ComputerName"
}

function MakeExistingExchangesDurable() {
    Param(
        [string] $HostName = $defaultComputerName,
        [string] $UserName = $defaultUserName,
        [string] $Password = $defaultPassword,
        [string] $VirtualHost = "/",
        [bool] $IgnoreConfirms = $false
    )

    $exchanges = Get-RabbitMQExchange
    $nondurableExchanges = New-Object System.Collections.ArrayList
    Foreach ($exchange in $exchanges) {
        if ($exchange.name -and -not ($exchange.durable) -and -not $exchange.name.Contains("Delinea-sr")) {
            $nondurableExchanges.Add($exchange) > $null
        }
    }
    if ($nondurableExchanges.Count -eq 0) {
        Write-Output "All the exchanges are durable."
        return
    }

    Write-Output "`r`nFound these exchanges as not durable:"
    Write-Output $nondurableExchanges | ForEach-Object { '{0}' -f $_.Name }

    $confirmation = "
    if ($IgnoreConfirms -eq $false) {
        $confirmation = Read-Host "Are you Sure You Want To Proceed [y/n]"
    }
    if ($confirmation -eq 'y' -or $IgnoreConfirms -eq $true) {
        try {
            Foreach ($nondurableExchange in $nondurableExchanges) {
                Remove-RabbitMQExchange -Name $nondurableExchange.Name -VirtualHost $nondurableExchange.vhost -Confirm:$(-not $IgnoreConfirms)
                Add-RabbitMQExchange -Name $nondurableExchange.Name -Durable:$true -Type $nondurableExchange.type -AutoDelete:$nondurableExchange.auto_delete -
                Internal:$nondurableExchange.Internal -VirtualHost $nondurableExchange.vhost -Confirm:$(-not $IgnoreConfirms)
            }
            $connections = Get-RabbitMQConnection
            Foreach ($connection in $connections) {
                if ($connection.Name)
                {
                    Remove-RabbitMQConnection $connection.Name
                }
            }
        }
        catch {
            throw $_
        }
        Write-Output "Exchanges are now durable."
    }
    else {
        Write-Output "Not going to make the exchanges durable."
    }
}

MakeExistingExchangesDurable -IgnoreConfirms $true

```

## RabbitMQ Naming Conventions for Queues

### Introduction

This document addresses RabbitMQ naming conventions for its queues. These queues are useful for application troubleshooting and proactive application monitoring.

Secret Server is an asynchronous message-based system where operational instructions and data are passed back and forth between various components running in Web nodes or distributed Engines. A GUI interaction to perform an action, such as heartbeat, remote password change, or bulk operations publishes a message and then returns control back to the user. RabbitMQ is the message bus or broker that facilitates the message traffic.

**Note:** All Secret Server messages are encrypted on the bus, so you cannot peek into the message contents during transit.

**Note:** Messages have a lifetime, and consumers discard expired messages. Therefore, any accumulation or backup of messages in any queue is abnormal and indicative of an application problem.

### Secret Server Roles

Secret Server divides its functionality by named and unnamed roles, and only named roles are configurable in a Web node via the GUI.

**Table:** Secret Server Roles Related to Message Queues

Background Worker	Named	Background work initiated by a task, schedule or UI interaction. Final action of the work might be done in the current Web node, another Web node or sent to a distributed Engine to complete.
Engine	Unnamed	Processes work related to but not limited to: Active Directory synchronization, discovery, heartbeat, and remote password change.
Engine Worker	Named	Processes the response sent back from an engine.
Session Recording Worker	Named	Background work dedicated to session recording processing.
UI	Unnamed	IIS/ASP.NET processing, inbound access controlled by a load balancer.
API	Unnamed	IIS/ASP.NET processing, inbound access controlled by a load balancer.

[Unexpected Link Text](#)

### Queue Names

A queue name is divided into three major sections with a colon (:) delimiter between each section:

Section1:Section2:Section3

#### Section1

Section1 represents a RabbitMQ exchange name. There are three predetermined exchange names, two legacy predetermined exchange names, and then a variable number of exchanges determined by the number of Secret Server sites.

**Table:** RabbitMQ Exchange Names

Background Worker	Delinea-Secret Server	Predetermined	Web Node	
Engine	Site Name	Variable	Web Node or Distributed Engine	The out-of-the-box local site can be configured for either a Web node or a distributed engine. Any other site name is processed by a distributed engine.
Engine Worker	Delinea-Secret Server-engine-response	Predetermined	Web Node	
Session Recording Worker	thycotic-sessionrec	Predetermined	Web Node	
Session Recording Worker	thycotic-sr	Predetermined-Legacy	Web Node	Legacy: background work dedicated to session recording processing.
Session Recording Worker	thycotic-sr-agent-response	Predetermined-Legacy	Web Node	Legacy: processes data sent by an advanced session recoding agent.

## [Unexpected Link Text](#)

Variable site exchanges: If the Secret Server site is called local, then local: will also be the exchange name. If the Site is called Mars, then Mars: will be the exchange name.

### Section2

Section2 typically has a name which represents a functional area in Secret Server code that is a consumer of the message.

### Section3

Section3 represents the message name.

### Secret Server Roles and Queues

This section of the message associates roles with queues and breaks the down by product functionality. Functionality can span multiple roles, for example, discovery is done by background worker, engine and engine worker roles while event pipelines is only done by a background worker role.

### Background Worker Role Queues

List of queues for background worker's functional areas:

## Active Directory Synchronization

- thycotic-Secret  
Server:Thycotic.iHawu.Business.Logic.Areas.ActiveDirectorySynchronization.SynchronizationConsumer:Thycotic.iHawu.Business.Messages.Areas.ActiveDirectorySynchronization.Request.RunNowSynchronizationMessage-Secret Server:
- thycotic-ss:Thycotic.iHawu.Business.Logic.Areas.ActiveDirectorySynchronization.SynchronizationConsumer:Thycotic.iHawu.Business.Messages.Areas.ActiveDirectorySynchronization.Request.SynchronizationMessage

## Bulk Operation

- thycotic-Secret  
Server:Thycotic.iHawu.Business.Logic.Areas.BulkOperation.BulkOperationConsumer:Thycotic.iHawu.Business.Messages.Areas.BulkOperation.Request.BulkOperationMessage

## ConnectWise Integration

- thycotic-Secret  
Server:Thycotic.iHawu.Business.Logic.Areas.ConnectWise.ConnectWiseConsumer:Thycotic.iHawu.Business.Messages.Areas.ConnectWise.Request.ConnectWiseMessage-Secret Server:
- thycotic-ss:Thycotic.iHawu.Business.Logic.Areas.ConnectWise.ConnectWiseConsumer:Thycotic.iHawu.Business.Messages.Areas.ConnectWise.Request.RunNowConnectWiseMessage

## Discovery

- thycotic-Secret  
Server:Thycotic.iHawu.Business.Logic.Areas.Discovery.ComputerScanConsumer:Thycotic.iHawu.Business.Messages.Areas.Discovery.Request.ComputerScanMessage
- thycotic-ss:Thycotic.iHawu.Business.Logic.Areas.Discovery.ComputerScanConsumer:Thycotic.iHawu.Business.Messages.Areas.Discovery.Request.RunNowComputerScanMessage
- thycotic-ss:Thycotic.iHawu.Business.Logic.Areas.Discovery.DiscoveryConsumer:Thycotic.iHawu.Business.Messages.Areas.Discovery.Request.DiscoveryMessage
- thycotic-ss:Thycotic.iHawu.Business.Logic.Areas.Discovery.DiscoveryConsumer:Thycotic.iHawu.Business.Messages.Areas.Discovery.Request.RunNowDiscoveryMessage
- thycotic-ss:Thycotic.iHawu.Business.Logic.Areas.Discovery.DiscoveryRuleApplierConsumer:Thycotic.iHawu.Business.Messages.Areas.Discovery.Request.RunDiscoveryRuleApplierMessage
- thycotic-ss:Thycotic.iHawu.Business.Logic.Areas.Discovery.SecretComputerMatcherConsumer:Thycotic.iHawu.Business.Messages.Areas.Discovery.Request.RunNowSecretComputerMatcherMessage
- thycotic-ss:Thycotic.iHawu.Business.Logic.Areas.Discovery.SecretComputerMatcherConsumer:Thycotic.iHawu.Business.Messages.Areas.Discovery.Request.SecretComputerMatcherMessage

## Duo Integration

- thycotic-Secret Server:Thycotic.iHawu.BackgroundWorker.Logic.Areas.Duo.DuoAuthConsumer:Thycotic.Messages.iHawu.Areas.Duo.DuoRequestMessage

## Email Processing

- thycotic-Secret  
Server:Thycotic.iHawu.BackgroundWorker.Logic.Areas.Email.SendEmailConsumer:Thycotic.Messages.iHawu.Areas.Email.Request.SystemSendEmailMessage

- thycotic-  
ss:Thycotic.ihawu.BackgroundWorker.Logic.Areas.Email.VerifySendEmailConsumer:Thycotic.Messages.ihawu.Areas.Email.Request.VerifySendEmailRequest

## Event Pipelines

- thycotic-Secret  
Server:Thycotic.ihawu.BackgroundWorker.Logic.Areas.EventPipelines.EventPipelineActivityConsumer:Thycotic.Messages.ihawu.Areas.EventPipelines.Request.EventPipelineActivityEventMessage
- thycotic-  
ss:Thycotic.ihawu.BackgroundWorker.Logic.Areas.EventPipelines.PipelinePolicyProcessConsumer:Thycotic.Messages.ihawu.Areas.EventPipelines.Request.PipelinePoliciesProcessBlockingMessage
- thycotic-  
ss:Thycotic.ihawu.BackgroundWorker.Logic.Areas.EventPipelines.PipelinePolicyProcessConsumer:Thycotic.Messages.ihawu.Areas.EventPipelines.Request.PipelinePoliciesProcessMessage
- thycotic-  
ss:Thycotic.ihawu.BackgroundWorker.Logic.Areas.EventPipelines.PipelineProcessConsumer:Thycotic.Messages.ihawu.Areas.EventPipelines.Request.PipelineProcessBlockingMessageWithPolicies
- thycotic-  
ss:Thycotic.ihawu.BackgroundWorker.Logic.Areas.EventPipelines.PipelineProcessConsumer:Thycotic.Messages.ihawu.Areas.EventPipelines.Request.PipelineProcessMessageWithPolicies
- thycotic-  
ss:Thycotic.ihawu.Business.Logic.Areas.EventPipelines.PipelinePolicyProcessEventConsumer:Thycotic.Messages.ihawu.Areas.EventPipelines.Request.PipelinePolicyProcessEventBlockingMessage
- thycotic-  
ss:Thycotic.ihawu.Business.Logic.Areas.EventPipelines.PipelinePolicyProcessEventConsumer:Thycotic.Messages.ihawu.Areas.EventPipelines.Request.PipelinePolicyProcessEventMessage
- thycotic-  
ss:Thycotic.ihawu.Business.Logic.Areas.EventPipelines.PipelineProcessScheduledEventConsumer:Thycotic.ihawu.Business.Messages.Areas.EventPipelines.ProcessPipelineScheduledEventMessage

## Heartbeat and Remote Password Change

- thycotic-Secret  
Server:Thycotic.ihawu.Business.Logic.Areas.RemotePasswordChanging.CheckinExpiredCheckedoutSecretConsumer:Thycotic.ihawu.Business.Messages.Areas.RemotePasswordChanging.Request.CheckinExpiredCheckedoutSecretMessage
- thycotic-  
ss:Thycotic.ihawu.Business.Logic.Areas.RemotePasswordChanging.ExpiredSecretLocalPasswordChangeConsumer:Thycotic.ihawu.Business.Messages.Areas.RemotePasswordChanging.Request.ExpiredSecretLocalPasswordChangeMessage
- thycotic-  
ss:Thycotic.ihawu.Business.Logic.Areas.RemotePasswordChanging.ExpiredSecretLocalPasswordChangeConsumer:Thycotic.ihawu.Business.Messages.Areas.RemotePasswordChanging.Request.RunNowExpiredSecretLocalPasswordChangeMessage
- thycotic-  
ss:Thycotic.ihawu.Business.Logic.Areas.RemotePasswordChanging.ExpiredSecretPasswordChangeConsumer:Thycotic.ihawu.Business.Messages.Areas.RemotePasswordChanging.Request.ExpiredSecretPasswordChangeMessage
- thycotic-  
ss:Thycotic.ihawu.Business.Logic.Areas.RemotePasswordChanging.ExpiredSecretPasswordChangeConsumer:Thycotic.ihawu.Business.Messages.Areas.RemotePasswordChanging.Request.RunNowExpiredSecretPasswordChangeMessage
- thycotic-  
ss:Thycotic.ihawu.Business.Logic.Areas.RemotePasswordChanging.ProcessHeartbeatConsumer:Thycotic.ihawu.Business.Messages.Areas.RemotePasswordChanging.Request.ProcessHeartbeatMessage
- thycotic-  
ss:Thycotic.ihawu.Business.Logic.Areas.RemotePasswordChanging.ProcessHeartbeatConsumer:Thycotic.ihawu.Business.Messages.Areas.RemotePasswordChanging



g.Request.RunNowProcessHeartbeatMessage

- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.RemotePasswordChanging.ProcessLocalHeartbeatConsumer:Thycotic.ihawu.Business.Messages.Areas.RemotePasswordChanging.Request.ProcessLocalHeartbeatMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.RemotePasswordChanging.ProcessLocalHeartbeatConsumer:Thycotic.ihawu.Business.Messages.Areas.RemotePasswordChanging.Request.RunNowProcessLocalHeartbeatMessage

## Import

- thycotic-Secret Server:Thycotic.ihawu.Business.Logic.Areas.Import.SecretImportConsumer:Thycotic.ihawu.Business.Messages.Import.SecretImportBulkMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Import.SecretImportFileConsumer:Thycotic.ihawu.Business.Messages.Import.SecretImportFileMessage

## Management: Backup, and Cleanup

- thycotic-Secret Server:Thycotic.ihawu.Business.Logic.Areas.OnPremisesOnly.BackgroundWorkerTaskConsumer:Thycotic.ihawu.Business.Messages.Areas.OnPremisesOnly.BackgroundWorkerTaskMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.OnPremisesOnly.BackupConsumer:Thycotic.ihawu.Business.Messages.Areas.OnPremisesOnly.BackupMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.OnPremisesOnly.BackupConsumer:Thycotic.ihawu.Business.Messages.Areas.OnPremisesOnly.RunNowBackupMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.OnPremisesOnly.GenerateSLMConsumer:Thycotic.ihawu.Business.Logic.Areas.OnPremisesOnly.GenerateSLMMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.SessionArchiving.RecordedSessionsArchiveConsumer:Thycotic.ihawu.Business.Messages.Areas.SessionArchiving.Request.ArchiveRecordedSessionsMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.SessionArchiving.RecordedSessionsArchiveConsumer:Thycotic.ihawu.Business.Messages.Areas.SessionArchiving.Request.DeleteRecordedSessionsMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.SessionArchiving.RecordedSessionsArchiveConsumer:Thycotic.ihawu.Business.Messages.Areas.SessionArchiving.Request.RunNowDeleteRecordedSessionsMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.TruncateRecords.TruncateRecordsConsumer:Thycotic.ihawu.Business.Messages.Areas.TruncateRecords.TruncateRecordsForAllConfigurationsMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.TruncateRecords.TruncateRecordsConsumer:Thycotic.ihawu.Business.Messages.Areas.TruncateRecords.TruncateRecordsForConfigurationMessage
- thycotic-ss:Thycotic.MessageQueue.Common.Consumers.AutomaticSink.CreateAutomaticSinkConsumer:Thycotic.MessageQueue.Common.Messages.AutomaticSink.Request.CreateAutomaticSinkMessage

## Distributed Engine Management

- thycotic-Secret Server:Thycotic.ihawu.Business.Logic.Areas.DistributedEngine.EngineStatusUpdateConsumer:Thycotic.ihawu.Business.Messages.Areas.DistributedEngine.Request.EngineStatusUpdateMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.DistributedEngine.TruncateEngineLogConsumer:Thycotic.ihawu.Business.Messages.Areas.DistributedEngine.Request.TruncateEngineLogMessage

## Password Generation

- thycotic-Secret  
Server:Thycotic.ihawu.Business.Logic.Areas.PasswordGeneration.GeneratePasswordConsumer:Thycotic.ihawu.Business.Messages.Areas.PasswordGeneration.Request.GeneratePasswordMessage

## Reports

- thycotic-Secret Server:Thycotic.ihawu.Business.Logic.Areas.Report.EmailReportConsumer:Thycotic.Messages.ihawu.Areas.Email.Request.EmailReportMessage-Secret Server:
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Report.ScheduledReportConsumer:Thycotic.ihawu.Business.Messages.Areas.Reports.Request.ProcessReportsMessage

## Run Now

- thycotic-Secret  
Server:Thycotic.ihawu.Business.Logic.Areas.RunOnceTasks.RunNowProcessDashboardJsonValidationConsumer:Thycotic.ihawu.Business.Messages.Areas.RunOnceTasks.RunNowProcessDashboardJsonValidationMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.RunOnceTasks.RunNowProcessFieldEncryptionChangesConsumer:Thycotic.ihawu.Business.Messages.Areas.RunOnceTasks.RunNowProcessFieldEncryptionChangesMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.RunOnceTasks.RunNowProcessFieldEncryptionChangesConsumer:Thycotic.ihawu.Business.Messages.Areas.ScheduledTask.Request.ProcessFieldEncryptionChangesMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.RunOnceTasks.RunNowProcessSecretKeyRotationConsumer:Thycotic.ihawu.Business.Logic.Areas.SecretKeyRotation.Messages.RunNowProcessSecretKeyRotationMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.RunOnceTasks.RunNowProcessSecretPolicyChangesConsumer:Thycotic.ihawu.Business.Messages.Areas.RunOnceTasks.RunNowProcessSecretPolicyChangesMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.RunOnceTasks.RunNowProcessSecretPolicyChangesConsumer:Thycotic.ihawu.Business.Messages.Areas.ScheduledTask.Request.ProcessSecretPolicyChangesMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.RunOnceTasks.RunNowToggleHsmConsumer:Thycotic.ihawu.Business.Logic.Areas.SecretKeyRotation.Messages.RunNowToggleHsmMessage

## Scheduled Tasks

- thycotic-Secret  
Server:Thycotic.ihawu.Business.Logic.Areas.ScheduledTask.DatabaseCleanupConsumer:Thycotic.ihawu.Business.Messages.Areas.ScheduledTask.Request.DatabaseCleanupMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.ScheduledTask.EventQueueMonitorConsumer:Thycotic.ihawu.Business.Messages.Areas.ScheduledTask.Request.EventQueueMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.ScheduledTask.ExpiringLicenseTaskConsumer:Thycotic.ihawu.Business.Messages.Areas.ScheduledTask.Request.ExpiringLicenseTaskMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.ScheduledTask.ExpiringSecretTaskConsumer:Thycotic.ihawu.Business.Messages.Areas.ScheduledTask.Request.ExpiringSecretTaskMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.ScheduledTask.PasswordRequirementConsumer:Thycotic.ihawu.Business.Messages.Areas.ScheduledTask.Request.PasswordRequirementMessage

- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.ScheduledTask.SqlReplicationConflictConsumer:Thycotic.ihawu.Business.Messages.Areas.ScheduledTask.Request.SqlReplicationConflictMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.ScheduledTask.TruncateDatabaseCacheConsumer:Thycotic.ihawu.Business.Messages.Areas.ScheduledTask.Request.TruncateDatabaseCacheMessage

## Search

- thycotic-Secret  
Server:Thycotic.ihawu.Business.Logic.Areas.Search.ProxySessionDataHashConsumer:Thycotic.ihawu.Business.Messages.Areas.Search.Request.ProxySessionDataHashIndexRequest
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Search.ProxySessionDataHashConsumer:Thycotic.ihawu.Business.Messages.Areas.Search.Request.ProxySessionDataHashReIndexRequest
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Search.ProxySessionDataHashConsumer:Thycotic.ihawu.Business.Messages.Areas.Search.Request.RunNowProxySessionDataHashReIndexRequest
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Search.RdpSessionDataHashConsumer:Thycotic.ihawu.Business.Messages.Areas.Search.Request.RdpSessionDataHashIndexRequest
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Search.RdpSessionDataHashConsumer:Thycotic.ihawu.Business.Messages.Areas.Search.Request.RdpSessionDataHashReIndexRequest
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Search.RdpSessionDataHashConsumer:Thycotic.ihawu.Business.Messages.Areas.Search.Request.RunNowRdpSessionDataHashReIndexRequest
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Search.SecretItemHashConsumer:Thycotic.ihawu.Business.Messages.Areas.Search.Request.RunNowSecretItemHashIndexRequest
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Search.SecretItemHashConsumer:Thycotic.ihawu.Business.Messages.Areas.Search.Request.SecretItemHashIndexRequest
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Search.SessionDataHashConsumer:Thycotic.ihawu.Business.Messages.Areas.Search.Request.RunNowSessionDataHashReIndexRequest
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Search.SessionDataHashConsumer:Thycotic.ihawu.Business.Messages.Areas.Search.Request.SessionDataHashIndexRequest
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Search.SessionDataHashConsumer:Thycotic.ihawu.Business.Messages.Areas.Search.Request.SessionDataHashReIndexRequest

## SSH Terminal

- thycotic-Secret  
Server:Thycotic.ihawu.BackgroundWorker.Logic.Areas.SSHTerminal.TerminalCommandBackgroundConsumer:Thycotic.Messages.DE.Server.Areas.SSHTerminal.Request.TerminalCommandMessage

## Delinea Privilege Behavior Analytics Integration

- thycotic-Secret  
Server:Thycotic.ihawu.Business.Logic.Areas.Pba.PbaAppendMetadataSinkConsumer:Thycotic.Messages.SA.Areas.Metadata.Request.SAAppendMetadataSinkMessage

age

- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Pba.PbaCreateMetadataSinkConsumer:Thycotic.Messages.SA.Areas.Metadata.Request.SACreateMetadataSinkMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Pba.PbaDirectiveConsumer:Thycotic.ihawu.Business.Messages.Areas.PBA.Request.DirectiveProcessMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Pba.PbaEventConsumer:Thycotic.Messages.SA.Areas.EventData.Request.SAEventMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Pba.PbaEventUploadConsumer:Thycotic.Messages.SA.Areas.EventData.Request.SAEventUploadMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.Pba.PbaMetadataUploadConsumer:Thycotic.Messages.SA.Areas.Metadata.Request.SAMetadataUploadMessage
- thycotic-ss:Thycotic.SecurityAnalytics.DataUploader.Consumers.DirectiveAddConsumer:Thycotic.Messages.SA.Areas.Directive.Request.SADirectiveSendMessage
- thycotic-ss:Thycotic.SecurityAnalytics.DataUploader.Consumers.DirectiveCheckConsumer:Thycotic.Messages.SA.Areas.Directive.Request.SADirectiveCheckMessage
- thycotic-ss:Thycotic.SecurityAnalytics.DataUploader.Consumers.HealthCheckConsumer:Thycotic.Messages.SA.Areas.Status.Request.SAHealthCheckMessage
- thycotic-ss:Thycotic.SecurityAnalytics.DataUploader.Consumers.HeartbeatConsumer:Thycotic.Messages.SA.Areas.Status.Request.SAHeartbeatMessage

## Delinea Privilege Manager Integration

- thycotic-Secret  
Server:Thycotic.ihawu.BackgroundWorker.Logic.Areas.TmsNotifications.NotifyTmsDatabaseUpdatedConsumer:Thycotic.Messages.ihawu.Areas.TmsNotifications.Request.NotifyTmsDatabaseUpdatedMessage
- thycotic-ss:Thycotic.ihawu.BackgroundWorker.Logic.Areas.TmsNotifications.NotifyTmsEmailSettingsUpdatedConsumer:Thycotic.Messages.ihawu.Areas.TmsNotifications.Request.NotifyTmsEmailSettingsUpdatedMessage
- thycotic-ss:Thycotic.ihawu.BackgroundWorker.Logic.Areas.TmsNotifications.NotifyTmsLicenseUpdatedConsumer:Thycotic.Messages.ihawu.Areas.TmsNotifications.Request.NotifyTmsLicenseUpdatedMessage

## Delinea Telemetry

- thycotic-Secret  
Server:Thycotic.ihawu.BackgroundWorker.Logic.Areas.Telemetry.TelemetryConsumer:Thycotic.Messages.ihawu.Areas.Telemetry.Request.SendAnonymousTelemetryMessage

## Delinea One Identify Provider Integration

- thycotic-Secret  
Server:Thycotic.ihawu.Business.Logic.Areas.ThycoticOne.ThycoticOneSyncUserConsumer:Thycotic.ihawu.Business.Messages.Areas.ThycoticOne.Request.ThycoticOneScheduledSyncMessage
- thycotic-ss:Thycotic.ihawu.Business.Logic.Areas.ThycoticOne.ThycoticOneSyncUserConsumer:Thycotic.ihawu.Business.Messages.Areas.ThycoticOne.Request.ThycoticOneSyncUserMessage

## Engine Role Queues

List of queues for engines' functional areas.

**Note:** In the example listed below, the Secret Server site name is called "Gamma-Engines".

## Active Directory Synchronization

- Gamma-Engines:Thycotic.DE.Feature.SS.AdSync.Areas.ActiveDirectory.ADSyncRequestConsumer:Thycotic.Messages.DE.Engine.Areas.ActiveDirectory.Request.ADSyncMessage
- Gamma-Engines:Thycotic.DE.Feature.SS.AdSync.Areas.ActiveDirectory.AllUsersByDomainQueryConsumer:Thycotic.Messages.DE.Engine.Areas.ActiveDirectory.Request.All

UsersByDomainQueryMessage

- Gamma-  
Engines:Thycotic.DE.Feature.SS.AdSync.Areas.ActiveDirectory.GenericQueryConsumer:Thycotic.Messages.DE.Engine.Areas.ActiveDirectory.Request.GroupsAndMembersQueryMessage
- Gamma-  
Engines:Thycotic.DE.Feature.SS.AdSync.Areas.ActiveDirectory.GenericQueryConsumer:Thycotic.Messages.DE.Engine.Areas.ActiveDirectory.Request.GroupsByDomainQueryMessage
- Gamma-  
Engines:Thycotic.DE.Feature.SS.AdSync.Areas.ActiveDirectory.GenericQueryConsumer:Thycotic.Messages.DE.Engine.Areas.ActiveDirectory.Request.UsersByGroupsQueryMessage
- Gamma-  
Engines:Thycotic.DE.Feature.SS.AdSync.Areas.ActiveDirectory.ResolveDomainNameConsumer:Thycotic.Messages.DE.Engine.Areas.ActiveDirectory.Request.ResolveDomainDistinguishedNameMessage
- Gamma-  
Engines:Thycotic.DE.Feature.SS.AdSync.Areas.ActiveDirectory.ResolveDomainNameConsumer:Thycotic.Messages.DE.Engine.Areas.ActiveDirectory.Request.ResolveFullyQualifiedDomainNameMessage
- Gamma-  
Engines:Thycotic.DE.Feature.SS.AdSync.Areas.Authentication.AuthenticateByAdConsumer:Thycotic.Messages.DE.Engine.Areas.Authenticate.Request.AuthenticateByAdMessage
- Gamma-  
Engines:Thycotic.DE.Feature.SS.AdSync.Areas.General.DomainCredentialTestConsumer:Thycotic.Messages.DE.Engine.Areas.General.Request.DomainCredentialTestMessage

## Discovery

- Gamma-  
Engines:Thycotic.DE.Feature.SS.LocalAccountDiscovery.Areas.Discovery.HostRangeConsumer:Thycotic.Messages.DE.Engine.Areas.Discovery.Request.ScanHostRangeMessage
- Gamma-  
Engines:Thycotic.DE.Feature.SS.LocalAccountDiscovery.Areas.Discovery.HostRangeConsumer:Thycotic.Messages.DE.Engine.Areas.Discovery.Request.SpecificOuScanHostRangeMessage
- Gamma-  
Engines:Thycotic.DE.Feature.SS.LocalAccountDiscovery.Areas.Discovery.LocalAccountConsumer:Thycotic.Messages.DE.Engine.Areas.Discovery.Request.ScanLocalAccountMessage
- Gamma-  
Engines:Thycotic.DE.Feature.SS.LocalAccountDiscovery.Areas.Discovery.MachineConsumer:Thycotic.Messages.DE.Engine.Areas.Discovery.Request.ScanMachineMessage

## Heartbeat, Remote Password Change, and Dependency

- Gamma-  
Engines:Thycotic.DE.Feature.SS.PasswordChanging.Areas.BlockingChangePasswordConsumer:Thycotic.Messages.DE.Engine.Areas.PasswordChanging.Request.BlockingPasswordChangeMessage
- Gamma-  
Engines:Thycotic.DE.Feature.SS.PasswordChanging.Areas.BlockingPrivilegeChangePasswordConsumer:Thycotic.Messages.DE.Engine.Areas.PasswordChanging.Request.BlockingPrivilegedPasswordChangeMessage
- Gamma-  
Engines:Thycotic.DE.Feature.SS.PasswordChanging.Areas.Heartbeat.SecretHeartbeatConsumer:Thycotic.Messages.DE.Engine.Areas.Heartbeat.Request.SecretHeartbeatMessage
- Gamma-  
Engines:Thycotic.DE.Feature.SS.PasswordChanging.Areas.SecretBasicChangePasswordConsumer:Thycotic.Messages.DE.Engine.Areas.PasswordChanging.Request.SecretBasicPasswordChangeMessage

- Gamma-Engines:Thycotic.DE.Feature.SS.PasswordChanging.Areas.SecretPrivilegeChangePasswordConsumer:Thycotic.Messages.DE.Engine.Areas.PasswordChanging.Request.SecretPrivilegedPasswordChangeMessage
- Gamma-Engines:Thycotic.DE.Feature.SS.PasswordChanging.Areas.SecretRunDependenciesConsumer:Thycotic.Messages.DE.Engine.Areas.PasswordChanging.Request.SecretChangeDependencyMessage Gamma-Engines:Thycotic.DE.Feature.SS.PasswordChanging.Areas.Verification.VerifyPasswordConsumer:Thycotic.Messages.DE.Engine.Areas.Verify.Request.VerifyPasswordMessage
- Gamma-Engines:Thycotic.DE.Feature.SS.ServiceAccountManagement.Areas.Dependency.DependencyConsumer:Thycotic.Messages.DE.Engine.Areas.Discovery.Request.SecretCanDependencyMessage
- Gamma-Engines:Thycotic.DE.Feature.SS.ServiceAccountManagement.Areas.Dependency.SecretTestDependencyConsumer:Thycotic.Messages.DE.Engine.Areas.PasswordChanging.Request.SecretTestDependencyMessage

## Management

- Gamma-Engines:Thycotic.DistributedEngine.Logic.Areas.Connectivity.PingConsumer:Thycotic.Messages.DE.Engine.Areas.Connectivity.Request.PingMessage
- Gamma-Engines:Thycotic.MessageQueue.Common.Consumers.AutomaticSink.CreateAutomaticSinkConsumer:Thycotic.MessageQueue.Common.Messages.AutomaticSink.Request.CreateAutomaticSinkMessage

## Proxy

- Gamma-Engines:Thycotic.DE.Feature.SS.RdpProxy.AssignProxiedRdpSessionConsumer:Thycotic.Messages.DE.Engine.Areas.RDPProxy.Request.AssignProxiedRdpSessionMessage
- Gamma-Engines:Thycotic.DE.Feature.SS.SshProxy.Areas.Proxy.AssignProxiedSessionConsumer:Thycotic.Messages.DE.Engine.Areas.SSHProxy.Request.AssignProxiedSessionMessage

## Scripting

- Gamma-Engines:Thycotic.DistributedEngine.Logic.Areas.Script.ScriptConsumer:Thycotic.Messages.DE.Engine.Areas.Script.Request.PowerShellScriptMessage
- Gamma-Engines:Thycotic.DistributedEngine.Logic.Areas.Script.ScriptConsumer:Thycotic.Messages.DE.Engine.Areas.Script.Request.SqlScriptMessage
- Gamma-Engines:Thycotic.DistributedEngine.Logic.Areas.Script.ScriptConsumer:Thycotic.Messages.DE.Engine.Areas.Script.Request.SshScriptMessage

## Syslog Integration

- Gamma-Engines:Thycotic.DE.Feature.SS.AdvancedAuditing.Areas.SIEM.SysLogConsumer:Thycotic.Messages.DE.Engine.Areas.SIEM.Request.SysLogMessage

## Delinea Privilege Behavior Analytics Integration

- Gamma-Engines:Thycotic.DE.Feature.SS.Pba.Areas.Event.PbaEventConsumer:Thycotic.Messages.SA.Areas.EventData.Request.SAEventMessage
- Gamma-Engines:Thycotic.DE.Feature.SS.Pba.Areas.Metadata.PbaAppendMetadataSinkConsumer:Thycotic.Messages.SA.Areas.Metadata.Request.SAAppendMetadataSinkMessage
- Gamma-Engines:Thycotic.DE.Feature.SS.Pba.Areas.Metadata.PbaCreateMetadataSinkConsumer:Thycotic.Messages.SA.Areas.Metadata.Request.SACreateMetadataSinkMessage
- Gamma-Engines:Thycotic.SecurityAnalytics.DataUploader.Consumers.DirectiveAddConsumer:Thycotic.Messages.SA.Areas.Directive.Request.SADirectiveSendMessage
- Gamma-

- Engines:Thycotic.SecurityAnalytics.DataUploader.Consumers.DirectiveCheckConsumer:Thycotic.Messages.SA.Areas.Directive.Request.SADirectiveCheckMessage
- Gamma-Engines:Thycotic.SecurityAnalytics.DataUploader.Consumers.HealthCheckConsumer:Thycotic.Messages.SA.Areas.Status.Request.SAHealthCheckMessage
- Gamma-Engines:Thycotic.SecurityAnalytics.DataUploader.Consumers.HeartbeatConsumer:Thycotic.Messages.SA.Areas.Status.Request.SAHeartbeatMessage

## Ticketing System Integration

- Gamma-Engines:Thycotic.DE.Feature.SS.SecretWorkflow.Areas.TicketingSystem.TicketingAddCommentConsumer:Thycotic.Messages.DE.Engine.Areas.TicketingSystem.Request.TicketingAddCommentBasicRequest
- Gamma-Engines:Thycotic.DE.Feature.SS.SecretWorkflow.Areas.TicketingSystem.TicketingAddCommentConsumer:Thycotic.Messages.DE.Engine.Areas.TicketingSystem.Request.TicketingAddCommentMessage
- Gamma-Engines:Thycotic.DE.Feature.SS.SecretWorkflow.Areas.TicketingSystem.TicketingGetStatusConsumer:Thycotic.Messages.DE.Engine.Areas.TicketingSystem.Request.TicketingGetStatusMessage

## Engine Worker Role Queues

List of queues for engine worker's functional areas:

### Active Directory Synchronization

- thycotic-Secret Server-engine-response:Thycotic.ihawu.EngineWorker.Logic.Areas.ActiveDirectory.ActiveDirectorySynchronizationConsumer:Thycotic.Messages.DE.Server.Areas.ActiveDirectory.Request.ADSyncMessage
- thycotic-ss-engine-response:Thycotic.ihawu.EngineWorker.Logic.Areas.ActiveDirectory.AllUsersByDomainQueryConsumer:Thycotic.Messages.DE.Server.Areas.ActiveDirectory.Request.AllUsersByDomainQueryMessage

### Discovery

- thycotic-Secret Server-engine-response:Thycotic.ihawu.EngineWorker.Logic.Areas.Discovery.ScanDependencyConsumer:Thycotic.Messages.DE.Server.Areas.Discovery.Request.ScanDependencyMessage
- thycotic-ss-engine-response:Thycotic.ihawu.EngineWorker.Logic.Areas.Discovery.ScanHostRangeResponseConsumer:Thycotic.Messages.DE.Server.Areas.Discovery.Request.ScanHostRangeMessage
- thycotic-ss-engine-response:Thycotic.ihawu.EngineWorker.Logic.Areas.Discovery.ScanLocalAccountConsumer:Thycotic.Messages.DE.Server.Areas.Discovery.Request.ScanLocalAccountMessage
- thycotic-ss-engine-response:Thycotic.ihawu.EngineWorker.Logic.Areas.Discovery.ScanMachineResponseConsumer:Thycotic.Messages.DE.Server.Areas.Discovery.Request.ScanMachineMessage
- thycotic-ss-engine-response:Thycotic.ihawu.EngineWorker.Logic.Areas.Discovery.SpecificOuScanHostRangeResponseConsumer:Thycotic.Messages.DE.Server.Areas.Discovery.Request.SpecificOuScanHostRangeMessage

### RDP Proxy, SSH Proxy, and SSH Terminal

- thycotic-Secret Server-engine-response:Thycotic.ihawu.EngineWorker.Logic.Areas.RDPProxy.AppendKeystrokeDataConsumer:Thycotic.Messages.DE.Engine.Areas.RDPProxy.Request.AppendKeystrokeDataMessage

- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.SSHProxy.AppendSessionDataConsumer:Thycotic.Messages.DE.Server.Areas.SSHProxy.Request.AppendSessionDataMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.SSHProxy.CloseSecretSessionConsumer:Thycotic.Messages.DE.Server.Areas.SSHProxy.Request.EndSessionDataMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.SSHProxy.EndRdpProxySessionConsumer:Thycotic.Messages.DE.Engine.Areas.RDPProxy.Request.EndRdpProxySessionMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.SSHProxy.GetStatusUpdatesRequestConsumer:Thycotic.Messages.DE.Server.Areas.SSHProxy.Request.GetStatusUpdatesMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.SSHProxy.InitiateRDPProxiedSessionConsumer:Thycotic.Messages.DE.Engine.Areas.RDPProxy.Request.InitiateProxiedRdpSessionMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.SSHProxy.InitiateSSHProxiedSessionConsumer:Thycotic.Messages.DE.Server.Areas.SSHProxy.Request.InitiateProxiedSessionMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.SSHProxy.InitiateSshSessionDataCaptureSinkConsumer:Thycotic.Messages.DE.Server.Areas.SSHProxy.Request.InitiateProxiedSessionDataCaptureSinkMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.SSHProxy.RdpProxySessionStatusesConsumer:Thycotic.Messages.DE.Engine.Areas.RDPProxy.Request.GetRdpProxySessionStatusesMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.SSHProxy.UpdateSessionsRequestConsumer:Thycotic.Messages.DE.Server.Areas.SSHProxy.Request.UpdateSessionsMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.SSHProxy.UpdateUserPasswordRequestConsumer:Thycotic.Messages.DE.Server.Areas.SSHTerminal.Request.UpdateUserPasswordMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.SSHTerminal.TerminalCommandEngineConsumer:Thycotic.Messages.DE.Server.Areas.SSHTerminal.Request.TerminalCommandMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.UserSession.CloseUserSessionConsumer:Thycotic.Messages.DE.Server.Areas.UserSession.CloseUserSessionMessage

## Syslog Integration

- thycotic-Secret Server-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.SEIM.SysLogResultResponseConsumer:Thycotic.Messages.DE.Server.Areas.SEIM.Request.SysLogResultMessage

## Heartbeat, Remote Password Change, and Dependency

- thycotic-Secret Server-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.Dependency.DependencyChangeConsumer:Thycotic.Messages.DE.Server.Areas.Dependency.Request.DependencyChangeMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.Heartbeat.SecretHeartbeatConsumer:Thycotic.Messages.DE.Server.Areas.Heartbeat.Request.SecretHeartbeatMessage
- thycotic-ss-engine-



response:Thycotic.ihawu.EngineWorker.Logic.Areas.PasswordChanging.RemotePasswordChangeResponseStoreConsumer:Thycotic.Messages.DE.Server.Areas.PasswordChanging.Request.RemotePasswordChangeMessage

## Delinea Privilege Behavior Analytics Integration

- thycotic-Secret Server-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.PasswordChanging.PbaDisableConsumer:Thycotic.Messages.DE.Server.Areas.PBA.PbaDisableMessage

## Distributed Engine Management

- thycotic-Secret Server-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.Connectivity.PingConsumer:Thycotic.Messages.DE.Server.Areas.Connectivity.Request.PingMessage
- thycotic-ss-engine-  
response:Thycotic.ihawu.EngineWorker.Logic.Areas.Maintenance.LogConsumer:Thycotic.Messages.DE.Server.Areas.Maintenance.Request.EngineLogMessage
- thycotic-ss-engine-  
response:Thycotic.MessageQueue.Common.Consumers.AutomaticSink.CreateAutomaticSinkConsumer:Thycotic.MessageQueue.Common.Messages.AutomaticSink.Request.CreateAutomaticSinkMessage

## Session Recording Worker

List of queues for session recording worker's functional areas:

### Post Recording

- thycotic-sessionrec:Thycotic.ihawu.SessionRecordingWorker.Logic.Areas.SessionRecording.PostMetadataConsumer:Thycotic.Messages.ihawu.Areas.SessionRecording.Request.ProcessUploadedMetadataMessage
- thycotic-sessionrec:Thycotic.ihawu.SessionRecordingWorker.Logic.Areas.SessionRecording.PostRecordedSessionConsumer:Thycotic.Messages.DE.Server.Areas.AdvancedSessionRecording.Request.RecordedSessionChunkMessage
- thycotic-sessionrec:Thycotic.ihawu.SessionRecordingWorker.Logic.Areas.SessionRecording.PostRecordedSessionConsumer:Thycotic.Messages.ihawu.Areas.SessionRecording.Request.ProcessBusStreamedSessionMessage
- thycotic-sessionrec:Thycotic.ihawu.SessionRecordingWorker.Logic.Areas.SessionRecording.PostRecordedSessionConsumer:Thycotic.Messages.ihawu.Areas.SessionRecording.Request.ProcessUploadedSessionMessage

### Video Conversion

- thycotic-sessionrec:Thycotic.ihawu.SessionRecordingWorker.Logic.Areas.SessionRecording.VideoConversionConsumer:Thycotic.Messages.ihawu.Areas.SessionRecording.Request.ConvertAllVideosMessage
- thycotic-sessionrec:Thycotic.ihawu.SessionRecordingWorker.Logic.Areas.SessionRecording.VideoConversionConsumer:Thycotic.Messages.ihawu.Areas.SessionRecording.Request.ConvertVideoMessage
- thycotic-sessionrec:Thycotic.ihawu.SessionRecordingWorker.Logic.Areas.SessionRecording.VideoConversionConsumer:Thycotic.Messages.ihawu.Areas.SessionRecording.Request.DeleteOldCompletedImagesMessage
- thycotic-sessionrec:Thycotic.ihawu.SessionRecordingWorker.Logic.Areas.SessionRecording.VideoConversionConsumer:Thycotic.Messages.ihawu.Areas.SessionRecording.Request.RunNowConvertVideoMessage
- thycotic-sessionrec:Thycotic.ihawu.SessionRecordingWorker.Logic.Areas.SessionRecording.VideoConversionConsumer:Thycotic.Messages.ihawu.Areas.SessionRecording.Request.RunNowConvertVideoMessage

equest.RunNowSetStatusForTimedOutSessionsMessage

- thycotic-sessionrec:Thycotic.ihawu.SessionRecordingWorker.Logic.Areas.SessionRecording.VideoConversionConsumer:Thycotic.Messages.ihawu.Areas.SessionRecording.Request.SetStatusForTimedOutSessionsMessage

## Post Recording (Legacy)

- thycotic-sr-agent-response:Thycotic.ihawu.SessionRecordingWorker.Logic.Areas.SessionRecording.PostMetadataConsumer:Thycotic.Messages.DE.Server.Areas.AdvancedSessionRecording.Request.PostMetadataMessage
- thycotic-sr-agent-response:Thycotic.ihawu.SessionRecordingWorker.Logic.Areas.SessionRecording.PostRecordedSessionConsumer:Thycotic.Messages.DE.Server.Areas.AdvancedSessionRecording.Request.PostRecordedSessionMessage

## Management

- thycotic-sessionrec:Thycotic.MessageQueue.Common.ConsumersAutomaticSink.CreateAutomaticSinkConsumer:Thycotic.MessageQueue.Common.MessagesAutomaticSink.Request.CreateAutomaticSinkMessage

## Security

Please see [Distributed Engine Hardening](#).

You can change how Secret Server processes messages by navigating to **Admin > See All** and selecting **Networking**.

Messages are generated and placed on the internal site connector, or backbone bus, every time a background operation is triggered whether by a schedule or on-demand.

The internal site connector receives and processes messages as a result of numerous actions:

- Bulk Operations
- Generate Password
- Secret Import (CSV and XML)
- Run Heartbeat Now
- Run Heartbeat (Scheduled)
- Run Password Change Now
- Run Password Change (Scheduled)
- Run Discovery Now
- Run Discovery (Scheduled)
- Run AD Sync Now
- Run AD Sync (Scheduled)
- Elements of Session Recording

The internal site connector, using the internal hosted bus, is adequate for bulk operations, heartbeat, discovery, and the like, but some Secret Server features, such as a clustered Web server node configuration or session recording, require a scalable messaging solution to boost processing performance. Our choice is [RabbitMQ](#), which is an intermediary messaging broker that can handle large-scale message processing.

The following is a typical internal hosted bus operation (for a bulk operation):

1. A Secret Server user triggers the a bulk operation.
2. A message is formed and sent over a TCP connection to the internal hosted bus.
3. Secret Server (on the same machine) receives the message.
4. Secret Server (on the same machine) processes the message.

We continually improve the internal hosted bus but still recommend RabbitMQ for a scalable performance boost. See [Installing RabbitMQ](#) for more information.

Overview

This article lists ports typically used in Secret Server. Please note the following:

- The RPC Dynamic Port ranges are a range of ports utilized by Microsoft's Remote Procedure Call (RPC) functionality. This port range varies by operating system. For Windows Server 2008 or greater, this port range is 49152 to 65535 and this entire port range must be open for RPC technology to work. The RPC range is needed to perform Remote Password Changing since Secret Server will need to connect to the computer using DCOM protocol.
- The range can vary separately for Exchange servers. For more information about changing the RPC port range, see the related Microsoft's Knowledge Base article on how to configure RPC dynamic port allocation to work with firewalls.
- To see your ipv4 dynamic range on a given machine, type `netsh int ipv4 show dynamicport tcp` in the command line.
- To specify a specific port on your environment that Secret Server will communicate to, see the related article on enabling WMI ports on Windows client machines

Port Listing

Table: Active Directory Sync Ports

Kerberos	TCP/88, UDP/88
LDAP	TCP/389, UDP/389
LDAPS	TCP/636, UDP/636
SMB/Microsoft-DS	TCP445, UDP/445

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**Note:** For LDAPS to work the LDAP port (389) must also be open.

Table: Discovery Ports

RPC Dynamic Port Range	TCP/49152-65535, UDP/49152-65535
SMB/Microsoft-DS	TCP/445, UDP/445
RPC Endpoint Mapper	TCP/135
SSH	TCP/22

[Unexpected Link Text](#)

Table: Remote Password Changing Ports


RPC Dynamic Port Range	TCP/49152-65535, UDP/49152-65535
SSH	TCP/22
Telnet	TCP/23
Microsoft SQL	TCP/1433, UDP/1434
SMB/Microsoft-DS	TCP/445, UDP/445
LDAP	TCP/389, UDP/389
LDAPS	TCP/636, UDP/636
Sybase	TCP/2638, TCP/5000
Oracle Listener	TCP/1521
Kerberos Password Change	TCP/464, UDP/464
Windows Privileged Account (WinNT ADSI Service Provider)	TCP/139

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**Table:** Web Server Incoming Ports

HTTP	TCP/80
HTTPS	TCP/443

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**Table:** Database Server Incoming Ports

SQL Connection	TCP/1433, UDP/1434

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**Table:** Email Ports

SMTP	TCP/25

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**Table:** RADIUS Server Ports

RADIUS Authentication	
UDP/1812	

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**Table:** Syslog Ports

Syslog	
TCP/514, UDP/514	

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**Table:** Internal Site Connector Ports

RabbitMQ	
TCP/5672 (non-SSL), TCP/5671 (SSL)	
MemoryMQ	TCP/8672 (non-SSL), TCP/8671 (SSL)

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**Table:** RabbitMQ Clustering Ports

EPMD	
TCP/4369	
Inter-node Communication	TCP/25672
Inter-node Communication	TCP/44002

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**Related Articles and Resources**

- [How to configure RPC dynamic port allocation to work with firewalls](#) (KBA)

**Important:** RDP Proxy requires .NET 4.7.2 or later. Also, CredSSP, NTLMv2, and NLA must be enabled. LAN Manager authentication must be set to NTLMv2 (Lmcompatibilitylevel configured to 3 or above). See the [RDP Proxy Technical Notes](#) for details.

## Overview

The RDP Proxying feature allows RDP connections, established using a launcher, to be routed through Secret Server. You can set it up one of two ways:

- Recommended method: The launcher connects to the newer RDP proxy with temporary credentials, and the RDP proxy connects to the remote server using the protected credentials from the secret. This method is preferred because it prevents the secret credentials from reaching the client machine. For this method, you simply configure the RDP proxy.
- Alternative method: The launcher uses an SSH proxy to tunnel a local RDP connection to a remote server. This method does not protect the credential from reaching the client machine. For this method you configure the SSH proxy and enable SSH tunneling.

**Note:** We provide the alternate method to support legacy installations and troubleshooting (it can potentially be more stable when the RDP proxy does not work).

These two approaches to RDP proxying are not compatible—you may use one or the other but not both. We performance tested both methods. Either can support 100 concurrent connections.

## Recommended Method

### How It Works

1. The user clicks the RDP launcher in Secret Server.
2. The launcher executes on the client's machine.
3. The launcher establishes a connection to the RDP Proxy using credentials generated for the session.

**Note:** These credentials are short-lived and can only be used within a 15-minute window. To support reconnects in keeping with the RDP protocol, the window resets upon reconnect.

4. Once the launcher has successfully authenticated with the RDP proxy, the RDP proxy looks up the credentials and target hostname to connect to.

**Note:** The secret credentials *do not* get served to the client machine in this flow, which improves credential security.

5. The RDP proxy connects to the desired remote host with the secret credentials.
6. The RDP session is established.
7. RDP traffic is sent back and forth over the RDP proxy, session keystrokes are monitored if session recording is enabled.

## Configuration

1. Navigate to the **Admin > Proxying** page.
2. Click the **RDP Proxy** tab.



Admin > Proxying

SSH Proxy **RDP Proxy** Endpoints Proxy Audit

The RDP proxy is currently running on 0 site(s) and 0 engine(s). Please see the Endpoints tab for more details.

**RDP Proxy Settings**

- Secret Server can proxy Remote Desktop connections through a Distributed Engine to a Windows end point.
- You can configure your SSH server to only accept connections from the proxy, thus forcing all connections through Secret Server.
- With Session Recording enabled, you will be able to record keystrokes sent during RDP proxy sessions
- To enable RDP proxying, install at least one Distributed Engine and specify the Public Host and Bind IP address.
- Secrets with launchers which support proxying can have it enabled or disabled on an individual basis from their security tab. This setting can also be set via Secret Policy.

Enable RDP Proxy	Yes	<a href="#">Edit</a>
RDP Proxy Port	3390	<a href="#">Edit</a>
Validate Remote Certificates	Yes	<a href="#">Edit</a>
Allow AD Site Selection	Yes	<a href="#">Edit</a>
Proxy New Secrets By Default	Yes	<a href="#">Edit</a>
Days to Keep Operational Logs	30	<a href="#">Edit</a>
RDP Server Certificate	thyp2.pfx	<a href="#">Edit</a> <a href="#">Generate Self-Signed</a>

- If necessary, enable the RDP proxy.
- Click the **Endpoints** tab to ensure that your server nodes, sites, and engines have RDP Proxy enabled.
- Proxied RDP secrets now launch into the RDP proxy using short-lived credentials, protecting the secret credentials from the client machine.

## Configuration Settings

The RDP proxy configuration settings for the recommended method:

- Enable RDP Proxy:** This setting determines whether or not the RDP proxy is enabled
- RDP Proxy Port:** This setting is the port that the RDP proxy runs on (defaulting to 3390). You usually cannot set this to 3389 as that port is already occupied by default by the Windows operating system.
- Validate Remote Certificates:** Delinea recommends that you operate in an environment where RDP server certificates are created by a controlled CA and are trusted by machines in the domain. If that is not possible, you can disable remote certificate validation to allow connection to machines that do not serve trusted certificates.
- Allow AD site selection:** This setting allows you to select any configured sites when using the RDP launcher on an Active Directory secret. This allows a secret credential to access machines that may exist in different network boundaries.
- Proxy New Secrets By Default:** This setting determines if SSH and RDP secrets are created with "Proxy Enabled" set by default. This setting is shared with the SSH proxy configuration.
- Days To Keep Operational Logs:** This setting determines how long, in days, the operational logs for the RDP proxy are kept.
- RDP Server Certificate:** This setting is the certificate that is served to the clients who connect to the RDP proxy. You can generate a certificate for a given DNS name, or you can upload your own.

## Alternative Method

**Note:** This approach is not recommended as it exposes the secret credentials to the client machine.

## How It Works

- The user clicks the RDP launcher in Secret Server.

2. The launcher executes on the client's machine.
3. The launcher establishes a connection to the SSH proxy to begin port forwarding.
4. The launcher authenticates with the SSH Proxy.
5. The launcher opens a socket.
6. The launcher listens for a connection on an available ephemeral port (the forwarding port) on the client's machine.
7. RDP launches on the client machine using the secret credentials and connects locally to the forwarding port.
8. All RDP traffic for this session is routed through the SSH tunnel to Secret Server, then forwarded to the target machine.
9. The RDP session is established.

## Configuration

1. Navigate to the **Admin > Proxying** page.

Admin > Proxying

SSH Proxy RDP Proxy Endpoints Proxy Audit

The SSH proxy is currently running on 0 site(s) and 0 engine(s). Please see the Endpoints tab for more details.

### SSH Proxy Settings

- Secret Server can proxy connections through a Distributed Engine to an SSH server end point.
- Remote Desktop Sessions can also be proxied if enable SSH tunneling is set.
- You can configure your SSH server to only accept connections from the proxy, thus forcing all connections through Secret Server.
- All proxied traffic can be recorded for security and auditing purposes.
- To enable SSH proxying, install at least one Distributed Engine and specify the Public Host and Bind IP address.
- Secrets with launchers which support proxying can have it enabled or disabled on an individual basis from their security tab. This setting can also be set via Secret Policy.

Enable SSH Proxy	Yes	<a href="#">Edit</a>
SSH Proxy Port	22	<a href="#">Edit</a>
Enable SSH Tunneling	No	<a href="#">Edit</a>
Proxy New Secrets By Default	Yes	<a href="#">Edit</a>
Enable SSH Proxy Inactivity Timeout	No	<a href="#">Edit</a>
SSH Proxy Banner	Welcome to the Secret Server SSH Proxy	<a href="#">Edit</a>
SSH Proxy Host Fingerprint	SHA1 - 8e:80:65:1f:d8:a7:84:c1:33:f2:80:7f:dc:84:48:d0:41:29:06:c7 MD5 - 99:0b:df:99:15:e4:a1:7f:7c:70:ec:12:87:16:8e:fb	<a href="#">Edit</a> <a href="#">Generate</a>
Days to Keep Operational Logs	50	<a href="#">Edit</a>

2. Enable the **Enable SSH Tunneling** option.
3. Click the **Endpoints** tab to ensure that your server nodes, sites, and engines are properly configured.
4. Proxied RDP secrets now launch into the SSH proxy using local port forwarding.

## Known Issues

### "Could not load file or assembly..." Error

Error appears in Secret Server.log or DE.log. Install the most recent version of the .NET Framework to correct it.

### RDP Proxy Does Not Work with FIPS Validation

RDP proxy does not work on machines the have the FIPS validation security policy active. No fix is currently available.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

This document is a guide to Delinea's Secret Server clusters for administrators and advanced users. Secret Server can run with multiple front-end Web servers. For a critical instance, clustering offers a redundant system to limit potential down time from a single point of failure. Clustering also allows users to load balance for better performance.

## Overview

### Clustering and Background Thread Changes in 10.7.

There are two major architectural changes in Secret Server 10.7:

**Note:** The first change is obvious in the Secret Server user interface, and the second is hidden but very important to those supporting Secret Server.

- **Primary Node:** We eliminated "primary nodes." Previously, some important background operations, such as password changing and heartbeat, would only run from the primary node. Now they run from all nodes. Given that, there is no longer a "Make Primary" button, and the ValidPrimaryNode setting no longer applies.
- **Background Operations:** There are no longer background threads for scheduled operations. Instead, operations are scheduled by Quartz.

## Clustering Overview

With Secret Server clustering, you can easily scale Secret Server for redundancy and performance. Basic Secret Server clustering is simple—you install Secret Server and then copy the installation to another machine. Secret Server clustering has four core concepts or components:

### Nodes

Each machine with Secret Server installed on it, pointing to the same database, is a *node*. All nodes respond to Web requests and thus are Web servers.

### Backbone Bus

The backbone bus internally handles all communication between the roles. In a clustered environment, the backbone bus should always be an installed RabbitMq messaging queue. This allows every node in the cluster to help with the workload. If the backbone bus is set to "internal," then each node is using its own internal backbone bus.

### Engine Response Bus

The engine response bus facilitates communication from Secret Server to distributed engines and back.

### Worker Roles

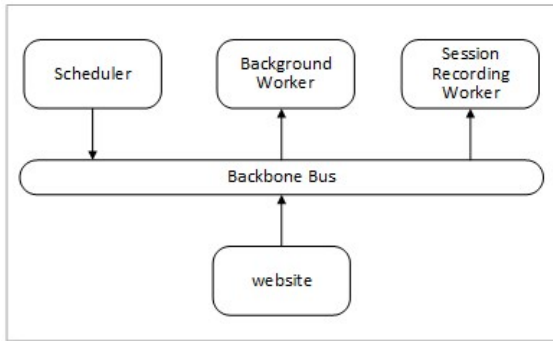
Each node can optionally run one or more worker roles: background Worker, engine worker, and session recording worker. Though they may run on the same machine, the roles do not directly communicate with each other.

Each node that is set to run the background worker role automatically runs the scheduler role as well. The scheduler role is responsible for running the vast majority of Secret Server background operations. It uses Quartz to run "trigger jobs" that send a message on the backbone bus for each scheduled operation. One or more background worker roles then processes those messages.

**Note:** See the article [Troubleshooting Quartz Trigger Jobs](#) for more information about Quartz.

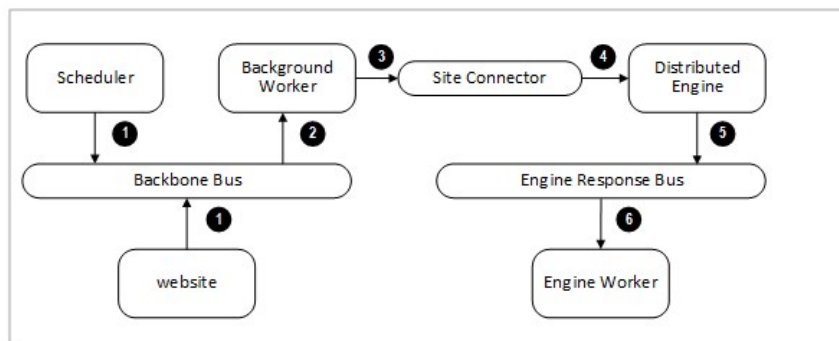
## Component Communication

**Figure:** Secret Server Internal Cluster-Component Communication



Messages are placed on the backbone bus by the Scheduler role and the website. Messages are retrieved from the backbone bus.

**Figure:** Secret Server Distributed Engine Communication





1. Manual or scheduled operation.
2. Background worker processes a message.
3. Outbound messages (password changes, heartbeats, and others) are placed on the site connector.
4. Distributed engine performs the operation.
5. Engine worker processes the response.

## Server Node Configurations

The work an individual node handles depends entirely on which boxes are checked on the Server Nodes page (in edit mode):

## Server Nodes

MACHINE NAME (ID)	BINARY VERSION	DATABASE	ERROR MESSAGE	LAST CONNECTED	IN CLUSTER	BACKGROUND WORKER	ENGINE WORKER	SESSION RECORDING WORKER	MAINTENANCE MODE	
QA-CUST-01 (1) (Current Node)	10.7.000000	SS_Playground		8/13/2019 5:35:08 PM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	 

Enable Clustering ☐ No

 Back

☒ Enable Clustering

 SQL Server Replication

- **In Cluster** is a toggle that turns a server node on or off. If enabled this node can process Web requests, and (if configured) will run the background, engine, and session recording roles. If disabled, the node is just a backup—it cannot run any roles, and trying to access the website on the node will redirect to the server nodes page.
- **Background Worker** is a toggle for all background operations, such as password changing, heartbeat, and discovery. When it is set to false, only the bulk operations, password generation, email, and secret import operations run on the node. See the list of background operations below.
- The **Background Worker**, **Engine Worker**, and **Session Recording Worker** check boxes enable the corresponding roles for that node.
- **Engine Worker** enables or disables the engine worker role, which processes responses from distributed engines.
- **Session Recording Worker** enables or disables the session recording role, which encodes session videos.
- **Maintenance Mode** enables or disables a read-only mode where the node cannot change secrets or related data.

## Scheduled Background Operations

The current scheduled background operations in Secret Server are:

- ActiveDirectorySynchronizationMonitor
- BackgroundWorkerTaskTriggerJob
- BackupMonitor
- Bulk Operations When triggered by user
- CheckOutMonitor
- ComputerScanMonitor
- ConnectWiseMonitor
- DatabaseCleanupTriggerJob
- DiscoveryMonitor
- EventQueueMonitor
- ExpiredSecretPasswordChangeTriggerJob
- ExpiringLicenseTaskTriggerJob
- ExpiringSecretTaskTriggerJob
- HeartbeatMonitor
- Local Heartbeat Trigger Job
- Local Password Change Trigger Job
- NodeClusteringMonitor
- NodeTaskTriggerJob
- PasswordRequirementTriggerJob
- PbaDirectiveTriggerJob
- PbaMetadataUploadTriggerJob
- PrimaryNodeTaskMonitor
- Process Field Encryption Changes Task

- ProcessDashboardJsonValidationTask
- ProcessSecretPolicyChangesMessage
- ScheduledReportMonitor
- SecretComputerMatcherMonitor
- SecretItemHashMonitor
- SqlReplicationConflictMonitor
- TelemetryTriggerJob
- ThycoticOneSyncUserTriggerJob
- TruncateDatabaseCacheTriggerJob
- TruncateEngineLogTriggerJob
- VideoConversionTriggerJob

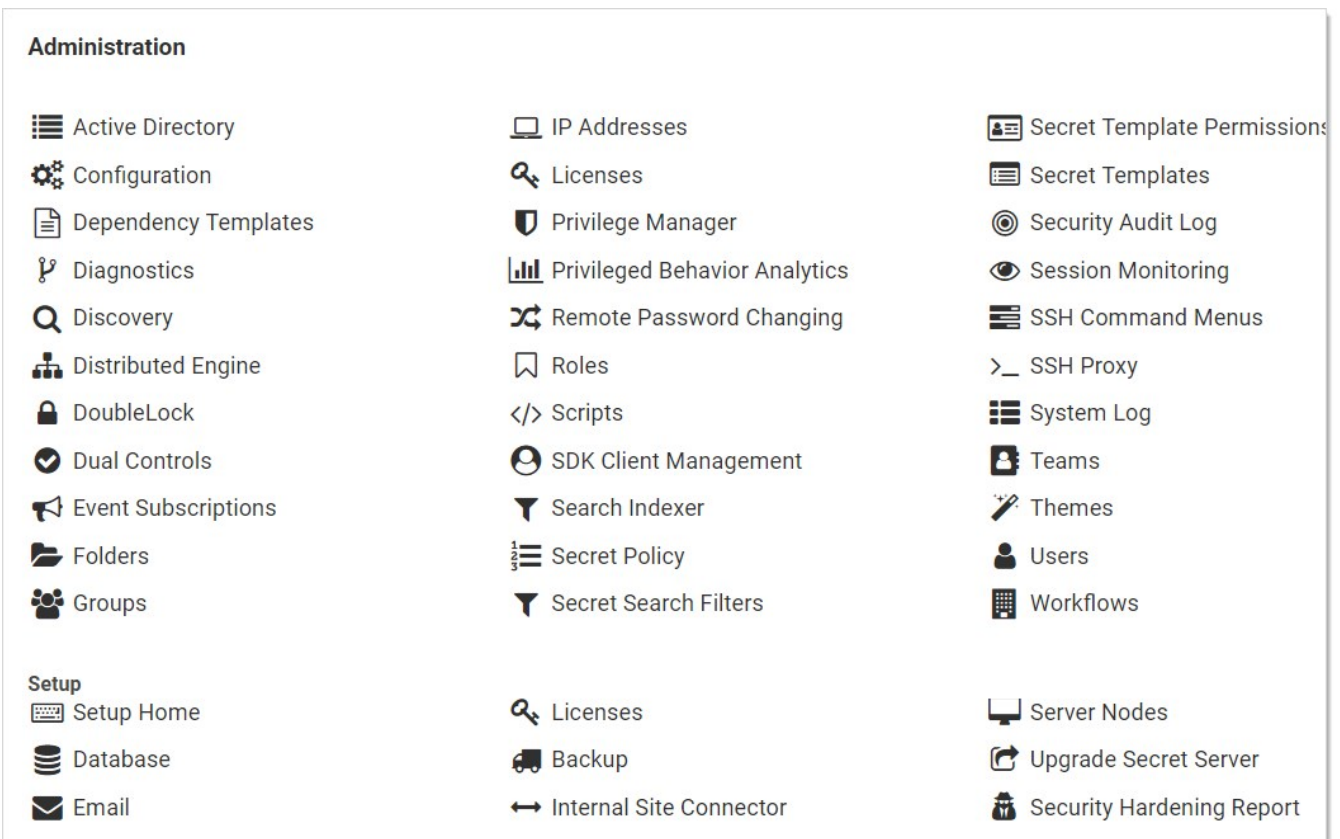
To see the current state of these jobs, such as the last time they ran and how long until they run again, go to **Admin > Diagnostics**.

## Procedures

### Markdig.Syntax.Inlines.EmphasisInline

**Note:** Clustering requires a Secret Server Premium add-on or Enterprise Plus edition license.

1. Have Secret Server upgraded or installed and running on a server.
2. Enable clustering on the node:
  1. In Secret Server, click **Admin > See All**. The Administration page appears:



2. Click the **Server Nodes** button in the **Setup** section. The Server Nodes page appears:

Server Nodes

MACHINE NAME (ID)	BINARY VERSION	DATABASE	ERROR MESSAGE	LAST CONNECTED	IN CLUSTER	BACKGROUND WORKER	ENGINE WORKER	SESSION RECORDING WORKER	MAINTENANCE MODE
QA-CUST-01 (1) (Current Node)	10.7.000000	SS_Playground		8/13/2019 8:05:19 PM	Yes	Enabled	Enabled	Enabled	Disabled

Enable Clustering

No

Back

Enable Clustering

SQL Server Replication

[KB Article: Server Nodes, Clustering and Worker Roles](#)

3. Click the **Enable Clustering** button.

3. Copy the entire Secret Server application folder (typically c:\inetpub\wwwroot\SecretServer) from the existing node to the secondary node.

4. Follow the steps in the Installation Guide for setting up the application pool and virtual directory in IIS.

**Note:** If you use DPAPI encryption for your encryption.config file, you need to transfer the non-DPAPI-encrypted version of the file to the secondary node. You can turn on DPAPI encryption from that server node locally after Secret Server is running. This setting can be found at **ADMIN > Configuration** on the **Security** tab.

5. If running Secret Server 8.9.300000 or later, ensure that both servers are using the same date and time.

6. Once the secondary server is running, navigate to its Secret Server using a Web browser.

7. Reset the database connection, following the instructions at [Changing SQL Server Connection Parameters](#).

8. Activate licenses for the new node. You can do this on either server once the database connection is established on the secondary node.

9. Configure your load balancer for the two sites to have "sticky sessions" to prevent a user from bouncing between server on each request.

10. Configure the worker roles for the cluster:

- Each server node can optionally run the background worker, engine worker, and session recording worker roles.
- At least one instance of **each** type of those roles must be active in the cluster for the clustered Secret Server application to function.
- You may run more than one instance of each role as desired to improve the performance of the clustered Secret Server application.

**Note:** For more information on what the various roles do, please see the [Worker Roles](#) section.

## Upgrading Secret Server in a Clustered Environment

### Overview



Secret Server has a built-in Web installer. That installer is a series of pages inside Secret Server for downloading and updating Secret Server. Secret Server is accessible by users for most of the upgrade process. You can stop outside access to the site if you want to prevent users from making changes during the upgrade. Preventing user access will make restoring the database and site backups simpler if you decide to roll back the upgrade immediately afterward.

**Warning:** Before upgrading, **backup your Secret Server folder and database**. See [Upgrading Secret Server - Single Instance and Web Clustering](#) for important steps for ensuring your data is backed up.

**Important:** Upgrading to Secret Server version 8.9.000000+ requires Windows Server 2008 R2 or greater.

**Important:** If upgrading to Secret Server version 8.5.000000+, there are changes in the required .NET Framework that may require additional steps in the upgrade process. For more information, see [Secret Server Moving to .NET Framework 4.5.1](#).

**Important:** Upgrading to Secret Server 10.0.000000 and above requires configuring integrated pipeline mode on the Secret Server application pool. Please see [Configuring IIS for Installing or Upgrading to Secret Server 10](#) for details.

**Important:** If using Integrated Windows authentication you will also need to update IIS authentication settings as detailed in [Setting Up Integrated Windows Authentication in Secret Server 10.0+](#). If you are at version 9.1.000000 and below, you will need to first upgrade to 9.1.000001 before you can upgrade to 10.0.000000+.

**Note:** You do **not** need to download the Secret Server installer to perform an upgrade.

## Procedure

1. Before you start:
  - Ensure that you have account credentials information and access for the server hosting Secret Server and the SQL Server instance hosting your Secret Server database.
  - Have a recent backup of the application files and database available.
  - Stop the application pools on all of the servers except the one that you have chosen to upgrade.
2. Choose one Secret Server server to upgrade
3. Perform a backup of that server.
4. Stop the Web servers of all other nodes.
5. Perform the upgrade using the same procedure as a single instance.

**Note:** If applicable, see [Upgrading Secret Server without Outbound Access](#).
6. Once Secret Server is upgraded and working, copy the Web application folder (without the database.config or encryption.config files) to all other servers.

**Warning:** Never overwrite or delete the encryption.config file on a Secret Server server.

**Note:** Both encryption.config and database.config are automatically propagated to the new servers from the original. If you need to copy those files because of database configuration changes and are using DPAPI, disable DPAPI encryption in Secret Server by going to **Admin > Configuration** on the **Security tab**, and clicking **Decrypt Key to not use DPAPI** before copying those files to secondary servers.

**Note:** EFS encryption is tied to the user account running the Secret Server application pool, so it is not machine-specific. Thus, it is not necessary to copy EFS encrypted files between Secret Server instances, but it is allowed.

7. If Delinea management server (TMS) is installed and clustered, copy the TMS directory to the secondary servers as well. The TMS directory is included by default for new installs of Secret Server 10.2+. TMS is used by advanced session recording and Privilege Manager. If the TMS folder and site does not exist in IIS, then no additional actions are needed.
8. Start the secondary servers to confirm they still work.

## Upgrading Database Mirroring

1. If there is more than one Web server running Secret Server, ensure all instances are pointing to their primary database.
2. Select one server to perform the upgrade on, stop all other web servers.
3. Perform the upgrade on the single instance.
4. Once upgraded and working, copy the Web application folder to all other Web servers.
5. Start all other Web servers and confirm they work
6. Ensure all instances are properly activated
7. Ensure that the primary database changes have been replicated to the mirror database.
8. If one of the servers was pointing originally to the secondary database, adjust it to point there again.

## Upgrading Disaster Recovery Installations

1. Perform the upgrade on the production instance.
2. Backup the production instance.
3. Copy the database backup to the remote DR instance and restore the database.
4. Once the database is upgraded and working, copy the web application folder (but not the database.config or encryption.config files) to the remote DR instance, overwriting the existing files.
5. Restart IIS or recycle the application pool running Secret Server on the remote DR instance.
6. Confirm that the remote DR instance is working correctly.

## Load Balancing Secret Server Clusters

In a clustered Secret Server environment set up behind a load balancer, the accessible outside URL may be something other than the server name.

**Important:** Customers often configure the service monitor on the load balancer to hit `login.aspx`. This can cause performance issues and memory leaks. We strongly suggest hitting `healthcheck.aspx` instead.

## Custom URL Configuration

In Secret Server 8.5 and later, the Custom URL setting can be configured to ensure that links and resources are resolved correctly and are not based upon the server name. The Custom URL sets a definitive URL for Secret Server. Without it, features in Secret Server that need to build a link back to the server must construct the link using the host value on the request, which is susceptible to manipulation.

1. Navigate to **Admin > Configuration**.
2. On the **General** tab, click the **Edit** button.

3. Go to the **Application Settings** section.
4. Click to select the **Custom URL** check box.
5. Type the desired URL in the **Secret Server Custom URL** text box.

## SSL Recommendations

For the best security, we recommend placing the SSL certificate on each of the Web servers. This ensures the traffic leaving the server is encrypted by SSL. Optionally, the load balancer would need the certificates as well for adding the client's IP address.

If the connection between the load balancer and the server is isolated in a security zone, you could leave HTTP between the load balancer and the server and have the SSL on the load balancer.

## Configuring Client's IP Address (X-Forwarded-For)

Routing traffic through a load balancer will cause Secret Server to audit the IP address of the load balancer instead of the end user. To avoid this:

First, configure the load balancer to pass along the client's IP address in the header.

Then add the appSettings key `IpAddressHeader` with the value of the name of the header field containing the client's IP address. This setting must be added to **all** Secret Server Web servers. Depending on your Secret Server version, do this in one of two ways:

For Secret Server prior to 10.5.000000:

In the `web-appSetting.config` file in your Secret Server directory, add the following key:

```
<?xml version="1.0" encoding="utf-8" ?>
<appSettings>
  <add key="IpAddressHeader" value="X-Forwarded-For" />
</appSettings>
```

For Secret Server 10.5.000000 and later:

1. Go to `https://<SecretServerAddress>/ConfigurationAdvanced.aspx`.
2. Scroll to the bottom and click **Edit**.
3. Locate the **IP Address Header** text box, type `X-Forwarded-For`.
4. Click the **Save** button.

**Note:** The SSL certificate needs to exist on the load balancer and the Web server to ensure it has access to add the client IP address header.

## Clustering Errors

The following error may arise when setting up or operating Secret Server clustering:

- Server dates do not match: If the Web server dates do not match, the audit records could be bad. The fix is to set the servers to the same time.

**Note:** This only applies to Secret Server before version 8.9.300000.

- Secret Server version does not match: If some of the cluster nodes have been upgraded and others have not, their versions will conflict, producing this error. Nodes which have the wrong (older) version will not function correctly. To fix this issue, ensure that all the nodes in your cluster are upgraded. For nodes that are having this issue, you can copy the application folder (minus the `database.config` file)

to replace the server files with the correct version.

HTTP/2 is supported in IIS 10. HTTP/2 is handled within IIS, so this is primarily a Microsoft question in regards to compatibility. Please see [HTTP/2 on IIS](#). At the end of this article, it clarifies when HTTP/2 is not supported

Secret Server does support Windows Integrated Authentication where a user's windows session is passed through for authentication to Secret Server. That is, there is no log on page for Secret Server. The majority of our customers are (and the default configuration for Secret Server is) using forms-based authentication with a log on page. Only the latter is HTTP/2 compliant.

HTTP/2 is only compatible with HTTPS protocol. Secret Server can also be configured to operate only on HTTPS (Admin > Configuration > Security > Force HTTPS/SSL), which we strongly recommend.

HTTP Strict Transport Security (HSTS) is an additional security layer for HTTPS that ensures anybody accessing a given Web site or entity is forced to use HTTPS and not HTTP *prior* to making any HTTP requests, eliminating man-in-the-middle attacks. HSTS is an IETF Internet Standards Track protocol as specified in RFC 6797.

When the Force HTTPS/SSL option is enabled in Secret Server, the **Enable HSTS** check box is displayed. After the option is turned on, you can click the **Advanced** link to specify the **Maximum Age** in seconds, which is how long the policy is in affect before re-evaluating. The default value is 31536000 seconds or one year. We recommend that you set the value as high as possible, up to a year if the site should never be accessed without SSL. Even after HSTS is disabled, your browser automatically redirects to over SSL for the duration of the configured maximum age.

**Note:** We recommend using the IISReset command-line utility or restarting IIS in IIS manager after enabling the setting for the setting to take effect.

This feature is available in Secret Server version 8.6.000009 and higher and Password Reset Server version 4.0.000000 and higher.

**Note:** To see which browsers support HSTS, please refer to the [Strict Transport Security](#) page on the Can I Use website.

## Overview

You can configure a custom cipher suite to assign to a site. The cipher is used for SSH client and server operations for that site, including SSH proxy, SSH terminal, discovery, remote password change, heartbeat and SSH scripts. Each cipher in the suite is prioritized by order used. Each one is tried before moving on to the next lower one if unsuccessful.

**Note:** This feature requires Secret Server 11.3.000001 or later.

**Note:** Please see [SSH Cipher Support](#) for a listing of the default cipher suites.

## Using Custom SSH Cipher Suites

To enable the feature for a distributed engine:

1. Click the **Administration** button on the main menu. The Secrets Administration page appears:

### Secrets Administration

Settings for Secrets on Platform and Secret Server Cloud. Some links are not yet available in Platform and will open in a new tab.

Search

### Commonly Used Settings

Pin an item to this area by selecting the pin next to it in All Settings. Click on the item to unpin it and remove it from this area.

### All Settings

**Actions**

**Users, Roles, Access**

CORE ACTIONS	SSH	USERS, ROLES, ACCESS MANAGEMENT
<ul style="list-style-type: none"> <li>Event Pipeline Policy</li> <li>Event Subscriptions</li> <li>Notification Rules and Templates</li> <li>Lists</li> <li>Session Monitoring</li> <li>Secret Policies</li> <li>Secret Templates</li> <li>Workflows</li> </ul>	<ul style="list-style-type: none"> <li>Proxying</li> <li>SSH Cipher Suites</li> <li>SSH Command Restrictions</li> <li>Jumpbox Routes</li> </ul>	<ul style="list-style-type: none"> <li>User Management</li> <li>Roles</li> <li>Teams</li> <li>IP Addresses</li> </ul>
	<b>SCRIPTING</b> <ul style="list-style-type: none"> <li>Scripts: PowerShell, SQL, SSH</li> <li>REST API Guide</li> </ul>	

2. Click the **Configuration > General > Distributed Engine** link. The Distributed Engine page appears:



# Distributed Engine

- Sites and Engines
- Site Connectors
- Configuration
- Logs

☒ ☐ Show Inactive

▼ Pending Engines

There are currently no engines pending action. After downloading and installing an engine on a server it should appear here. If it does not appear check the engine logs where the engine was installed.

Site: Local		ACTIVE SECRETS 14659
Site: Gamma-Engines	Engines: 2	ACTIVE SECRETS 136
Site: New-Omega-Engines	Engines: 2	ACTIVE SECRETS 2
Site: Omega-Engines	Engines: 2	ACTIVE SECRETS 64
Site: Omega-Engines-2	Engines: 1	ACTIVE SECRETS 5

3. Click the desired distributed engine in the table. Its configuration page appears:



Omega-Engines-2

Site Audit Engine Log Engine Audit

Reassign Secrets Default Engine Settings Validate Connectivity

### Site

A site can contain multiple engines to increase throughput and can be defined for separation of work. For example, all Secrets in the Extranet DMZ might be assigned to a specific site that has engines that run within that isolated subnet. Think of a site as a way to organize types of work or for scalability.

[Learn More](#)

Site Name *	Omega-Engines-2
Active	Yes
Site Connector *	QA-NEW-RMQ
Engine Callback Interval *	30

### Advanced Site Configuration

Allows for PowerShell scripts to execute on the server. Certain features will require scripting and WinRM to be configured.

[Windows Remote Management](#)

[Configure CredSSP for WinRM](#)

WinRM Endpoint URL	http://localhost:5985/wsman
Default PowerShell RunAs Secret	No Secret Selected
Enable CredSSP Authentication for WinRM	Yes
SSH Cipher Suite	Use recommended Delinea cipher suite

4. Edit the page, which exposes two selection buttons for **SSH Cipher Suite**.

**Note:** If you cannot edit the page, you may need the "administer distributed engines" permission.

5. Click to enable **Use Custom Cipher Suite** for the selection button

## Configuring Custom SSH Cipher Suites

**Note:** Currently, you can only configure one custom SSH cipher suite.

To configure a custom SSH cipher suite:

1. Click the **Administration** button on the main menu. The Secrets Administration page appears:

## Secrets Administration

Settings for Secrets on Platform and Secret Server Cloud. Some links are not yet available in Platform and will open in a new tab.

### Commonly Used Settings

Pin an item to this area by selecting the pin next to it in All Settings. Click on the item to unpin it and remove it from this area.

### All Settings

**Actions**

**Users, Roles, Access**

#### CORE ACTIONS

- Event Pipeline Policy
- Event Subscriptions
- Notification Rules and Templates
- Lists
- Session Monitoring
- Secret Policies
- Secret Templates
- Workflows

#### SSH

- Proxying
- SSH Cipher Suites
- SSH Command Restrictions
- Jumpbox Routes

#### SCRIPTING

- Scripts: PowerShell, SQL, SSH
- REST API Guide

#### USERS, ROLES, ACCESS MANAGEMENT

- User Management
- Roles
- Teams
- IP Addresses

2. Click the **SSH Cipher Suites** link in the **SSH** subsection of the **Actions** section. The Custom SSH Cipher Suite page appears:

Admin > Custom SSH Cipher Suite

## Custom SSH Cipher Suite

Details

Encryption Algorithms

Key Exchange Algorithms

MAC Algorithms

Audit

### Details

Configure a custom cipher suite to assign to a site. This will be used for SSH Client and Server operations for that site, including SSH Proxy, SSH Terminal, Discovery, Remote Password Change, Heartbeat and SSH Scripts.

Edit

Name Custom Ciphers



Description Custom Cipher Suite

### Current Set Values

Ordered list of Encryption Algorithms negotiated during SSH Handshake.

### Encryption Algorithms

0 items

NAME	PRIORITY ↑	FIPS COMPLIANT	 
No data found			

The default Details tab provides a brief summary of the cipher suite. You can edit the name and description for the cipher suite, as well as view the currently enabled algorithms.

- Click the **Encryption Algorithms** tab:

Custom SSH Cipher Suite

Details

Encryption Algorithms

Key Exchange Algorithms

MAC Algorithms

Audit

Encryption Algorithms

0 items

Add

NAME	

Each algorithms tab enables, disables, and prioritizes a list of each type of algorithm for the cipher suite. You can also check FIPS compliance for each of the algorithms. The types include encryption, key exchange, and MAC algorithms.

4. To add algorithms to the list:

1. Click the **Add** button on the top right of the table. The tab becomes editable. On the left is a table where your ordered algorithms appear. On the right are your available encryption algorithms.

Admin > Custom SSH Cipher Suite

## Custom SSH Cipher Suite

Details Encryption Algorithms Key Exchange Algorithm

### Encryption Algorithms

0 items Add

NAME	
	↓

Drag and drop one or multiple items to add

#### Available Encryption Algorithms

Select multiple items and drag, or click add.

Search...

Select Visible

- 3des-cbc | FIPS Compliant
- blowfish-cbc
- twofish256-cbc
- twofish192-cbc
- twofish128-cbc
- aes256-cbc | FIPS Compliant
- aes192-cbc | FIPS Compliant
- aes128-cbc | FIPS Compliant
- serpent256-cbc
- serpent192-cbc
- serpent128-cbc

37 items Add

- Move algorithms over to the enabled one of two ways:
  - Dragging and dropping from the list on the right to the table on the left.
  - Clicking individual algorithms and then clicking the **Add** button in the bottom right.
- Drag individual entries in the left table by clicking and holding the dots icon to change their priority. They are used from top to bottom.
- Hover the mouse pointer over any entry in the left table and click the trashcan icon to remove that entry.
- Click the **X** button in the top right to close the add list and apply your changes.

5. Click the **Audit** tab to display a list of actions taken with the cipher suite:

Custom SSH Cipher Suite

Details

Encryption Algorithms



Key Exchange Algorithms

MAC Algorithms

**Audit**

8 Items

Q Search cipher audits

DATE ↓	NAME	ACTION	DETAILS	 
8/30/2022 11:10 AM	AutomatedTestSuperAdmin	Edit	EncryptionAlgorithms: '3des-cb...	
8/30/2022 11:05 AM	AutomatedTestSuperAdmin	Edit	EncryptionAlgorithms: '3des-cb...	
8/30/2022 11:02 AM	AutomatedTestSuperAdmin	Edit	EncryptionAlgorithms: 3des-cbc...	

This topic details SSH cipher suite encryption, key exchange, and MAC algorithms.

**Important:** Enable FIPS in Secret Server to ensure all algorithms are FIPS-certified.

**Note:** SecureBlackbox enables all available SSH encryption, key exchange, and MAC algorithms by default.

This information applies to the following as of Secret Server 11.2.X (June 2022).

- SSH Server: Used by SSH proxy
- SSH Client: Used by SSH proxy, RPC, heartbeat, discovery, and script runners.
- Local port forwarding: Used by SSH proxy Jumpbox routes)

## Secret Server with FIPS Enabled

### Default Encryption Algorithms,

**Note:** The algorithm with highest priority is chosen first, if unsuccessful, the next highest is attempted. The table is ordered by priority.

aes256-gcm@openssh.com	SSH_EA_AES256_GCM_OPENSSH	2147483646
aes128-gcm@openssh.com	SSH_EA_AES128_GCM_OPENSSH	2147483645
aes256-gcm	SSH_EA_AES256_GCM	2147483644
aes128-gcm	SSH_EA_AES128_GCM	2147483643
aes256-ctr	SSH_EA_AES256_CTR	2147483642
aes192-ctr	SSH_EA_AES192_CTR	2147483641
aes128-ctr	SSH_EA_AES128_CTR	2147483640
aes256-cbc	SSH_EA_AES256	2147483639
aes128-cbc	SSH_EA_AES128	2147483638
3des-cbc	SSH_EA_3DES	2147483637

### Default Key Exchange Algorithms,

**Note:** The algorithm with highest priority is chosen first, if unsuccessful, the next highest is attempted. The table is ordered by priority.

curve25519-sha256@libssh.org	SSH_KEX_CURVE25519	2147483646
------------------------------	--------------------	------------

diffie-hellman-group-exchange-sha256	SSH_KEX_DH_GROUP_EXCHANGE256	2147483645
diffie-hellman-group14-sha1	SSH_KEX_DH_GROUP_14	2147483644
diffie-hellman-group-exchange-sha1	SSH_KEX_DH_GROUP_EXCHANGE	2147483643
diffie-hellman-group14-sha256	SSH_KEX_DH_GROUP_14_SHA256	2147483642
ecdh-sha2-nistp521	SSH_KEX_ECDH_NIST_P521	2147483641
ecdh-sha2-nistp384	SSH_KEX_ECDH_NIST_P384	2147483640
ecdh-sha2-nistp256	SSH_KEX_ECDH_NIST_P256	2147483639

## Default MAC Algorithms,

**Note:** The algorithm with highest priority is chosen first, if unsuccessful, the next highest is attempted. The table is ordered by priority.

chacha20-poly1305@openssh.com	SSH_MA_POLY1305	2147483646
aes256-gcm	SSH_MA_AES256_GCM	2147483645
aes128-gcm	SSH_MA_AES128_GCM	2147483644
hmac-sha2-512	SSH_MA_HMAC_SHA2_512	2147483643
hmac-sha2-256	SSH_MA_HMAC_SHA2_256	2147483642
hmac-sha256@ssh.com	SSH_MA_HMAC_SHA256	2147483641
hmac-sha256-96@ssh.com	SSH_MA_HMAC_SHA256_96	2147483640
hmac-sha1	SSH_MA_HMAC_SHA1	2147483639

## Secret Server with FIPS Disabled

### Default Encryption Algorithms, Non-FIPS

**Note:** The algorithm with highest priority is chosen first, if unsuccessful, the next highest is attempted. The table is ordered by priority.

aes256-gcm@openssh.com	SSH_EA_AES256_GCM_OPENSSSH	2147483646
aes128-gcm@openssh.com	SSH_EA_AES128_GCM_OPENSSSH	2147483645



aes256-gcm	SSH_EA_AES256_GCM	2147483644
aes128-gcm	SSH_EA_AES128_GCM	2147483643
aes256-ctr	SSH_EA_AES256_CTR	2147483642
aes192-ctr	SSH_EA_AES192_CTR	2147483641
aes128-ctr	SSH_EA_AES128_CTR	2147483640
aes256-cbc	SSH_EA_AES256	2147483639
aes192-cbc	SSH_EA_AES192	2147483638
aes128-cbc	SSH_EA_AES128	2147483637
3des-cbc	SSH_EA_3DES	2147483636
twofish256-cbc	SSH_EA_TWOFISH256	36
twofish192-cbc	SSH_EA_TWOFISH192	35
twofish128-cbc	SSH_EA_TWOFISH128	34
serpent256-cbc	SSH_EA_SERPENT256	33
serpent192-cbc	SSH_EA_SERPENT192	32
serpent128-cbc	SSH_EA_SERPENT128	31
blowfish-cbc	SSH_EA_BLOWFISH	30
twofish128-ctr	SSH_EA_TWOFISH128_CTR	29
twofish192-ctr	SSH_EA_TWOFISH192_CTR	28
twofish256-ctr	SSH_EA_TWOFISH256_CTR	27
serpent128-ctr	SSH_EA_SERPENT128_CTR	26
serpent192-ctr	SSH_EA_SERPENT192_CTR	25
serpent256-ctr	SSH_EA_SERPENT256_CTR	24
blowfish-ctr	SSH_EA_BLOWFISH_CTR	23
idea-ctr	SSH_EA_IDEA_CTR	22
cast128-ctr	SSH_EA_CAST128_CTR	21

arcfour128	SSH_EA_ARCFOUR128	20
arcfour256	SSH_EA_ARCFOUR256	19
cast128-cbc	SSH_EA_CAST128	18
3des-cbc	SSH_EA_3DES	17
3des-ctr	SSH_EA_3DES_CTR	16
chacha20-poly1305	SSH_EA_CHACHA20	15
arcfour	SSH_EA_ARCFOUR	14
idea-cbc	SSH_EA_IDEA	13
chacha20-poly1305@openssh.com	SSH_EA_CHACHA20_OPENSSH	12
des-cbc	SSH_EA_DES	11
none	SSH_EA_NONE	10

## Default Key Exchange Algorithms, Non-FIPS

**Note:** The algorithm with highest priority is chosen first, if unsuccessful, the next highest is attempted. The table is ordered by priority.

<a href="#">curve25519-sha256@libssh.org</a>	SSH_KEX_CURVE25519	2147483646
diffie-hellman-group-exchange-sha256	SSH_KEX_DH_GROUP_EXCHANGE256	2147483645
diffie-hellman-group14-sha1	SSH_KEX_DH_GROUP_14	2147483644
diffie-hellman-group1-sha1	SSH_KEX_DH_GROUP	2147483643
diffie-hellman-group-exchange-sha1	SSH_KEX_DH_GROUP_EXCHANGE	2147483642
diffie-hellman-group14-sha256	SSH_KEX_DH_GROUP_14_SHA256	2147483641
ecdh-sha2-nistp521	SSH_KEX_ECDH_NIST_P521	2147483640
ecdh-sha2-nistp384	SSH_KEX_ECDH_NIST_P384	2147483639
ecdh-sha2-nistp256	SSH_KEX_ECDH_NIST_P256	2147483638

## Default MAC Algorithms, Non-FIPS

**Note:** The algorithm with highest priority is chosen first, if unsuccessful, the next highest is attempted. The table is ordered by priority.

chacha20-poly1305@openssh.com	SSH_MA_POLY1305	2147483646
aes256-gcm	SSH_MA_AES256_GCM	2147483645
aes128-gcm	SSH_MA_AES128_GCM	2147483644
hmac-sha2-512	SSH_MA_HMAC_SHA2_512	2147483643
hmac-sha2-256	SSH_MA_HMAC_SHA2_256	2147483642
hmac-sha256@ssh.com	SSH_MA_HMAC_SHA256	2147483641
hmac-sha256-96@ssh.com	SSH_MA_HMAC_SHA256_96	2147483640
hmac-sha1	SSH_MA_HMAC_SHA1	2147483639
umac-128@openssh.com	SSH_MA_UMAC128	2147483638
umac-96@openssh.com	SSH_MA_UMAC96	2147483637
umac-64@openssh.com	SSH_MA_UMAC64	2147483636
umac-32@openssh.com	SSH_MA_UMAC32	2147483635
hmac-sha2-512-etm@openssh.com	SSH_MA_HMAC_SHA2_512_ETM	28
hmac-sha2-256-etm@openssh.com	SSH_MA_HMAC_SHA2_256_ETM	27
hmac-sha256-96@ssh.com	SSH_MA_HMAC_SHA256_96	24
hmac-ripemd160	SSH_MA_HMAC_RIPEMD160	23
hmac-ripemd	SSH_MA_HMAC_RIPEMD	22
hmac-ripemd160@openssh.com	SSH_MA_HMAC_RIPEMD_OPENSSH	21
hmac-sha1-96	SSH_MA_HMAC_SHA1_96	15
hmac-md5	SSH_MA_HMAC_MD5	13
hmac-md5-96	SSH_MA_HMAC_MD5_96	12
none	SSH_MA_NONE	10

**Note:** Please click the table of contents on the left to see the sub-pages to this one. Click the table of contents on the right to see headings on this page.

## SSH Blocked Command Lists

**Important:** This feature is part of the early release of Secret Server 10.11. The general release is not till April 13, 2021 for the on-premises version and between April 3rd and May 15th 2021, depending on region, for the cloud version.

### Overview

Secret Server supports privilege management and command restrictions for UNIX and other platforms with SSH interfaces. Privilege management is an additional layer of access control that you can apply to secrets with SSH launchers over SSH proxy. With privilege management, you can grant users access to a machine to block specific commands that a user may run as root or any other privileged account.

**Note:** To use command restrictions, Secret Server must have SSH Proxy and Enable Block Listing enabled.

With SSH blocked command lists, you can define disallowed commands when connecting as a privileged account. The blocked command list is defined by a series of regular expressions.

Upon launching a secret with an assigned SSH command blocklist, each command sent to the target is evaluated for a match on the blocklist. If the command is found to match a list entry, that command is blocked from execution. Blocked output is shown to the user at the terminal.

### Requirements

System requirements:

- Secret Server 10.11 or later
- Secret Server Platinum Edition license or Secret Server Professional and Unix SUPM license
- SSH proxy must be enabled

## Creating SSH Blocked Command Lists

The format for specifying a blocked command follows a regular expression syntax that is typical to most scripting languages. The blocked commands are surrounded with `\b` word boundary anchors. For example, to block the `sudo` command, you use:

```
\bsudo\b
```

This expression blocks the execution of any command with the `sudo` string in it (as a separate word), for example, these are blocked:

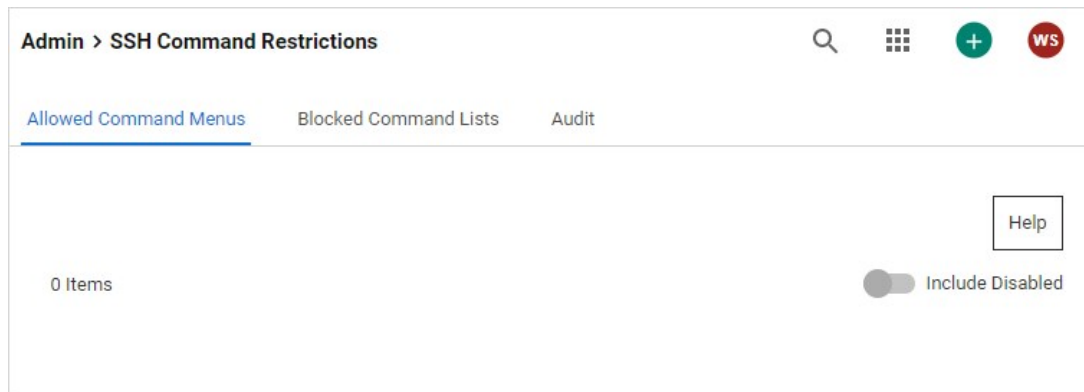
- `sudo`
- `sudo root`
- `sudo ls /usr/local/protected`
- `sudo shutdown -r +15 "quick reboot"`

And these are not:

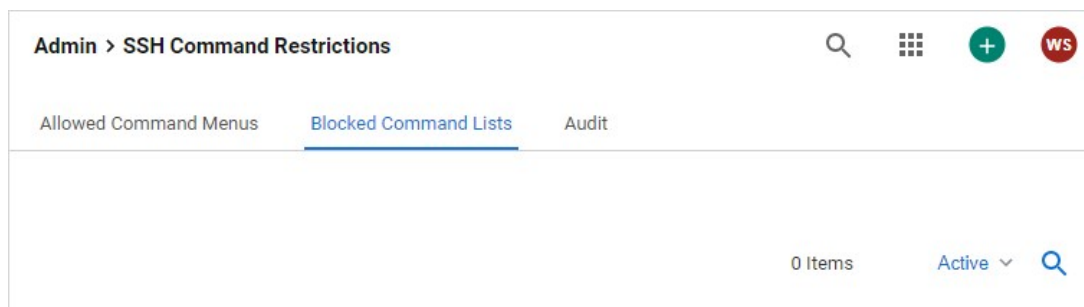
- `cat sudoku`
- `echo "sudo"`

To create a list of blocked commands:

1. Go to **Admin > See All**.
2. Hover the mouse pointer over the **Actions** menu item and select **SSH Command Restrictions**. The SSH Command Restrictions page appears:



3. Click the **Blocked Command List** tab:



4. Click the **Create Blocked Command List** button. The New Blocked Command List page appears:

## New Blocked Command List

Name \*

Prevent superuser commands

Enabled \*

☒

Description

Prevents superuser commands

Blocked Commands \*

Selected Commands (2)

Blocks su commands : \bsu\b

Blocks sudo commands : \bsudo\b

Remove

Remove

Add Commands to Blocked Command List

Search for commands

+ Blocks copy commands : \wcp\b

+ Blocks move commands : \bmv\b

+ Blocks reboot commands : \breboot\b

+ Blocks remove commands : \brm\b

+ Blocks shred commands : \bshred\b

+ Blocks wget commands : \bwget\b

Cancel

Create Blocked Command List

5. Type the list name in the **Name** text box.
6. Ensure the **Enabled** check box is selected.
7. **Either** select a predefined regex from the **Add Commands to Blocked Command List** dropdown list. **Or** add a custom regex of your own:
  1. Scroll to the bottom of the dropdown list.
  2. Click the **Create New Command** link. The Create Command and Add to Blocked Command List popup appears:

**Create Command and add to Blocked Command List**

**Command Name \***

**Command Pattern(regex) \***

1	\\b1s\\b
---	----------

3. Type the name for the command in the **Command Name** text box.
4. Type or paste the regex in the **Command Pattern** text box.
5. Click the **Create and Add** button. The command is added to the dropdown list.
8. Click the **Create Blocked Command List** button.

## Applying SSH Command Blocked Lists in Secret Settings

To enable privilege management for an account:

1. Navigate to a PuTTY secret's **Settings** tab.
2. Go to the **SSH Launcher** section.
3. Click the **Edit** link.
4. Click the **Connect Using** dropdown list and select **Credentials on Another Secret**.
5. Click the **No Secret Selected** link to choose a secret containing your log on credentials, which the launcher uses when logging on the SSH service.
6. Enable command restrictions:
  1. Click the **Security** tab.
  2. Go to the **Other Security** section.
  3. Click the **Edit** link to set **Enable Proxy** to Yes.
  4. Click the **Edit** link for the **Enable SSH Command Restrictions**. The Edit SSH Command Restrictions popup appears:



Edit SSH Command Restrictions

☒ Restrict SSH Commands

☐ Allowed Command Menus

☒ Blocked Command Lists

Owner Permission

Unrestricted

Edit Permission

Admin Command Blocklist

View Permission

User Command Blocklist

Cancel

Save

5. Ensure the Restrict SSH Commands check box is selected.
6. Click to select the Blocked Command Lists selection button.
7. Click the **Owner**, **Edit**, and **View Permission** dropdown lists to map the blocked command lists to users via those permissions. You can also leave them as unrestricted.
8. Click the **Save** button.

SSH Command Restrictions via a Secret Policy

You can apply SSH command restrictions to a secret policy for ease of management. You can apply secret policies to secret folders or directly to a secret itself. To apply command restrictions, set a policy as follows:

**Table:** Secret Policy Security Settings for SSH Command Restrictions

Security Settings	Enable Proxy	Enforced	Checked
Security Settings	Enable SSH Command Restrictions	Enforced	Checked
Security Settings	SSH Command Restriction Type	Enforced	Blocked List
Security Settings	SSH Command Blocklist for Secret Owners	Enforced or Not Set	Desired Block Command List or Not Set
Security Settings	SSH Command Blocklist for Secret Editors	Enforced or Not Set	Desired Block Command List or Not Set
Security Settings	SSH Command Blocklist for Secret Viewers	Enforced or Not Set	Desired Block Command List or Not Set

## SSH Command Menus

Secret Server supports privilege management and command restrictions for UNIX and other platforms with SSH interfaces. Privilege management is an additional layer of access control that can be applied to secrets with SSH Launchers over SSH Proxy. Privilege management gives the ability to grant users access to a machine with specific command restrictions to define the available commands that a user may run as root or another privileged account.

**Note:** To use command restrictions, Secret Server must have SSH Proxy enabled.

With command menus, you can configure predefined commands that users or groups will be able to access when connecting as a privileged account. A command menu is a list of command names mapped to system commands. The format for specifying a command is to separate a name and command with an equals symbol. For example:

```
restart_apache = /usr/sbin/service apache restart
```

You may also use parameters in commands so users can execute more complex commands. For example:

```
move_file = /bin/mv $src $dst
```

You can specify environmental variables by escaping dollar signs in commands. For example:

```
go_home = cd $$HOME
```

Command restrictions currently do not support complex commands, such as multiple commands on one line, piping, or output redirection. To support these functions, you may add a script to the system that has these capabilities and point map the command to that script. We highly recommend that generated scripts have proper user permissions and that the absolute path is used. The absolute path ensures that the correct script is being executed.

Commands may not be named as numbers or one of the following predefined commands:

```
..
up
-help
?
-more
logout
exit
```

To enable privilege management for an account, navigate to a PuTTY Secret's launcher tab and specify the "Connect As" secret that you wish to connect as. When launching this secret, the launcher uses it as credentials to log into the SSH service and then log into the credentials specified on the secret.

To enable command restrictions, navigate to a PuTTY secret's security tab and specify "Enable Proxy" and "Enable SSH Command Restrictions." This gives you the ability to map users and groups to command menus. When the unrestricted command menu is specified for a user, the user is launched into a normal shell environment without command restrictions. Likewise, if the "Allow Owners Unrestricted SSH Commands" option is enabled, the owners of the secret are also launched into a normal shell environment without command restrictions.

When specifying command menus on a secret, at least one command menu must be selected unless "Allow Owners Unrestricted SSH Commands" is enabled.

You can apply command restrictions to a secret policy for ease of management.

## Introduction

SSH IP block listing is a feature that reduces the attack surface of the Secret Server SSH proxy and SSH terminal services.

Enabled by default, the feature adds to a block list any single IP address that fails to authenticate a number of connections across a defined time period. Once on the block list, the client IP is rejected when authenticating, reducing the chances of a successful brute-force credential or denial of service (DOS) attack.

## SSH Block Listing Rules

### Client Override Settings

Client override settings allow creating allow/block lists, and blocked IP administration is provided via IP restriction administration.

Examples:

- A blocked IP is allowed if in a bypass allow-list entry
- A normally unblocked IP is blocked if included in a block list entry

### Default Rules

The defaults are:

- SSH block listing is enabled
- Five connection attempts are allowed in a 30-minute period

That is, any single IP that fails to authenticate five times in any one 30 minute period is added to a permanent block list.

## SSH Proxy Block List Settings

The feature is administered via **Admin > Proxying > SSH Proxy**:

Admin > Proxying			
SSH Proxy	SSH Terminal	SSH IP Restrictions	RDP Proxy
Endpoints	Proxy Audit	Proxy Logs	
SSH Proxy Block List Settings			
<ul style="list-style-type: none"> <li>• SSH Proxy can block incoming clients that connect and fail to authenticate.</li> </ul>	Enable Block Listing	Yes	<a href="#">Edit</a>
	Auto Block Max Attempts	5	<a href="#">Edit</a>
	Auto Block Time Frame (minutes)	30	<a href="#">Edit</a>

SSH proxy block-list settings:

- **Enable Block Listing:** Enable or disable the SSH block listing feature. When enabled, IPs reaching the defined blocking threshold are automatically added to the SSH IP restrictions block list. When disabled, all IP addresses are able to connect and attempt to authenticate an unrestricted number of times.
- **Auto Block Max Attempts:** The maximum failed or unauthenticated connections allowed.

- **Auto Block Time Frame (minutes)**: The period length during which the "Auto Block Max Attempts" must reach before a client IP is added to the block list.

## Client Override IP Address Ranges


You can configure specific IP address ranges to always allow or always block an incoming connection. If allowed, authentication is still required to access the SSH proxy or SSH terminal services.

To add a range:

1. Scroll down on the same tab:

### Client Override IP Address Ranges [Add](#)

- Specific IP address ranges can be configured to always allow or always block the incoming connection



No Items Found

There is no information available to display on this screen.

2. Click the **Add** link. A popup appears:

### Add New Client Override IP Address Range

Range

Examples:

- 192.168.3.12
- 192.168.42.147-192.168.42.194
- 192.168.3.52/22

Client Type

Cancel

Save

3. Type an IP address or range in the **Range** text box. You can use CIDR notation. Examples:
  - 192.168.3.12

- o 192.168.42.147-192.168.42.194
- o 192.168.3.52/22

4. Click the **Client Type** dropdown list to select **Allow List** or **Block List**.

5. Click the **Save** button. Your choices appear:

Admin > Proxying		
SSH Proxy	SSH Terminal	SSH IP Restrictions
Client Override IP Address Ranges <a href="#">Add</a>		
<ul style="list-style-type: none"> <li>Specific IP address ranges can be configured to always allow or always block the incoming connection</li> </ul>		
IP ADDRESS RANGE	CLIENT TYPE	
192.168.0.1/24	BlockList	<a href="#">Edit</a> <a href="#">Delete</a>
10.12.60.1/24	AllowList	<a href="#">Edit</a> <a href="#">Delete</a>

**Note:** These rules have priority over individual IP client settings in the SSH IP restrictions list.

## IP Address Management

### SSH IP Restrictions

Client IP address management is accessed via **Admin > Proxying > SSH IP Restrictions**:

Admin > Proxying		
SSH Proxy	SSH Terminal	SSH IP Restrictions
1 Item <a href="#">Block List</a> <a href="#">Q</a>		
IP ADDRESS	CLIENT TYPE	LAST CONNECTED
<a href="#">10.12.60.106</a>	Block List	9/12/2022 03:36 PM
		<a href="#">Edit</a>

This page lists client IP addresses that were added by a connection exceeding the limits allowed for failed or unauthenticated attempts to one of the proxy endpoints, including any that have been previously reclassified.

The list has a number of built in display filters:

- All
- Allow List
- Block List
- Unknown

Use the search feature to locate specific IP addresses.

### Managing IP Addresses

If an IP address is located on the SSH IP Restrictions page, you can view or edit its current SSH proxy block status. For example, a user may have inadvertently blocked her client IP for a number of reasons, such as testing the connection too many times in a short time period or performing a vulnerability or port scan against the proxy endpoint IP addresses.

**Client Types**

The SSH IP Restrictions page categorizes clients as follows:

Allow List	Yes	Static	These IPs are allowed. Meeting the automatic blocking thresholds will not result in block listing.	Could be useful to allow list a vulnerability scanner. Is overridden by a matching override block list.
Block List	No	Static	These IPs are always blocked.	Is overridden by a matching override allow list.
Unknown	Yes	Dynamic	These are IPs that have previously accessed the SSH proxy and have not met the automatic block thresholds. They are in neither static allow nor block states	This is a client default, even if covered by a override allow or block list.

**IP Address Activity**

The SSH IP Restrictions page allows you to view the connection history for an IP address:

## History

IP ADDRESS	AUTHENTIC...	ENGINE ID	DATE	
10.12.60.106	Failed	56775aa5-cd1b-4f60-b6eb-78529...	2022.09.15. 14:13:11	
10.12.60.106	Successful	56775aa5-cd1b-4f60-b6eb-78529...	2022.09.15. 14:13:04	
10.12.60.106	Successful	56775aa5-cd1b-4f60-b6eb-78529...	2022.09.15. 14:12:25	
10.12.60.106	Successful	56775aa5-cd1b-4f60-b6eb-78529...	2022.09.14. 16:58:10	
10.12.60.106	Failed	56775aa5-cd1b-4f60-b6eb-78529...	2022.09.14. 16:58:04	
10.12.60.106	Successful	56775aa5-cd1b-4f60-b6eb-78529...	2022.09.14. 16:57:57	
10.12.60.106	Successful	56775aa5-cd1b-4f60-b6eb-78529...	2022.09.14. 9:28:08	
10.12.60.106	Successful	56775aa5-cd1b-4f60-b6eb-78529...	2022.09.14. 9:27:25	
10.12.60.106	Failed	56775aa5-cd1b-4f60-b6eb-78529...	2022.09.14. 9:24:28	
10.12.60.106	Successful	56775aa5-cd1b-4f60-b6eb-78529...	2022.09.14. 9:24:19	
10.12.60.106	Failed	56775aa5-cd1b-4f60-b6eb-78529...	2022.09.13. 18:45:03	
10.12.60.106	Successful	56775aa5-cd1b-4f60-b6eb-78529...	2022.09.13. 18:44:36	

Close

This shows the authentication status of each connection attempt, which is especially helpful when troubleshooting SSH terminal connectivity.

### Blocking or Unblocking Client IPs

1. Go to the **SSH IP Restrictions** tab:

Admin > Proxying

SSH Proxy	SSH Terminal	SSH IP Restrictions	RDP Proxy	Endpoints	Proxy Audit	Proxy Logs
-----------	--------------	---------------------	-----------	-----------	-------------	------------

1 Item    Block List    🔍

IP ADDRESS	CLIENT TYPE	LAST CONNECTED	
10.12.60.106	Block List	9/12/2022 03:36 PM	Edit

2. Locate the desired IP address in the list using the filter and search features.
3. Click the **Edit** link to the right of that IP address in the list. A popup appears.
4. Click the **Client Type** dropdown list to select either **Allow List** or **Block List** for the client type.

5. Click the **Save** button.

## Troubleshooting

If a user reports he or she is unable to connect an SSH proxied or tunneled secret launcher for IPs included in the block list, you will see the following logging:

### Secret Server On-Premises

For Secret Server On-Premises where the SSH proxy is on a web-node (IIS):

Path: c:\inetpub\wwwroot\SecretServer\log\SS.log

Message:

INFO Thycotic.SSHProxy.SSHServer - SSHProxy\_Server\_ConnectionReceived INFO Thycotic.SSHProxy.Logic.ConnectionBridge - SSHProxy\_Client\_Stopped\_NoAuth  
WARN Thycotic.SSHProxy.Logic.ConnectionBridge - SSH Proxy host 10.12.60.148:22 refused a connection from client 10.12.60.106:52572 for too many failed authentication attempts. If this was in error, please go to Admin > Proxying, click the SSH IP Restrictions tab and update the Client Type to Allow List for this client IP.

### Distributed Engines

For Secret Server Cloud or On-Premises with a distributed engine:

Path: C:\Program Files\Thycotic Software Ltd\Distributed Engine\log\SSDE.log

Message:

INFO Thycotic.SSHProxy.SSHServer - SSHProxy\_Server\_ConnectionReceived - String[] {10.12.60.148:22, 10.12.60.106:50182} INFO  
Thycotic.SSHProxy.Logic.ConnectionBridge - SSHProxy\_Client\_Stopped\_NoAuth - String[] {}~ WARN Thycotic.SSHProxy.Logic.ConnectionBridge -  
SSHProxy\_Server\_ConnectionRefused - (null) INFO Thycotic.SSHProxy.Logic.ClientToServerConnection - ClientToServerConnection, buffer, and tunnel disposed - (null)



An *SSH jumpbox route*, is a series of regular Linux servers, accessible from the Internet, that is a gateway to other Linux machines on a private network using the SSH protocol. This topic and its subtopics address using jumpbox routes.

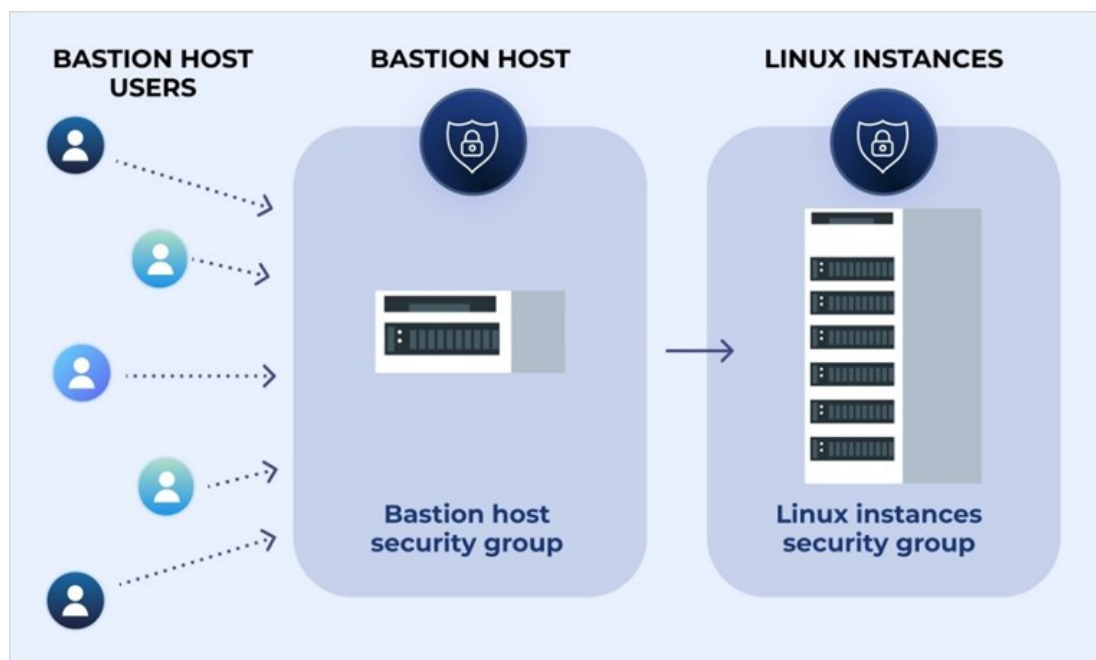
**Note:** SSH jumpboxes are also called *bastion hosts*, *jump hosts*, or *jump box servers*. *Bastion* is a military term meaning *a projecting part of a fortification*. Bastion hosts are hardened and monitored servers that reside outside of an organization's security zone, usually exposed to the internet. All jumpboxes are bastion hosts, but all bastion hosts are not necessarily jumpboxes.

Because SSH jumpboxes usually reside on the Internet, they run a minimum of services to reduce their attack vulnerability. Similarly, limiting the Internet access to your infrastructure to one hardened gateway server also reduces risk. In addition, a dedicated SSH access point makes it easier to have an aggregated audit log of all SSH connections.

With early SSH, users had to SSH into a jump host and then type `ssh` again to manually jump to a destination host. Today, this is done automatically using the built-in SSH -J ProxyJump option.

Secret Server can now create a chain of jumpbox secret connections to reach an otherwise inaccessible Linux instance. This sequence is called a *jumpbox route* and can contain up to 20 jumpbox levels (hops between instances).

**Figure:** SSH Jumpbox Route Setup



## Best Practices for Jumpbox Routes

**Note:** See [SSH Jumpbox Routes](#) for an introduction.

### Overview

This topic discusses configuring an SSH jumpbox route using OpenSSH.

We strongly recommend a dedicated SSH jumpbox without any other publicly accessible software on the machine. Occasionally, multiple jumpboxes (a jumpbox route) may be required to access a target machine that is behind several layers of network security.

### Assumptions

We want:

- The jumpbox to forward SSH connections to our internal hosts. Users must authenticate to the SSH jumpbox and the internal target host. Users need valid credentials for both hosts.
- A single shared user for everyone with no interactive terminal sessions allowed.
- Users to connect to internal target hosts using Secret Server's jumpbox route feature, which uses the jumpboxes as jump route "levels" to ultimately launch a target secret that has this jumpbox route selected.

### Best Practices

We recommend not allowing users to log into a jumpbox directly because they might introduce security issues by:

- Inadvertently updating the jumpbox configuration
- Using the jumpbox machine for unrelated tasks.
- Making copies of cryptographic keys used to access destination servers.

We recommend changing the default TCP port on the SSH jumpbox from 22 to something else.

### Example Setup

The following example uses these conventions:

- The organization domain is example.com.
- The DNS name of the jumpbox is proxy.example.com, which is the only machine accessible from the Internet.

#### Task 1: Launching a New Linux Instance

- Stand up a Linux instance on your cloud provider. We use Ubuntu 20.04 LTS because it is simple, well-supported, and includes the recently released OpenSSH 8.2.
- Set up a firewall or security group policy to restrict connections to the jumpbox to port 22 (SSH).
- Allow connections only from IPs you trust.

#### Task 2: Configuring OpenSSH

- Read and apply [Mozilla's OpenSSH Security Guidelines](#).

**Note:** The guidelines only cover up to OpenSSH 6.7. Most are still relevant to OpenSSH 8.2.

- OpenSSH is bundled by default with most Linux distributions. It is almost certain your Linux machine already has it installed. If the server is accessible via proxy.example.com, clients can access other servers behind the same NAT boundary via the -J command line flag. For instance: `$ ssh -J proxy.example.com 10.2.2.1`

In the example above, the jumpbox is used to access another host on an AWS VPC with an address of 10.2.2.1.

### Task 3: Configuring Public Key Authentication and Disabling Root Logins

#### Configuring the sshd\_config File

In your new jumpbox's `/etc/ssh/sshd_config` file, consider adding the following SSHD config parameters:

```
# Supported HostKey algorithms by order of preference.
HostKey /etc/ssh/ssh_host_ed25519_key
HostKey /etc/ssh/ssh_host_ecdsa_key
HostKey /etc/ssh/ssh_host_rsa_key

# Password based logins are disabled - only public key based logins are allowed.
AuthenticationMethods publickey

# LogLevel VERBOSE logs user's key fingerprint on login. Needed to have a clear audit track of which key was using to log in.
LogLevel VERBOSE

PermitRootLogin no

# Log sftp level file access (read/write/etc.) that would not be easily logged otherwise.
Subsystem sftp /usr/lib/ssh/sftp-server -f AUTHPRIV -l INFO
```

The setup above works only when the public SSH keys are properly distributed, not only between clients and the jumpbox but also between the clients and the destination servers. With these settings, password authentication is disabled.

#### Setting Key Exchange Algorithms, Ciphers, and MACs

Consider which algorithms and key types you want to support. Mozilla recommends the following key types (more restrictive than the OpenSSH defaults):

In `/etc/ssh/sshd_config`, add:

```
KexAlgorithms curve25519-sha256@libssh.org,ecdh-sha2-nistp521,ecdh-sha2-nistp384,ecdh-sha2-nistp256,diffie-hellman-group-exchange-sha256
Ciphers chacha20-poly1305@openssh.com,aes256-gcm@openssh.com,aes128-gcm@openssh.com,aes256-ctr,aes192-ctr,aes128-ctr
MACs hmac-sha2-512-etm@openssh.com,hmac-sha2-256-etm@openssh.com,umac-128-etm@openssh.com,hmac-sha2-512,hmac-sha2-256,umac-128@openssh.com
```

### Task 4: Disabling Forwarding

Next, harden the server configuration by disabling interactive SSH sessions on the jumpbox for regular users, leaving it turned on for the administrators. To do this, update the sshd configuration `/etc/ssh/sshd_config` with the following:

```
# Do not let SSH clients do anything except be forwarded to the destination:
AllowAgentForwarding no
AllowStreamLocalForwarding no
X11Forwarding no
```

If you only have a few users, consider creating a separate user account on the jumpbox dedicated to "jumping users." For example, call it "jumpuser" and update the configuration `/etc/ssh/sshd_config`:

```
Match User jumpuser
  PermitTTY no
  X11Forwarding no
  PermitTunnel no
  GatewayPorts no
```

## Task 5: Changing the Default SSH Port

If you do not want to restrict access by IP address in your security group rules, consider changing your default SSH port. This will deter many basic bots.

In `/etc/ssh/sshd_config`, add Port 37271.

## Task 6: Testing Configuration and Restarting SSHD Service

You can test your configuration with `sshd -t`, then restart the SSHD server. Make sure you can still ssh into the machine before you continue!

## Task 7: Send Your Users' SSH Keys to the Jumpbox

Add the jump user's public keys to the `/home/jumpuser/.ssh/authorized_keys` file. These keys can be stored in Secret Server and used during the Jumpbox Route launch session.

## Using Bastion Hosts with Secret Server and Jumpbox Routes

Please see [Creating and Testing Secrets for Jumpbox Routes](#).

## References

Johnson, Brian. "How to Create a Bastion Host I Part 1 of a Step-by-step Tutorial." *Strongdm*, 25 March, 2021, <https://www.strongdm.com/blog/bastion-hosts-with-audit-logging-part-one>, Accessed 12 October, 2021

Kontsevov, Ev. "How to Set Up an SSH Jump Server." *Teleport*, 30 March, 2021, <https://goteleport.com/blog/ssh-jump-server/>, Accessed 12 October, 2021

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## Creating and Testing Secrets for Jumpbox Routes

### Overview

This topic shows how to create secrets used for jump server routes by way of an extended example.

**Note:** Please see [Best Practices for Jumpbox Routes](#) for creating hardened jump servers for use in jump server routes.

We use following scenario:

A target Ubuntu host is only accessible via an SSH proxyjump directive. The sequence is Secret Server to bastion01.thycotic.com to bastion02.thycotic.com to remote-hostname.thycotic.com, the target Ubuntu host.

As suggested in the **Bastion Design Best Practices** guide:

- Both bastion hosts 01 and 02 have changed their default SSH ports for all incoming connections to 2222 and 3333, respectively.
- Both use a single jump user, betty on bastion01 and wilma on bastion02.
- Both users have SSH public key authentication enabled and have an `/home/<username>/.ssh/authorized_keys` file storing all the public keys.

You can connect to the target server without Secret Server from any SSH client using the following SSH command, with the built-in SSH ProxyJump directive `-J` and defined aliases:

```
$ ssh -J <jumpbox1>, <jumpbox2> <remote-host-target>
```

...with local `~/.ssh/config` aliases configured this way:

```
### First Jumpbox
Host jumpbox1
  HostName bastion01.thycotic.com
  Port 2222
  User betty
  IdentityFile /home/betty/.ssh/jumpbox1_ssh_rsa
```

```
### Second Jumpbox
Host jumpbox2
  HostName bastion02.thycotic.com
  Port 3333
```

To replicate this jump scenario using Secret Server, we need to create three new secrets and a new jumpbox route, and then assign that route to the target secret. Once that is done, launching the remote-host-target secret is as simple as clicking the PuTTY launcher icon—the jumpbox route is automatically set up for you.

### Task 1: Creating Jumpbox and Target Host Secrets

**Note:** All three connections require SSH public key authentication.

1. Create a new secret based on the Unix Account (SSH Key Rotation) template with these particulars:
  - Secret name: bastion01
  - Machine: bastion01.thycotic.com
  - Username: betty
2. Upload or generate the private/public key pair. Set a passphrase if necessary.
3. If the key pair is generated, save the public key on the secret to the user's `/home/betty/.ssh/authorized_keys` file on the jumpbox.
4. Create a second new secret also based on the Unix Account (SSH Key Rotation) template with these particulars:
  - Secret name: bastion02

- Machine: bastion02.thycotic.com
  - Username: wilma
5. Upload or generate the private/public key pair. Set a passphrase if necessary.
  6. If the key pair is generated, save the public key on the secret to the user's `/home/wilma/.ssh/authorized_keys` file on the jumpbox.
  7. Create a third new secret also based on the Unix Account (SSH Key Rotation) template with these particulars:
    - Secret name: remote-host-target
    - Machine: remote-hostname.thycotic.com
    - Username: remote\_user
  8. Upload or generate the private/public key pair. Set a passphrase if necessary.
  9. If the key pair is generated, save the public key on the secret to the user's `/home/remote_user/.ssh/authorized_keys` file on the target host.

## Task 2: Creating a Jumpbox Route with Secret Levels

**Note:** See [Creating and Editing Jump Server Routes](#) for more on creating jumpbox routes.

1. Create a new jumpbox route named flintstone.
2. For level 1, select the bastion01 secret and choose 2222 as the port.
3. For level 2, Select the bastion02 secret and choose 3333 as the port.

## Task 3: Assigning a Jumpbox Route on the Target Secret

1. Open the remote-host-target secret.
2. Ensure SSH proxying is enabled (Security > Enable SSH Proxy) on the secret.
3. Navigate to the secret's **Settings** tab.
4. Scroll down to edit the **Jumpbox Route** section.
5. Select the **Flintstone Route** in the drop-down.
6. Save your changes.

## Task 4: Test Launching the Target Secret with PuTTY Launcher over SSH Proxy

1. Open the remote target secret.
2. Click the **General** tab.
3. Click the **PuTTY Launcher** link to begin a new SSH proxy session with a jump server route. The launcher connects to the target via the jump server route:

```
toor@dev-ssh-client01:~
Using username "30005f3e-6ca2-441e-aac5-35be56f9d9ef".
Keyboard-interactive authentication prompts from server:
End of keyboard-interactive prompts from server
Pre-authentication banner message from server:
| Welcome to Thycotic SSH Proxy!
End of banner message from server

Connecting to target through jumpbox route...
Successfully connected to jumpbox level #1. Forwarding to local port: 17392
Successfully connected to jumpbox level #2. Forwarding to local port: 17365
Jumpbox route complete. Connecting to target [toor@10.61.10.200:22]...

Last login: Tue Oct 12 14:50:44 2021 from 10.60.23.141
[toor@dev-ssh-client01 ~]$
```

## Task 5: Test Launching the Target Secret with SSH Terminal

1. Note the secret ID of your remote target secret.
2. Using an SSH client, log in to SSH Terminal. See [SSH Terminal Administration](#) for details.
3. Enter `cat <secret id>` to view the remote target secret's details:

```
THY-01-0325-LT.testparent.thycotic.com - PuTTY
launch - begin SSH Proxy session using credentials on specified Secret
man - an interface to the on-line reference manuals
search - search for Secrets by keyword
exit - exits this terminal session
clear - clears the screen
[j@c.com@127.0.0.1 ~] $ cat 79
Secret Name:    remote-host-target
Secret ID:      79
Secret Type:    Unix Account (SSH Key Rotation) [ID:6029]
Folder:         \Launchers\Jumpbox Route (19)
SSH Key:        *****
Machine:        remote-hostname.thycotic.com
Username:       remote_user
Password:       *****
Private Key:    *** Not Valid For Display ***
Private Key Passphrase: *****
Public Key:     *** Not Valid For Display ***
SECURITY
  Restrict SSH Commands:  disabled
  Session Recording Enabled: False
-----
LAUNCH INSTRUCTIONS
Can be launched with Terminal command:

launch 79

-----
Jumpbox Route: Flintstone Route (ID: f89f35b2-0934-4b44-898c-80802d630efc)
SSH Key Secret: on the Secret (if available)
Connect as Secret: Credentials on the Secret
[j@c.com@127.0.0.1 ~] $
```

4. Enter `launch <secret id>` to launch the remote target secret with a jumpbox route:

```
[j@c.com@127.0.0.1 ~] $ launch 74
Secret Server Launch: Secret ID 74 found. Attempting launch...

Connecting to target through jumpbox route...
Successfully connected to jumpbox level #1. Forwarding to local port: 16634
Successfully connected to jumpbox level #2. Forwarding to local port: 18676
Jumpbox route complete. Connecting to target [toor@10.61.10.200:22]...

Proxy shell tunnel to target opened. Attempting to connect...
Last login: Tue Oct 12 13:00:29 2021 from 10.60.23.141
[toor@dev-ssh-client01 ~]$
```

5. You should now be connected to remote-hostname.thycotic.com as remote\_user.
6. Enter exit to return to the terminal.



## Creating and Editing SSH Jumpbox Routes

**Note:** See [SSH Jumpbox Routes](#) for an introduction.

### Introduction

You can add jumpbox routes to Unix secrets when SSH proxying is enabled. A jumpbox route assigned to a target secret specifies a series of Unix servers called *jumpboxes*, *jumpbox servers*, or *bastion hosts*. The proxied connection is forwarded through the jumpbox route before reaching the server specified in the target secret.

### Prerequisites

Using jumpbox routes requires these prerequisites:

- Only use Unix servers and secrets: At this time, jumpbox routes are only supported by Unix secrets. The option to add a jumpbox route does not appear on any target secret that is not based on the Unix secret template. Similarly, a jumpbox route that attempts to connect to jumpbox servers that do not use a Unix secret template will also fail.
- Enable SSH proxy on Secret Server: For more information on how to enable proxying on Secret Server, see [SSH Proxy Configuration](#).
- Enable the SSH Proxy setting for the target secret using a jumpbox route: To assign a jumpbox route to a target secret, the target secret itself must have SSH proxying enabled. The enable SSH Proxy check box appears in the secret's Security tab if proxying is enabled on Secret Server itself.

### Permissions

Using jumpbox routes requires these permissions:

- Adding a jumpbox route to a target secret: A user must have owner permissions on a secret to assign, change, or remove that secret's jump server route. Additionally, users are only able to pick from a list of routes where they have at least list permission on the first jump route server.
- Editing Jumpbox Routes: Users must have the "Administer Jumpbox Route" permission to create, edit, or deactivate jump server routes. Users with the "View Jumpbox Route" permission can view the details of all jump server routes in the Admin Jumpbox Route page, but they cannot make any changes.

### Creating, Editing, and Deactivating Jumpbox Routes

1. Go to **Admin > See All**.
  2. Search for and select **Jumpbox Routes**. The Jumpbox Routes page appears:
-

Custom URL needs to be defined as it is used to build links in email. ×

**Admin > Jumpbox Routes** Q ⋮ + JC

Configure Jumpbox Routes in order to select which machines and networks are used as intermediaries between the user and the target secret. Permissions to assign to Secret are based off having List permission on the Level 1 Secret in the Route.  
[Learn More](#)

2 Items Active ▾ Q Create Jumpbox Route

NAME	↑	DESCRIPTION	ACTIVE	⋮ ↓
Router Network		Contains router machines for providing VPN access	Yes	
Secure DC Route		Contains server machines off the main lan network	Yes	

This page lists all existing jumpbox routes.

3. Select an existing route to edit or create a new route by clicking the **Create Jumpbox Route** button.
4. If you chose to create a new route, a popup appears. Type the name and description and click the **Create Jumpbox Route** button.
5. In either case, the Jumpbox Routes page appears for the new or edited route:

Custom URL needs to be defined as it is used to build links in email. ✕

**Admin > Jumpbox Routes > Router Network** 🔍 ⌵ + JC

General Audit

**Jumpbox Route Status** [Edit](#)

Disable a route to prevent it from being used. Active Yes

**Jumpbox Route Details** [Edit](#)

Configure Jumpbox Routes in order to select which machines and networks are used as intermediaries between the user and the target secret. Permissions to assign to Secret are based off having List permission on the Level 1 Secret in the Route.

<b>Route Name *</b>	Router Network
<b>Route Description</b>	Contains router machines for providing VPN access

**Jumpbox Route Levels**

Each level represents a bastion host used in the jumpbox route. Ports must be specified at each level. Permissions of the Jumpbox Route are based on the Level 1 Secret. Users need List on the Level 1 Secret to assign to the Secret on the Secret Settings tab.

2 Items [Add Level](#)

ORDER	↑	PORT	SECRET	⌵
1		22	Custom Lau...	
2		22	runscripts@...	

- Note that routes can only be deactivated, not deleted, in the **Jumpbox Route Status** section.
- You can view or edit the the route's jump servers in the **Jumpbox Route Levels** section. Each row in the grid represents a *level*, each of which has these attributes:
  - Secret: Each level contains one secret that represents a jump server.
  - Port: The port used on the jump server for the route. Choose an available port on which the server listening for SSH connections. Typically, this is port 22, but we recommend changing it to deter basic script bots, see [Best Practices for Jumpbox Routes](#) for more information.
 

**Note:** This value overrides any port specified on the secret.
  - Order: The sequence of jumpboxes forwarding the proxied connection, starting with 1. You can hover over any level to present a handle for dragging it to reorder the list.
- Click the **Add Level** hyperlink to add a jumpbox to the route. An Add Level popup appears.

9. Select or type your desired port in the **Port** list box.
10. Click the **No Secret Selected** hyperlink to choose the secret for the new level (server).
11. Click the **Save** button.
12. Hover over any level to present a handle (on the left) for dragging the level to reorder the list.
13. Hover over any level to present an ellipsis icon (on the right).
14. Click the icon and choose **Edit** or **Delete** to change or remove the level. You can change the port or related secret. Deletion permanently removes the level from the jumpbox route. It is not deactivated as with the route itself.

## Assigning a Jumpbox Route to a Secret

1. Select or create a Unix secret for the route. Ensure that proxying and all other prerequisites described above are met.
2. Navigate to the secret's **Settings** tab and go to the **Jumpbox Route** section.

CentOS Test Server ☆

General

Security

Audit

Remote Password Changing

Dependencies

Sharing

Settings

Metadata

Email Notifications [Edit](#)

Choose your personalized email settings for this specific Secret.

Send Email When Viewed

No

Send Email When Changed

No

Send Email When Heartbeat Fails

No

SSH Launcher [Edit](#)

Configure your settings when launching SSH for this Secret.

Connect Using

Credentials on this Secret

Jumpbox Routes [Edit](#)

Choose a Jumpbox Route for this Secret.

Jumpbox Route

No Jumpbox Route

3. Click the **Edit** hyperlink. The section becomes editable:

### Jumpbox Routes

Choose a Jumpbox Route for this Secret.

Jumpbox Route

No Jumpbox Route

Cancel

Save

- Click to select the desired jumpbox route from the drop-down. Only active jump server routes to which you have access are visible. You can unassign the jumpbox route by selecting **No Jumpbox Route** in the dropdown list.

**Note:** If the jumpbox route becomes deactivated, "Router Network (inactive)" appears in the Jumpbox Route dropdown list. You should select a new one.

**Note:** You can also assign jumpbox routes through a secret policy. See [Creating Secret Policies](#).

## Global Jumpbox Settings

The **Admin > Proxying** page has these jumpbox settings that impact your jumpbox routes:

- **Tunnel Keep Alive:** This setting is to stop intermediaries (such as firewalls or proxies) from deeming your connections inactive and timing them out and closing them. The default is 50 seconds (just shy of a common timeout setting). Adjust this to be just short of your network's timeout setting. Type 0 to disable the setting.
- **Available Port Range:** This sets the port range for the SSH proxy endpoint for jumpbox forwarding. Type a range separated by a hyphen, such as 10000-15000. The ports are used for local port forwarding for jumps. You cannot use the ports for other processes, so we recommend using a high range (ports above 10000).

The Secret Server proxy routes SSH and RDP sessions and helps protect the endpoint credentials. There are two configuration options for proxying:

- Proxy through the Secret Server Web application
- Proxy through a distributed engine

**Note:** To learn more about RDP Proxying, please see [RDP Proxy Configuration](#).

## Enabling Proxy

1. Go to **Admin > Proxying**.
2. Enable **SSH Proxying**.
3. Generate a new key.
4. To enable proxying on Web nodes, edit the row in the **Endpoints** tab to set the **Public Host** and **Bind IP Address**. For a standard server, these can be the same, but if the public IP of the server is not set on the server (such as a load balancer or an EC2 instance with an elastic IP), they will be different.
5. To enable proxying for a specific site and all engines within that site, edit the row in the **Sites** section and enable proxying and set the **SSH Port**.
6. The engines for the sites are listed in the **Engines** section. The **Hostname/IP Address** is the public host or IP the launcher connects to and the **SSH Bind Address** is the IP on the server that the SSH proxy is listen on. Again, these will typically be the same, but may be different if the resolvable IP or host of the engine machine is different than the IP on the network adapter on the machine.
7. Enable proxying on a secret with a PuTTY launcher. The launcher now connects to the assigned site, which is set on the **General** tab. If the site has proxying enabled, it will go through the engines available in the site, otherwise it will use the Secret Server Web application proxy.

## Web Application Proxy Performance

### Minimum Hardware

- Intel 3.7 GHz Quad Core
- 16 GB of RAM
- 100 MB/s plus network capability

### Session Activity

We tested sessions with standard usage, such as opening and modifying files and navigating the file system on Linux. On Windows, the activity was opening MMC snap-ins, editing files, and copying files through the RDP session. If you have constant large file transfers across multiple concurrent sessions or otherwise transferring large amounts of data (such as streaming a video through an RDP session), the maximum concurrent sessions will be significantly reduced.

**Table:** Concurrent Proxy Sessions

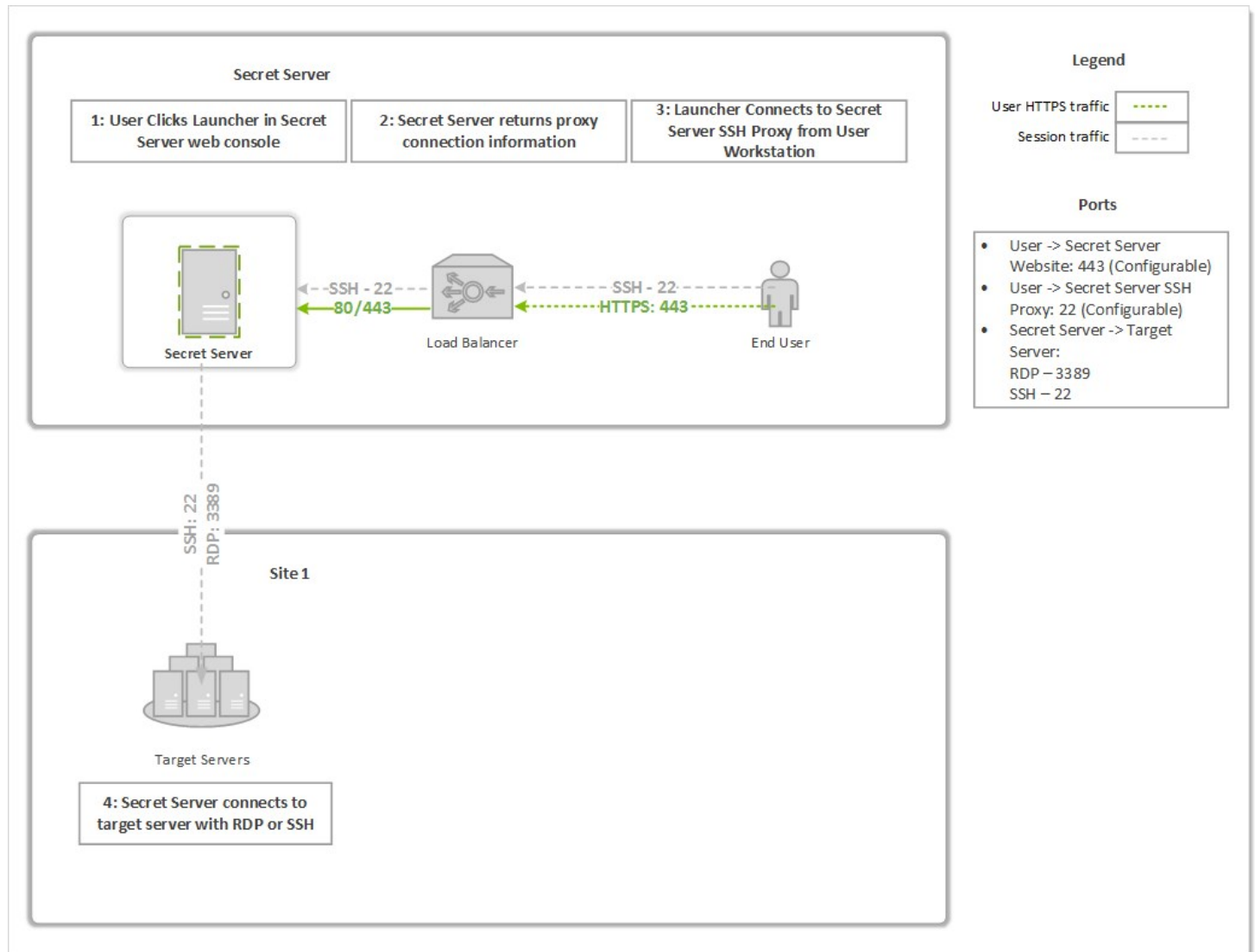
SSH	300
-----	-----

RDP	100

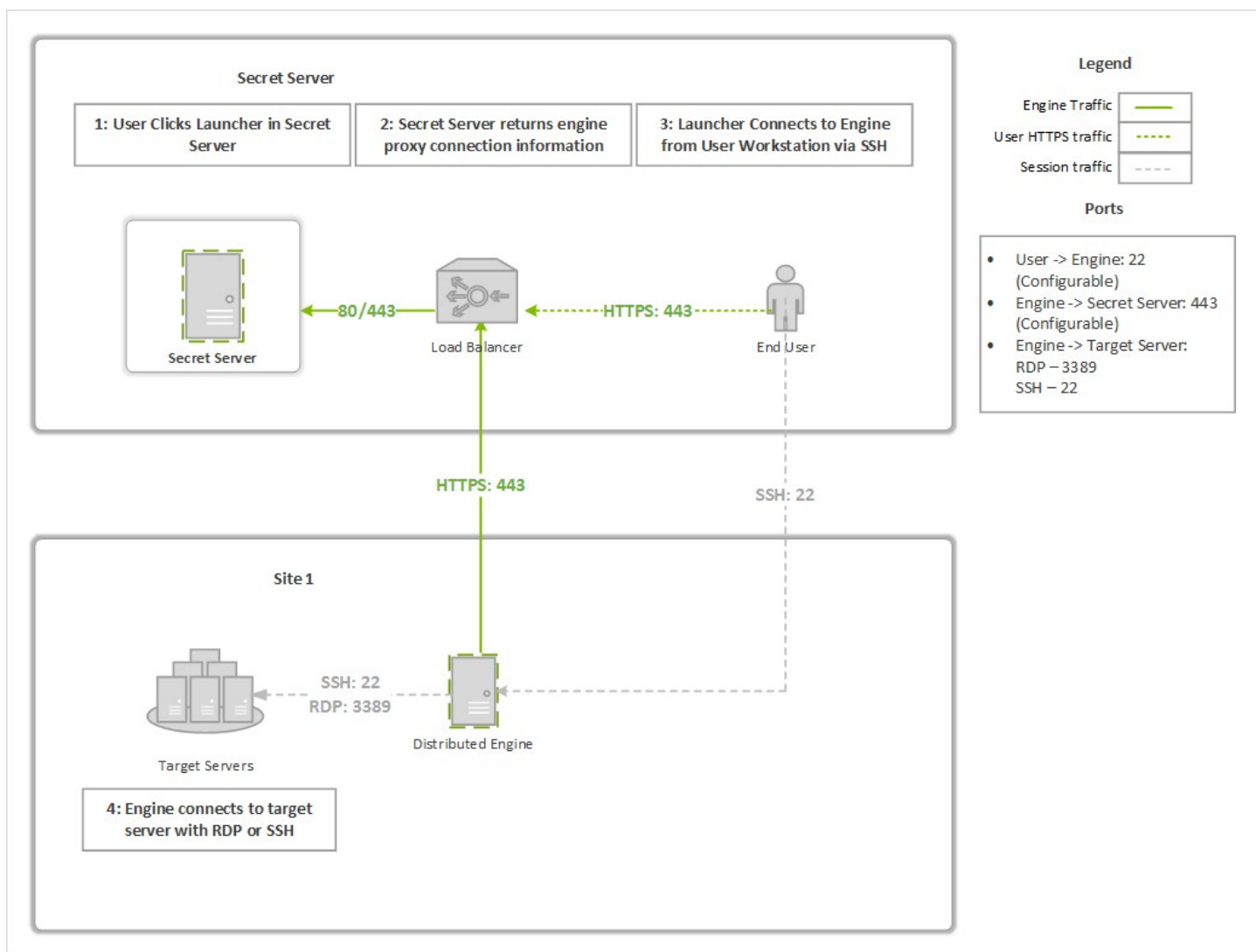
## Proxy Connections

Connections from the user to the proxy are over SSH, and you can configure the port. The user's machine will connect to either an engine SSH proxy or the Secret Server Web application SSH proxy.

**Figure:** Default Secret Server Web Application Proxy (example)



**Figure:** Proxy through a Distributed Engine (example)



## SSH Proxy with Multiple Nodes

If you are using clustering with Secret Server, you can pick exactly which of your nodes act as a SSH proxy by going to the **Admin > Proxying** page and scrolling down to the **Nodes** section. For each node you wish to be a proxy, configure the **SSH Public Host** (must be an IP address, not a DNS name) and the **SSH Bind IP Address** (use 0.0.0.0 to easily bind to all IPv4 Ps on a server). There is no need to configure all nodes if you do not want them all to be proxies.

As soon as the IPs are saved for each node, the node should start listening on the SSH proxy port. You can verify that with netstat. If you do not see the node listening on your chosen port, perform an IIS reset and hit its Secret Server website. It should be listening once Secret Server starts up again. For example:

```
C:\Users\Administrator>netstat -ano | find ":22"
TCP 0.0.0.0:22 0.0.0.0:0 LISTENING 3600
```

Now, when a user connects to the Secret Server Web page, if the node they are hitting is setup to be a SSH proxy, they will connect to that node's SSH public host IP. If the node they are connected to is not setup to be a SSH proxy, then users will round robin between the other nodes that are SSH proxies and connect to their SSH public host IP.



## Introduction

This document discusses using an SSH terminal with Delinea Secret Server.

## Feature Summary

- Connect using SSH to a terminal hostname and port to log in to terminal and run commands
- Display custom terminal banner after successful connection
- Display available commands on successful login (display again with `man` command)
- Log in to the terminal as a Secret Server user (SSH Proxy must be enabled)
- Can set an inactivity timeout. Can be set to *disabled* or with a two-minute minimum.
- Start a terminal connection and launch in a single line. For example:  

```
ssh <user>@<ss_ip> -t launch <secret_id>
```
- Use two-factor authentication (2FA) for access (optional)
- Use the SSH terminal interface to Secret Server for viewing and launching secrets
- Use these commands:
  - `Man` command to display detailed command description
  - `Search` command to display matching secrets
  - `Cat` command to display secret details of with specified secret ID
  - `Launch` command to begin a Proxy launch session with specified secret ID
- Use up and down keystrokes for command history
- Supports custom SSH command menus and session recording logging

## Requirements

### System Requirements

- Secret Server 10.7.000000 Secret Server
- Secret Server **Professional** or **Platinum** Edition license

### Recommended

[RabbitMq Site Connector](#)

### Secret Server Permission Requirements

Admin:

- Administer Configuration
- Administer Proxying Configuration
- View Configuration
- View Proxying Configuration

User: View Secret

## Configuring SSH Terminal

### Enabling SSH Terminal on Secret Server

1. Prerequisites:
  - Must meet Admin permission requirements (see [Secret Server Permission Requirements](#))
  - Secret Server **Professional** or **Platinum** Edition license
2. Navigate to **Secret Server > Admin > Proxying**.

#### SSH Proxy Configuration


[Explain](#)

##### SSH PROXY SETTINGS

Enable Proxy	Yes
Enable SSH Tunneling	Yes
Proxy New Secrets By Default	Yes
SSH Banner	Welcome to Secret Server
SSH Proxy Host Fingerprint	SHA1 - 50:2d:99:d9:f3:2a:b8:9d:68:b4:9e:a5:2b:a2:9a:18:2f:b8:bf:61 MD5 - 04:9e:8b:44:f1:ed:5b:fd:e1:18:79:9c:9c:fb:66:41
Enable Inactivity Timeout	No

##### SSH TERMINAL SETTINGS

Enable Terminal	No
-----------------	----

 Edit

3. Click the **Edit** button.
4. Type your SSH proxy configuration settings (see [Configuring SSH Proxies for Launchers](#)):
  1. Enable **SSH Proxy** (required to use SSH terminal).
  2. (optional) Enable **Proxy New Secrets by Default**.
 

**Note:** To launch a secret via the terminal, the secret must have proxy enabled. Only SSH-based credentials can be launched in the terminal.
  1. Click to enable **SSH Terminal**.
  2. (optional) Customize the **Terminal banner** for your environment.
  3. (optional) Click to enable **Terminal Inactivity Timeout** (in seconds).
  4. The resulting settings should look something like this:

SSH PROXY SETTINGS

Enable Proxy	Yes
Enable SSH Tunneling	No
Proxy New Secrets By Default	Yes
SSH Proxy Port	22
SSH Banner	Welcome to Secret Server SSH Proxy
SSH Proxy Host Fingerprint	SHA1 - 13:a8:b4:93:b9:17:11:02:18:5f:7c:5c:56:e9:3f:c7:c1:1d:9a:8e MD5 - d5:f8:7f:85:a0:db:d8:6d:b1:44:3c:20:10:bc:d7:66
Enable Inactivity Timeout	No

SSH TERMINAL SETTINGS

Enable Terminal	Yes
SSH Terminal Banner	===== WELCOME TO THYCOTIC TERMINAL (ThyTTY) =====

Edit

1. Specify the IP address for nodes (and engines) that will run SSH proxy:

1. Navigate to **Admin > Proxying > Nodes**.
2. Set the **SSH Public Host**. This is the public hostname or IP that the client launcher connects to. In most cases, this is the same as the SSH bind address; however, there are cases where the public IP or host differs from the private IP that Secret Server should bind to, such as NAT or Amazon EC2 instances.
3. Set the **SSH Bind IP Address**. This defaults to (0.0.0.0). The IP Address of the network adapter that the Secret Server SSH listener should bind to. This should not be localhost or 127.0.0.1. If you are not sure which bind IP address to use, you may use 0.0.0.0, which binds to all IPv4 interfaces on the machine.

## Enabling Terminal on Secret Server Distributed Engine

SSH terminal can also run on each proxy-enabled distributed engine (DE) site.

**Note:** To launch secrets on non-local sites, users **must** connect to an SSH terminal over an engine on this site.

1. Go to **Admin > Proxying > Sites**.
2. Click to select **Proxy Enabled**.
3. Type an **SSH Port**.
4. Go to **Admin > SSH Proxy > Engines**.
5. Type the **Hostname** and **IP Address** (description above).
6. Type the **SSH Bind Address** (description above).

## Logging into the SSH Terminal

1. From any SSH terminal, connect to hostname or IP address and port, as specified in the SSH Proxy Configuration page. Use the DE

hostname or IP if connecting to an engine. Examples:

```
ssh 127.0.0.1 -p 22
```

```
ssh user54@127.0.0.1 -p 22
```

2. If not provided in the SSH connect command, enter your Secret Server username and password at the **Login as:** prompt.
3. If successful, you will see the terminal banner displayed, along with a list of available commands.

## Increasing Maximum Concurrent Logins for Users

Logging in to SSH terminal counts against the number of concurrent Secret Server sessions a user is allowed. For example, if **Maximum concurrent logins per user** is set to "1" and the user john.smith is logged into the Secret Server Web user interface, then john.smith logs into SSH terminal, his first Web session will end, and he will have to log in again to use the Web user interface.

To increase the maximum concurrent logins per user:

1. Go to **Admin > Configuration**. The Configuration page appears.
2. Click the **Login** tab.
3. Click the **Edit** button at the bottom of the page. The page becomes editable.
4. Click the **Maximum concurrent logins per user** dropdown list and select the desired number.
5. Click the **Save** button.

## SSH Terminal Login with Two Factor Authentication

SSH terminal is considered a Web service and can be used with two factor authentication (2FA). To enable 2FA for terminal:

1. Follow the steps under [Two-Factor Authentication](#) to set up 2FA.
2. Go to **Admin > Configuration > Login > Require Two Factor for these Login Types** and select one of these:
  - **Website and Web Service Login**
  - **Web Service Log on Only**
3. Enable 2FA on the Secret Server user by going to **Admin > Users > Select a user > Edit > Two Factor** and select the 2FA option.

**Note:** FIDO2 authentication is not supported in this version of SSH terminal.

4. From any SSH terminal, connect to hostname or IP address and port, as specified in the SSH Proxy Configuration page. Use the distributed engine hostname or IP if connecting to an engine. Examples:

```
ssh 127.0.0.1 -p 22
```

```
ssh username@127.0.0.1 -p 22
```

5. If not provided in the SSH connect command, enter your Secret Server username and password at the **Login as:** prompt.
6. You will be prompted for a PIN or custom challenge message by your 2FA provider. Example:

```
login as: duouser <Enter>
```

Using keyboard-interactive authentication:

```
duouser@127.0.0.1's password: uewori#$$%tdtd <Enter>
```

Using keyboard-interactive authentication:

Pin Code: 3787 <Enter>

7. If successful, you will see the terminal banner displayed, along with a list of available commands.

## Escaping Special Characters

When manipulating secrets containing special characters, such as single quotes and double quotes, you must escape those characters in the command.

Example: To search for an item with a space in the name, put the name in single or double quotes:

```
search "My Secret" Or search 'My Secret'
```

Example: To search for an item with a single quote embedded in the name, there are two options:

- Encase the term in double quotes:

```
search "Bob's Secret"
```

- Escape the single quote with a backslash:

```
search 'Bob\'s Secret'
```

Example: Similarly, to search for an item with a double quote embedded in the name, there are two options:

- Encase the term in single quotes:

```
search "'Weird' Secret"
```

- Escape the internal double quotes with a backslash:

```
search "\"Weird\" Secret"
```

## Terminal Commands

### man

#### Syntax

```
man [command name]
```

#### Description

Displays command help for specific or all commands. *Man* is short for *manual*.

#### Examples

```
man
```

Short help for all commands.

```
man cat
```

A detailed description of the `cat` command.

### search

## Syntax

```
search [-st] <search_text> [-f <folder_id>] [-fav] [-r] [-sf <search_field>] [-skip <skip_results>] [-s] [-t <secret_template_id>] [-take <max_results>]
```

## Description

Returns a list of Secret Server secrets by keyword, which you can filter using several command-line switches.

## Parameters

**-st <search\_text>**

Required. Text to search for. -st is optional. Returns 25 results by default. Use -take to change from the default.

**-f <folder\_id>**

ID of the secret folder to limit the search to.

**-fav**

Only search "favorite" secrets.

**-r**

Ignore restricted secrets in the search. Restricted secrets are included by default.

**-s**

Ignore subfolders in the search. Subfolders are included by default.

**-sf <search\_field>**

ID of the secret field to limit the search to. Potential fields, which vary by secret template, can include the following examples:

- Address1
- Address2
- Address3
- Blog
- CardType
- City
- Combination
- Contact Number
- Country
- Email Address
- ExpirationDate
- Fax
- First Name
- FullName
- Home Phone
- Last Name
- Machine
- Mobile Phone
- Notes
- Number
- Password
- Pin
- PinCode
- Server

- SSN
- State
- Username
- Website
- Work Phone
- Zip

**Note:** These fields match those on the REST API endpoint.

`-skip <skip_results>`

Skip this number of initial results. Useful for processing "pages" of results.

`-t <secret_template_id>`

Only search secrets based on the template with this template ID.

`-take <max_results>`

Take a total of only this number of results. Useful for processing "pages" of results. Defaults to 25 results.

## Examples

`search -st admin`

Find a list of secrets matching "admin." Returns 25 results (the default).

`search admin`

Same search using alternate syntax. `-st` is not required.

`search -st jones -fav`

Find a list of "favorite" secrets matching "jones" in any field Returns 25 results (the default).

`search admin -take 50`

Outputs a list of secrets matching "admin", up to 50 results.

`search ZardoZ -take 50 - skip 50 -sf "Secret Name"`

Find a list of secrets with "ZardoZ" in the "Secret Name" field. Return 50 results, starting with the 51st secret found.

`search admin -skip 25 -r`

Find a list of secrets matching "admin" in any field. Return 25 results, which is the default. Skip the first 25 results. Ignore restricted secrets.

## cat

### Syntax

`cat [-sl-idl-secret-id] <secret_id> [-cl-comment <comment_or_access_request>] [-tl-ticket <ticket_number>] [-ticketsystemid <ticket_system_id>]`

### Description

- Displays information on a secret. The available information depends on the secret's template. *cat* is short for *concatenate*.
- Catches access errors, such as "comment required" or "requires approval", and displays them on the terminal
- Audits "view" comments.

- Provides launch connection command instructions. Shows the correct launch parameter and a connection string (if the terminal connection and the site on the secret do not match).

**Note:** If a required access element is not provided in the command, the terminal will respond with an error that should indicate what is missing.

## Parameters

`[-sl-idl-secret-id] <secret_id>`

Required. The secret ID. Three optional switches.

`[-cl-comment <comment_or_access_request>]`

The text for the comment or access request.

`[-tl-ticket <ticket_number>]`

The ticket number for the request.

`[-ticketsystemid <ticket_system_id>]`

The unique ticket system ID.

## Examples

```
cat 24
```

Display the contents of the secret with the ID 24. Only works after access is approved.

```
cat -id 24
```

Alternate syntax. Display the contents of the secret with the ID 24.

```
cat -id 25 -comment "Viewing this secret"
```

Add a "view" comment to, and then display the contents of the secret with the ID 25.

```
cat -id 26 -comment "Requesting view access to install software" -ticket 123 -ticketsystemid 2
```

Add an "access request" comment to the secret with the ID 26. Assign the request the ticket number 123 and the ticket system ID of 2 to that request.

**Note:** The most common secret restrictions are "requires view comment" or "requires access request." The `-comment` parameter takes care of both of these because the underlying API call (`SecretAccessCreateArgs`) is agnostic.

## launch

### Syntax

```
launch [-sl-idl-secret-id] <secret_id> [-ml-Machine <machine_name>] [-cl-comment <view_comment_or_approval_request_reason>] [-tl-ticket <ticket_number>] [-ticketsystemid <ticket_system_id>]
```

### Description

- Creates a proxy connection to the machine
- Secret must have proxy enabled
- Supports launch from secrets with private keys
- Audits launches



## Parameters

`[-sl-idl-secret-id] <secret_id>`

Required. The secret ID. Three optional switches.

`[-cl-comment <comment_or_access_request>]`

The text for the comment or approval request.

`[-ml-Machine <machine_name>]`

Machine name for the launch. This may be required if a customized secret template does not contain a machine field or a launcher requires a machine entry on launch.

`[-tl-ticket <ticket_number>]`

The ticket number for the request.

`[-ticketsystemid <ticket_system_id>]`

The unique ticket system ID.

## Examples

`launch 24`

Begins the SSH proxy session with the secret with the ID 24 and the specified credentials and machine. Only works after access is approved.

`launch -id 24`

Alternate syntax. Begins the SSH proxy session with the secret with the ID 24 and the specified credentials and machine. Only works after access is approved.

`launch -id 25 -comment "Launching this secret"`

Submits a "view" comment to the secret with ID 25. Begins the SSH proxy session with secret credentials and machine.

`launch -id 26 -machine XYZ -comment "Requesting view to launch temporary sudo account for the XYZ machine"`

Submits an "access request" comment to the secret with ID 26 on the machine XYZ with the ticket number 123 and ticket system ID 2.

## Launching a Secret with the SSH Terminal

### Launching a Secret on a Local Site

1. To launch, the secret must be:
  - Enabled for proxy (**Secret Server > Secret > Security > Enable Proxy**)
  - Shared with the terminal user
2. Log in to the terminal with Secret Server user credentials:

```
login as: sshuser
Keyboard-interactive authentication prompts from server:
sshuser@127.0.0.1's password:
End of keyboard-interactive prompts from server
Pre-authentication banner message from server:
===== WELCOME TO THYCOTIC TERMINAL (ThyTTY) =====
End of banner message from server

Available Commands
-----
cat - concatenate Secrets and print on the standard output
launch - begin SSH Proxy session using credentials on specified Secret
man - an interface to the on-line reference manuals
search - search for Secrets by keyword
exit - exits this terminal session
[sshuser@127.0.0.1 ~] $
```

3. If the secret ID is unknown, search for the desired secret with the search command:

```
[sshuser@127.0.0.1 ~] $ search ubuntu
Folder Id      Template      Secret Name      Proxy Enabled
-----
Everyone Owns  68           Unix Account (SSH)  ubuntu\steph      True
Showing 1 - 1 of 1 results
[sshuser@127.0.0.1 ~] $
```

4. To view secret detail, get the secret ID from search results, and run

cat <secret\_id>

```
[sshuser@127.0.0.1 ~] $ cat 68
Secret Name:  ubuntu\steph
Secret ID:    68
Secret Type:  Unix Account (SSH)
Folder:       \Everyone Owns
Launch Enabled: True
Machine:      [REDACTED].thycotic.com
Username:     steph
Password:     *****

Can be launched with command:

launch 68
[sshuser@127.0.0.1 ~] $
```

5. To launch the secret, enter the launch command as specified in the last line of secret details:

launch <secret\_id>

```
[sshuser@127.0.0.1 ~] $ launch 68
Secret Server Launch: Secret ID 68 found. Attempting launch...
Connected to Target! Attempting Authentication...
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.4.0-151-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Wed Jul 24 13:07:53 EDT 2019

System load:  0.0               Processes:            101
Usage of /:   40.2% of 14.58GB   Users logged in:     0
Memory usage: 22%              IP address for eth0:  192.168.60.252
Swap usage:   0%               IP address for docker0: 172.17.0.1

Graph this data and manage this system at:
https://landscape.canonical.com/

82 packages can be updated.
63 updates are security updates.

Last login: Wed Jul 24 12:59:59 2019 from 192.168.68.137
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

steph@ubuntu:~$
```

- To exit the launch session and return to the terminal, type `exit`.

```
Last login: Wed Jul 24 12:59:59 2019 from 192.168.68.137
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

steph@ubuntu:~$ exit
logout
Socket was shutdown.
[sshuser@127.0.0.1 ~] $
```

- To exit the terminal session, type `exit` again.

## Launching a Secret on a Distributed Engine Site

- To launch, the secret must be:
  - Enabled for proxy (**Secret Server > Secret > Security > Enable Proxy**)
  - Shared with the terminal user
- Log in to the terminal with Secret Server user credentials:

```
login as: sshuser
Keyboard-interactive authentication prompts from server:
sshuser@127.0.0.1's password:
End of keyboard-interactive prompts from server
Pre-authentication banner message from server:
===== WELCOME TO THYCOTIC TERMINAL (ThyTTY) =====
End of banner message from server

Available Commands
-----
cat - concatenate Secrets and print on the standard output
launch - begin SSH Proxy session using credentials on specified Secret
man - an interface to the on-line reference manuals
search - search for Secrets by keyword
exit - exits this terminal session
[sshuser@127.0.0.1 ~] $
```

3. If secret ID is unknown, search for the desired secret with the search command:

```
[sshuser@127.0.0.1 ~] $ search ubuntu
Folder Id      Template      Secret Name      Proxy Enabled
-----
Everyone Owns  68           Unix Account (SSH)  ubuntu\steph      True
Showing 1 - 1 of 1 results
[sshuser@127.0.0.1 ~] $
```

4. To view secret detail, get the secret ID from search results, and run

cat <secret\_id>

```
[sshuser@127.0.0.1 ~] $ search "engine site"
Folder Id      Template      Secret Name      Proxy Enabled
-----
Everyone Owns  69           Unix Account (SSH)  ubuntu\steph (Engine Site)      True
Showing 1 - 1 of 1 results
[sshuser@127.0.0.1 ~] $ cat 69
Secret Name:      ubuntu\steph (Engine Site)
Secret ID:        69
Secret Type:      Unix Account (SSH)
Folder:           \Everyone Owns
Launch Enabled:   True
Site:             ihawu-mmq (ID: 9)

Active Proxy Engines:

Engine Host/Port: [REDACTED].thycotic.com:23

Machine:          [REDACTED].thycotic.com
Username:         steph
Password:         *****
Different Site:   Unable to launch Secret '69' with current Terminal connection.
Exit and connect to Terminal host with the command below to launch.
-----

LAUNCH INSTRUCTIONS:
To launch this Secret on a different Site, SSH to the following Terminal host/port:

SSH Host: [REDACTED].thycotic.com
SSH Port: 23

Command:

ssh sshuser@[REDACTED].thycotic.com -p 23 -t launch 69

[sshuser@127.0.0.1 ~] $
```

5. Note that the connection is not made, and instructions are displayed for logging into another distributed engine terminal to launch the

secret.

6. Note the suggested parameters in the **Launch Instructions**.
7. Type `exit` and press **<Enter>** to disconnect from the current session:

```
Last login: Wed Jul 24 12:59:59 2019 from 192.168.68.137
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

steph@ubuntu:~$ exit
logout
Socket was shutdown.
[sshuser@127.0.0.1 ~] $
```

8. Open a new SSH session suggested parameters:  
`ssh <secret_server_username>@<engine_hostname_or_ip> -p <Port> -t launch <secret_id>`
9. Enter the password to log in, and the secret should immediately launch.

## Launching a Secret upon Terminal Connection

1. To launch, the secret must be:
  - Enabled for proxy (**Secret Server > Secret > Security > Enable Proxy**)
  - Shared with the terminal user
2. If the secret ID and connection string is known, you can log in and immediately launch the secret with the following command:  
`ssh <secret_server_username>@<hostname_or_ip> -p <Port> -t launch <secret_id>`
3. If you do not know that connection string, log into terminal and run:  
`cat <secret_id>`
4. Look at the **Launch Instructions** at the end of secret details, and note the parameters.

## SSH Terminal Launching with a Custom SSH Command Allowlist

Secret Server terminal can launch secrets with custom SSH Command restrictions. For detailed instructions on SSH command menus, please see [Managing Superuser Privilege](#).

**Note:** Custom SSH command menus require either the Secret Server Platinum or Unix SUPM add on license.

1. Go to **Admin > See All**. The Administration page appears.
2. Click the **SSH Command Menus** link. The SSH Command Menus page appears.
3. Click the **Create New** button.
4. Type a name, description and the SSH commands:

New Command Menu

Name

Whitelisted Commands \*

Description

For General Users

SSH Commands

1

view\_shadow = cat /etc/shadow

2

view\_secure\_log = cat /var/log/secure

3

start\_apache = /usr/sbin/service apache start

4

stop\_apache = /usr/sbin/service apache stop

✓OK

✕Cancel

Once one or more command menus have been created, access can be controlled to individual Unix SSH secrets.

- On the **Security** tab of a secret that can use a proxied SSH session, proxy must be enabled, as well as command menu restrictions. If **Allow Owners Unrestricted SSH Commands** is enabled, any user who is an owner of the secret has unrestricted use of the launched session. That is, that user is able to type in commands as in a normal SSH session. Additionally, other groups can be assigned the unrestricted role as well.
- In the following example, the "admin" group is unrestricted, and everyone who is not in that admin group is restricted to only being able to run the allowlisted commands that are specified in the user command menu created above.

Terminal > Shared with Local User > ubuntu\ [redacted] ☆

General Security Audit Dependencies Sharing Settings

**APPROVAL** [Edit](#)

**Require Approval** No

**OTHER SECURITY**

**Require Comment** No [Edit](#)  
Users will be prompted for comment and ticket number when accessing a Secret.

**Enable DoubleLock** No

**Enable Proxy** Yes [Edit](#)

**Hide Launcher Password** No [Edit](#)

**Restrict SSH Commands** Owners Unrestricted 2 items [Edit](#)

When you click the Edit link:

Edit SSH Command Restriction

☒ Restrict SSH Commands

☒ Allow Owners Unrestricted SSH Commands

Unrestricted (1) ▼

Add User / Group: All ▼ Search for groups or users 🔍

admin [Remove](#)

And click the dropdown list to select Allowlisted Commands:

## Edit SSH Command Restriction

☒ Restrict SSH Commands
 ☒ Allow Owners Unrestricted SSH Commands

Whitelisted Commands (1)

Add User / Group:

All

Search for groups or use

Q

Everyone

Remove

7. A user who is subject to SSH command restrictions is presented with a screen similar to the following when launching this secret from Secret Server terminal:

```
Using username "729ddaef-38d0-48e0-b9dc-d4911e76d0c1".

1. User Command Menu

    ?. Show Command Menus
    exit. Exit session
Last login: Thu Mar 17 12:38:46 2016 from 192.168.60.153
[runscripts@centostestserver ~]$
```

The user simply enters the number of the command menu to see available commands or types "?" to display the options again:

```
1. User Command Menu

    ?. Show Command Menus
    exit. Exit session
Last login: Thu Mar 17 12:38:46 2016 from 192.168.60.153
[runscripts@centostestserver ~]$ 1

1. view_shadow = cat /etc/shadow
2. view_secure_log = cat /var/log/secure
3. start_apache = /usr/sbin/service apache start
4. stop_apache = /usr/sbin/service apache stop

    up. Return to Command Menu selection. You may also type ..
    ?. Show Commands
    exit. Exit session
[runscripts@centostestserver ~]$
```

Only the commands listed can be run by this user. The user can either enter the number of the command to be run, or the name of the command, which is the word to the left of the equal = sign. Other options are available (as shown) to navigate through the available command menus, display help, or exit the session.

## SSH Terminal Launching with Session Recording

Secret Server SSH terminal launches also support session recording for session client or server data. When a user launches a secret with



session recording enabled through SSH terminal, session data is available in the Secret Audit tab as session data.

**Note:** Session recording requires either Secret Server Platinum or the session recording add-on license.

**Note:** See the Session Recording section for more information.

To enable session recording:

1. Go to **Admin > Configuration**. The Configuration page appears.
2. Click the **Session Recording** tab.
3. Click the **Edit** button at the bottom of the page. The page becomes editable.
4. Ensure the **Enable Session Recording** check box is selected.
5. Modify other settings as desired.
6. Click the **Save** button.

To enable session recording on a secret:

1. Open a secret.
2. Click the **Security** tab.
3. Click the **Edit** link to the right of the **Session Recording Enabled** setting. The Edit Security popup page appears.
4. Click to select the **Session Recording Enabled** check box.
5. Click the **Save** button.

To view session data following a terminal secret launch:

1. Open a secret.
2. Click the **Audit** tab.
3. Find the **LAUNCH** action in the table.
4. Click the **View SSH Session Log** link.

## SSH Key Pairs for Terminal

### Overview

SSH key pairs allow users to authenticate to Secret Server terminal without using a password. The user generates a key pair in Secret Server, at which time the private key can be downloaded by the user locally in the format they require. The key pair generation process is the only time the private key will be provided to the user. If this private key is lost, the user must log back into Secret Server and generate a new public/private key pair.

### Limitations

- Currently users can only authenticate to Secret Server using SSH keys by using Secret Server's SSH terminal.
- Only PuTTY and OpenSSH keys can be generated.

### Enabling Users to use SSH Key Pairs to Authenticate

There are three requirements for enabling Public SSH Keys:

- SSH Proxy is enabled in Secret Server.
  - SSH Terminal is enabled in SS.
  - SSH key integration is enabled in SS's Configuration > Login settings. To do so:
    1. **Unix Authentication Method**: choose **Public Key only**, **Password or Public Key** or **Password and Public Key** to enable SSH key pair authentication.
1. Once done, the admin can also set an optional expiration time frame for the public SSH keys, which applies to all users.

Once these 3 requirements have been met, users can use the main navigation to create SSH key pairs.

## Creating SSH Key Pairs

An SSH key pair consists of a private key and a public key. Only the public key is stored in the user's settings—the private key downloaded during generation is **not** saved inside Secret Server and should only be available to the user, to remain secure.

During terminal login, if the user provides a private key for authentication, Secret Server validates the provided private key against the user's available (and enabled) saved public keys. If a key pair match is found, the authentication succeeds (or the next required authentication step, for example a password prompt, is shown).

For security reasons, only users can create their own SSH key pairs. However, Secret Server Administrators can deactivate any user's public SSH keys as follows:

1. Navigate to the **Public SSH Keys** page using the main navigation at the top right of the page.
2. Click the **Create SSH Key** button above the grid, then fill out the form in the popup page.
3. Click the **Create SSH Key** button in the popup. After a moment you will be able to save the private key.

## Administering Public SSH Keys

1. Navigate to the User by going to **Admin > Users**.
2. Locate the user in the dropdown list and select it.
3. On the **General** tab click the **Administer Public SSH Keys** button. You can now deactivate the user's public SSH keys.

## Using SSH Keys for Authentication (PuTTY Example)

1. In PuTTY, fill in the **Session** view to match your SSH proxy connection settings in Secret Server.
2. In the **SSH > Auth** section of PuTTY, add the private key file that was saved when generating the key in Secret Server.
3. You will be prompted to enter your passphrase for the key if one was set.
4. You will be prompted to enter your password if **Unix Authentication Method** also requires a password.

## Remote Password Changing

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

*Remote Password Changing* (RPC) allows secrets to automatically update a corresponding remote account. You can set secrets for automatic expiration, followed by automatic strong password generation and a remote password update to keep the subject accounts synchronized with Secret Server.

RPC allows Secret Server to rotate passwords to meet domain password policy requirements. In most cases, RPC is configured with the secret "auto change" setting set to true. This causes the secret to rotate the password as soon as it expires. The "auto change schedule" setting changes the password on a set schedule, rather than when it expires. This provides the ability to change passwords when network activity is lower. You have a choice of changing the password as soon as the schedule interval arrives or only after the secret expires *and* the interval arrives. It is important to choose a large enough interval to complete all your password changes, otherwise any excess changes will have to wait for the next interval. Because the smallest interval is one day, this is only relevant if you have thousands of changes. If Secret Server fails to change a remote password, an alert states there are secrets out of sync.

You can pair secrets with Secret Server checkout, which is Delinea's one-time password functionality (not the same as [TOTP](#)). This allows you to rotate the password on a particular expiration schedule and limit the password to a single user for a set time period, after which it is changed. This is for situations where you need the password to change after every use, such as vendors who need temporary access to a server or system. For additional security on sensitive systems, approval workflow or session recording can be paired with checkout to add layers of authentication to gain access to the secret and track how that secret is used.

Regardless of the timing of password change, you may want to rotate dependent resources (dependencies) right after you rotate the password on a secret. For example, a Windows domain account could be a service account that starts many windows services. In the event that you rotate that password, you would need to also rotate the password for this account on the services which start using that account. If you do not, starting those services will fail the next time they are restarted, which could cause other components to fail too. You can create dependencies on a secret for scheduled tasks, application pools, or services (with or without using PowerShell to undertake tasks at rotation time).

We have a large number of out-of-the-box RPC changers, which are expandable by writing your own SSH, SQL or PowerShell scripts to do RPC, which can get information from the secret. See [Configuring Secret Dependencies for RPC](#) and the [Password Changer List](#).

**Note:** You can configure [event pipelines](#) and [notifications](#) to track whether an RPC has failed. Heartbeats allow you to check whether a password is incorrect and the machine is online.

To assign any type of password changer to a Secret template, use the procedure below.

1. From the **Admin** menu, select **Secret Templates**. The Secret Templates page appears:

Admin > Secret Templates

Templates Character Sets Password Requirements Launchers Audit

88 Items Active

Create Template

SECRET TEMPLATES	TOTAL SECRETS	ACTIVE	
Acme Server Template	0		
Active Directory Account	37		
Active Directory No Prompt	1		
AD Test Template	1		

2. Click the name of the desired template in the list. The page for that template appears:

Admin > Secret Templates > Acme Server Template

+

WS

General
Fields
Mapping
Permissions
Audit

ExportDuplicate

**Template Status**
Edit

Indicates how many Secrets use this template and whether or not the template is active.

Secret Templates

**Template Usage**
0

**Active**
Yes

**Template Settings**
Edit

Configure settings for this template.

**Secret Template Name \***
Acme Server Template

**Name Pattern**
None

**Description**
None

**All History**
No

**Secret Name History Length \***
0

**Validate Password Requirements On Create**
No

**Validate Password Requirements On Edit**
No

3. Click the **Mapping** tab:

Admin > Secret Templates > Acme Server Template

+

WS

General
Fields
Mapping
Permissions
Audit

ExportDuplicate

**Password Changing**
Edit

Enables heartbeat, remote password changing, and configures / maps the password changer type and fields.

**Enable RPC**
No

**Enable Heartbeat**
No

Scan Templates

Add Mapping

4. Click the **Edit** link next to the **Password Changing** section. The section becomes editable:

### Password Changing

Enables heartbeat, remote password changing, and configures / maps the password changer type and fields.

Scan Templates

Add Mapping

Enable RPC ☐

Enable Heartbeat ☐

Cancel

Save

- Click to select the **Enable RPC** check box. An editable section appears:

**Note:** This enables the feature, but auto RPC is set through policies or secret settings.

Enable RPC ☒

RPC Max Attempts

10000

RPC Interval Days

0

RPC Interval Hours

1

RPC Interval Minutes

0

Enable Heartbeat ☐

Password Type to use

Search or pick one

▼

Cancel

Save

- Click the **Password Type to Use** dropdown list to select the desired type. For this instruction, we chose Active Directory Account. New controls appear for that specific type:

Enable RPC	<input checked="" type="checkbox"/>
RPC Max Attempts	10000
RPC Interval Days	0
RPC Interval Hours	1
RPC Interval Minutes	0
Enable Heartbeat	<input type="checkbox"/>
Password Type to use	Active Directory Account <span>▼</span>
Default Privileged Account	No Secret Selected
Domain	Search or pick one <span>▼</span>
Password	Search or pick one <span>▼</span>
User Name	Search or pick one <span>▼</span>
Domain Controller (DC)	<blank> <span>▼</span>
<div> <div>Cancel</div> <div>Save</div> </div>	

- Click to select or type text for each item to configure your desired setup. For more on configuring your choice, refer to the applicable configuration in the [RPC](#) section for details. For example, for Active Directory, go to [Minimum Permissions for Active Directory Remote Password Changing](#).
- When finished, click the **Save** button.

The Remote Password Changing tab contains the settings for configuring RPC on an individual secret. Enabling RPC *auto change* on a secret allows Secret Server to remotely change the password when it expires. The user must have owner permission on the secret to enable auto change.

**Note:** If the password change fails, Secret Server flags the secret as out of sync and continue to retry until it is successful. If the secret cannot be corrected or brought In sync, manually disabling auto change stops the secret from being retried.

## Auto Change Schedule

The Auto Change Schedule button is visible on the secret View RPC tab when RPC and autochange is enabled on a secret.

☒
**Auto Change**  
 Secret Server will automatically initiate a password change after a Secret expires or on a schedule.

**Next Password**

Randomly generated

**Auto Change Schedule**

When password expires (Expires every 30 day(s))

Cancel

Save

The Auto Change Schedule section, which appears when you set the Auto Change Schedule list box to other than "When password expires," allows you to specify an interval (daily, weekly, or monthly), start date, start time, and time frame (interval count) for when the password can be changed:

☒
**Auto Change**  
 Secret Server will automatically initiate a password change after a Secret expires or on a schedule.

**Next Password**

Randomly generated

**Auto Change Schedule**

Daily

Change every
 
 days

Starting on \*

☐ Only change password if the Secret is expired

Cancel

Save



This setting is useful for having the RPC occur during off-hours in order to prevent disruptions. By default, this setting is "When password expires," which allows the secret to be changed immediately upon expiration.

**Note:** There is a check box in the auto change schedule settings labeled "Only change password if the secret is expired." When it is enabled, auto change will not change the password until after the secret expires. The auto change occurs on the first scheduled time after the secret expires. If the box is unchecked, auto change occurs on the defined schedule, whether or not the secret has expired.

**Note:** While the password change is waiting for this next scheduled time, the RPC Log (visible by navigating to **Configuration > Remote Password Changing**) reports the secret could not be changed because of a time schedule. The secret also remains expired until this auto change schedule is reached, even if the secret was forced to expire.

## Understanding Expiration, Auto Change and Auto Change Schedules

### Definition

What is the difference between expiration, auto change and auto change schedules?

- **Expiration:** sets whether or not a secret in Secret Server is marked as expired and the period Secret Server counts down before marking the secret as expired.
- **Auto Change:** sets Secret Server to automatically initiate a password change after a secret expires.
- **Auto Change Schedule:** sets the day and time to initiate the password change after the secret has expired. This cannot be configured without also enabling Auto Change.

### Examples

Some examples to illustrate this:

#### Scenario One: Expiration with Auto Change and No Auto Change Schedule

- A Secret has an expiration period of 30 days, and auto change is enabled. No auto change Schedule has been set.
- At the end of the 30-day expiration period, the secret will expire.
- Immediately after the secret expires, it will be queued for a password change.
- Once the password has been changed, the secret is no longer marked as expired and expiration is reset to count down again from 30 days.

#### Scenario Two: Expiration with Weekly Auto Change

- A secret has an expiration period of 30 days, auto change is enabled, and an auto change schedule is configured for Weekly, recurring once a week on Tuesday, changing at 0300.
- At the end of the 30-day expiration period, the secret will expire.
- Immediately after the secret expires, Secret Server will comply with the auto change schedule to determine when a password change occurs.
- The secret is queued for a password change as soon as it becomes 0300 on a Tuesday.
- Once the password is changed, the secret is no longer marked as expired. Expiration is reset to count down again from 30 days.

#### Scenario Three: Expiration with No Auto Change

- A Secret has an expiration period of 30 days, and auto change is not enabled.
- At the end of the 30-day expiration period, the secret expires.
- The secret remains expired until the field it applies to (usually the password field) is updated on the secret. This happens by manually updating the field or by using the "Change Password Remotely" button on the Remote Password Changing tab of the secret.
- Once the password is changed, the secret is no longer be marked expired, and expiration is reset to count down again from 30 days.

### Important Considerations and Best Practices

- If you want to rely strictly on expiration for password changing, enable auto change but set the schedule to none. Leave "Only change password when Secret is expired" checked.
- If you want to set an auto change schedule to run daily at a specific time, the change will only happen at maximum once per day at that given time. If a change happens already within that same day for the same secret, you cannot adjust the auto change schedule to run later within the same day and then have a password change occur again within that same 24-hour period. For example, if the password was already changed earlier in the day. The schedule is then adjusted to run a few minutes later within the same day. In that case, another password change will not occur until 24 hours has passed since the last change.
- If you set the auto-change schedule to run once per week, for example, on a Thursday, and "Only change password when secret is expired" is checked. Even if the secret expires on a Monday, a password change would not occur until the secret has expired and the scheduled time on Thursday has passed.
- If you set the auto change schedule to run once per week on a Thursday and "only change password when Secret is expired" is not checked, the password would be changed every Thursday, regardless of the secret's expiration status.
- If a secret has an expiration period but auto change is not enabled, no password change occurs automatically. The expiration would only update when the password is manually updated or a remote password change is manually triggered through Secret Server.
- If you want to change a password more frequently than once per day, we recommend using some of the advanced security features at the secret level or controlling the change through a secret policy. Use the check out feature combined with "Change Password on Check In" on the Security tab of a Secret. You can specify a custom interval to check out the secret. After the password check out interval expires or a user manually checks in the secret, the password is automatically changed.

**Important:** For the configuration above, ensure that these accounts have a password-related group policy in Active Directory that specifies that the "Minimum Password Age" is set to 0. We recommend creating fine-grained password policies to achieve this. Add all the accounts that need rotation more frequently than once per day to an AD security group assigned to the fine-grained password policy. See [Password and account lockout policies on Azure Active Directory Domain Services managed domains](#) for more information.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

*Secret dependencies* are items that rely on the username, password, or SSH private key stored in the secret. By adding them to the Dependencies tab, they are automatically updated when the secret's password is changed, ensuring they are up to date with the account on which they depend.

🔍
🗖️ ? 👤

## Secret Dependency Templates Designer

[Explain](#)

+ Create New Dependency Template

Filter by Dependency Type All ▼

Dependency Template Name	Dependency Type	Active	Options
Application Pool	Application Pool	Yes	
Application Pool Recycle	Application Pool Recycle	Yes	
COM+ Application	COM+ Application	Yes	
Remote File	Remote File (Regex Replace)	Yes	
Scheduled Task	Scheduled Task	Yes	
Windows Service	Windows Service	Yes	
SSH Key Rotation	SSH Script	Yes	
SSH Key Rotation Privileged	SSH Script	Yes	
ind	PowerShell Script	Yes	

☐ Show Inactive

← Back

Configure Dependency Changers

Adding a custom dependency template may require additional settings (these settings are described in the following section):

## COM+ Dependency Scanner

The COM+ Dependency Scanner allows for an Active Directory domain discovery source to locate COM+ Applications running on machines on the domain that are being run by Domain Accounts.

Firewall concerns may be addressed by ensuring that Port 135 is open between the target machine being scanned and the machine that engine is installed on.

### Requirements for Discovery

#### Windows Services

For all supported versions of Windows and Windows Server, ensure that **Remote Procedure Call (RPC)** and **Remote Procedure Call (RPC) Locator** services are running. To help prevent any errors that would stop the services, set the **Startup Type** to **Automatic**.

#### Component Services

For all supported versions of Windows and Windows Server, ensure that **NETWORK** has remote access permissions to the machine.

1. Open **Component Services** (dcomcnfg.exe).
2. Under **Console Root**, expand **Component Services** and the **Computers** folder.
3. Right-click **My Computer**
4. Select **Properties**.
5. Under the **Default Properties** tab, ensure that the **Default Authentication Level** is set to **Connect** and that **Default Impersonation Level** is set to **Identify**.
6. On the **COM Security** tab, for both the **Access Permissions** and **Launch and Activation Permissions** sections, click **Edit Limits** and then add **NETWORK**.
7. Check **Allow** for all Remote permissions.

**Note:** If the **Edit Limits** button is disabled, open the **Local Security Policy**. Under **Security Settings** expand **Local Policies** and select **Security Options**. There will be two **DCOM: Machine Access/Launch Restrictions**. Edit the one that corresponds to the disabled **Edit Limits** buttons, adding **NETWORK** and giving Remote permissions there.

**Important:** Editing or altering the existing permissions on the machine or editing the **Default Permissions** listed can have a negative impact on the machine.

#### COM+ Network Access

For all supported versions of Windows Server, ensure that COM+ Network Access is enabled by installing the Application Server Role. During the installation process, check the box next to **COM+ Network Access** under **Features**.

### Versions Supported

- Windows 7
- Windows 8
- Windows 10
- Windows Server 2008

- Windows Server 2008 R2
- Windows Server 2012
- Windows Server 2012 R2

#### Versions Not Supported

- Windows Vista and earlier versions of Windows
- Versions of Windows Server pre-2008
- Windows Server 2016

#### Configuring COM+ Discovery for a New Domain

1. Navigate to **Admin > Discovery**
2. Click **Edit Discovery Sources**.
3. Click **Create New**.
4. Select **Active Directory Discovery Source** and click **OK**.
5. In the wizard, click **Next**.
6. Select a **Site** that is set up with **Distributed Engine**
7. Click **Next**.

**Note:** The COM+ Dependency Scanner will only run when a Distributed Engine Site is applied to the Discovery Source. The Engine will need to be installed either on the Domain to be scanned, a Child Domain relative to the Domain being scanned, a Parent Domain relative to the Domain being scanned, or another Trusted Domain relative to the Domain being scanned.

8. Check the box next to **COM+ Application**.
9. Click **Next**.
10. Enter your **Fully Qualified Domain Name**.
11. Select or create a Secret for an Active Directory account that will scan for your COM+ dependencies.
12. Click **Next**.

Your new domain is now configured in Secret Server and Discovery will search for COM+ dependencies in it.

#### Configuring COM+ Discovery for an Existing Domain

1. Navigate to **Admin > Discovery**.
2. Click **Edit Discovery Sources**.
3. Click on the domain where you wish to search for COM+ dependencies.
4. Click the **Scanner Settings** tab.
5. Scroll down to the **Find Dependencies** section and click **Add New Dependency Scanner**.

6. Click the plus symbol to the left of **COM+ Application**.

You will be unable to make additional changes.

7. Click **OK** to proceed. Discovery will now search for COM+ dependencies.

## Creating Custom Dependencies

If there are different dependency types that you want to manage that are not supported out of the box, new ones can be created based on a script. A custom dependency consists of two components:

- **Dependency Template:** The dependency template defines how a dependency is matched to discovered accounts and how it updates the target after a password change occurs on the account. to create a new dependency template, go to **Admin > Secret Templates** and click the **Dependency Templates** button.
- **Dependency Changer:** A dependency changer is a script and the associated parameters to be passed into the script. Dependency changers can be created and modified by going to **Admin > Remote Password Changing > Configure Dependency Changers**.

**Note:** Please see [Discovery](#) for comprehensive guidance on configuring and using dependency changers and dependency templates.



## Dependency Groups

By default, all dependencies are updated in the order listed. There are cases where you may want to split out different sets of dependencies into separate groups. Typically, this is because a single service account may run services across different segregated networks that can communicate with the domain but not each other and have different distributed engine sites assigned. In this case you can create two dependency groups and assign them to different distributed engine sites to solve connectivity issues.

## Dependency Settings and Information




Dependencies have the following settings:

**Note:** Not all dependency types have all these settings.

- **Change Fail Script:** For SSH key rotation and SSH key rotation privileged dependency types, this is the built-in script that determines if Secret Server was unable to update the public key on the dependency.
- **Change Script:** For SSH key rotation and SSH key rotation privileged dependency types, this is the built-in script that updates the public key on the dependency.
- **Change Success Script:** For SSH key rotation and SSH key rotation privileged dependency types, this is the built-in script that determines if Secret Server was able to update the public key on the dependency.
- **Database:** For SQL script dependency types, the database name for the script.
- **Dependency Group:** Name of the group to run the dependency update in.
- **Description:** Description of the dependency for documentation purposes.
- **Enabled:** Whether Secret Server attempts to update the dependency. A disabled dependency is ignored by Secret Server.
- **File Path:** For Remote File Dependency types, this is the UNC file path on the remote server where the embedded password exists.
- **Machine Name:** Computer name or IP address on which the dependency is located.
- **Name:** Name of the dependency on the remote machine.
- **Port:** For SQL and SSH script dependency types, the port name for the script.
- **Privileged Account:** The account Secret Server authenticates as when changing the dependency's credentials, so it must have privileges on the remote machine to edit the dependency.
- **Public Key:** For SSH key rotation and SSH key rotation privileged dependency types, this text-entry field holds the value of the public key stored on the dependency.
- **Regex:** For Remote File Dependency types, the regular expression used to locate the password embedded in the configuration file.
- **Restart:** Determines if the dependency is restarted once the account has been updated.
- **Run Condition:** Allows the dependency to run conditionally depending on the outcome of the dependencies above it.
- **Script:** Name of the PowerShell script, SSH script, or SQL script in the scripts repository configured on the Dependency Template. The actual script selected can be previewed by clicking the eye icon.
- **Server Key Digest:** For SSH key rotation and SSH key rotation privileged dependency types, a text-entry field that serves as a security control for specifying the SHA1 hash of the SSH host key on the remote server.
- **Server Name:** For SQL script dependency types, the server name for the script.
- **SSH Key Secret:** An account with SSH Key that Secret Server uses to authenticate when executing the SSH Script or SSH Key rotation dependency types.
- **Template:** Whether the dependency is an IIS application pool, Scheduled Task, windows service, remote file, COM+ application. Custom dependencies can also be created using a SQL, SSH, or PowerShell script.
- **Verification Script:** For SSH key rotation and SSH key rotation privileged dependency types, this is the built-in script that verifies that the new public key on the dependency matches the private key on the secret.
- **Wait(s):** Time in seconds that Secret Server pauses before changing the dependency.

Example values for a Windows service dependency on a remote computer might be: 192.11.158.99, Windows Service, aspnet\_state, OR DOMAIN\admin.

The following operations can be performed in the Dependency grid:

- **Delete:** Click the  icon to delete the dependency.
- **Edit:** Click the  icon to edit dependency text boxes. Cancel changes by pressing the Cancel button.
- **Run Dependency:** Click the second arrow icon to run the script on the selected dependency and set the password on the selected dependency to the current password for the secret
- **Test Connection:** Click the return arrow icon to test the dependency connection, the tests results are displayed afterward.
- **View Dependency History:** Click the  icon to view the activity logs for the dependency.

**Note:** Due to security constraints, scheduled tasks require an Active Directory domain user as the privileged account.

## Manually Adding Dependencies

To manually add a dependency:

1. Click **Admin > Secret Templates**. The Manage Secret Templates page appears:

**Manage Secret Templates**

Acme Server Template ☐ Show Inactive

[Back](#) [Edit](#) [+ Create New](#) [Export](#) [View Audit](#)

[Active Templates](#) [Password Requirements](#) [Character Sets](#)

[Configure Launchers](#) [Configure Secret Template Permissions](#)

**Other Templates**

[Configure Dependency Templates](#) [Configure Scan Templates](#)

2. Click the **Configure Dependency Templates** button. The Secret Dependency Templates Designer page appears:

## Secret Dependency Templates Designer

[Explain](#)

Create New Dependency Template

Filter by Dependency Type
 

All

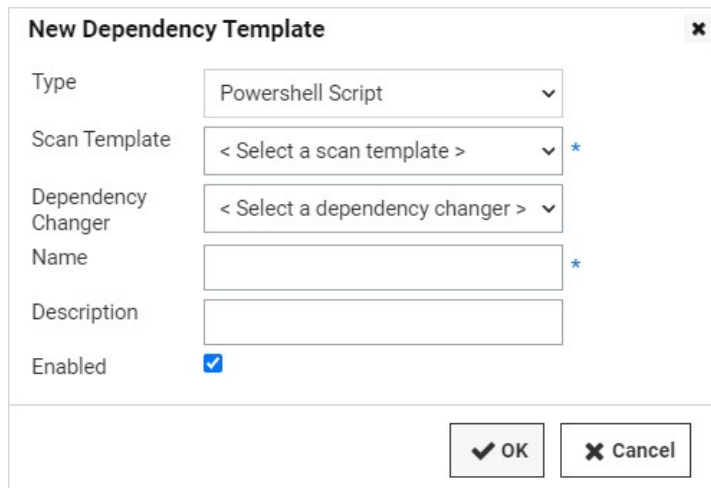
DEPENDENCY TEMPLATE NAME	DEPENDENCY TYPE	ACTIVE	OPTIONS
Application Pool	Application Pool	Yes	
Application Pool Recycle	Application Pool Recycle	Yes	
COM+ Application	COM+ Application	Yes	
Remote File	Remote File (Regex Replace)	Yes	
Scheduled Task	Scheduled Task	Yes	
Windows Service	Windows Service	Yes	
SSH Key Rotation	SSH Script	Yes	
SSH Key Rotation Privileged	SSH Script	Yes	
PowerShell Multi-RPC	PowerShell Script	Yes	
SQL Service Dependency Changer	PowerShell Script	Yes	

☐ Show Inactive

Back

Configure Dependency Changers

- Click on the plus icon next to **Create New Dependency Template**. The New Dependency Template popup appears:



The image shows a 'New Dependency Template' dialog box. It has a title bar with a close button (X). The dialog contains several fields: 'Type' is a dropdown menu with 'Powershell Script' selected; 'Scan Template' is a dropdown menu with '< Select a scan template >' selected, followed by a blue asterisk; 'Dependency Changer' is a dropdown menu with '< Select a dependency changer >' selected; 'Name' is a text input field followed by a blue asterisk; 'Description' is a text input field; and 'Enabled' is a checked checkbox. At the bottom right, there are two buttons: 'OK' with a checkmark icon and 'Cancel' with an X icon.

Type	Powershell Script	▼
Scan Template	< Select a scan template >	▼ *
Dependency Changer	< Select a dependency changer >	▼
Name		*
Description		
Enabled	<input checked="" type="checkbox"/>	

✓ OK    ✕ Cancel

4. Choose your dependency type from the **Type** dropdown list.
5. Click to select your desired scan template from the **Scan Template** dropdown list.
6. Click to select your desired dependency changer from the **Dependency Changer** dropdown list.
7. Fill in the dependency name, machine name, and other information depending on the dependency type.
8. Ensure the **Enabled** check box is selected.
9. Click the **OK** button to finish adding the dependency.

## Secret Dependency Status

You can see a list and status of all dependencies for a secret when viewing that secret in the UI. For example:

Secret Dependencies > Local > Remote File Dependency\RegTestUser ☆

General Security Audit Remote Password Changing **Dependencies** Sharing Settings Metadata

Launched Options

This Secret is currently marked as Inactive. Certain actions such as password changing will be unavailable until the secret is activated.

Find New Dependencies Dependency Templates New Dependency

Group: RegTestUser Group, Site: Local (3 Total Enabled) 2 Not Run 1 Failed

3 Items All Templates All Run Results Include Disabled

ORDER	TITLE	TYPE	MACHINE	ENABLED	RUN RESULT
1	c:\dependency\depe...	Remote File (Regex R...	jumphost.gamma.thy...	✓	✗
2	c:\dependency\depe...	Remote File (Regex R...	jumphost.gamma.thy...	✓	ⓘ
3	c:\dependency\depe...	Remote File (Regex R...	jumphost.gamma.thy...	✓	ⓘ

## Account Dependence

You can use a single account (username and credential) for OS login and also for running Windows services, scheduled tasks, IIS application pools, and more. This is especially common for functional accounts. You can link the credentials of one account object to such usages. The link is independent of the actual system that the dependency is running on.

For example, given this scenario:

- The Windows domain account DOM\svc\_app1 is managed on windows domain controller, where it is located.
- SRV1 is running a Windows service under the user DOM\svc\_app1.
- SRV2 is running a scheduled task under the user DOM\svc\_app1.
- When the account DOM\svc\_app1 is changed, the dependencies of that account on SRV1 and SRV2 need to be updated too.
- The Windows service on SRV1 may have to be restarted for the password change to work.

The modeling of the dependency would take place in / with the master object, which in this case is the windows domain account DOM\svc\_app1. When selecting the master account object in the UI, it shows the dependencies along with their status.

## Account Clusters

You can group different account objects in clusters where the account name may be different but the credential and password are the same for all members of the cluster. Account clusters can also support the account dependency functionality from above. For example:

For example, given this scenario:

- Windows domain account DOM\svc\_app1 has dependencies as outlined above.
- Linux OS login svc\_app2 on LinSRV1 runs a daemon local to that system.
- Database login svc\_db1 on DBSRV1 is consumed by a billing application.
- A dependency exists where the account's password can also be pushed into the configuration file of an application running as user

svc\_app2 on LinSRV1.

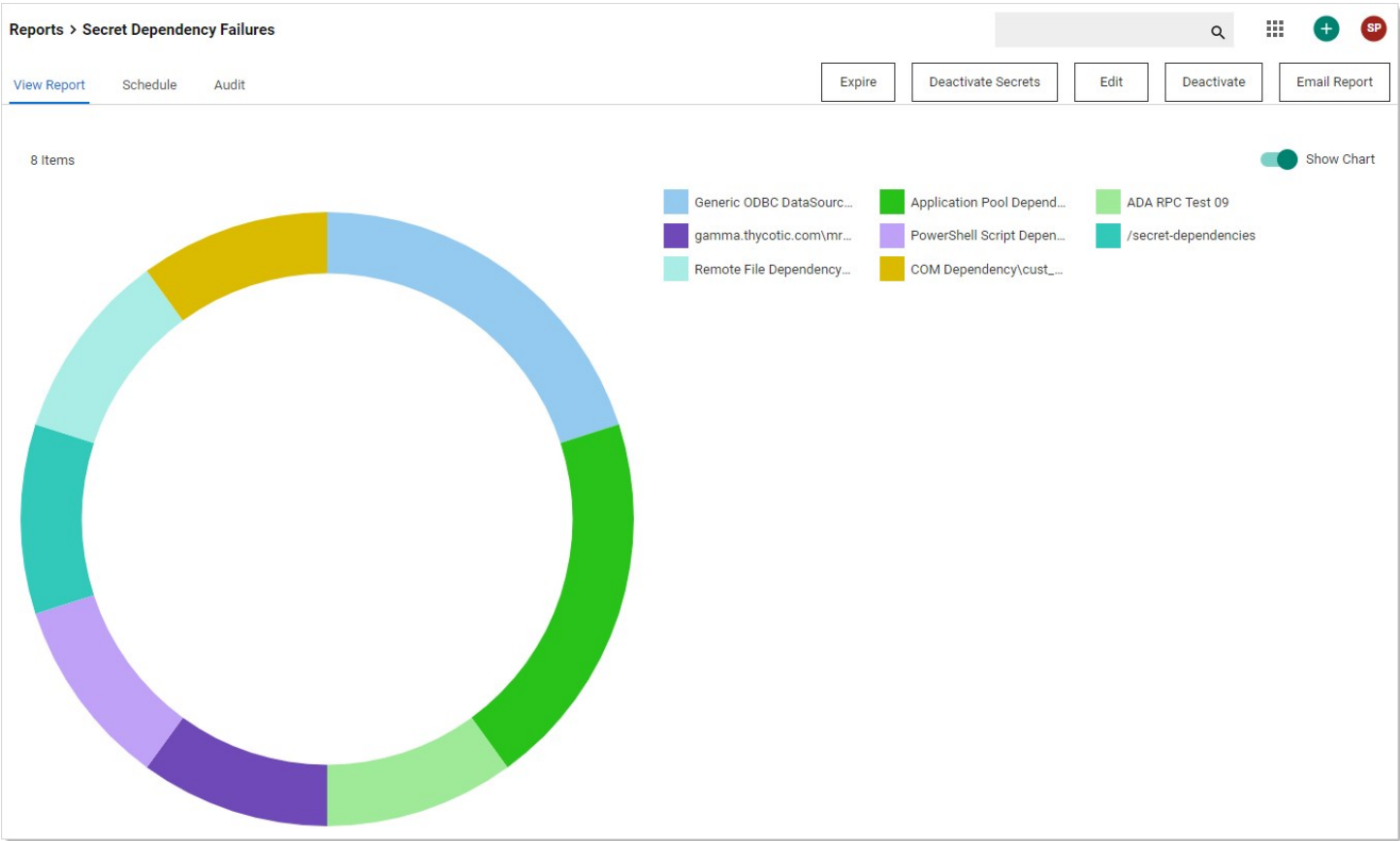
Accounts DOM\svc\_app1, svc\_app2 and svc\_db1 would all have the same password when the password is rotated. The system can re-sync passwords of all members of the account cluster in case one of the members runs out of sync for whatever reason, such as restoring from a backup.

Viewing Dependency Status

We offer four reports for viewing your secret dependency status:

Secret Dependency Failures

Figure: Secret Dependency Failures Report

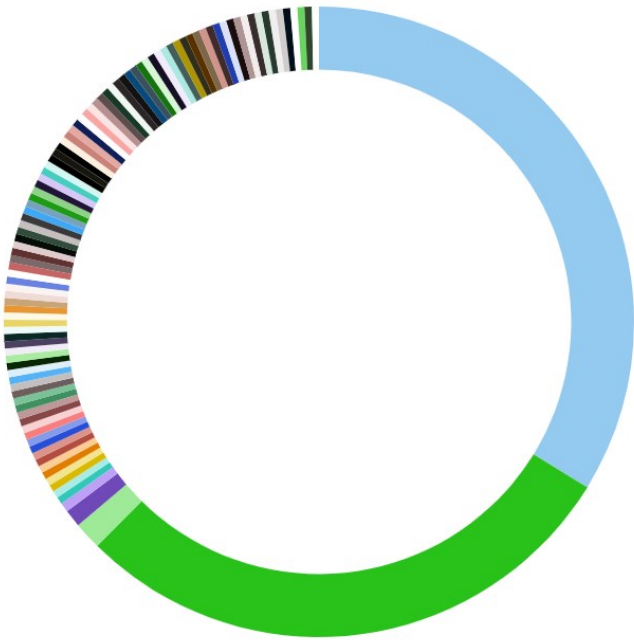


Secret Dependency Not Run

Figure: Secret Dependency Not Run Report

599 Items

Show Chart

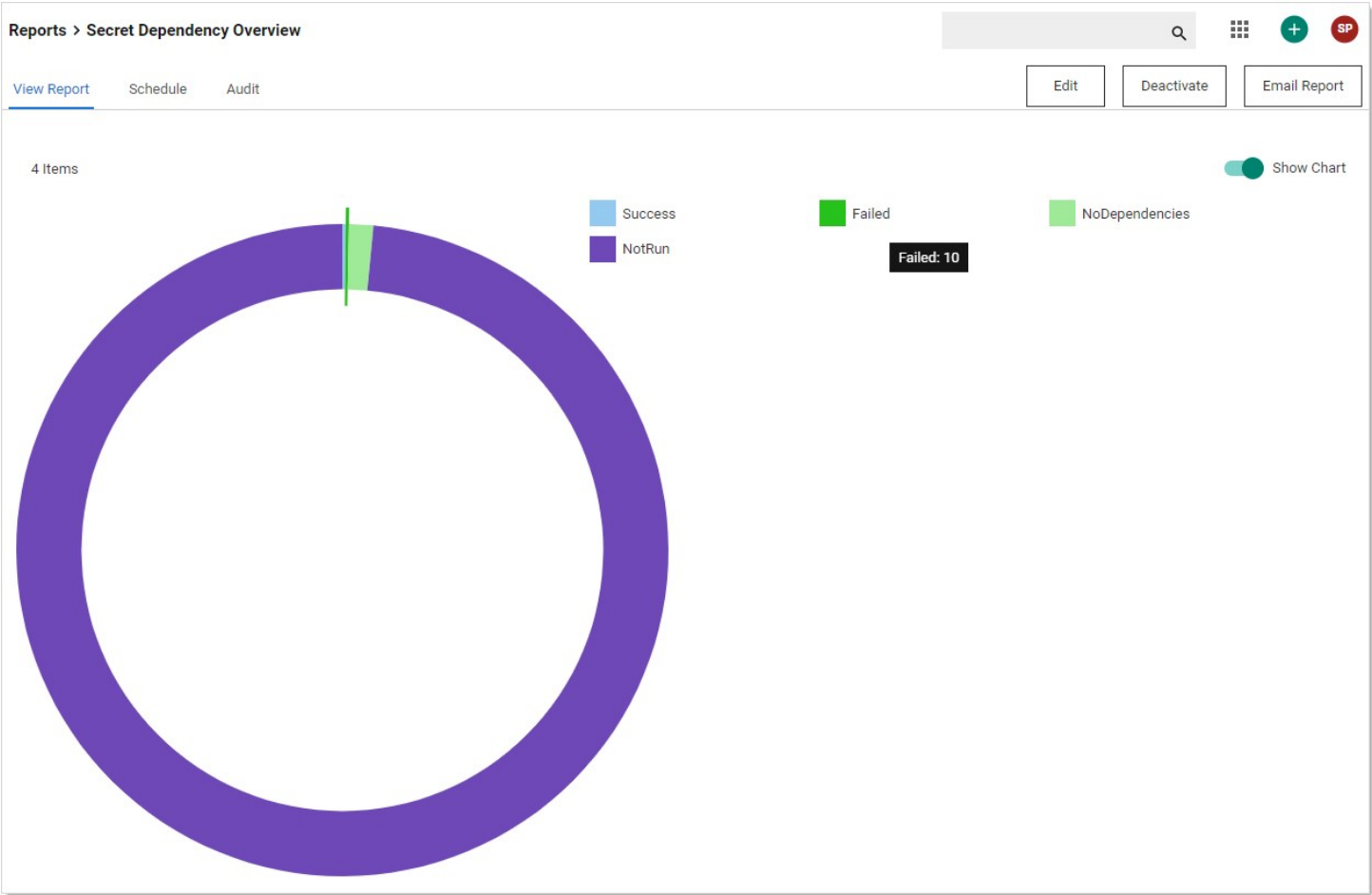


SOAP AddDependency	/secret-dependencies	Gamma Secret Server IIS...
gammamperson	Secret 1006990042	Secret 946088318
Secret 1503236485	Secret 1030197109	Secret 771722427
Secret 44287015	Secret 1914587575	Secret 235624052
Secret 1227258127	Secret 1049939697	Secret 1174419300
Secret 1021544676	Secret 1086883180	Secret 616002022
Secret 1581674811	Secret 1781935036	Secret 23012200
Secret 1840490680	Secret 1779298771	Secret 939331187
Secret 212066599	Secret 954327404	Secret 1144561053
Secret 1685775132	Secret 1884151588	Secret 1079934917
Secret 1987435262	Secret 793649081	Secret 827824828
Secret 1177584147	Secret 1567944708	Secret 83270199
Secret 667351489	Secret 396398303	Secret 1484508088
Secret 1673119778	Secret 1129898305	Secret 892478510
Secret 764750812	Secret 786324204	Secret 63763401
Secret 96432271	Secret 1721681734	Secret 1061133549
Secret 2000784473	Secret 1737752685	Secret 77782664
Secret 1245105151	Secret 1220761601	Secret 1961731619
Secret 1159915894	Secret 1338469274	Secret 685963775
Secret 940738126	Secret 334075820	Secret 1713288423

Secret Dependency Overview

Figure: Secret Dependency Overview Report





Secret Dependency Status

Figure: Secret Dependency Status Report

Reports > Secret Dependency Status

615 Items

View Report Schedule Audit

Expire Deactivate Secrets Edit Deactivate Email Report

SECRETNAME	DEPENDENCYGRO...	SITENAME	SUCCESS	FAILED	NOTRUN
\$domain\launcher	group		0	0	1
/secret-dependencies	Dependency Gr...		0	1	696
/secret-dependencies	Dependency Gr...	Gamma-Engines	0	0	8

## Using Regex with Dependencies

### Overview

In release version 7.8.00010 and later, Secret Server allows a secret to have file dependencies. File dependencies allow text files with embedded credentials to be changed via Regex.

A Regular Expression (Regex) is a phrase in a language for matching text. For details on the .NET Regex language, see [.NET Framework Regular Expressions](#).

Secret Server replaces the contents of the first group (within parentheses) within the Regex.

Setting up a remote file dependency, requires:

- **File Path:** This is the file path on the remote server where the remote password exists. UNC paths do not work here. See [UNC Names](#).
- **Regex:** This regular expression to be used to locate the password embedded in the configuration file.
- **Machine Name:** Computer name or IP address where the dependency is located.
- **Privileged Account:** The account Secret Server will authenticate as when changing the dependency. It must have privileges on the remote machine.

A typical filled in New Dependency page looks something like this:

Dependency Type	Remote File	
Dependency Group	Default	
File Path	C:\testFolder\testfile.config	*
Regex	Password=([^\;]+)	*
Machine Name	Hostname01.testdomain.local	*
Description		
Wait (s)	0	
Enabled	<input checked="" type="checkbox"/>	
Privileged Account	testdomain\myadaccount	clear

### UNC Names

UNC names, such as:

\\BARAKA\SHARE\test.txt Or

\\192.168.1.154\SHARE\test.txt

do **not** work in the file path. You can, however, put the machine name or IP address in the Machine Name text box, and put the rest of the path in the file path. For example:

In the **File Path** text box:

\\SHARE\test.txt Or

SHARE\test.txt

In the **Machine Name** text box:

192.168.1.154 Or

BARAKA

## Examples

The following are some examples of using Regex within file dependencies:

### XML Configuration Files

#### Example One

##### Source

```
<Configuration>
  <User>
    <UserName>Bob</UserName>
    <Password>Password1</Password>
  </User>
  <User>
    <UserName>Sam</UserName>
    <Password>DontChangeThisOne</Password>
  </User>
</Configuration>
```

##### Regex

```
<UserName>Bob</UserName>\s*<Password>([^\<]+)</Password>
```

#### Example Two

##### Source

```
<Configuration>
  <User name="Bob" password="Password1" />
  <User name="John" password="Password1" />
</Configuration>
```

##### Regex

```
<User name="Bob" password="([^\"]+)" />
```

### Windows Initialization (.ini) Files

##### Source

```
[owner]
name=John Doe
password=Password1
organization=Acme Widgets Inc.
```

##### Regex

```
name=John\sDoe\s*password=([^\r\n]+)
```

### SQL Server Connection Strings

##### Source

```
Data Source=myServerAddress;Initial
Catalog=myDataBase;UserId=myUsername;Password=myPassword;Server=myServerAddress;Database=myDataBase;Trusted_Connection=False;
```

##### Regex

Password=([^\;]+)

## Oracle Connection Strings

### Example One

#### Source

```
Data Source=(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=MyHost)(PORT=MyPort)))(CONNECT_DATA=(SERVER=DEDICATED)(SERVICE_NAME=MyOracleSID)));
```

```
User Id=myUsername;Password=myPassword;
```

#### Regex

Password=([^\;]+)

### Example Two

#### Source

```
Data Source=username/password@//myserver:1521/[my.service.com](http://my.service.com);
```

#### Regex

username/([^\@/]+)

## YAML

#### Source

```
receipt: Oz-Ware Purchase Invoice
```

```
date: 2007-08-06
```

```
user:
```

```
name: Dorothy
```

```
password: Password1
```

#### Regex

```
name:\s*Dorothy\s*password:\s*([^\v\n]+)
```

In most environments, we recommend using a separate password for each account for optimal security. However in environments where identical credentials are used in multiple secrets, we recommend using RPC to change the password on one primary parent account secret, and then using a PowerShell dependency script to update values in child secrets. The PowerShell script calls back to Secret Server's API, retrieves a list of comma-separated values representing child secret IDs, and updates the values stored in the child secrets. We recommend using this process for no more than 25 child secrets.

## Requirements

- A Secret Server instance version 10.1.000000 or newer with a premium add-on or Enterprise Plus
- A PowerShell implementation enabled and working properly. See [Configuring WinRM for PowerShell](#)
- the [WellnessChecker tool](#)

For this procedure you will need to create the four types of user accounts listed below, and for each account you will need to create a corresponding secret in Secret Server with the account's login credentials and other information.

Create the user accounts and secrets described below:

- An API User account and a corresponding secret. This API User account will NOT take up a user license. Recommended templates for the secret include the Active Directory template and the Web Password template. Credentials may be a local account or an Active Directory service account assigned to the Synchronization group, but must be stored in Secret Server to be passed to the PowerShell script.
- A primary parent account and a corresponding secret that has RPC set up and the PowerShell dependency script from this page attached. The primary parent account credentials may be either a local account or an Active Directory service account assigned to the Synchronization group.
- Child accounts with a corresponding secret for each account containing the child secret ID, with edit permissions granted to the API User account.
- A privileged Active Directory account and a corresponding secret that can run PowerShell on the Secret Server machine.


To create a new dependency changer for synchronizing passwords during RPC, follow the procedure below.

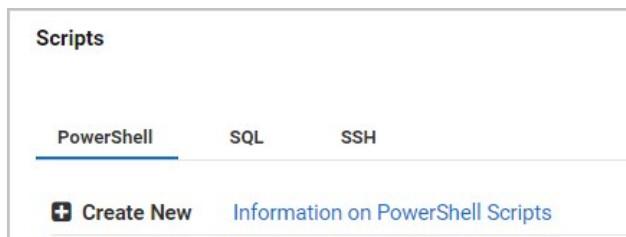
1. Download the [WellnessChecker tool](#) ZIP file.

2. Extract the ZIP file and run this command:

```
PowerShell.WellnessChecker.exe -fixerrors
```

3. In Secret Server, browse to **Admin > Scripts**.

4. Click the  symbol next to **Create New**.



5. In the **New PowerShell Script** dialog, fill in the fields for **Name**, **Description**, and **Category**.

6. In the **Script** field, paste in the script provided at the bottom of this page.

7. Click **OK** to save the file.

New PowerShell Script

Name

!

Description

\*

Category

Untyped

▼

Script

1

✓ OK

✕ Cancel

8. Browse to **Admin > Configuration**.
9. On the **General** tab, make sure **Enable Webservices** is set to **Yes**.

Configuration

General

Login

SAML

Folders

Local User Passwords

Secrets

APPLICATION SETTINGS

Allow Automatic Checks for Software Updates

Yes

Early Adopter

No

[Anonymized System Metrics Information](#)

Send Anonymized System Metrics to Thycotic

No

[View Webservices](#)

Enable Webservices

Yes

10. Browse to the primary parent account secret and ensure that RPC is setup on it. See [link-to-page](#).
11. In the primary parent account secret, click the **RPC** tab.

12. Click **Edit**.
13. In the secret grid at the bottom, select the API User account secret you created. The API User account secret should be the only secret in the grid. If you have not yet created the PowerShell script, you will see no grid.
14. Browse to **Admin > Discovery** and click the **Configuration** tab.
15. Click **Discovery Configuration Options** and select **Extensible Discovery** from the drop-down list.

Admin > Discovery

Discovery Sources
Configuration
Discovery Logs
Computer Scan Logs

Discovery
Edit

Discovery is used to scan for machines, local accounts and dependencies on Active Directory, Unix systems, and VMware ESX servers, AWS, and GCP.

Discovery is easy to set up and provides a great range of customizations for specific network requirements.

[KB Link](#)

Discovery Configuration Options

Rules
Extensible Discovery
Scanners
Scan Templates
Command Sets
Domain Name Index

Enable Discovery

Discovery Interval D

Discovery Interval H

Ignore Cluster Node Objects

No

Discovery Scan Offset Hours

0

Days to Keep Operational Logs

30

16. On the **Extensible Discovery Configuration** page, click **Configure Dependency Changers**.

### Dependency Changers

Dependency Changers define the type of dependency and method for changing the dependency's password by utilizing information from the Secret and the the Scan Template. Dependency Changers are either built-in or Scriptable via PowerShell, SSH or SQL.

Configure Dependency Changers

17. On the **Secret Dependency Changers** page, click **Create New Dependency Changer**.

**Secret Dependency Changers**

[Explain](#)

 **Create New Dependency Changer**

- In the **New Dependency Changer** dialog, click the **Basic** tab and enter the following information:

**New Dependency Changer**

**Basic**   Scripts

Explain

Type

Powershell Script

Scan Template

Computer Dependency (Basic)

Name

PowerShell Multi-RPC

Description

Port

Wait (s)

0

Enabled

☒

Create Template

☒

✓ Save

✗ Cancel

- Click the **Scripts** tab and enter the following information:



**New Dependency Changer**

Basic **Scripts**

Explain  
☐ Use advanced scripts ?

▼ Change Script RPC - Child Secrets ✓

Script: RPC - Child Secrets

Arguments: `${1}$USERNAME ${1}$PASSWORD $PASSWORD $NOTES ${1}$DOMAIN`

✓ Save ✗ Cancel

20. In the **Arguments** field, paste the following:

```
${1}$USERNAME ${1}$PASSWORD $PASSWORD $NOTES ${1}$DOMAIN
```

The actions of the Arguments are as follows:

- `${1}$USERNAME` pulls the username from the first linked secret on the primary parent account, which will be used to execute the PowerShell script.
- `${1}$PASSWORD` pulls the password from the first linked secret on the primary parent account, which will be used to execute the PowerShell script.
- `$PASSWORD` pulls the password from the primary parent account, which will be set for all secrets listed in the **Notes** field.
- `$NOTES` pulls the **Notes** content from the primary parent account, and parses the comma separated list of secret IDs to find the other secrets to update.
- `${1}$DOMAIN` pulls the **Domain** field from the first linked secret on the primary parent account. For local accounts, leave the **Domain** field on the linked secret empty. It must be listed last because of the way PowerShell parses empty fields.

21. Browse back to the **Extensible Discovery Configuration** page and this time, click **Configure Dependency Templates**.

**Dependency Templates**

Dependency Templates link Scan Templates to Dependency Changers. Every Dependency Changer requires a Dependency Template.

Configure Dependency Templates

22. On the **Secret Dependency Templates Designer** page, select the new dependency changer you configured in the last step.

**Secret Dependency Templates Designer**

[Explain](#)

**Create New Dependency Template** Filter by Dependency Type: All

DEPENDENCY TEMPLATE NAME	DEPENDENCY TYPE	ACTIVE	OPTIONS
PowerShell Multi-RPC	PowerShell Script	Yes	

23. Browse to the primary parent account secret and click the **Dependencies** tab.
24. Click **New Dependency**.

Remote Password Changing **Dependencies** Sharing Options

[Find New Dependencies](#) [Dependency Templates](#) [New Dependency](#)

25. In the **Create Dependency** dialog, click the **Select Type** dropdown and select the PowerShell dependency template you created.

Create Dependency

Type \*

-- Select Type --

- Select Type --
- Standard
- Application Pool
- Application Pool Recycle
- COM+ Application
- PowerShell Multi-RPC
- Remote File
- Scheduled Task
- SSH Key Rotation
- SSH Key Rotation Privileged
- Windows Service
- Run PowerShell Script
- Hello World
- Synch Passwords During RPC

[Save](#)

26. In the **Edit Dependency** dialog, enter default in the **Machine Name** field.
27. Select a privileged account (active directory account secret able to run PowerShell on the server)
28. Add the following to the **Arguments** field: `${1}$USERNAME ${1}$PASSWORD $PASSWORD $NOTES ${1}$DOMAIN`
29. In the primary parent account secret's **Notes** field, ensure that the child secret IDs appear in a comma-separated-values list, for example 19,39,81...

Now the dependency has been added and you can test the full process by running a remote password change on the primary parent account. All of the secrets listed by ID in the **Notes** field should be updated with the same password.

## PowerShell Script

Replace \$url with the name of the machine hosting your Secret Server instance.

```
$url = 'http://MySecretServerURL/webservices/sswebservice.asmx';
$username = $Args[0]
$password = $Args[1]
$newpassword = $Args[2]
$secretIdArray = $Args[3]
$domain = $Args[4]
$proxy = New-WebServiceProxy -uri $url -UseDefaultCredential
$result1 = $proxy.Authenticate($username, $password, "", $domain)
if ($result1.Errors.length -gt 0){
    $errors = $result1.Errors[0]
    Write-Debug "Errors result1: $errors"
    exit
} else {
    $token = $result1.Token
}
$secretIds = $secretIdArray -split " "
foreach($secretId in $secretIds){
    $result2 = $proxy.GetSecret($token, $secretId, $false, $null)
    if ($result2.Errors.length -gt 0){
        $errors = $result2.Errors[0]
        Write-Debug "Errors result2: $errors"
    } else {
        $secretName = $result2.Secret.Name
        Write-Debug "Updating Secret: $secretName"
        foreach ($item in $result2.Secret.Items) {
            if($item.IsPassword) {
                $item.Value = $newpassword
            }
        }
        $secret = $result2.Secret
        $result3 = $proxy.UpdateSecret($token, $secret)
        if ($result3.Errors.length -gt 0) {
            $errors = $result3.Errors[0]
            Write-Debug "Errors result3: $errors"
        } else {
            Write-Debug "Updated Secret: $secretName"
        }
    }
}
```

The Password Changers Configuration page can be accessed by navigating to **Admin > Remote Password Changing > Configure Password Changers**.

There are a few password changing types that allow the user to enter in specific commands that are sent to the computer where the password is changing. This enables the system to accommodate for differences in the standard password change procedure. For example: The Unix system that is being changed prompts for the current password twice instead of only once before asking for the new password.

## Changing Ports and Line Endings

To change the port or line ending used on a password changer, click the password changer on the **Configure Password Changers** page and then click **Edit**. There, you can choose the line ending and port used by the device. By default, line endings are set to New Line (\n), however some devices and applications (such as HP iLO) use a different line ending system. The port defaults to 22 for SSH connections and 23 for Telnet connections.

For the built in Windows password changer there is a ports text-entry field available that can be filled in to help ensure a computer is listening. This can be used if DNS returns multiple IP addresses for a single box and only one is valid. For example, a laptop might get two IP addresses for an Ethernet and wireless connection, but if it is unplugged the Ethernet IP is invalid. In this case, Secret Server can do a reverse lookup and test each IP until it is able to connect on one of the specified ports. When it gets a response, it uses that IP for the password change.

## Creating a Custom Password Changer for IBM AS/400

**Note:** Password changing on the IBM AS/400 can be performed through SSH, which is installed by default. If you are using an earlier version, you will need to install SSH.

To create a custom password changer for IBM AS/400 on newer systems such as i7, use the procedure for [Creating a Custom Password Changer](#) but be sure to use the following SSH command:

- Command: `system CHGUSRPRF $USERNAME PASSWORD($NEWPASSWORD)`
- Comment: Set Password on account
- Pause(ms): 2000

For additional information, see [Securing Communications with OpenSSH on IBM i5/OS](#).

### Creating a Custom Password Changer for IBM AS/400 in Secret Server 10.5.

The procedure for creating password changers in Secret Server 10.5 for the IBM AS/400 terminal includes using the 5250 terminal connection and scripting to perform the password change and heartbeat.

To create this IBM AS/400 password changer, start with an existing z/OS Mainframe password changer as a baseline, then modify the changer commands. You also need to create an AS/400 secret template using the z/OS secret template as a baseline, then modify the template to use the new password changer.

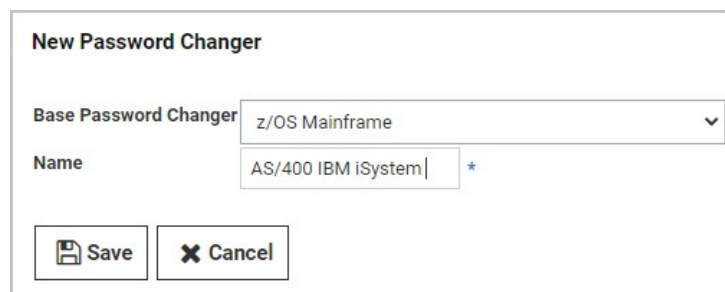
**Note:** Support for this feature, including script customization for advanced requirements, is available only through professional services.

### Configuration

Follow the procedure below, in the sequence presented.

**Create an AS/400 password changer from an existing z/OS Mainframe password changer:**

1. Browse to **Admin > Remote Password Changing > Configure Password Changers**.
2. Scroll to the bottom and select **New**.
3. For the **Base Password Changer**, select the **z/OS Mainframe**.
4. In the **Name** field, enter AS/400 IBM iSystem



**New Password Changer**

Base Password Changer: z/OS Mainframe ▼

Name: AS/400 IBM iSystem \*

Save Cancel

5. Click **Save**.

**Modify the AS/400 IBM iSystem password changer commands:**

To add custom password changer commands to the AS/400, you must replace the existing standard z/OS mainframe command set.

1. Browse to **Admin > Remote Password Changing > Configure Password Changers**.
2. Click the **AS/400 IBM iSystem** password changer you just created.
3. On the **AS/400 IBM iSystem** page, scroll to the bottom and click the **Edit Commands** button. The commands that appear initially on the **Verify Password Changed Commands** page represent the standard z/OS Mainframe command set. You can use these commands as a baseline but you must customize them to suit your environment.

### Verify Password Changed Commands

ORDER	COMMAND	COMMENT	PAUSE(MS)	
1	LOGON \$USERNAME/\$CURRENTPASSWORD NORECONNECT	Logon	2000	
2	<ENTER>	Enter	2000	
3	\$\$CHECKCONTAINS READY	Ready For Next Input	4000	
4	LOGOFF	##SESSIONLOGOFF	2000	
	<input type="text"/>	<input type="text"/>	<input type="text" value="2000"/>	

### Password Change Commands

ORDER	COMMAND	COMMENT	PAUSE(MS)	
1	LOGON \${1}\$USERNAME/\${1}\$PASSWORD NORECONNECT	Logon	2000	
2	<ENTER>	Enter	2000	
3	\$\$CHECKCONTAINS READY	Ready For Next Input	4000	
4	<CLEAR>	Clear	2000	
5	alu \$USERNAME password(\$NEWPASSWORD) resume noexpire	Change Password	2000	
6	\$\$CHECKCONTAINS READY	Ready For Next Input	2000	
7	LOGOFF	##SESSIONLOGOFF	2000	
	<input type="text"/>	<input type="text"/>	<input type="text" value="2000"/>	

[Advanced Settings](#)

Back
Configure Scan Template
View Audit

4. Click the **Back** button when you have finished customizing your password changer commands, to return to the **AS/400 IBM iSystem** password changer page.

## Modify the AS/400 password changer for 5250 emulation and commands:

1. On the **AS/400 IBM iSystem** page, scroll to the bottom and click the **Edit** button.
2. On the **Edit Password Changer** page, check the box next to **Use SSL** (recommended).
3. Set the **Custom Port** to 992.

### Edit Password Changer

Name

\* AS/400 IBM iSystem

Line Ending

New Line (\n)

Custom Port

992

(e.g. override the default value of 22 for SSH or 23 for Telnet with another value)

Request Terminal

☐

(If checked, the standard out and standard error data streams combine for \$\$CHECK\* con

Connection String

Use SSL

☒

Ignore SSL Verification

☐

Active

☒

Valid for Discovery Import

☐

Save

Cancel

For extra troubleshooting assistance, you can add TRACE to the connection string to have a trace file written to the Secret Server website or engine.

## Create an AS/400 template from the z/OS Secret Template:

1. Browse to **Admin > Secret Templates**.
2. On the **Manage Secret Templates** page, select **z/OS Mainframe** from the drop-down menu and click **Edit**.
3. On the **Secret Template Designer** page, scroll to the bottom and click **Copy Secret Template**.
4. On the **Name New Secret Template** page, enter AS/400 IBM iSystem in the **Name** field.

### Name new Secret Template

Name:

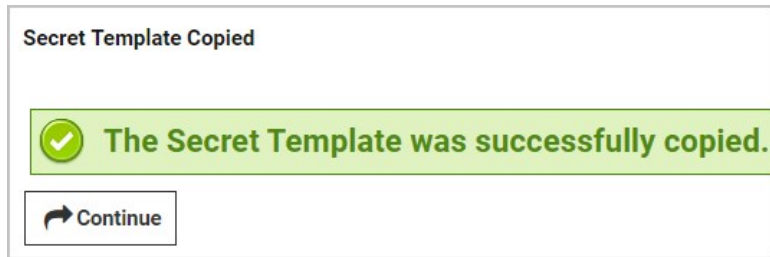
AS/400 IBM iSystem

OK

Cancel

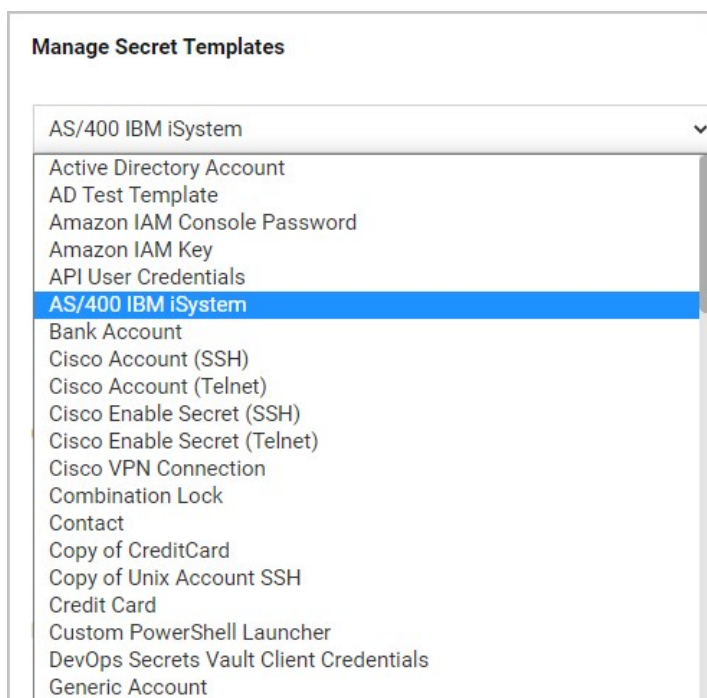
5. Click **OK**.
6. On the confirmation screen, click **Continue**.





Modify the **AS/400 Secret Template** to use the **AS/400 Password Changer**:

1. Browse to **Admin > Secret Templates**.
2. On the **Manage Secret Templates** page, click the drop-down menu and select the new **AS/400 IBM iSystem** secret template you just created.



3. Click **Edit**.
4. On the **Secret Template Designer** page, scroll to the bottom and click **Configure Password Changing**.
5. On the **Secret Template Edit Password Changing** page, click **Edit**.

### Secret Template Edit Password Changing

Enable Remote Password Changing

Yes

Retry Interval

2 hours

Maximum Attempts

12

Enable Heartbeat

Yes

Heartbeat Check Interval

1 day

#### Password Type to use z/OS Mainframe

PASSWORD TYPE	SECRET FIELD	SCRIPT VARIABLE
Machine Name	Machine	\$machine
Passphrase	Passphrase	\$passphrase
Password	Password	\$password
Port	Port	\$port
User Name	Username	\$username

Back

Edit

- On the second **Secret Template Edit Password Changing** page, select **AS/400 IBM iSystem** from the **Password Type to Use** drop-down menu.

## Secret Template Edit Password Changing

Enable Remote Password Changing

☒

Retry Interval

Days

0

Hours

2

Minutes

0

Maximum Attempts

12

Enable Heartbeat

☒

Heartbeat Check Interval

Days

1

Hours

0

Minutes

0

Password Type to use

AS/400 IBM iSystem

Machine Name

Machine

Passphrase

Passphrase

Password

Password

Port

Port

User Name

Username

Save

Cancel

7. Click **Save**.

You can now create secrets using your new template and password changer in Secret Server 10.5.

If you would like to test your template and password changer but you do not have access to an AS/400 IBM iSystem, you can use the website [PUB400.com](http://PUB400.com).

## Creating a Custom Password Changer

To create a custom password changer, follow the procedure below.

**Note:** Before creating the password changer and attempting to change a password through Secret Server, we recommend that you test the command set you are using directly.

1. From the **Admin** menu, select **Remote Password Changing**.
2. Click **Configure Password Changers**, then scroll to the bottom of the page and click **+New**.

### Remote Password Changing Configuration

Enable Remote Password Changing	Yes
Enable Password Changing on Check In	No
Enable Heartbeat	Yes

[Advanced \(not required\)](#)

Back
Edit
Configure Password Changers

3. Choose a **Base Password Changer** with a command set that most closely matches the type of password changer you are creating, as this determines which customizable parameters and test actions are available to you. To create a custom SSH password changer, choose a base password changer with a name that ends in (SSH).

### New Password Changer

Base Password Changer

Account Custom (SSH) ▼

Name

Save
Cancel

4. Give your new password changer a **Name** and click **Save**.
5. Edit the **Password Change Commands** to contain the command set you need.
  - Use the Delete button to remove a row.
  - Use the Edit button to modify a row.
  - Use the up and down arrows to move a row.
  - Use the Plus button to save a row.

## New PW Changer

### Verify Password Changed Commands

AUTHENTICATE AS

Username

\$USERNAME

Password

\$CURRENTPASSWORD

Key

Passphrase

Save

ORDER	COMMAND	COMMENT	PAUSE(MS)
			2000

### Password Change Commands

AUTHENTICATE AS

Username

\$USERNAME

Password

\$CURRENTPASSWORD

Key

Passphrase

Save

6. Edit the **Verify Password Changed Commands** to create the command set for checking that the password is valid. These commands are used by heartbeat and after a password change to verify that the change was successful.
7. When you are finished editing the commands, scroll to the bottom and click **Back** to return to the overview screen and access test actions for your new password changer. To edit advanced commands and settings, see the instructions below.

### Advanced Post Change Commands

To modify advanced post change commands, do the following:

1. Scroll to the bottom of the page and click **Advanced Post Change Commands**.

[Advanced Post Change Commands](#)  
[Advanced Settings](#)

Back

Configure Scan Template

View Audit

2. Change the commands as desired in the under **Post Successful Change Commands** and **Post Failure Change Commands**.

Post Successful Change Commands ?
Test Disabled


AUTHENTICATE AS

Username

Password

Key

Passphrase

 Save

ORDER	COMMAND	COMMENT	PAUSE(MS)
	<input type="text"/>	<input type="text"/>	<input type="text" value="2000"/> <div>+</div>

Post Failure Change Commands ?
Test Disabled


AUTHENTICATE AS

Username

Password

Key

Passphrase






 Save




ORDER	COMMAND	COMMENT	PAUSE(MS)
	<input type="text"/>	<input type="text"/>	<input type="text" value="2000"/> <div>+</div>

## Advanced Settings

To modify advanced settings, do the following:

1. Scroll to the bottom of the page and click **Advanced Settings**.
2. Change the settings as desired in the under **Post Successful Change Commands** and **Post Failure Change Commands**.

SETTING	VALUE	
Remote Password Changing Timeout (minutes)	5	
Bypass Verify After Password Change	No	
Heartbeat Unknown Error to Unable to Connect Translation (regex)		
Attempt Password Change with new password when error contains (regex)		
Advanced: Delay Verify After Password Change (seconds)		

 Back
  Configure Scan Template
  View Audit

**Note:** Before attempting to change a password through Secret Server using your new custom password changer, we recommend that you test the command set you are using.

## A Note About Commands

Any term in these commands preceded by \$ will reference a secret template field. Any term preceded by \${1}\$ refers to the Secret template field of a linked Secret. If you need to reference a secret template field, make sure you are using the exact secret template field name.

To use your new password changer, you will need to assign it to a secret template. See [Assigning a Password Changer to a Secret Template](#).

## Creating a Custom Password Changer for Cisco ASA

To create a custom password changer using SSH for Cisco ASA 5505, 5515 and other models with IOS 12.2 and earlier that cannot use the copy command, follow the procedure for [Creating a Custom Password Changer](#). Make sure you choose a base password changer that ends with (SSH) with a command set similar to the one you are adding, and use the following settings:

### Authenticate As

1. `$_1$USERNAME`
2. `$_1$PASSWORD`

### Commands

1. Enter enable
2. Enter `$CURRENTPASSWORD`
3. Enter config terminal
4. Enter enable password `$NEWPASSWORD`
5. Enter end
6. Enter `wr mem`
7. Enter exit



## Creating a Custom SSH Password Changer

To create a custom SSH password changer for a device that supports changing passwords via SSH, follow the procedure for [Creating a Custom Password Changer](#). Be sure to choose a base password changer with a name that ends in (SSH).

## Deactivating Password Changers

To make a password changer unavailable for use and to hide it from view in your list of password changers, you must mark it inactive:

1. From the **Password Changers Configuration** page, click the password type name of the password changer you would like to make inactive.
2. Click **Edit**.
3. Uncheck the **Active** box.
4. Click **Save**.

To view inactive password changers, check the **Show Inactive** box at the bottom of the list of password changers. The Active column in the table indicates the status of the password changer.

## Distributed Engines and RPC

Distributed Engines allow RPC, heartbeat and discovery to occur on networks that are not directly connected to the network that Secret Server is installed on. See the linked KB and its associated white paper for details on configuration and functionality.

**Note:** Distributed Engines were released in version 8.9.000000 and replaced remote agents.

## Editing Custom Commands

The SSH type changers use the SSH protocol to access the machine. This type contains custom commands for password reset and can contain commands for the verify password functionality but most SSH type changers simply verify that a connection can be established with the username and password. The Telnet type changers use the Telnet protocol in order to access the machine and contain custom commands for both the password reset and the verify password functionality. The verify functionality is used in the heartbeat, as well as verifying that the password was changed successfully.

SSH key rotation type changers also include post-reset success and failure custom commands. These extra command sets are run after both the reset and verify functions are run and are used to either finalize the key rotation and password change (success) or clean up after a failure. If both the reset and verify functions are successful, the post-reset success command set is run. If either the reset or the verify fail, the post-reset failure command set is run.

To edit the custom commands, click on the **Edit** Commands button. This sets the command grids into Edit mode where you can add, update, or delete the commands in order to suit their purpose.

## RPC-Mapped Text-Entry Fields

Prepend a \$ to any text-entry field name to access that field. For example, to echo the notes value for a secret, you would use this command: `echo $Notes`. Commonly accessed fields include:

- `$USERNAME` The username text-entry field mapped in RPC on the secret template.
- `$CURRENTPASSWORD` The password text-entry field mapped in RPC on the secret template.
- `$NEWPASSWORD` The next password (filled in Next Password textbox or auto-generated).
- `$PRIVATEKEY` The private key text-entry field mapped in RPC on the secret template.
- `$NEWPRIVATEKEY` The next private key (filled in Next Private Key text box or auto-generated).
- `$CURRENTPUBLICKEY` The public key text-entry field mapped in RPC on the secret template.
- `$NEWPUBLICKEY` The next public key (generated from the next private key).
- `$PASSPHRASE` The passphrase text-entry field mapped in RPC on the secret template.
- `$NEWPASSPHRASE` The next passphrase (filled in Next Private Key Passphrase text box or auto-generated).

## Associated Reset Secrets

- `$(1)$` Adding this prefix to any text-entry field targets the associated reset secret with order 1.
- `$(1)$USERNAME` The mapped username of the associated secret, identified by order. Can also reference any other property on the associated secret. Common examples include:
  - `$(1)$PASSWORD`
  - `$(1)$CURRENTPASSWORD`
  - `$(1)$PRIVATE KEY`
  - `$(1)$PRIVATE KEY PASSPHRASE`
- `$(SID:105)` Adding this prefix to any text-entry field targets the associated reset secret with a secret Id of 105.
- `$(SID:105)$USERNAME` The mapped username of the associated secret, identified by secret id. Like referencing an associated secret by order, referencing by secret id can also access any text-entry field on the secret by name.

**Note:** Both the mapped text-entry fields and secret text-entry field names can be used.

## Check-Result Commands

- `$$CHECKCONTAINS <text>` Checks that the response from last command contains <text>.
- `$$CHECKFOR <text>` Checks that the response from the last command equals <text>.
- `$$CHECKNOTCONTAINS <text>` Checks that the response from last command does not contain <text>.

**Note:** If these conditions are not met the process fails and immediately returns a result.

If you want to exit out of the command set early without triggering a failure, echo an "OK" on the line immediately preceding the `exit 0;` statement. "OK" must be the only text in the response from the server for this to work.

You can test out your password reset and verify password command sets by clicking on the **Test Action** buttons next to the relevant sections. All communication between Secret Server and the target machine is displayed when using these test buttons.

## Enabling RPC

RPC is enabled under the Administration, Remote Password Changing page. Click **Edit** to enable RPC, secret heartbeat, and secret checkout. Once enabled, all secret templates with RPC configured are available to use with RPC.

## Mapping Account Fields for RPC

All the secret templates with the prefix RPC have RPC configured by default. For creating a custom template that uses RPC it can be configured from the Secret Template Designer. **Enable Remote Password Changing** must be turned on for secrets created from the template to make use of this feature. Select the password type for the account and map the text-entry fields to be used for authenticating to the remote server. The secret fields must be mapped to the corresponding required text-entry fields based on the password change type. Do that in the **Secret Template Edit Password Changing** page for the secret template:

### Secret Template Edit Password Changing

Enable Remote Password Changing	Yes
Retry Interval	1 hour
Maximum Attempts	10000
Enable Heartbeat	Yes
Heartbeat Check Interval	8 hours

**Password Type to use** Active Directory Account

PASSWORD TYPE	SECRET FIELD	SCRIPT VARIABLE
Domain	Domain	\$domain
Password	Password	\$password
User Name	Username	\$username
Domain Controller (DC)		\$domaincontroller
Default Privileged Account		< None >

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The **Retry Interval** text box is the amount of time that a secret waits before once again attempting to change a password after a password change is unable to succeed.

The **Default Privileged Account** text box is the secret that is set as the privileged account for all new secrets that are created with this secret template. Changing this does not affect any existing secrets.

## Mapping an SSH Key or Private Key Passphrase for Authentication

Some password changers may be customized to use SSH key authentication. Secret Server needs to know which text-entry fields contain the key and the passphrase. These text-entry fields can be specified after clicking **Edit** from the password changer page.

**Unix Account Custom (SSH)**

Verify Password Changed Commands
Test Action

AUTHENTICATE AS

Username \$USERNAME  
Password \$CURRENTPASSWORD  
Key < None >  
Passphrase < None >

ORDER	COMMAND	COMMENT	PAUSE(MS)
Password Change Commands			
Test Action			
<div>AUTHENTICATE AS</div> <div> Username \$USERNAME  Password \$CURRENTPASSWORD  Key &lt; None &gt;  Passphrase &lt; None &gt; </div>			
ORDER	COMMAND	COMMENT	PAUSE(MS)
1	passwd	Password Command	2000
2	\$CURRENTPASSWORD	Current Password	2000
3	\$NEWPASSWORD	New Password	2000
4	\$NEWPASSWORD	Confirmed Password	2000

[Advanced Post Change Commands](#)  
[Advanced Settings](#)

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The key and passphrase must be identified by a \$ sign and the secret text-entry field name, which can be obtained from the secret template.

To set which text-entry fields are your key and passphrase, go to the extended mappings for a secret template by clicking **Extended Mappings** from the **Secret Template Edit** page. Select the text-entry fields that correspond to the SSH private key and passphrase if applicable. No matter what you name your key text-entry field, Secret Server knows what it is. This is set up by default, so you should not need to do this unless you've created custom Unix templates you want to use keys with.



Once Secret Server knows which text-entry fields contain the private key and private key passphrases, it can automatically use them as a part of launchers.

## Minimum Requirements for Windows Local Accounts

Due to a security issue ([MS KB3178465](#)), we do not allow Windows local accounts to change their own passwords. Instead, we recommend using the discovery privileged account to change them. Each privileged account should meet the following requirements:

- Must be a domain user
- Must be a member of the local administrator group on all target end points

**Note:** The discovery account for Secret Server can also be used for RPC.

## Modifying Password Changers

To modify a password changer, click the password changer name under **Admin > Remote Password Changing > Configure Password Changers** and then use the **Edit** or **Edit Commands** buttons to make changes. For more information about editing the custom PowerShell password changer, see [Remote Password Changing with PowerShell](#).

**Note:** You can find the full, up-to-date list of password changers included with Secret Server by default in [List of Built-In Password Changers](#) (KB).

## Password Changing Scripts

PowerShell scripts, SSH scripts, and SQL scripts for password changing (PowerShell only), dependencies, and discovery custom actions can be created by administrators with the role permission called Administer Scripts. The scripts can be accessed by going to **Administration > Remote Password Changing > Scripts**.

**Note:** Secret Server requires that WinRM is configured on the Web server. For instructions please see [Configuring WinRM for PowerShell](#).

### Creating Scripts

On the **Scripts** screen, select desired script tab and click **Create New** to enter the name of the script, a description, and the commands to run, then click **OK**. The script now shows up in the grid. Scripts can be deactivated and reactivated from the grid.

### Testing Scripts

All scripts run from the machine that Secret Server is installed on, or the site assigned to the secret. To test a script, click the **Test** button on the grid next to the corresponding script.

PowerShell scripts run as the identity of the secret, so enter in an Active Directory credential to run the script as or select a secret to pre-fill the run-as credentials. Then enter in any command line arguments that the script requires. The output of the script is displayed above the grid for debugging purposes. To test the script over an engine, select a site from the **Site** list. This helps in diagnosing server specific issues where engines are installed.

### Using Scripts

To use a script as a password changer or Dependency, it must be wired up to the appropriate action under **Admin > Remote Password Changing** on the password changer or dependency changer.

Discovery scripting is done under **Admin > Discovery > Extensible Discovery**. For more information on configuring extensible discovery see the [Extensible Discovery Overview](#).

### Viewing Audits

A full history of each PowerShell script is kept and can be downloaded from the audit trail. Click **View Audit** to view the audit trail for PowerShell. Each time a script is updated, the previous one can be downloaded from the corresponding audit record.

**Note:** For additional information on setting up PowerShell scripts, please read the following KB article: [Creating and Using PowerShell Scripts](#).

## RPC Error Codes

The most common RPC errors are:

- **NERR\_PasswordPolicySettings:** The password Secret Server attempted to set is a repeating password or one that does not meet domain password policy standards. A common reason is minimum password age, which is often defaulted to 24 hours.
- **ERROR\_ACCESS\_DENIED:** The user account's "Not Able to Change Password" setting could not be set or logon was denied.
- **ERROR\_INVALID\_PASSWORD:** Either the user does not exist (ensure the usernames match) or the password is not correct.

For more information about common error messages for Remote Password Changing, see [Remote Password Changing Errors](#) (KB).

## **RPC for Service Accounts and SSH Keys**

### **Service Accounts**

RPC can be performed on service accounts where the dependent services is automatically updated and restarted as the service account password is changed. Administrators are notified if a dependency fails to restart. The supported dependency types are IIS application pools, IIS application pool recycle, scheduled tasks, windows services, passwords embedded in .ini, .config, and other text files. Custom dependencies can be created using SSH, PowerShell, or SQL scripts. The application pool recycle only recycles the specified application pool, it does not update the password of the service account running the application pool. Secret Server attempts to unlock the service account should the account become locked during the dependency password change if there is a privileged account assigned to the secret.

### **SSH Keys**

RPC can be performed on multiple public keys referencing the same private key in Secret Server. The dependency types for this situation are SSH key rotation and SSH key rotation privileged.

## RPC Logs

The RPC logs for a specific secret can be accessed by clicking the **View Audit** button on Secret View page and ticking the check box at the bottom of the page for display password changing Log. The RPC logs for all secrets can be accessed by navigating to **Admin > Remote Password Changing**.

You can change the **Days to Keep Operational Logs** text box to set the period to keep RPC-related logs that might contain PII. Secret Server automatically deletes logs older than that (in days).


## Running a Manual RPC

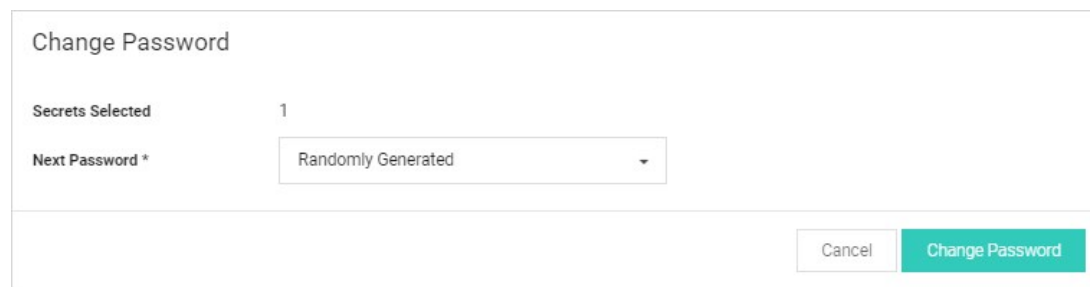
On the RPC tab there is a button called Change Password Remotely button that allows the use to change the password immediately instead of waiting for it to expire. When this button is clicked the user is taken to the Change Password Remotely page where they can enter in or generate the new password for the account. When the user clicks the Change button the secret enters the queue for having its password changed. The RPC Log found on the Remote Password Changing page details the results of the password change attempts and can be used for debugging.

If the secret is a Unix or Linux account and uses a password changer that supports SSH key rotation, the user can change the account's password, public and private keypair, and the private key passphrase. The user can enter or generate any of these items.

**Note:** If the password change fails, Secret Server continues to retry until it is successful, or the change is canceled by the user. To manually cancel the change, click Cancel Password Change on the RPC tab.

To run a manual RPC:

1. From **Dashboard**, click its check box to select secret you want to test.
2. Click the  Change Password Remotely button. The Change Password popup page appears:



The image shows a 'Change Password' popup form. At the top, it says 'Change Password'. Below that, there is a label 'Secrets Selected' followed by the number '1'. Underneath, there is a label 'Next Password \*' followed by a dropdown menu that currently shows 'Randomly Generated'. At the bottom right of the form, there are two buttons: a 'Cancel' button and a 'Change Password' button.

3. Click to select the **Next Password** dropdown list and select **Manual** or **Randomly Generated**. If you chose manual:
  1. The Password text box appears.
  2. Type the new password in the **Password** text box.
  3. Click the **Change Password** button.

Otherwise, click the **Change Password** button. The password change is now queued.

4. You can verify that the password change completed either by unmasking the password on this screen (click the lock icon beside the password field) or by looking at the **Remote Password Changing** log. You can find the Remote Password Changing log by going to **Admin > Remote Password Changing**.



## Treating Specific Heartbeat "Unknown Errors" as Connection Failures

**Note:** This setting was previously called "Password Change Error Code Translation (regex)."

The Secret Server "Heartbeat Unknown Error to Unable to Connect Translation (regex)" setting can translate UnknownError heartbeat errors into connection errors based on text, such as the error code, in the error message. Using a regular expression, which you define, Secret Server scans heartbeat UnknownError messages for specific text strings. When there is a match, Secret Server changes the UnknownError to an "Unable to Connect" heartbeat error. This setting is useful if a custom command error is interpreted as UnknownError but the message indicates it actually was unable to connect. The translated connection error will cause Secret Server to attempt another heartbeat.

**Figure:** Heartbeat Unknown Error to Unable to Connect Translation (regex) Setting

Active Directory Account

Verify Password Changed Commands Test Action

Password Change Commands Test Action

*This process is done through internal commands. The commands cannot be edited.*

Password Change By Admin Credentials Commands Test Action

*This process is done through internal commands. The commands cannot be edited.*

[Hide Advanced Settings](#)

SETTING	VALUE
Heartbeat Unknown Error to Unable to Connect Translation (regex)	
Attempt Password Change with new password when error contains (regex)	

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**Note:** The UnknownError error is very common when running scripts and commands, making the regex discrimination desirable.

Logic:

(RPC UnknownError) AND (Regex match in error message) = > RPC status changed to "Unable to Connect"

Example:

. \*error code is 10060.\* (any error with the code 10060 changes the RPC status to "Unable to Connect")

### Procedure

To configure the unknown errors to trigger connection failures:

1. Go to **Admin > Remote Password Changing**. The Remote Password Changing Configuration page appears:

## Remote Password Changing Configuration

Enable Remote Password Changing	Yes
Enable Password Changing on Check In	No
Enable Heartbeat	Yes

Advanced (not required)

Days to Keep Operational Logs	30
-------------------------------	----

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Configure Dependency Changers

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### Logs

Password Changing

Heartbeat

Run Now

Search...

50

90 minutes

Record Count 0 Page 1 / 1 « Prev Next »

No results matching the current filter.

- Click the **Configure Password Changers** button. The Password Changers Configuration page appears:

## Password Changers Configuration

PASSWORD TYPE NAME	SCAN TEMPLATE	ACTIVE
Active Directory Account	Active Directory Account	Yes
Amazon IAM Console Password Privileged Account	AWS User Account	Yes
Amazon IAM Key	AWS Access Key	Yes
Blue Coat Account Custom (SSH)	SSH Local Account	Yes
Blue Coat Enable Password Custom (SSH)	SSH Local Account	Yes

3. Click the link for the desired password type. Its Account page appears:

Active Directory Account

Verify Password Changed Commands

Test Action

Password Change Commands

Test Action

This process is done through internal commands. The commands cannot be edited.

This process is done through internal commands. The commands cannot be edited.

Password Change By Admin Credentials Commands

Test Action

This process is done through internal commands. The commands cannot be edited.

Hide Advanced Settings

SETTING

VALUE

Heartbeat Unknown Error to Unable to Connect Translation (regex)

Attempt Password Change with new password when error contains (regex)

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- If necessary, click the **Advanced Settings** link.
- Click the pencil icon next to **Heartbeat Unknown Error to Unable to Connect Translation (regex)**. The Value text box appears.
- Determine the desired text string to search for.
- Type the desired regex in the **Value** text box.
- Click the **Save** icon next to the text box

## Triggering an RPC When Defined Errors Occur

When the "Attempt Password Change with new password when error contains (regex)" setting is enabled, Secret Server generates a new password to use during the next RPC attempt when the defined error is returned. Using a regular expression, which you define, Secret Server scans the error message for specific text strings. When there is a match, Secret Server generates and sets a new next password for the secret that will be used in the next RPC attempt, which will occur based on the templates RPC interval. To keep this process from generating too many next passwords, it is restricted to five attempts while failing RPC.

**Note:** Only the password field is updated. Passcodes and SSH keys are left alone.

**Figure:** Attempt Password Change with new password when error contains (regex) setting

Active Directory Account

Verify Password Changed Commands [Test Action](#)

Password Change Commands [Test Action](#)

*This process is done through internal commands. The commands cannot be edited.*

Password Change By Admin Credentials Commands [Test Action](#)

*This process is done through internal commands. The commands cannot be edited.*

[Hide Advanced Settings](#)

SETTING	VALUE
Heartbeat Unknown Error to Unable to Connect Translation (regex)	<a href="#">Edit</a>
Attempt Password Change with new password when error contains (regex)	<a href="#">Edit</a>

[Back](#) [Configure Scan Template](#) [View Audit](#)

Logic:

(RPC Error) AND (one or more regex matches) AND (five or fewer attempts) = > New password generated

Examples:

.\*UnknownError.\* (any unknown error)

.\* (any error)

.\*minimum.\* (minimum password length requirement error)

.\*0x80072035.\* (server rejects password error)

.\*0x80072035.\*!.\*minimum.\* (server rejects password or password length error)

## Procedure

To configure RPC in response to specific unknown errors:

1. Go to **Admin > Remote Password Changing**. The Remote Password Changing Configuration page appears:

## Remote Password Changing Configuration

Enable Remote Password Changing	Yes
Enable Password Changing on Check In	No
Enable Heartbeat	Yes

[Advanced \(not required\)](#)

Days to Keep Operational Logs	30
-------------------------------	----

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[Edit](#)
[Configure Password Changers](#)
[Configure Dependency Changers](#)

[Distributed Engine Configuration](#)
[View Audit](#)

### Logs

[Password Changing](#)
[Heartbeat](#)

[Run Now](#)

Record Count 0 Page 1 / 1 « Prev Next »

**i** No results matching the current filter.

1. Click the **Configure Password Changers** button. The Password Changers Configuration page appears:

## Password Changers Configuration

PASSWORD TYPE NAME	SCAN TEMPLATE	ACTIVE
Active Directory Account	Active Directory Account	Yes
Amazon IAM Console Password Privileged Account	AWS User Account	Yes
Amazon IAM Key	AWS Access Key	Yes
Blue Coat Account Custom (SSH)	SSH Local Account	Yes
Blue Coat Enable Password Custom (SSH)	SSH Local Account	Yes

1. Click the link for the desired password type. Its Account page appears:

Active Directory Account

Verify Password Changed Commands

Test Action

Password Change Commands

Test Action

*i* This process is done through internal commands. The commands cannot be edited.

*i* This process is done through internal commands. The commands cannot be edited.

Password Change By Admin Credentials Commands

Test Action

*i* This process is done through internal commands. The commands cannot be edited.

Hide Advanced Settings

SETTING	VALUE
Heartbeat Unknown Error to Unable to Connect Translation (regex)	<div></div>
Attempt Password Change with new password when error contains (regex)	<div></div>

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1. If necessary, click the **Advanced Settings** link.
2. Click the pencil icon next to **Attempt Password Change with new password when error contains (regex)**. The Value text box appears.
3. Determine the desired text string to search for.
4. Type the desired regex in the **Value** text box.
5. Click the **Save** icon next to the text box.



## Overview

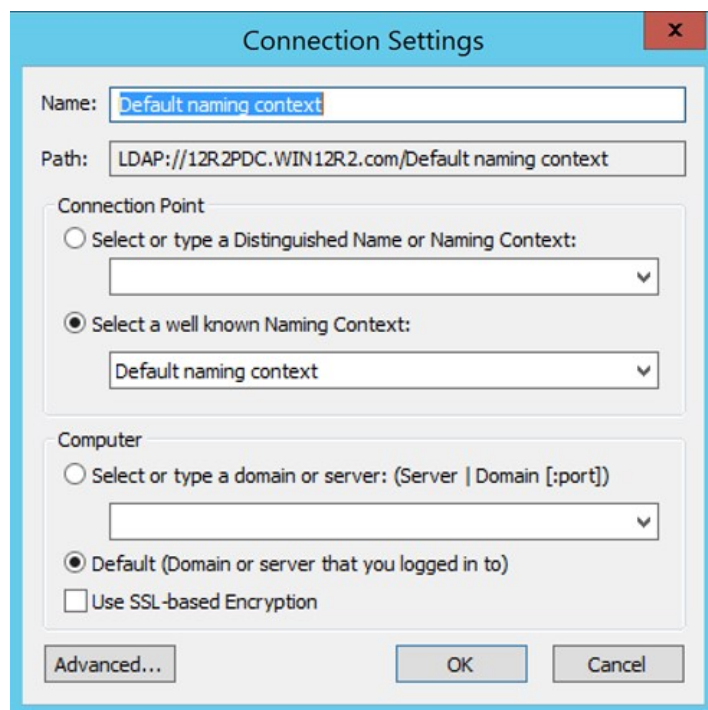
Secret Server requires proper permissions to perform remote password changing (RPC). The privileged Delinea Secret Server RPC service account used for RPC of an Active Directory (AD) account secret must have granular permissions applied to it. You will be using two Active Directory tools to make these modifications to the RPC account:

- ADSI Edit
- Active Directory Users and Computers.

**Note:** ADSI stands for *Active Directory Service Interfaces*. It is a set of COM interfaces used to access the features of directory services from different network providers

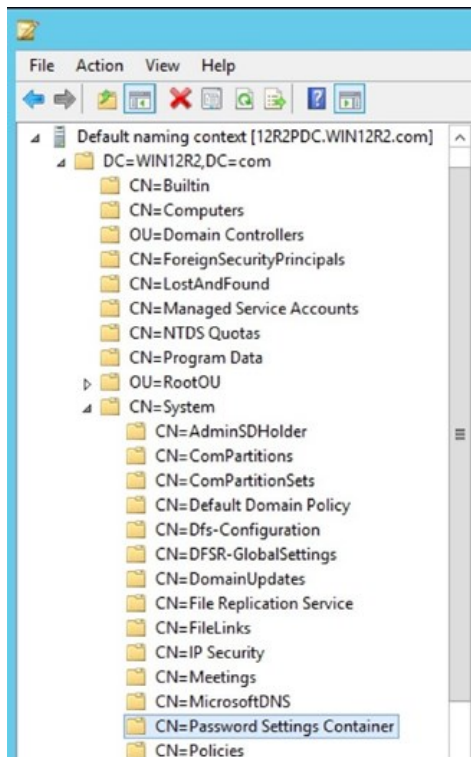
## Setting ADSI Permissions

1. Open ADSI Edit (found on Domain Controllers as part of the Active Directory Administration Tools).
2. From the **Action** drop down menu select **Connect to...**. The "Connection Settings" window appears:

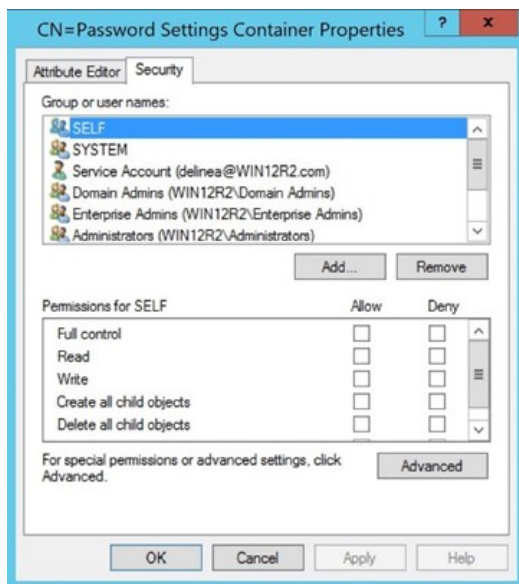


3. Make any adjustments if needed.
4. Click the **OK** button to connect to the domain you are logged into. The ADSI Edit window appears.
5. Click on the **Default naming context** node (the root of the domain).
6. Expand the domain name root and maneuver down until you reach **CN=System > CN=Password Settings Container** as noted in the image below:

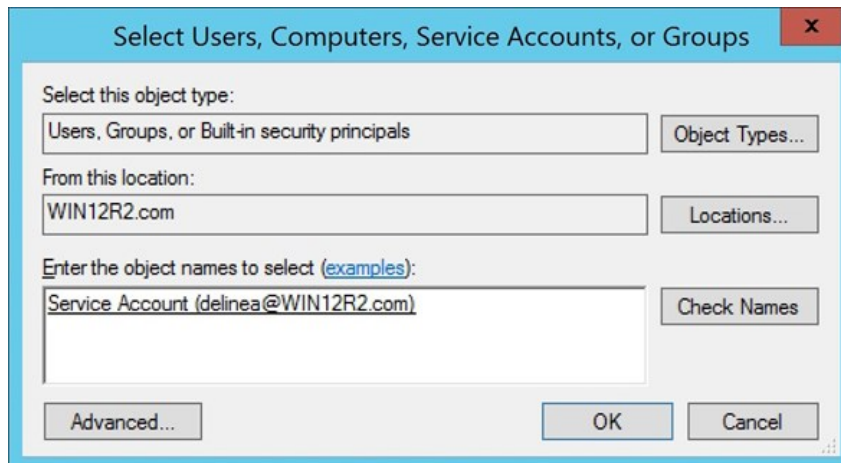




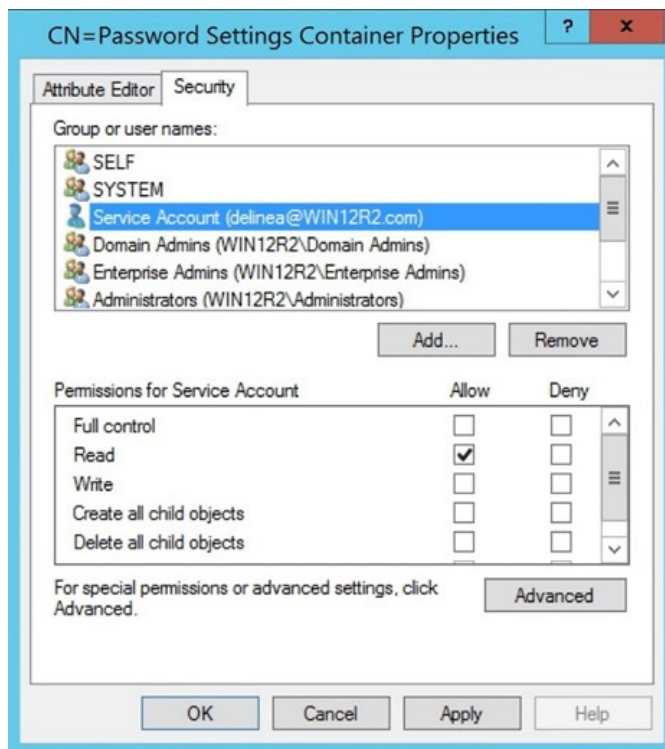
7. Right-click **CN=Password Settings Container** and select **Properties**. A properties dialog box appears:



8. Click the **Add...** button. The "Select Users, Computers, Service Accounts, or Groups" dialog box appears:



9. Enter the information for the Delinea Secret Server RPC account.
10. Click the **OK** button. The previous dialog box reappears with the "delinea" service account appearing in the "Group or user names" list.
11. Click on the new account. Its permissions appear.

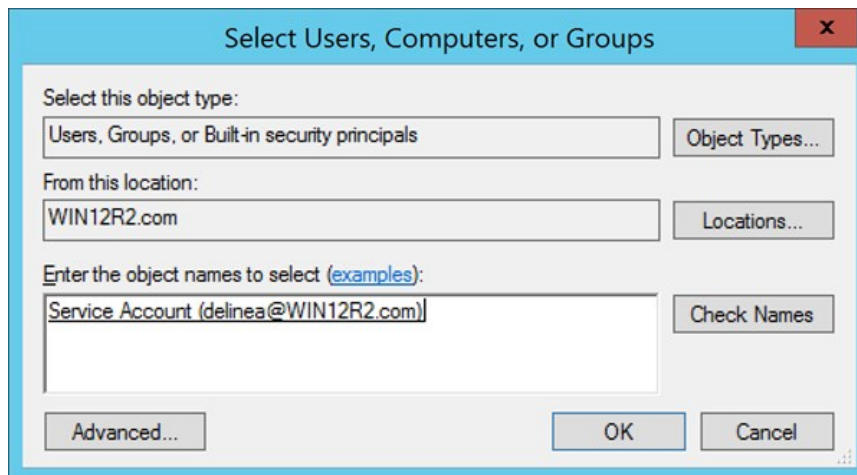


12. Click to select the **Read** check box in the **Allow** column.
13. Click the **OK** button.

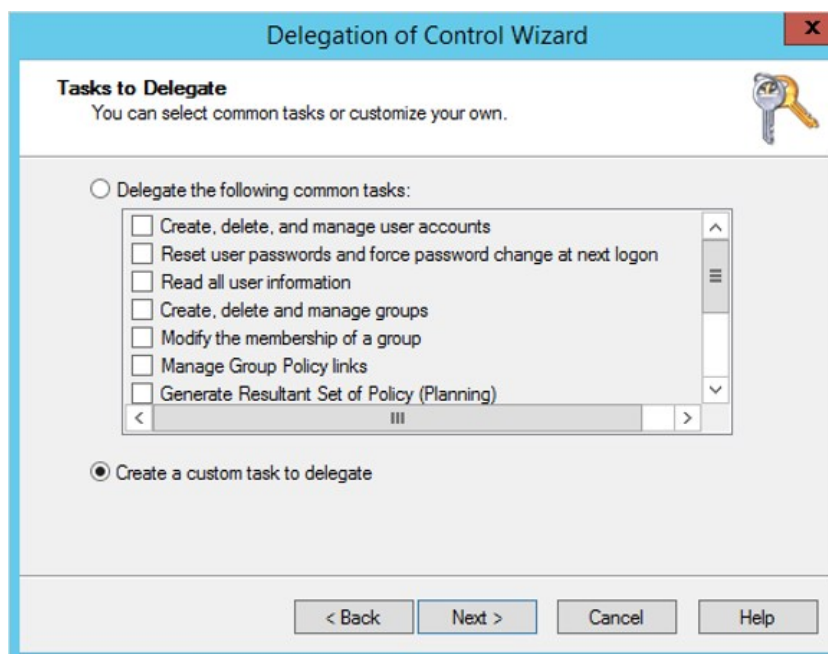
## Setting Delegate Control Permissions

1. Open the Active Directory Users and Computers administrative console.

2. Right-click the Organizational Unit (OU) or the top-level domain you want to configure and select **Delegate Control...** as noted in the image below. The "Delegation of Control Wizard" appears.
3. Click the **Next** button. The **Users or Groups** dialog appears.
4. Click the **Add...** button in the **Users or Groups** section.
5. Click the **Add...** button. The "Select Users, Computers, Service Accounts, or Groups" dialog box appears:



6. Enter the information for the Delinea Secret Server RPC account.
7. Click the **OK** button. The Wizard reappears.
8. Click the **Next** button. The Tasks to Delegate page of the wizard appears:



9. Click to select the **Create a custom task to delegate** selection button.

- Click the **Next** button. The Active Directory Object Type page of the wizard appears.

**Delegation of Control Wizard**

**Active Directory Object Type**  
Indicate the scope of the task you want to delegate.

Delegate control of:

☐ This folder, existing objects in this folder, and creation of new objects in this folder

☒ Only the following objects in the folder:

- ☐ Site Settings objects
- ☐ Sites Container objects
- ☐ Subnet objects
- ☐ Subnets Container objects
- ☐ Trusted Domain objects
- ☒ User objects

☐ Create selected objects in this folder

☐ Delete selected objects in this folder

< Back   Next >   Cancel   Help

- Click to select the **Only the following objects in the folder** selection button.
- Scroll to bottom of the list.
- Click to select the **User objects** check box.
- Click the **Next** button. The Permissions page of the wizard appears:

**Delegation of Control Wizard**

**Permissions**  
Select the permissions you want to delegate.

Show these permissions:

☒ General

☒ Property-specific

☐ Creation/deletion of specific child objects

Permissions:

- ☐ Full Control
- ☐ Read
- ☐ Write
- ☐ Create All Child Objects
- ☐ Delete All Child Objects
- ☐ Read All Properties

< Back   Next >   Cancel   Help

- Click to select the **General** and **Property-specifics** check boxes.
- In the **Permissions** list, ensure none of the check boxes are selected.

17. Locate and click to select the following check boxes in the **Permissions** list:

- Change Password
- Read lockoutTime
- Read pwdLastSet
- Reset Password
- Write lockoutTime
- Write pwdLastSet
- Write UserAccountControl
- Read UserAccountControl

18. Click the **Next** button.

19. Click the **Finish** button.

This document explains how to configure Oracle Database 19c for heartbeat and remote password changing (RPC) with Secret Server. It consists of installing the Oracle Database Access Components (ODAC), configuring Secret Server, and configuring one or more distributed engines.

**Note:** This document is not updated with every release—many releases do not affect the guide's contents and thus do not warrant a document update.

This Delinea technical configuration knowledge base article is relevant to and has been tested on:

- Secret Server 10.7 on Windows Server 2016 Standard (64-bit)
- Distributed engine 10.7 on Windows Server 2016 Standard (64-bit)
- Oracle Database 19c on Windows Server 2019 Standard (64-bit)

## Introduction

This document explains how to configure Oracle Database 19c for heartbeat and remote password changing (RPC) with Secret Server. The process consists of installing the Oracle Database Access Components (ODAC), configuring Secret Server, and configuring one or more distributed engines.

## Procedure

### Task One: Installing the Oracle Database Access Components

1. Navigate to [ODAC Runtime Downloads](#) in your browser.
2. Download the latest version of the ODAC OUI file with the same major number as your database version.
3. Unzip the file.
4. Right click and run setup.exe as a Windows administrator. The setup wizard appears.
5. Click to select **Use Windows Built-in Account**.
6. Click the **Next** button.
7. Type the desired installation path, such as c:\oracle.
8. Click the **Next** button.
9. Confirm the default product components are selected. If not, click to select **Reset Defaults**.
10. Click the **Next** button.
11. Leave the **DB Connection Configuration** fields as they are (empty).
12. Click the **Next** button. The setup runs some pre-installation configuration tests.
13. When the tests are completed, click the **Install** button.
14. Reboot your machine.

### Task Two: Configuring Secret Server

1. Navigate to the ODAC directory, such as c:\oracle.

2. Copy the C:\oracle\product\19.x.x\client\_1\odp.net\bin\4\Oracle.DataAccess.dll file to the bin directory of your Secret Server directory, for instance, c:\inetpub\wwwroot\SecretServer\bin.
3. Navigate to the C:\Windows\Microsoft.NET\Framework64\v4.0.30319\Config directory.
4. Open the machine.config file.
5. Copy and paste the line below into the DbProviderFactories section:

```
<add name="Oracle.DataAccess" invariant="Oracle.DataAccess.Client" description="Oracle Data Provider for .NET, Unmanaged Driver"
type="Oracle.DataAccess.Client.OracleClientFactory, Oracle.DataAccess, Version=4.122.19.1, Culture=neutral, PublicKeyToken=89b483f429c47342"/>
```

The section should look like this:

```
<system.data>
<DbProviderFactories>
  <add name="Oracle.DataAccess" invariant="Oracle.DataAccess.Client" description="Oracle Data Provider for .NET, Unmanaged Driver"
type="Oracle.DataAccess.Client.OracleClientFactory, Oracle.DataAccess, Version=4.122.19.1, Culture=neutral, PublicKeyToken=89b483f429c47342"/>
</DbProviderFactories>
</system.data>
```

**Note:** There may be additional <Add> sections, such as for Microsoft SQL Server. Leave them as is.

## Task Three: Configuring a Secret Server Distributed Engine

1. Install ODAC on the machine hosting the distributed engine using the same procedure as Task One.
2. Navigate to the ODAC directory on the distributed engine machine, such as c:\oracle.
3. Copy the C:\<ODAC\_Directory>\odp.net\bin\4\Oracle.DataAccess.dll file to the Distributed Engine directory, for instance, C:\Program Files\Thycotic Software Ltd\Distributed Engine.
4. Navigate to the C:\Windows\Microsoft.NET\Framework64\v4.0.30319\Config directory.
5. Open the machine.config file.
6. If necessary, create a <DbProviderFactories> section within the <system.data> section.
7. Copy and paste the line below into the <DbProviderFactories> section:

```
<add name="Oracle.DataAccess" invariant="Oracle.DataAccess.Client" description="Oracle Data Provider for .NET, Unmanaged Driver"
type="Oracle.DataAccess.Client.OracleClientFactory, Oracle.DataAccess, Version=4.122.19.1, Culture=neutral, PublicKeyToken=89b483f429c47342"/>
```

The section should look like this:

```
<system.data>
<DbProviderFactories>
  <add name="Oracle.DataAccess" invariant="Oracle.DataAccess.Client" description="Oracle Data Provider for .NET, Unmanaged Driver"
type="Oracle.DataAccess.Client.OracleClientFactory, Oracle.DataAccess, Version=4.122.19.1, Culture=neutral, PublicKeyToken=89b483f429c47342"/>
</DbProviderFactories>
</system.data>
```

## Troubleshooting

### Log Files

The errors below may appear in these files:

- SS-BWSR.log (Secret Server)
- SSDE.log (distributed engine)

These files are located within the log subdirectory of the application's directory. Typically, these are:

- Secret Server: c:\inetpub\wwwroot\secretserver\log\SS-BWSR.log
- Distributed engines: c:\program files\thycotic software ltd\distributed engine\log\SSDE.log

## Errors

### **Oracle.DataAccess.Client.OracleException: The provider is not compatible with the version of Oracle client**

This error occurs when the Oracle ODAC driver does not match the Oracle database version.

Uninstall the ODAC, and then re-install the correct version. You can uninstall ODAC using the universal installer that is included with the ODAC installation that resides in the ODAC directory.

### **Oracle.DataAccess.Client.OracleException (0x80004005): ORA-12514: TNS:listener does not currently know of service requested in connect descriptor**

This error occurs when the secret's database field does not match the Oracle SERVICE\_NAME database.

**Note:** The default "Oracle Account" secret template's database field is looking for the Oracle SERVICE\_NAME database. You can find that database's location by reading the tnsnames.ora configuration file on your Oracle database server.

### **System.ArgumentException: Unable to find the requested .Net Framework Data Provider. It may not be installed.**

This error occurs when Oracle parameters are missing from the section in the machine.config file.

### **System.Configuration.ConfigurationErrorsException: Unrecognized element**

This error occurs when the section, located in the machine.config file, is not properly formatted.



## Overview

Secret Server includes many pre-configured password changers that are used by Remote Password Changing (RPC). The following are commonly used password changers, and the list is always growing.

**Note:** To see the latest list, go to Admin > RPC > Configure RPC.

**Note:** Secret Server can use scripted password changers for devices that support SSH or Telnet (this allows for flexibility in changing passwords on less common devices). You can also run custom RPC PowerShell scripts to conduct password changes to other platforms.

## List

The followings are the current built-in password changers:

- Active Directory Account
- Active Directory LDS
- AD LDS
- Amazon IAM Console Password Privileged Account
- Amazon IAM Key
- AS/400 IBM iSystem
- Azure AD
- Blue Coat Account Custom (SSH)
- Blue Coat Enable Password Custom (SSH)
- Cisco Account Custom (SSH)
- Cisco Account Custom (Telnet)
- Cisco Enable Secret Custom (SSH)
- Cisco Enable Secret Custom (Telnet)
- Dummy Powershell Changer
- ESX/ESXi (API)
- F5 BIG-IP Root Account (SSH)
- Generic Discovery-Only Credentials
- Generic ODBC (DataSource)
- Generic ODBC (PostgreSQL DataSource)
- Generic ODBC (SQL DataSource)
- Google IAM Service Account Key
- HP iLO Account Custom (SSH)
- IBM iSeries Mainframe
- Juniper Account Custom (SSH)
- LDAP (Active Directory)
- LDAP (DSEE)
- LDAP (OpenLDAP)
- Mister Test
- MySQL Account
- New Cisco PW Changer
- New PW Changer
- Oracle Account
- Oracle Account (AS SYS)
- Oracle Account (DataSource)
- Oracle Account (TCPS)
- Oracle Account (Template Ver 2)

- PostgreSQL Account (x64)
- PowerShell Script \*\*
- SAP Account \*\*
- SonicWall NSA Web Admin Account
- SonicWall NSA Web Local User Account
- SQL Server Account
- SSH Key Rotation \*\*
- SSH Key Rotation (No Password) \*\*
- SSH Key Rotation Privileged Account \*\*
- SSH Key Rotation Privileged Account (No Password) \*\*
- Sybase Account
- Test PC
- Unix Account (SSH)
- Unix Account (Telnet)
- Unix Account Custom (SSH)
- Unix Account Custom (Telnet)
- Unix Account SU Takeover (SSH)
- Unix Account SUDO Takeover (SSH)
- Unix Root Account Custom (SSH)
- WatchGuard Custom (SSH)
- Web User Account (built-in support for AWS, Google, Salesforce)
- Windows Account
- z/OS Mainframe
- z/OS Mainframe (Priv Account)

\* Does not require an Advanced Scripting Add-On License. Will require PowerShell installation. \*\* Professional Edition add-on/Platinum Edition only

Other platforms that Secret Server can change passwords on include:

- AS/400
- Linux / Mac
- Check Point
- Enterasys
- Dell DRAC

## Overview

You can create custom SQL password changers based on an ODBC driver. The Secret Server machine must have the corresponding ODBC driver installed. These can be downloaded from the corresponding database vendor sites.

ODBC connection strings vary depending on product. See [Example Connection Strings](#) below for sample ODBC connection strings for Microsoft SQL server and PostgreSQL.

## Create an ODBC Password Changer

1. In Secret Server, go to **Admin > Remote Password Changing**.
2. Click **Configure Password Changers**, and then scroll to the bottom of the page.
3. Click the **New** button.
4. Select **Generic ODBC (DataSource)** in the **Base Password Changer** dropdown list.
5. Type a name for your new custom password changer.
6. Under **Password Reset Commands**, type a command to reset a password (see below).

**Note:** Secret field variables can be used in a way similar to how they are used in a Linux or UNIX password changer, with the exception that they can be specified as ODBC parameters, assuming the command allows it. To parameterize a secret field variable, prefix it with the @ symbol instead of a \$.

## Example Reset Commands

Parameterized SQL server command:

```
EXEC sp_password @CURRENTPASSWORD, @NEWPASSWORD
```

**Note:** If the command does not support using parameters, the secret field values can be substituted into the command.

Substitution PostgreSQL command:

```
ALTER ROLE "USERNAME" WITH ENCRYPTED PASSWORD '$NEWPASSWORD'
```

Substitution MySQL command:

```
ALTER USER 'USERNAME' IDENTIFIED BY '$NEWPASSWORD';
```

## Adding Connection Strings

Each ODBC password changer requires a connection string. This can be specified within the password changer settings or in the secret itself.

### Adding Connection Strings to Password Changer Settings

Add a connection string to password changer settings:

1. In Secret Server, go to **Admin > Remote Password Changing**.
2. Click **Configure Password Changers**.

3. Click the name of your password changer.
4. Click the **Edit** button.
5. Type your database ODBC connection string in the **Connection String** text box.
6. Click the **Save** button.

## Adding Connection Strings to Secrets

The Connection String can also be specified on the secret by adding a new field to the template and mapping it to the **Data Source** property on the template's **Remote Password Changing** configuration. Otherwise, that mapping field can be left blank.

**Note:** See [Creating or Editing Secret Templates](#) for more information about adding fields to secret templates.

Example connection strings:

SQL 2012:

```
Driver={SQL Server Native Client 11.0};Server=$SERVER;Database=master;Uid=$USERNAME;Pwd=$PASSWORD;
```

PostgreSQL (x64):

```
Driver={PostgreSQL ANSI(x64)};Server=$SERVER;Port=$PORT;Database=$DATABASE;Uid=$USERNAME;Pwd=$PASSWORD;
```

## Troubleshooting

A common problem experienced with ODBC drivers is they require the IIS application pool to be set to either 32-bit or 64-bit mode to match the specified ODBC driver. When not set correctly, you will see an error in the system log when running heartbeat for a secret using that password changer.

PostgreSQL with 64-bit drivers will throw the following error if the IIS application pool is in 32-bit mode:

```
ExpiredSecretMonitor - System.Data.Odbc.OdbcException (0x80131937): ERROR [IM002] [Microsoft][ODBC Driver Manager] Data source name not found and no default driver specified
```

## PostgreSQL with Distributed Engines

A machine with a distributed engine installed requires the corresponding ODBC driver. In some cases, additional configuration may be necessary. For example, PostgreSQL requires adding an additional host entry:

1. Install the latest PostgreSQL ODBC drivers on the agent computer.
2. Modify the `pg_hba.conf` (for example: `/PostreSql/9.3/pg_hba.conf`) file to have a host entry for the agent computer IP address. For example, where 192.168.60.147 is the IP address of the distributed engine:

```
host all all 192.168.60.147/32 md5
```

By default, RPC uses the credentials on secret option, using the credentials stored in the secret to invoke a password change. For Windows and Active Directory accounts, a privileged account can be used instead by selecting the Privileged Account Credentials option and selecting an Active Directory secret with permission to change the account's password.

For secret templates with a custom commands password type, any number of associated reset secrets can assign for use in the custom commands.

When a secret is wired up with a privileged account or reset secrets, the ability to edit the username, host, domain, or machine is restricted if the user does not have access to those associated secrets. On the RPC tab, the user sees "You do not have access to View this secret" for the secret name and on the Edit page all text-entry fields mapped for RPC except the password is disabled. This added security prevents the user from changing the username and resetting another account's password.

**Note:** If the user does not have access to the privileged account or reset secrets, the ability to edit all secret text-entry fields mapped for RPC except the password text-entry field is restricted to prevent changing the password on another account.

**Note:** To appear in searches, privileged accounts must have RPC enabled in their originating template or the Active Directory secret.

## Overview

This topic lists some of the common errors experienced when setting up Remote Password Changing (RPC) for an account.

To view the errors, navigate to **Admin > Remote Password Changing** in Secret Server and look for the name of the secret you are testing.

## Errors

### The user name cannot be found

For local Windows accounts, ensure you only have the username in the username field (do not include the machine name). The machine name should go in the Machine field only. If the RDP Launcher stops working when you remove the machine name from the username field, see [RDP Proxy Configuration](#).

### Change password failed: Unknown. (ERROR\_CANT\_ACCESS\_DOMAIN\_INFO)

For RPC on local Windows accounts, this error can be deceptive because the built-in Windows method used to change a password takes either a machine or domain name, so if the machine is not found, it thinks a domain was passed in and throw a domain error.

For RPC on Active Directory accounts, this error may occur if the account does not have permission to perform the password change or the domain name is wrong or abbreviated. Verify by checking the account properties in Active Directory or log in to the account and try to change the password manually or use privileged secret to perform the RPC.

**Note:** The RPC process uses information from the secret, not a central configuration for resetting the password. The Active Directory configuration settings are used for user synchronization only, so ensure the information on the secret is correct, including the Active Directory domain.

Common causes include:

- The machine name is wrong or abbreviated. For example: comp3 is entered as the machine name instead of comp3.yourdomain.com.  
Try replacing the machine name in the secret with the IP address of the machine and seeing if you still receive the domain error.
- The firewall is blocking the ports. See [Secret Server Ports](#).

Monitor activity to see if the authentication is accepted on the machine by viewing the security log:

1. Run secpol.msc from the Run prompt.
2. Click on Local Policies, Audit Policy.
3. Turn on "Audit account logon events" and "Audit logon events" for both Successes and Failures.
4. View the logs at Administrative Tools > Event Viewer. Check the Security Logs to determine whether the requests are getting through to the computer.

**Note:** The RPC log looks different if the firewall denies the connection, and will show ERROR\_ACCESS\_DENIED in some cases.

Firewall settings also apply to changing passwords on the local machine that Secret Server is running on because net authentication is used.

### Change password failed: Unknown. (NERR\_PasswordPolicySettings)

Cause: repeating password or a password that does not meet domain standards.

Check the minimum password age. When performing RPC on Active Directory accounts, this error may occur due to a minimum password age policy on the domain. If the minimum password age is set to 1 day or greater, and due to testing, the password has already been changed once, a follow up password change will violate the domain policy.

If you need to change the user's password more than the policy allows, change their policy so they are not subject to minimum password ages, or use the privileged account option in the Remote Password Changing tab on the secret. Privileged account will perform a password reset instead of changing the password using the accounts credentials.

#### **Change password failed: Unknown. (ERROR\_ACCESS\_DENIED)**

Cause: User account is set to Not Able to Change Password, firewall denial, or login incorrect. May also occur when the userWorkstations attribute on the user is set.

#### **Change password failed: Unknown. (ERROR\_INVALID\_PASSWORD)**

Cause: Either the user does not exist (ensure the usernames match) or the password is not correct.

#### **Change password failed: Unknown. (ERROR\_ACCOUNT\_LOCKED\_OUT)**

Cause: User account is locked out.

#### **ExpiredSecretMonitor - Unspecified error**

Cause: Firewall issue or ports are blocked.

#### **DirectoryEntry.Invoke SetPassword - The network path was not found.**

Cause: Domain can not be found from the computer. Check the machine can ping the domain.

#### **Secret '**

Cause: the password changer for the secret template this secret is based on is looking for an "associated secret." Associated secrets are additional accounts that are needed in the password change process.

You can view the commands being used for the password change and add the associated Secret by going to the Remote Password Changing tab of the Secret in question and clicking Edit (you may also need to click Show Commands).

#### **Error changing password - Check Out is enabled on associated Secret.**

Cause: The secret has a Privileged Account Credentials option selected for performing the password change and the privileged account secret has the Require Check Out option enabled. This configuration causes an error with the remote password change process because the Required Check Out option is not intended for use by the system to avoid conflict from user's request, which is the intended usage.

## Overview

This address using a Secret Server privileged account to change SQL Server accounts. This enables taking over those accounts without knowing their password.

## Creating the Account

1. Open SQL Server Management Studio.
2. Connect to your database server.
3. Expand the root-level security folder.
4. Right-click the **Logins** folder and select **New Login**.
5. Give the account a log on name.
6. Select SQL authentication.
7. Go to Secret Server.
8. Create a secret using the **SQL Server Account** template.
9. Assign it the desired username .
10. Click the **Generate** button on the secret password field to create a password.
11. Copy that password to the account creation wizard in SQL Server Management Studio.
12. Click the **OK** button to save the secret.

## Assign Permissions

1. In SQL Server Management Studio, go to **Security > Logins** in the object explorer.
2. Right click on the SQL login object and select **Properties**. The Login Properties dialog box appears.
3. Select **Securables** in the **Select a page** list.
4. Find the **Alter any login** permission on the **Explicit** tab at the bottom of the dialog box.
5. Click to select the **Grant** check box for that permission.
6. Click the **OK** button.
7. Similarly, enable the **Control Server** permission. This is for changing the target logins that are members of the **sysadmin** fixed server role or grantees of this permission.

## Using the Account

1. In Secret Server, open the SQL Server secret that you created.
2. Click the **Remote Password Changing** tab.
3. Click the **Edit** link.
4. Click to select **Privileged Account Credentials** in the **Change Password Using** selection buttons. The Privileged Account section appears.
5. Click the **No Secret Selected** link.



6. Select the secret you created earlier. The secret appears in the Privileged Account section.
7. Click the **Save** button.
8. Click the **Change password remotely** button.
9. Provide or generate a new password.
10. Click the **Change** button. You have now successfully changed a SQL Server account password using a privileged account.

**Note:** You can also assign the account for use by multiple secrets by creating a secret policy and applying that policy to a folder.

## Overview

As of version 8.8, Secret Server supports running PowerShell scripts for Remote Password Changing (RPC) and heartbeat. Below are the steps for creating an Active Directory (AD) password changer that uses PowerShell scripts. The example is meant as a simple guide for how to wire-up the template to scripts as a proof of concept. Your actual PowerShell password changer scripts may be more complex depending on your environment and needs.

**Important:** Before you begin, please ensure password changing and heartbeat are enabled in **Admin > Remote Password Changing** and review the information on [Configuring CredSSP for use with WinRM/PowerShell](#), which will be necessary for most PowerShell password changing tasks.

## Procedure

The PowerShell scripts are created and accessed through the **Admin > Scripts** page. To create a PowerShell password changer, you need to create two scripts. The first script verifies the account's current password. The second script changes the account's password. These two scripts are linked to a new secret template.

### Task 1: Creating the Active Directory Verify Password Script

1. Navigate to **Admin > Scripts**.
2. Click the **+ Create New** button on the **PowerShell** tab.
3. Type the following information in the dialog:
  - **Name:** Active Directory Verify
  - **Description:** Script used to verify an Active Directory account
  - **Category:** Heartbeat
  - **Script:**

```
$domain = "LDAP://"+$Args[0];
$sdn = New-Object System.DirectoryServices.DirectoryEntry($domain, $Args[1], $Args[2]);
if ($sdn.name -eq $null){ throw "Authentication failed - please verify your username and password." };
```

4. Click the **OK** button to save the script.

### Task 2: Creating the Active Directory Change Script

1. On the **PowerShell** tab, click the **+ Create New** button.
2. Type the following information in the dialog:
  - **Name:** Active Directory Change
  - **Description:** Script used to change the password of an Active Directory account
  - **Category:** Password Changing
  - **Script:**

```
$Domain = $args[0]
$UserToChange = $args[1]
$NewPassword = $args[2]
$P_User = $args[0] + "\" + $args[3]
$P_PWord = ConvertTo-SecureString -String $args[4] -AsPlainText -Force
$Creds = New-Object -TypeName System.Management.Automation.PSCredential -ArgumentList $P_User, $P_PWord
$pwd = ConvertTo-SecureString $NewPassword -AsPlainText -Force;
Set-ADAccountPassword -Server $Domain -Identity $UserToChange -NewPassword $pwd -Reset -Credential $Creds
```

3. Click the **OK** button to save the script.

### Task 3: Testing the Scripts

For the AD verification script:

1. Go to **Scripts > PowerShell tab**.
2. Click the Run Script arrow icon on the AD verify script. The Test Script popup appears.
3. Type the arguments (separated by spaces) in the **Arguments** text box: domain name (for you), username (yours), password (yours).  
For example: my.company.com ssadmin FD#@789Uik4\$
4. Type your domain name for the script-running account in the **Domain** text box.
5. Type the username in the **Username** text box for account that can run PowerShell scripts on the domain.
6. Type that user's password in the **Password** text box.
7. Click the **OK** button to test your script the with provided parameters.

For the Active Directory change script:

1. Go to **Scripts > PowerShell tab**.
2. Click the Run Script arrow icon on the AD change script. The Test Script popup appears.
3. Type the arguments (separated by spaces) in the **Arguments** text box: domain name (for you), username (yours), new password (yours), domain admin username, domain admin password. For example: my.company.com ssuser 08sSKthsoidPW ssadmin FD#@789Uik4\$
4. Type your domain name for the script-running account in the **Domain** text box.
5. Type the username in the **Username** text box for account that can run PowerShell scripts on the domain.
6. Type that user's password in the **Password** text box.
7. Click the **OK** button to test your script the with provided parameters.

**Note:** If successful, this will change the password on the account that is used for testing.

The remaining steps depend on the version of Secret Server you are using. In Secret Server 10.0.000006 we introduced the ability to create multiple PowerShell password changers, each with their own set of password change and verify scripts. These password changers can be assigned to different scan templates to automatically assign different PowerShell password changer scripts to different types of local accounts when creating local account import rules in discovery. For more information about how scan templates and password changers are used in discovery and local account import rules, please see [Discovery](#). Prior to 10.0.000006, there was only one PowerShell password changer and the scripts were assigned on the secret template.

### Task 4: Configuring a Password Changer for Secret Server Version 10.0.000006 and Later

In Secret Server versions 10.0.000006 and later, after the scripts are tested and working correctly, the next step is to create a PowerShell password changer.

1. Go to **Admin > Remote Password Changing**.
2. Click the **Configure Password Changers** button.
3. Click the **New** button.

4. In the **Base Password Changer** dropdown list, select **PowerShell Script**.
5. Type the name of the new password changer.
6. Click the **Save** button. On the next page you will select the scripts to use for password changing and verification (heartbeat).
7. Under **Password Change Commands**:
  1. Select the script that you created to do password changes.
  2. Type the following in the **Script Args** text box: \$DOMAIN \$USERNAME \$NEWPASSWORD \${1}\$USERNAME \${1}\$PASSWORD.
  3. Click the **Save** button next to the **Script Args** text box.
8. Under **Verify Password Changed Commands**:
  1. Select the script that you created to do heartbeats and verification.
  2. Type the following in the **Script Args** field: \$DOMAIN \$USERNAME \$PASSWORD.
  3. Click the **Save** button next to the **Script Args** text box.

**Note:** When Secret Server runs the script, it replaces the fields with the matching secret field values. \$NEWPASSWORD is a special case for the new password that is generated by Secret Server or specified by the user when performing a password change. For more information see [Using Secret Fields in Scripts](#).

**Important:** You must specify scripts for both sections and you must click the Save button next to each one for both to save.

## Task 5: Creating a Secret Template

The next step is to create the secret template:

1. Go to **Admin > Secret Templates**.
2. Click the **Create New** button.
3. Name the template PowerShell Active Directory.
4. Create the following new fields:
  - Domain Field Type: Text
  - Username Field Type: Text
  - Password Field Type: Password
  - Notes Field Type: Notes
5. Click the **Configure Password Changing** button.
6. Click the **Edit** button.
7. Click to select the **Enable Remote Password Changing** and **Enable Heartbeat** checkboxes.

## Task 6a: Finishing the Secret Template Configuration for Secret Server 10.0.000006 and later

**Note:** Complete either 6a or 6b, not both.

1. Select the password changer created in the previous section from the **Password Type to use** dropdown list.
2. Click to select **Domain** next to the **Domain** field.
3. Click to select **Username** next to the **User Name** field.
4. Click to select **Password** next to the **Password** field.

5. Click the **Save** button to save the mapping.

## Task 6b: Finishing the Secret Template Configuration for Secret Server 8.8.000000 to 10.0.000000

**Note:** Complete either 6a or 6b, not both.

1. Select **PowerShell Script** from the **Password Type to use** dropdown.
2. Click to select **Domain** next to the Domain field.
3. Click to select **Username** next to the User Name field.
4. Click to select **Password** next to the Password field.
5. Click to select **Active Directory Change** next to the **Remote Password Change Script** field.
6. Enter the following to the **Remote Password Change Args** field: `$DOMAIN $USERNAME $NEWPASSWORD ${1}$USERNAME ${1}$PASSWORD.`
7. Click to select **Active Directory Verify** next to the **Heartbeat Script** field.
8. Type the following next to the **Heartbeat Args** field: `$DOMAIN $USERNAME $PASSWORD.`

**Note:** When Secret Server runs the script, it replaces the fields with the matching secret field values. `$NEWPASSWORD` is a special case for the new password that is generated by Secret Server or specified by the user when performing a password change.

9. Click the **Save** button to save the mapping.

## Task 7: Creating Secrets Using PowerShell Remote Password Changing

Create the AD account secret PowerShell account:

1. Create three secrets (The first two **must** be different secrets):
  - One that is an Active Directory Account that has the necessary rights to run PowerShell on your domain
  - One that is an Active Directory Account that has the necessary rights to run a password change on your domain
  - One that is based on the new PowerShell Active Directory Template.
2. Create the Active Directory account secret PowerShell account.
3. On the dashboard, use the dropdown on the **Create Secret** widget and select **Active Directory Account**. Use the following parameters:
  - **Secret Name:** PowerShell Admin
  - **Domain:** Domain that the account exists on
  - **Username:** Account name that can run PowerShell scripts in the domain
  - **Password:** Password for the account
4. Click the **Save** button to save your secret and verify that it passes heartbeat.
5. Click the **Home** button to return to the dashboard.

Create the AD account secret for password changing:

1. On the dashboard, use the dropdown on the **Create Secret** widget and select **Active Directory Account**. Use the following parameters:
  - **Secret Name:** Password changing Admin
  - **Domain:** Domain that the account exists on
  - **Username:** Account name that can change passwords in the domain
  - **Password:** Password for the account
2. Click the **Save** button to save your secret and verify that it passes heartbeat.
3. Click the **Home** button to return to the dashboard.

Create the PowerShell Active Directory secret:

1. On the dashboard, use the dropdown on the **Create Secret** widget and select **PowerShell Active Directory Account**. Use the following parameters:
  - **Secret Name:** PowerShell AD user
  - **Domain:** Domain that the account exists on
  - **Username:** samAccountName of the account to be managed
  - **Password:** Password for the account
2. Click the **Save** button to save your secret and verify that it passes heartbeat.
3. Click the **Remote Password Changing** tab for the secret.
4. Click the Edit button.
5. Click to select **Privileged Account Credentials** in **Execute PowerShell**. The Privileged Account selector appears.
6. Click the **No Selected** Secret link.
7. Locate click on the **PowerShell Admin** secret.
8. Click the **Home** button to return to the dashboard.
9. In the **The following Secrets are available to be used in Custom Password Changing Commands and Scripts** section:
  1. Click the **No Selected Secret** link.
  2. Select your AD account secret for password changing.
  3. Click on the **Save** button.

Everything should now be configured for heartbeat and RPC on the Secret. Run **Heartbeat** (from the **General** tab in the Secret) to confirm that it works and run an RPC \*\* (from the **Remote Password Changing** tab of the secret) to confirm that it also works.

## Errors

If you receive the "The term 'Set-ADAccountPassword' is not recognized as the name of a cmdlet, function, script file, or operable program. Check the spelling of the name, or if a path was included, verify that the path is correct and try again." error, install the AD-Domain-Services in Powershell. To do this start PowerShell as an administrator then run the following command:

```
Install-windowsfeature -name AD-Domain-Services -IncludeManagementTools
```

Additionally you may need to install the Remote Server Administration Tools for your version of Windows and then in PowerShell run:

Import-Module Servermanager

This feature does not require the advanced scripting add-on license. To perform heartbeat checks and remote password changes on secrets using the Office 365 and Azure password changer for user accounts, follow the steps below:

## Procedure

**Note:** This applies to both the Secret Server Web server or distributed engines.

1. Run Windows PowerShell as an admin. This opens an elevated Windows PowerShell command prompt.
2. Run this command: `Install-Module -Name AzureAD`.
3. Recycle the application pool.

**Note:** These steps are required once on the subject computer, not every time you connect. However, you may want to update the module periodically as a security best practice using the command: `Update-Module -Name AzureAD`

## Troubleshooting

1. Uninstall AzureAD using command `remove-module AzureAD`.
2. Reinstall using the above procedure.
3. Ensure the Secret Server application pool setting *Load User Profile* is set to "True".
4. Recycle the application pool.



As of version 8.6, Secret Server supports password changing for Salesforce.com accounts.

The password changer can be enabled on secrets that were created using the default Web Password Secret template or any custom template that is configured to use the Web User Account Password type.

The Secret Server Web server's outbound IP Address must be added to the IP Address white list for your Salesforce.com organization. Please refer to the Salesforce.com documentation for instructions on how to set this up. See [Restricting Login IP Ranges for Your Organization](#).

In cases where this is not set up correctly, you may see the follow error in the Remote Password Changing logs:

Login failed: LOGIN\_MUST\_USE\_SECURITY\_TOKEN: Invalid username, password, security token; or user locked out.

Please note:

- Secret Server can only communicate to the following Salesforce default Login URLs: <https://test.salesforce.com> and <https://login.salesforce.com>.
- Having the domain URL in the secret will not work and will throw this exception: Login failed: INVALID\_LOGIN: Invalid username, password, security token; or user locked out. Only those two URLs work.
- There are three required Salesforce configurations:
  - Go to **Setup > Administration > Users > Profile**. Choose the user profile. Make sure that **Enabled API** is checked. This option is not available in all versions of Salesforce. Other versions will not have this enabled by default. Please see this ["Enable API" not available](#) article. If this setting is not enabled in salesforce you will get one of these errors: ERROR: Secret 'Salesforce Test' (Id = 1063) on Site 'EARTH' returned (LoginFailed). Exception: Login failed: API\_DISABLED\_FOR\_ORG: API is not enabled for this Organization OR Partner, System.Web.Services.Protocols.SoapException: API\_DISABLED\_FOR\_ORG: API is not enabled for this Organization or Partner.
  - Configure network access and allowlist the distribute engine or Secret Server IP address. If this is internal, use the public IP address.
  - Go to **Setup > Company Settings > My Domain**. Edit my domain settings and make sure that **Prevent login from** <https://login.salesforce.com> is unchecked.

You can enable Secret Server to perform heartbeat and change passwords on SAP accounts by following the procedures as indicated below (Premium Add-on or Enterprise Plus Edition Only).

First, create a new privileged SAP account administrator secret, typically for the SAP or DDIC account that is used to log on to SAP for administrative tasks. Select the **SAP Account** template and enter all required information to create the new SAP account administrator secret. By default, the **Instance Number** will be 00 and the **Client Number** will be 001.

**Note:** the default **System ID** for SAP is also NSP.

Second, create the account you are planning to change. Follow the same method as before and enter the current account password in the password field.

Third, in your new SAP account administrator secret, set the privileged account on the "Remote Password" changing tab.

**Note:** for an account to have its password changed, even a privileged account changing its own password, it requires permissions in SAP.

## For Secret Server 8.8.000000 and Higher

Download [SAP .Net Connector 3.0](#) and install it using the following procedure:

1. Navigate to [service.sap.com/connectors](https://service.sap.com/connectors).
2. Enter your credentials for the SAP Marketplace.
3. Click on SAP Connector for Microsoft .NET.
4. Download the .NET 4.0 Option with the proper bitness for your application pool (64-bit mode for most customers).
5. Install the downloaded file.
6. Copy the `sapnco.dll` and `sapnco_utils.dll` files into the bin folder of your web application.
7. Recycle the application pool.

Once these steps are complete, heartbeat and password changing should be working.

**Note:** Accounts can change their own SAP passwords just once per day. This is a restriction in the SAP software that cannot be changed. If an account needs its password to change more than once a day, use a privileged account to perform the reset.

If performing a Heartbeat on an SAP Secret fails with the error, `Exception: PASSWORD_EXPIRED`, it most likely means an administrator has reset the SAP account's password, and the account must log in and change its own password in SAP.

## For Secret Server 8.7.000000 and Below

1. Change your Secret Server application pool to run in 32-bit mode.
2. Download the SAP GUI version 720 from the [SAP Community website](#).
3. Extract the downloaded ZIP file. Depending on the version, the extracted download will have a GUI or Frontend Tools directory.
4. Copy that directory over to the machine running Secret Server.
5. Run the installer inside the directory. The install should take only a couple of minutes.

## Overview

This document enables you to password change SQL accounts using a privileged account. This allows you to take over accounts without knowing their password.

### Task 1: Creating an Account

1. Open SQL Server Management Studio.
2. Connect to your database server.
3. Expand the root-level security folder.
4. Right click the **Logins** folder.
5. Click **New login**.
6. Name the account.
7. Click **SQL Authentication**.
8. Go to Secret Server.
9. Create a secret using the **SQL Server Account** template. Give it the same username as the login name you are creating.
10. For best security, click the **Generate** button on the secret password field.
11. Copy the generated password to the account creation wizard in SQL Server Management Studio.
12. Click **OK**.
13. Save your secret.

### Task 2: Assigning Permissions

1. Right click on the SQL login and click **Properties**.
2. Select **Securables** in the left column.
3. Select **Grant** for **Alter any login**.

### Task 3: Using the Account

1. In Secret Server, select the SQL account secret you are going to have represent your new privileged account.
2. Select the **Remote Password Changing** tab and click **Edit**.
3. Click the **Change Password Using** selection button and select **Privilege Account Credentials**.
4. Click the **No Selected Secret** link.
5. Find and select the secret created for the privileged account in the first task.
6. Click the **Save** button.
7. Click the **Change password remotely** button.
8. Provide or generate a new password.
9. Click the **Change** button. You have now successfully changed a SQL account password using a privileged account.

**Note:** You can also assign the account for use by multiple secrets by creating a secret policy and applying that policy to a folder.

## Reports

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

The reporting interface comes with a set of standard reports. These reports include a variety of 2D and 3D charting and graphing components and a full grid of data. Some of the reports are purely data detailed and have no charts. You can also create your own reports based on any Secret Server data, such as user, audit, permissions, and folders. You can create report categories to aid in the organization of your reports. Reports can be arranged to provide access to auditors and meet compliance requirements. These reports can be accessed in the **General** tab on the **Reports** page.

**Figure:** Reports Page

The screenshot displays the Delinea Secret Server Reports page. The left sidebar contains navigation links: Secret Server, Dashboard, Secrets, Inbox, Reports (highlighted), and Administration. The main content area is titled 'Reports' and features tabs for General, Security Hardening, User Audit, and Schedules. The General tab is selected, showing a list of reports under the 'Activity' category. The reports listed are: Active Secret Sessions, Active Secret Sessions Count, Custom Report Activity, Database Configuration Audit, Distributed Engine Activity, Dual Control Audit, Engine Status, Event Subscription Activity, Folder Activity, Heartbeat Status, Heartbeat Status by Day, Internal Communication Changes, IP Address Range Audit, License Audit, RPC by Day, Secret Activity, and Secret Activity Today. On the right side of the main content area, there are sections for 'Roles and Permissions' and 'Secret Policy' with associated questions. A 'Show Inactive' toggle is located at the top right of the report list.

The *Security Hardening Report* checks aspects of Secret Server to ensure security best practices are being implemented. While Secret

Server runs with all the items failing, administrators should be aware of possible security issues within an installation. For details on this, see [Reports Security Hardening Tab](#).

The User Audit Report shows all secrets accessed by a user during a specified period.

Secret Server includes many pre-configured reports that you can run or use as templates for creating custom reports. Below are the reports shipped with current release of Secret Server:

**Note:** Unless otherwise designated, reports listed are available in all editions. However, older releases may not include all reports listed here.

## Activity

- Active Secret Sessions
- Active Secret Sessions Count
- Custom Report Activity
- Database Configuration Audit
- Distributed Engine Activity
- Dual Control Audit
- Engine Status
- Event Subscription Activity
- Folder Activity
- Heartbeat Status
- Heartbeat Status by Day
- Internal Communication Changes
- IP Address Range Audit
- License Audit
- RPC by Day
- Secret Activity
- Secret Activity Today
- Secret Activity Yesterday
- Secret Template Activity
- Session Recording Errors
- Unlimited Administrator behavior
- Users Activity

## Discovery Scan

- Discovery Scan Status
- GCP Discovery: What Instances do Service Accounts have access to?
- What computers have been successfully scanned?
- What computers in Active Directory no longer exist?
- What computers that exist have not been successfully scanned?
- What Secrets are pending import by Discovery?
- What Secrets failed to import by Discovery?

## Folders

- ConnectWise API Config
- What folder permissions exist for groups?
- What folder permissions exist?
- What folders can a user see?
- What folders can all users see?

## Groups

- Group Membership
- Group Membership By Group

## Legacy Reports

- Secret Expiration Health
- Secret Server Usage
- Secret Template Distribution
- Top Ten Viewers

## Password Compliance

- Secret Password Compliance Statuses
- What Secrets Do Not Meet Password Requirements?

## Report Schedules

- Report Schedules

## Roles and Permissions

- What role assignments exist?
- What role permission assignments exist?
- What role permissions does a user have?

## Secret Policy

- What Folders have Policies assigned?
- What Secrets have different Policies than their folders?
- What Secrets have policies assigned?

## Secrets

- Secret Count per Site
- Secret Dependency Failures
- Secret Dependency Not Run
- Secret Dependency Overview
- Secret Dependency Status
- Secret Permissions Mismatch.
- Secret Templates without an expiration field?
- Secrets Failing Heartbeat
- Secrets Pending Heartbeat
- Secrets with Failed Password Change
- What file types have been uploaded to Secrets?
- What file types have been uploaded to Secrets? (Pie Chart)
- What Secret permissions exist for a group?
- What Secret permissions exist for a user?
- What Secret permissions exist?
- What Secrets are expiring this week?
- What Secrets can a user see?
- What Secrets can all users see?
- What Secrets changed passwords in the last 90 days?

- What Secrets Do Not Have Distributed Engines?
- What Secrets don't require approval?
- What Secrets have been accessed by a user?
- What Secrets have been accessed by an impersonated user?
- What Secrets have been accessed?
- What Secrets Have Distributed Engines?
- What Secrets have Expiration?
- What Secrets have failed Heartbeat?
- What Secrets have not changed passwords for over 90 days?
- What Secrets require approval?
- What Secrets require Comments?
- What SSH Command Menus do Secrets have?

## System Reports

- Folder Permissions Report
- Folder Secrets Report
- Group Lookup Report
- Permission Lookup Report
- Privileged Behavior Analytics Configuration Activity
- Role Permissions Report
- User Access Report

## User

- Active Users Custom Report
- Failed login attempts
- Secret Template Permissions by User
- Session resumed
- What SSH Command Menus do users have access to?
- What users have had an admin reset their password?
- Who hasn't logged in within the last 90 days?

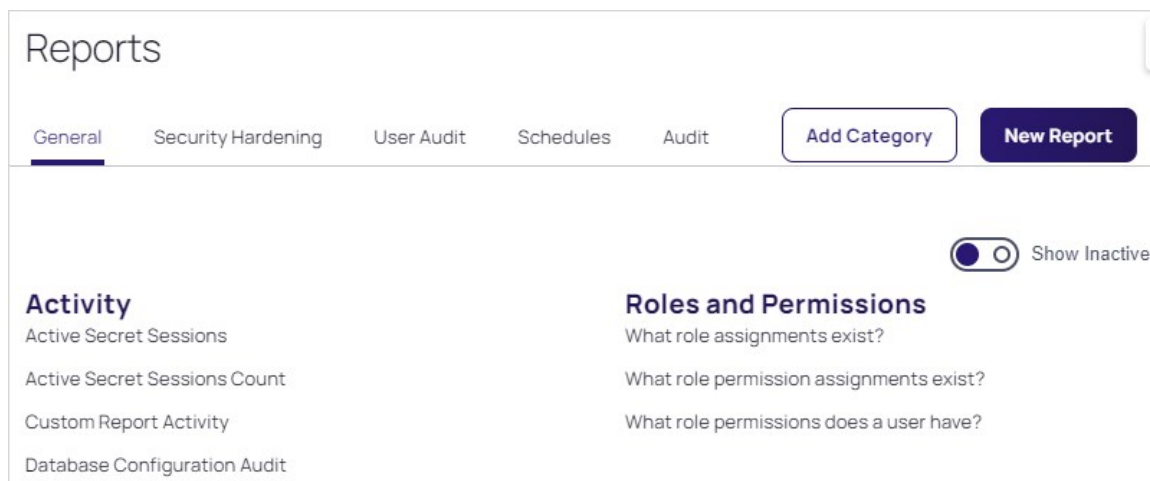
**Note:** You can find additional reports in the [Custom Report Gallery](#).



There are two ways to create a Report. From the Reports Edit page, click the **Add New** link at the bottom of a Report Category. Or alternatively, from the Reports View page, click the **Create it** link at the bottom of that page.

## Creating a Custom Report

1. Click **Reports** on the main menu. The Reports page appears:



2. Click the **New Report** button. The New Report page appears:

## New Report

### Report

Create customized reports based on any available SQL data, such as user, audit, permissions, and folders. These reports can be viewed online, exported, scheduled, and added to the dashboard. There are a number of chart options available for reports as well.

[Learn More](#)

Name \*

Description \*

Category \*

Search or pick one

Page Size

100

Use Database Paging

☒

Chart

< None >

Report SQL \*

Chart and SQL Editor

You can toggle the trapping of Tab with Ctrl+M on Windows and Linux and with Ctrl+Shift+M on OSX, and subsequent Tab keys will move focus out of the editor

1

Cancel

Save

3. Type the report name in the **Name** text box. This is the name that is displayed on the Reports page as a link underneath its containing category.
4. Type a description in the **Description** text box. This is displayed in the Report View page. It is also used as the Tooltip for the Report

name on the Reports page.

5. Click the **Category** dropdown list to select the category the report will appear in on the Reports page.
6. Click the **Page Size** dropdown list to select the page size limit for the data displayed in the grid.
7. Click to select the **Use Database Paging** check box if desired. See [Database Paging](#).
8. Click the **Chart** dropdown list to select the type of chart to use for displaying the results. If set to None, a grid displays.
9. Paste your script in the **Report SQL** text box. See [Report SQL Scripts](#).
10. (optional) Click the **Preview** button to see your report before creating it.
11. Click the **Save** button. The new report's page appears and now appears on the reports page:

## Editing Reports

To edit a report:

1. Click the **Reports** menu item. The Reports page appears, listing all the reports.
2. Click the name of the report, which is a link. That report's page appears.
3. Click the **Edit** button. The Report Edit page appears. See [Creating a Custom Report](#) for details about the parameters.

**Note:** The SQL script text cannot be edited for non-custom (built-in) reports.

## Report SQL Scripts

### Overview

The best way to create SQL scripts is to view existing ones and the Secret Server database structure. Click any existing report's link to arrive at its page. Then click the **Edit** button. The SQL appears in the Report SQL text box.

**Note:** Even though you are pressing the Edit button, you cannot edit non-custom reports. You can view their parameters, including their SQL script.

### Dynamic Parameters

Reports support the embedding of certain parameters into the SQL so you can dynamically change the resulting data set. Another option available for custom reports is to apply a different color to returned rows dependent on certain conditions. For more information as well as examples, see the [Using Dynamic Parameters in Reports](#) topic.

### Viewing Secret Server SQL Database Information

You can show Secret Server's SQL database information to assist with creating custom reports. By selecting the SQL Table from the list, the details of the table's columns display in a grid. Click the **Show Secret Server SQL database information** link to see the SQL Table list and SQL Table Columns grid. The link is also available on the [Report Edit](#) page.

You can click **Preview** button at the bottom of the page to see a preview of the chart. The resulting chart displays in the Report Preview section at the bottom of the page.

## Database Paging

Database paging allows the database to load large reports more quickly. We recommend database paging if the query is expected to pull

large amounts of data for the report. Implementing database paging may not work if the SQL query uses some keywords, including TOP, OPTION, INSERT, UNION, WITH, or aliases containing the word FROM.

Example queries:

- Works using database paging: `SELECT * FROM tbSecret WHERE NAME LIKE 'Test%'`
- Does not work using database paging: `SELECT TOP 10 * FROM tbSecret WHERE SecretName LIKE 'Test%'`

To delete or undelete a report.

- **Delete:** To delete a report, click the **Delete** button.
- **Undelete:** To undelete a report, you must navigate to the Reports Edit page as deleted reports are not visible on the Reports View page. On the Reports Edit page, click the **Show Deleted** button. This displays a Deleted Report category, which contains all the deleted reports. Either drag the report to a report category that is not deleted or click the report name to go into its Report View page. In there, click the **Undelete** button.

For details on the Show Deleted button, see [Deleting and Undeleting Reports](#).

- **Rearrange:** Any item with the icon can be dragged and dropped to a new location. Report categories can be moved anywhere within the page. Reports can be moved from one report category to another.
- **Create New:** Click **Create Report Category** and specify a category name and description on the following page. Note that the Report Category Description is used as the tooltip for the report category on the Reports View page.
- **Delete:** Click the icon next to the report category name. This deletes all the reports in the category. To undelete the reports, see [Deleting and Undeleting Reports](#).
- **Edit:** Click the icon next to the report category name to change the name or description of the category.

## Reports General Tab

See [Built-In Reports](#) for the most up-to-date list of reports included.

The reports are listed under the report categories. To view a report, click on its name. This takes you to the **Report View** page.

You can view a record of all the actions performed on reports by clicking on the **View Audit** button.

For details on the **Edit** button, see [Creating and Editing Reports](#).

The **Create it** link is a shortcut for creating a new report.

You can adjust the look of the Reports View page. The report categories as well as the reports can be rearranged on the page. To do this, click **Edit** on the Reports page.

## Reports Security Hardening Tab

The Security Hardening Tab configures aspects of Secret Server to ensure security best practices are being implemented. While Secret Server runs with all the items failing, administrators should be aware of possible security issues within an installation. Below is an explanation of the different features:

### Configuration Section

- **Allow Approval for Access from Email:** This is a convenience option that allows users to approve or deny a secret access request by clicking a link in the request email sent by Secret Server. Allow Approval From Email does not require a user to authenticate with Secret Server when approving access to a secret. This can be a security concern if the approver's email account becomes compromised. Turn Allow Approval From Email off to get a pass result. Secret Server.
- **Browser AutoComplete:** Browser AutoComplete allows Web browsers to save the login credentials for the Secret Server login screen. These credentials are often kept by the Web browser in an insecure manner on the user's workstation. Allowing AutoComplete also interferes with the security policy of your Secret Server by not requiring the user to re-enter their login credentials on your desired schedule. To prevent the AutoComplete feature, disable the Allow AutoComplete option on the Configuration page.
- **File Attachment Restrictions:** File attachment restrictions allows administrators to configure what kind of file attachments can be uploaded to secrets. This helps protect users from being tricked into downloading a malicious secret attachment. The file extension and maximum file size can be specified, such as:

\*.7z, \*.bmp, \*.ca-bundle, \*.cer, \*.config, \*.crt, \*.csr, \*.csv, \*.dat, \*.doc, \*.docx, \*.gif, \*.gz, \*.id-rsa, \*.jpeg, \*.jpg, \*.json, \*.key, \*.lic, \*.p7b, \*.pcf, \*.pdf, \*.pem, \*.pfx, \*.pkey, \*.png, \*.ppk, \*.pub, \*.tar, \*.tif, \*.tiff, \*.tpm, \*.txt, \*.vdx, \*.vsd, \*.vsdx, \*.xls, \*.xlsx, \*.xml, \*.zip

This security check will fail if the file attachment restrictions is not enabled. This check will return warnings if a potentially dangerous file extension is allowed, maximum file size is not specified, or maximum file size is greater than 30 MB.

- **Force Password Masking:** Password masking prevents over-the-shoulder viewing of your passwords by a casual observer (when masked, passwords show as \*). To activate this option, click to select the **Force Password Masking** option on the **Configuration** page.
- **Frame Blocking:** Frame blocking prevents the Secret Server site from being placed in an iFrame. This is to prevent clickjacking attacks. There may be legitimate reasons for placing Secret Server in a frame, such as embedding the UI in another site. To turn frame blocking on, enable the setting under the Security tab in Configuration.
- **Login Password Requirements:** Login passwords can be strengthened by requiring a minimum length and the use of various character sets. A minimum password length of 8 characters or longer is recommended. In addition, all character sets (lowercase, uppercase, numbers and symbols) are required to get a pass result. Turn on these login password settings on the Configuration page.

- **Maximum Login Failures:** The maximum number of login failures is the number of attempts that can be made to login to Secret Server as a user before that user's account is locked. A user with user administration permissions is then required to unlock the user's account. The maximum failures allowed should be set to 5 or less to get a pass result. Change the "Maximum Login Failures" settings on the Configuration page. Secret Server
- **Remember Me:** Remember Me is a convenience option that allows users to remain logged in for up to a specific period. This setting can be a security concern as it does not require re-entry of credentials to gain access to SS. Turn Remember Me off on the Configuration page to get a pass result. It must be set to be valid for 1 day or less to not get a fail result.
- **Secure Session and Forms Auth Cookies:** Cookies contain potentially sensitive information that can allow users to log onto application. By default, cookies are not marked with the secure attribute. That is, **they are transmitted unencrypted when a user accesses Secret Server through HTTP instead of HTTPS.**

**Note:** For more information about how to secure your cookies, see [Secure ASP Session and Forms Authentication Cookies](#) (KB).

- **Web Service HTTP Gets Allowed:** Web service HTTP get requests are allowed. Allowing HTTP GET requests allows REST-style calls to many Secret Server Web service methods. This can be a security concern because simply clicking a link to the Web service, created by a malicious user, would cause it to be executed.
- **Zero Information Disclosure Error Message:** Replace all error messages with a custom "contact your admin" message. Error messages can be very helpful when diagnosing installation and configuration issues. However, having errors displayed to a potential attacker can provide him or her with the critical information they need to perform a successful attack.

## Database Section

- **SQL Account Using Least Permissions:** Use the fewest Secret Server permissions as possible in the SQL Account used to access the database. We recommend using a least permission approach where the account only has dbOwner. See [Installing and Configuring SQL Server](#).
- **SQL Server Authentication Password Strength:** SQL Server authentication requires a username and password. The password must be a strong password to get a pass result. Strong passwords are 8 characters or longer and contain lowercase and uppercase letters, numbers and symbols. The SQL Server authentication credentials in use can be changed by going to the installer (installer.aspx) and changing them on Step 3. A pass result is also given if Windows authentication is used to authenticate to SQL Server.
- **SQL Server Authentication Username:** The SQL Server authentication username should not be obvious. The use of "sa", "Secret Server" or "secretserver" triggers a fail result. The SQL Server authentication credentials in use can be changed by going to the installer (installer.aspx) and changing them on Step 3. A pass result is also given if Windows authentication is used to authenticate to SQL Server.
- **Windows Authentication to Database:** Windows authentication takes advantage of Windows security to provide secure authentication to SQL Server. The SQL Server authentication options can be changed by going to the installer (installer.aspx) and changing them on Step 3. Please see [Installation](#) for instructions on configuring Windows authentication to SQL Server.

## Environment Section

- **Application Pool Identity:** The Application Pool identity GAMMA\ss\_iis\_svc appears to be a member of the administrators group on the system. This puts the system at risk by giving more access than necessary.
- **DPAPI or HSM Encryption of Encryption Key:** Encrypt your Secret Server encryption key, and limit decryption to that same server. Data Protection API (DPAPI) is an encryption library that is built into Windows operating systems. It allows encryption of data and configuration files based on the machine key. Enabling DPAPI Encryption in Secret Server protects the Secret Server encryption key by using DPAPI, so even getting access to the Secret Server encryption key is not enough to be useful—the machine key is required. If you enable this option, back up your encryption key first, as a DPAPI encrypted file can only be used by the machine it was encrypted on.



## SSL Section

**Note:** SSL needs to be running with at least a 128-bit key size to get a pass result. A warning result indicates your key size is less than 128 bits. A fail result indicates you are not using SSL.

- **Require SMTP SSL:** SMTP SSL is required to ensure that all communication between Secret Server and the email server is encrypted. Enable the "Use SSL" option in Secret Server to get a pass result.
- **Require SSL:** Secure Sockets Layer (SSL) is required to ensure that all communication between the Web browser and Secret Server is encrypted and secure. Once the SSL certificate is installed, Force HTTPS/SSL in Configuration to get a pass result. Please see the [Installing a Self-Signed SSL/HTTPS Certificate](#) Knowledge Base article for instructions.
- **SSL/TLS Hash:** Check the digest algorithm of the certificate. If the algorithm is SHA1, this check returns a warning because SHA1 is being phased out. If the digest algorithm is MD2, MD4, or MD5, the check will fail because they are not secure. SHA256, SHA384, and SHA512 will pass. This check fails if Secret Server cannot be loaded over HTTPS.
- **SSL/TLS Key:** Check the key size of the HTTPS certificate used. If it is RSA or DSA, the key must be at least 2048-bit to pass. If the signature algorithm of the certificate is ECDSA, the key size must be at least 256-bit to pass. If the algorithm of the certificate is unknown, the result shows "unknown". This check fails if Secret Server cannot be loaded over HTTPS.
- **SSL/TLS Protocols:** Check for legacy SSL or TLS protocols, which should not be used in a secure environment. If the server accepts SSLv2 or SSLv3 connections, this check will fail. SSLv2 is not considered secure for data transport, and SSLv3 is vulnerable to the POODLE attack. If this server does not support TLSv1.1 or TLSv1.2, this check will give a warning because they are recommended. The SSL certificate used may affect what protocols can be used, even if they are enabled. This check will fail if Secret Server cannot be loaded over HTTPS.
- **Using HTTP Strict Transport Security:** HTTP Strict Transport Security (HSTS) is an additional security layer for SSL. HSTS allows SS, Password Reset Server, or Group Management Server to inform browsers that it should only be accessible over HTTPS. With this setting enabled, visitors are automatically redirected by their browser to the HTTPS-enabled site.

## Reports User Audit Tab

User Audit Reports show all secrets accessed by a user during a specified period. For a more detailed explanation, see [Built-in Reports](#).

If there are requirements around protecting potentially personally identifying information when running reports or viewing recorded sessions, you can enforce that another user has authorized you by enabling dual control for a secret or Report. When enabled a user in the approver group must enter in their credentials before a report or session can be viewed.

Once the approver has entered their credentials, the resource can be accessed.

To configure dual control, perform the following steps:

1. Click **Administration > Diagnostics, Logs, Security > Dual Controls**.
2. On the Dual Controls page, click the **Create New** button.
3. On the **Create New** page in the **Type** drop-down box, select the report type you wish to modify.
4. In the drop-down list below **Add**, click the box next to each party you'd like to add as a Valid Approver. Their identities will automatically appear in the **Valid Approvers** field.

When you are finished, click the **Create New** button. The Dual Control page appears, displaying the parameters you have set.

1. Click the **Reports** menu item. The Reports page appears:

Reports

General Security Hardening User Audit Schedules

Add Category View Audit

Show Inactive

a chart.js

dbo.tbSecurity analytics

Fast Oint Chart

Activity

Active Secret Sessions

Active Secret Sessions Count

Custom Report Activity

Database Cache (locks)

Database Configuration Audit

Distributed Engine Activity

Dual Control Audit

Engine Settings

Folders

All User Permissions to Folders

ConnectWise

ConnectWise API Config

Folders

What folder permissions exist?

What folder permissions exist for groups?

What folders can all users see?

What folders can a user see?

Groups

Group Membership

Group Membership By Group

Secrets

Access v Create Date Check

All Secret Permissions

All Secrets Viewable by User

All Secrets Viewable by User

Bookmarks

BUG-164115 Small Pie Chart

What Secrets changed passwords in the last 90 days?

What SSH Command Menus do Secrets have?

Debugging Report

What file types have been uploaded to Secrets?

What file types have been uploaded to Secrets? (Pie Chart)

Last Launcher Images

2. Click the link for the desired report. Its page appears:


What Secrets are expiring this week?


View Report Permissions Schedule Audit

Expire Deactivate Secrets Edit Delete Email Report

172 Items

EXPIRATION DATE	FOLDER PATH	SECRET NAME	SECRET TEMPLATE
6/6/2022 11:38 AM	\\RPC\\Heartbeat\\Oracle Account\\Engine	Oracle Account 02	Oracle Account
6/6/2022 11:38 AM	\\Secret Expiration	Secret Expiration 06	Active Directory Account
6/6/2022 11:39 AM	\\Secret Expiration	Secret Expiration 05	zzAD - 1 Day
6/6/2022 11:47 AM	\\Secret Expiration	Secret Expiration 19	Active Directory Account

3. Click the  button in the top right of the item table. The download popup appears:



## Download

Would you like to download this table data as a CSV file?

Export

All Data ▼

Date Format

ISO (1994-11-05T13:15:30.939Z) ▼

Time Zone

UTC ▼

Cancel

Download

4. Click the **Export** dropdown list to choose which data to download.
5. Click the **Date Format** dropdown list to choose the date format.
6. Click the **Time Zone** dropdown list to choose the time zone.
7. Click the **Download** button. The reports save as a CSV file to your browser's default download location.

## Creating New Schedules for Reports

1. To create a schedule for a report, click the **Schedules** tab on the **Report View** page:

The screenshot shows the 'Reports > RPC by Day' page. At the top, there are navigation links: 'View Report', 'Schedule' (highlighted in blue), and 'Audit'. To the right of these links are three buttons: 'Edit', 'Delete', and 'Email Report'. Below the navigation links, there is a large green button labeled 'Create Schedule'. At the bottom left, it says '0 Items'. At the bottom right, there is a toggle switch labeled 'Include Deleted' which is currently turned off.

2. Click the **Create Schedule** button. The Report Schedule page appears:

The screenshot shows the 'Reports > RPC by Day > Schedules >' page. At the top, there are navigation links: 'View Report', 'Schedule' (highlighted in blue), and 'Audit'. To the right of these links are three buttons: 'Edit', 'Delete', and 'Email Report'. Below the navigation links, there is a section titled 'Report Schedule' with the instruction 'Define when the report should run.' The form contains the following fields:
 

- Schedule Name \***: A text input field.
- Health Check**: A checkbox that is currently unchecked.
- Start recurring on**: A date and time selector showing '3/10/2021' and '3:01 PM'.
- Schedule Type**: A dropdown menu currently set to 'Daily'.
- Recur every**: A text input field followed by the word 'Days'.

 At the bottom right, there are two buttons: 'Cancel' and 'Save' (highlighted in green).

3. Configure the report settings as listed in [Editing Schedule Settings](#)
4. Click the **Save** button. The page for the new report schedule appears:

Reports > RPC by Day > Schedules > Test

Detail History

Report Schedule [Edit](#)

Define when the report should run.

Schedule Name *	Test
Health Check	No
Start recurring on	3/10/2021 03:01 pm
Schedule Type	Daily

Recur every 1 Days

5. The report will now be saved for you, saving only one report at a time. If you want more saved or want it emailed to you according the the schedule:

1. Click the **Edit** link in the **Report Distribution** section. The section becomes editable:

Number of Saved Reports ☐ Save All

Format

Send Email ☐

2. Either click to select the **Save All** check box or type a new number in the **Number of Saved Reports** text box. Remember, saving reports can use a lot of disk space.
3. Click the **Format** dropdown list to select the report format:
  - HTML: Save the report as an HTML file.
  - CSV: Save the report as a comma separated value file for importation into a spreadsheet.

**Important:** The CSV feature is part of the early release of Secret Server 10.11. The general release is not till April 12, 2021 (on-premises version) and April 12, 2021 (cloud version).

1. Click to select the **Send Email** check box to have the report emailed to you at the reporting interval. An email section appears:

The screenshot shows a configuration panel with the following sections:

- Send Email**: A checked checkbox.
- Send Email With High Priority**: An unchecked checkbox.
- Selected groups ( 0 )**: A box containing the text "No users or groups have been selected".
- Report Subscribers**: A section with an "Add groups" header. It includes a dropdown menu set to "All" and a search box labeled "Search for groups". Below this is a list of groups with checkboxes:
  - ☐ Access Control Assistance Operators
  - ☐ Account Operators
  - ☐ admin
  - ☐ Administrators
- Additional Email Recipients**: A text input field.

2. Click the **All** dropdown list in the **Report Subscribers** section to choose the domain to look for users and groups.
3. Click the check boxes next to the users or groups you want to send the report to in the **Report Subscribers** section. You can also search for the same in the provided search box at the top of the section. The users or groups appear in the Selected Groups text box.
4. Type any additional email addresses in the **Additional Email Recipients** text box.
5. Click the **Save** button.

## Viewing Existing Report Schedules

1. To view existing schedules for a report, click **Schedule** on the Report View screen. A list of existing schedules for the report appear in the grid.
2. To view the details of a schedule, click the schedule name in the grid.
3. (Optional) Deleted schedules can be made visible by checking the **Show Deleted** box at the bottom of the grid.
4. Click the **View** link in the History column of the grid to view the history of all generated reports for that schedule.

## Editing Schedule Settings

When viewing a report, click Schedule and then the name of the report schedule to modify it. The following configuration options are available:

- **Schedule Name:** This is the name of the schedule for the report. This name must be unique to the Secret Server installation.
- **Health Check:** This sends an email notification only when the report contains data.
- **Recurrence Schedule:** This specifies the schedule runs every X number of days, weeks, or months, with the option to specify days of the week or month as well. The date and time that the report schedule is effective can be specified in this section as well.
- **Save Generated Reports:** This saves the history of generated reports in the database for later viewing. Enabling this setting also allows you to specify the number of generated reports to save.
- **Send Email:** Secret Server sends an email containing the generated report every time the schedule runs. Enabling this setting also allows you to specify whether the email is sent with the high priority flag and a list of Secret Server users or groups that receive the generated report email. Add additional email recipients in the text box below the subscribers, separating recipients with a semi-colon.

The following configuration options appear if the report being scheduled contains at least one dynamic parameter in the SQL of the report:

- **User Parameter Value:** Value of the #USER parameter to set in the report when it is generated.
- **Group Parameter Value:** Value of the #GROUP parameter to set in the report when it is generated.
- **Start Date Parameter Value:** Value of the #STARTDATE parameter to set in the report when it is generated.
- **End Date Parameter Value:** Value of the #ENDDATE parameter to set in the report when it is generated.



**Note:** As version 7.0, Secret Server allows creation of Reports using custom SQL.

Reporting supports embedding certain parameters into the SQL to give the viewer controls to dynamically change the report. The supported parameters are:

## Primary Parameters

### #STARTDATE

This displays a calendar picker on view and returns a date. This defaults to beginning of the year and truncates the hours and minutes to 12:00 AM.

Example: display all users who have logged in after a certain date:

```
SELECT
  Domain,
  Username,
  LastLogin
FROM tbUser
  LEFT JOIN tbDomain ON tbUser.DomainId = tbDomain.DomainId
WHERE
  LastLogin > #STARTDATE
```

### #ENDDATE

This displays a calendar picker on view and returns a date. This defaults the current day and truncates the hours and minutes to 11:59 PM.

Example: display all users who have logged on a certain date:

```
SELECT
  Domain,
  Username,
  LastLogin
FROM tbUser
  LEFT JOIN tbDomain ON tbUser.DomainId = tbDomain.DomainId
WHERE
  LastLogin > #STARTDATE
AND
  LastLogin < #ENDDATE
```

### #USER

This displays a user dropdown list with all active users on view and returns an user id. This defaults to the current logged in user.

Example: display all audit entries for a certain user:

```
SELECT
  tau.UserIdAffected,
  tau.[Action],
  tau.Notes,
  tau.DateRecorded,
  tau.IpAddress,
  tau.MachineName,
  tau.DatabaseName,
  tu.UserId,
  tu.UserName
FROM tbAuditUser tau INNER JOIN tbUser tu ON tau.UserId=tu.UserId WHERE tu.UserId=#USER
```

### #ORGANIZATION

This is an internal parameter that returns the current instance's organization code. This is only useful for Secret Server Online (a legacy product, which is *not* the same as Secret Server Cloud). Do not use this parameter in your reports for either Secret Server On-Premises or

Secret Server Cloud.

**Note:** As of Secret Server 7.8.000048 the #GROUP parameter is also available.

**#GROUP**

Displays a group dropdown list with all active groups on view and returns a group id. This defaults to the Everyone group.

Example: display the group details of the selected group:

```
SELECT
  GroupID,
  GroupName,
  Active
FROM tbGroup
WHERE GroupID = #GROUP
```

**#FOLDERID**

Displays a folder picker that shows all Folders and returns a folder id.

Example: Display secret names in a selected folder:

```
SELECT
  s.SecretName
FROM tbSecret s
WHERE s.Folderid = #FOLDERID
```

**#FOLDERPATH**

Displays a folder picker that shows all folders and returns the path of the folder.

Example: display folders that are child folders of the selected path:

```
SELECT *
FROM tbFolder f
WHERE FolderPath LIKE '% ' + #FOLDERPATH + '%'
```

**#CUSTOMTEXT**

Displays a text input where a user can put in arbitrary free text for searching.

Example: display secrets that have names that contain the text input:

```
SELECT *
FROM tbFolder f
WHERE FolderPath LIKE '% ' + #CUSTOMTEXT + '%'
```

**Additional Parameters**

The following additional parameters can be used to make your report more dynamic:

**Parameters**

**Table:** Additional Parameters

#ENDCURRENTMONTH	The last day of current month
------------------	-------------------------------

#ENDCURRENTYEAR	December 31st of the current year
#ENDPREVIOUSMONTH	The last day of the previous month at 11:59:59 PM
#ENDPREVIOUSYEAR	December 31st of the previous year
#ENDTODAY	End of today at 11:59:59 PM
#ENDWEEK	End of the current week (Sunday) at 11:59:59 PM
#ENDYESTERDAY	End of Yesterday at 11:59:59 PM
#STARTCURRENTMONTH	The first day of current month
#STARTCURRENTYEAR	January 1st of the current year
#STARTPREVIOUSMONTH	The first day of the previous month at 12:00 AM
#STARTPREVIOUSYEAR	January 1st of the previous year
#STARTTODAY	Beginning of today at 12:00 AM
#STARTWEEK	Beginning of the current week (Monday) at 12:00 AM
#STARTYESTERDAY	Beginning of yesterday at 12:00 AM

## Example

For example, the following script would give you a list of all users who have logged on during the last calendar month:

```
SELECT
  Domain,
  Username,
  LastLogin
FROM tbUser
LEFT JOIN tbDomain ON tbUser.DomainId = tbDomain.DomainId
WHERE
  LastLogin BETWEEN #STARTPREVIOUSMONTH AND #ENDPREVIOUSMONTH
```

**Note:** As of Secret Server 7.8.000048, the #STARTWEEK and #ENDWEEK parameters are available.

## Coloring Your Reports

Another option when creating reports is to include a Column in your SQL query called "Color" this will give the row that particular color. See [HTML Color Names](#).

For example, to show users who haven't logged in within 90 days in Red:

```
SELECT DisplayName
CASE
  WHEN LastLogin < GetDate() - 90 THEN 'Red'
  ELSE 'White'
END AS Color
FROM tbUser
```

To view auditing for all actions performed on a report, do the following:

1. Click Reports from the left navigation panel.
2. Click the report for which you wish to view an audit.
3. At the far right end of the page, click the button labeled **View Audit**. The audit information for the record appears in a pop-up message. For more information, See [Built-in Reports](#).

On this page you see the graph, chart, grid, and more for the report. To see a grid representation of the report, click the **Show Data** link to expand that area. If there is no data, then no graph is visible and the text "There are no items" displays in the Show Data section.

Some reports use dynamic values like user, start date, and end date. Adjust these values to generate the report you need. Click the **Update Report** button to generate the new report.

The **Edit** button allows you to alter the report to fit your requirements. See the Creating and Editing a Report topic for details.

## Roles

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Modeled after the role-based access control (RBAC) mechanism, role-based security (RBS) is Secret Server's method of regulating permission to system access. Each user and group must be assigned to a role. Secret Server ships with three roles: Administrator, User, and Read-Only User. Each role contains various permissions to match the job function of the user. With RBS, strict granular access to Secret Server is ensured. A list of role permissions and their descriptions can be found in the [Secret Server Role Permissions List](#).

You can assign multiple permissions to a role. For example, you could assign Administer Users, Edit Secret, Own Secret, and View Active Directory permissions to a role. That role can then be assigned to a user or group.

**Note:** The Unlimited Administrator permission allows the user to have unlimited administrator rights when Unlimited Administrator is enabled in the configuration. By default, it is disabled.

**Note:** to see the built-in roles and what permissions they possess, click the desired role link on the Admin > Roles page.

To assign roles to a user, click the **Assign Roles** button on the main **Roles** page. Depending on which tab is selected, this page allows you either view the roles that are assigned to users or view the users that are assigned to roles. To change these settings, click the **Edit** button. Now select a role from the list and assign or unassign users to the role. In the **By User or Group** tab, you can select a user or group from the list and assign or unassign roles to them in the selectable list boxes.

You can create roles from the Roles page. To get to the Roles page, navigate to **Administration > Roles**. Click the **Create New** button to add the role.



To add or remove permissions to an existing role, click the role name of the role you wish to edit.

On this Role View page, permissions can be added and removed from the role by clicking the **Edit** button. Use the arrow buttons to move permissions into and out of the current role. If needed, a role can also be enabled or disabled from this page. If you have finished with your changes, you must click the **Save** button to have the changes take effect.

## Overview

Secret Server uses role-based access control (RBAC) to regulate permissions. The roles are assigned to users or groups. A complete list of the permissions available to roles appears below:

**Note:** to see the built-in roles and what permissions they possess, click the desired role link on the Admin > Roles page.

Adding a jumpbox route to a target secret: A user must have owner permissions on a secret to assign, change, or remove that secret's jump server route. Additionally, users are only able to pick from a list of routes where they have at least list permission on the first jump route server. Editing Jumpbox Routes: Users must have the "Administer Jumpbox Route" permission to create, edit, or deactivate jump server routes. Users with the "View Jumpbox Route" permission can view the details of all jump server routes in the Admin Jumpbox Route page, but they cannot make any changes.

## Complete List

### Access Offline Secrets on Mobile

Allows a user to cache their Secrets in the Secret Server mobile application for offline use. This permission does not automatically come with the Administrator role.

### Add Secret

Allows a user to create new Secrets. The Add permission no longer include the role permission View Secret.

### Add Secret Custom Audit

Allows a user to make a custom audit entry when accessing a Secret using the web services API.

### Administer Active Directory

Allows a user to view domains, edit existing domains, delete domains, and add new domains. Also allows a user to force synchronization or set the synchronization interval.

### Administer Automatic Export

The user can do everything the other automatic export permissions allow *and* edit the automatic export configuration.

### Administer Backup

Allows a user to view and configure automated backups for Secret Server. Users with this role permission can change the backup path, disable backups, and set the backup schedule.

### Administer Configuration

Allows a user to view and edit general configuration options. For example, a user with this role permission can turn on "Force HTTPS/SSL" and disable "Allow Remember Me".

### Administer Configuration Proxying

Allows a user to view and edit SSH Proxy settings.

### Administer Configuration SAML

Allows a user to view and edit SAML integration settings on the Login tab of Configuration settings.

#### **Administer Configuration Security**

Formerly "Administer Security Configuration," allows a user to view and edit security configuration options in Secret Server. Currently, these include enabling FIPS compliance mode and protecting the encryption key.

#### **Administer Configuration Session Recording**

Allows a user to view and edit session recording settings on the Session Recording tab of Configuration settings.

#### **Administer Configuration Two Factor**

Allows a user to change the configuration settings of the two factor authentication that are available for users logging into Secret Server.

#### **Administer Configuration Unlimited Admin**

Formerly "Administer Unlimited Admin Configuration," allows a user to turn on Unlimited Admin Mode. When this mode is enabled, users with the "Unlimited Administrator" role permission can view and edit all Secrets in the system, regardless of permissions. Note that you can assign "Administer Unlimited Admin Configuration" to one user and "Unlimited Administrator" to another user. This would require one user to turn on the mode and another user to view and edit secrets.

#### **Administer ConnectWise Integration**

Allows a user to view and edit configuration options for synchronizing with ConnectWise. This can be accessed through the "Folder Synchronization" link on the Administration page. Note that you need at least view access on the sync folder in order to set up or edit the ConnectWise integration.

#### **Administer Create Application Accounts**

Formerly "Create Application Account", allows a user to create application user accounts to be used exclusively for accessing Secret Server via the API.

#### **Administer Create Users**

Allows a user to create new local users in Secret Server, but not edit them once created.

#### **Administer Custom Password Requirements**

Allows a user to view and edit custom password requirements that can be configured under the Security tab for individual Secrets.

#### **Administer Data Retention**

Can manage audit data retention, such as editing and running now. This permission does not automatically come with the Administrator role.

#### **Administer DevOps Secrets Vault Tenants**

Add, remove, and edit DSV tenants that automatically synchronize with Secret Server on a schedule.

#### **Administer Disaster Recovery**

Allows a user to configure instances as data sources or replicas for Disaster Recovery. Also allows user to initiate or test Data Replication and view related logs and audits.

## **Administer Discovery**

Allows a user to view and import computers and accounts that are found by Discovery.

## **Administer Distributed Engine Configuration**

Allows a user to update the Distributed Engine configuration.

## **Administer DoubleLock Keys**

Allows a user to view, edit, create, and disable DoubleLock keys. A DoubleLock key acts as a separate encryption key to protect your most sensitive secrets. This option allows users to access and use the "DoubleLocks" link on the Administration page.

## **Administer Dual Control**

Allows a user to view, edit, create, and disable Dual Control settings for reports and recorded sessions.

## **Administer Event Subscriptions**

Allows a user to view, edit and create event subscriptions.

## **Administer Export**

Allows a user to view the export log. Also allows users to export Secrets to which they have access to a clear text, CSV file.

## **Administer Folders**

Allows a user to view, edit, create, move, and delete folders. Users still need the relevant view, edit, and owner permissions on the folders to perform these tasks.

## **Administer Groups**

Allows a user to view, edit, create, and disable groups. Also allows users to assign users to groups and remove users from groups.

## **Administer HSM**

Allows a user to change configuration or disable the use of a Hardware Security Module (HSM).

## **Administer Inbox**

Administer notification settings for the inbox.

## **Administer IP Addresses**

Allows a user to create, edit, and delete IP Address Ranges. These ranges are used to restrict certain users to specific IP Addresses.

## **Administer Jumpbox Route**

Allows a user to create, edit, or deactivate jump server routes.

## **Administer Key Management**

Allows a user to enable, change, or disable the Key Management (Secret Server Cloud only).

## **Administer Languages**

Allows a user to change the default language of Secret Server.

## **Administer Licenses**

Allows a user to view, edit, install, and delete licenses.

## **Administer Lists**

Add, remove, and modify lists and list contents in Admin > Lists.

## **Administer Metadata**

Manage metadata fields and sections added to secrets and users in Secret Server.

## **Administer Nodes**

Allows a user to view and edit server nodes and clustering settings.

## **Administer OpenID Connect**

Allows a user to manage OpenID connections.

## **Administer Password Requirements**

Allows a user to view and edit character sets and password requirements.

## **Administer Pipelines**

Allows a user to create, edit, and remove event pipelines and event pipeline policies.

## **Administer Platform Integration**

Allows a user to manage the Secret Server connection to the Delinea platform.

## **Administer Remote Password Changing**

Allows a user to turn Heartbeat and Remote Password Changing on and off globally. Also allows users to create new password changers and install password changing agents on remote machines.

## **Administer Reports**

Allows a user to view, edit, delete, and create reports. Also allows users to customize report categories.

## **Administer Role Assignment**

Allows a user to view which users and groups are assigned to which roles. Also allows users to assign users and groups to different roles.

## **Administer Role Permissions**

Allows a user to view, edit, create and delete roles. Also allows users to assign different permissions to each role.

## **Administer Scripts**

Allows a user to view, edit, and add PowerShell, SQL, and SSH scripts on the Scripts Administration page.

#### **Administer Search Indexer**

Allows a user to view and edit search indexer options. These options control how searching in Secret Server works. For example, a user with this role permission could enable search indexing, which allows users to search on fields within a secret.

#### **Administer Secret Policy**

Allows a user to create and edit Secret Policies."

#### **Administer Secret Templates**

Allows a user to view, edit, disable, and create Secret Templates.

#### **Administer Security Analytics**

Allows a user to view and edit the settings for Privilege Behavior Analytics.

#### **Administer Session Monitoring**

Allows a user to view and terminate active launcher sessions.

#### **Administer SSH Menus**

Allows a user to edit and create SSH Menus, used in allowlisting commands that can be used on a SSH session.

#### **Administer System Log**

Allows users to view and clear the System Log, which shows general diagnostics information for Secret Server.

#### **Administer Teams**

Users can create, delete, and view all teams.

#### **Administer Template Custom Columns**

Allows a user to enable the "Expose for Display" setting of a Secret template field to make it available for use in Dashboard custom columns.

#### **Administer Users**

Allows a user to create, disable, and edit users in the system.

**Note:** This permission also allows a user to create and edit SDK/CLI rules.

#### **Administer Workflows**

Allows users to manage workflows (advanced access management).

#### **Advanced Import**

Allows a user to import Secrets from an XML file. Users with the this permission can import groups, folders, site connectors, sites, and secret templates, without having to create a secret. Users must have the Secret Server permissions needed for the objects listed in the XML.

## **Allow Access Challenge**

Allows a user be challenged by Privileged Behavior Analytics if their behavior deviates from their normal behavior and meets certain requirements set by Privileged Behavior Analytics. Administrators do not have this permission by default.

## **Allow List Secret Access for Assigning Policy**

Allows users with list access to a secret to assign policies. Users need the view permission if they do not have this one.

## **Approve via Duo Push**

Allow a user to approve access requests via Duo push notifications. Administrators do not have this permission by default.

## **Assign Pipelines**

Allows the user to assign an event pipeline policy to secret policies, or folders.

## **Assign Secret Policy**

Allows a user to assign Secret Policies to folders and secrets.

## **Browse Reports**

The "Browse Reports" role allows access to reports restricted by permissions. Permissions are configurable at the category and report levels and share a similar inheritance model to secrets and folders. You can define users or groups with "view" or "edit" permissions for each category or report.

**Note:** Users with the existing "view reports" and "edit reports" roles are not restricted by the permissions set.

## **Bypass Direct API Authentication Restriction**

Allows users to ignore the PreventDirectApiAuthentication advanced setting and log in via the API with a non-application account.

## **Bypass SAML Login**

Allows a user to login with local account without using SAML.

## **Copy Secret**

Allows a user to copy secrets when that user also has Own Secret role permission.

## **Create Root Folders**

Allows a user to create new folders at the root level of the folder structure.

## **Deactivate Secret**

Allows a user to mark secrets as deactivated.

## **Delete Secrets from Reports**

Allows a user to run the delete Secrets action from a report.

## **Download Automatic Export**

The user can view all of the automatic export tabs *and* download exports from cloud storage (cloud customers only).

## **Edit Secret**

Allows a user to edit secrets. Note that they still require the "Edit" or "Owner" permissions on the individual secrets they are editing.

## **Erase Secret**

Allows a user to permanently erase (as opposed to deactivate, which is reversible) a secret.

## **Expire Secrets from Reports**

Allows a user to expire Secrets listed in a report."

## **Force Check In**

Allows a user to force a secret that is checked out by another user to be checked in.

## **Own Group**

Allows a user to be an owner of a group. This permission is in the default Group Owner role, which is automatically assigned when that user is set as owner of a group.

## **Own Secret**

Formerly "Share Secret", allows a user to share secrets with other users. Also allows users to perform more advanced tasks on secrets of which they are "Owners", such as configuring expiration schedules, configuring the web launcher, converting secret template, and copying secrets (when a user also have the Copy Secret role permission.)

## **Own User**

Allows the user to become a user owner, used to configure specific users without the Administer Users permission.

## **Personal Folders**

Allows a user to have personal folder when the global personal folders configuration options is enabled.

## **Privilege Manager Administrator**

Allows the user to have the "Administrator" role for Privilege Manager, giving full access to the system.

## **Privilege Manager Helpdesk User**

Allows the user to have the "Help Desk" role for Privilege Manager, giving full access to approve or deny escalation requests.

## **Privilege Manager MacOS Admin**

Allows the user to have the MacOS "Administrator" role for Privilege Manager, giving full access to the system.

## **Privilege Manager Unix/Linux Admin**

Allows the user to have management permissions to Unix/Linux policies and machines.

## **Privilege Manager User**



Allows the user to have the "User" role for Privilege Manager, giving read and write permissions to most items, but not rights to modify security permissions. Administrators do not have this permission by default.

#### **Privilege Manager Windows Administrator**

Allows the user to have the Windows "Administrator" role for Privilege Manager, giving full access to the system.

#### **Rotate Encryption Keys**

Allows a user to start a process that rotates the Secret encryption keys.

#### **Run Automatic Export**

The user can view all of the automatic export tabs and run the export manually by clicking the Run Export button.

#### **Run Disaster Recovery Data Replication**

Allows user to initiate or test Data Replication.

#### **Run Scripts**

Separates privileges in script management. Holders of the "View Scripts" role permission cannot execute test runs of scripts, and this permission must be assigned to perform this task.

Administer Scripts remains unchanged and allows view, edit, and run permissions.

#### **Secret Launch**

Dictates whether or not a user can launch a secret. Previously, a user could launch a secret if their user's role had the "View Secret" permission. As of Version 11.5, a user needs this permission to launch. A user will also need the "Secret Launch Remote Access (Platform)" permission to be able to launch a Remote Session with (RAS)

#### **Secret Launch Remote Access (Platform)**

Dictates whether or not a user can launch a secret. Previously, a user could launch a secret if their user's role had the "View Secret" permission. As of Version 11.5, a user needs this permission to launch a remote session with RAS.

#### **Session Recording Auditor**

Grants access to the session recording of a secret to a user with at least "List Access" permission on the secret. Administrators do not have this permission by default.

**Note:** Users also need the "View Session Monitoring" permission to view the recordings in Secret Server.

#### **Unlimited Administrator**

Allows a user to view and edit all secrets in the system, regardless of permissions, when Unlimited Admin Mode is on. Note that another user with the "Administer Unlimited Admin Configuration" role permission would still need to turn this mode on.

#### **Unrestricted by Teams**

Users can view all users, groups, and sites, regardless of team affiliation. Essentially, teams do not exist for the users with this permission, and the Teams page is not available to them. The default user role has this permission.

## **User Audit Expire Secrets**

Allows a user to view the "User Audit" report, which shows all secrets that have been accessed by a particular user in a specified date range. Also allows the user to force expiration on all these secrets, which would make Secret Server automatically change the password.

## **View About**

Allows a user to view the "About" page from the Help menu, which links to external resources such as Technical Support and the Delinea blog.

## **View Active Directory**

Allows a user to view, but not edit, the Active Directory settings in the system.

## **View Advanced Dashboard**

Allows a user to view advanced dashboard. Without this permission, users will only be able to view basic dashboard.

## **View Advanced Secret Options**

Allows a user to view the Remote Password Changing, Security, and Dependency tabs on a Secret they have access to.

## **View Automatic Export**

The user can view all of the automatic export tabs.

## **View Backup**

Allows a user to view, but not edit, the automated backup settings.

## **View Configuration**

Allows a user to view, but not edit, general configuration settings.

## **View Configuration Proxying**

Allows a user to view, but not edit, SSH Proxy settings.

## **View Configuration SAML**

Allows a user to view SAML integration settings on the Login tab of Configuration settings.

## **View Configuration Security**

Formerly "View Security Configuration," allows a user to view the security configuration of Secret Server.

## **View Configuration Session Recording**

Allows a user to view session recording settings on the Session Recording tab of Configuration settings.

## **View Configuration Two Factor**

Allows a user to view the configuration settings of the two factor authentication that are available for users logging into Secret Server.

## **View Configuration Unlimited Admin**

Formerly "View Unlimited Admin Configuration," allows a user to view the Unlimited Admin Mode configuration. Also allows a user to view the Unlimited Admin Mode audit log.

#### **View ConnectWise Integration**

Allows a user to view, but not edit, the ConnectWise integration settings.

#### **View Data Retention**

Can view retained audit data. This permission does not automatically come with the Administrator role.

#### **View Deleted Secrets**

Allows a user to view Secrets that have been deleted in the system.

#### **View DevOps Secrets Vault Tenants**

View (not edit) the DSV tenants set to synchronize with Secret Server.

#### **View Disaster Recovery**

Allows a user to view configuration, logs and audits for Disaster Recovery.

#### **View Discovery**

Allows a user to view, but not edit, computers and accounts that are found by Discovery.

#### **View Distributed Engine Configuration**

Allows a user to view the Distributed Engine configuration.

#### **View DoubleLock Keys**

Allows a user to view which DoubleLock keys exist in the system.

#### **View Dual Control**

Allows a user to view configured Dual Control settings for reports and Secret sessions.

#### **View Event Subscriptions**

Allows a user to view event subscriptions.

#### **View Enterprise Objects**

Allows a user to view user and secret metadata.

#### **View Export**

Allows a user to view the export log of the system to see when users exported secrets. Does not allow a user to export.

#### **View Folders**

Allows a user to view, but not edit, folders in the system.

## **View Group Roles**

Allows a user to see which groups and users are assigned to which roles. Does not allow a user to change these assignments.

## **View Groups**

Allows a user to see which groups exist in the system. Also allows a user to see which users belong to each group.

## **View HSM**

Allows a user to view the Hardware Security Module (HSM) configuration settings.

## **View IP Addresses**

Allows a user to view IP Address Ranges that have been created to restrict access. Does not allow a user to edit these ranges.

## **View Jumpbox Route**

Allows a user to view the details of all jump server routes in the Admin Jumpbox Route page but not make any changes.

## **View Key Management**

Allows a user to view the Key Management settings (Secret Server Cloud only).

## **View Launcher Password**

Allows a user to unmask the password on the view screen of secrets with a launcher. Typically, this includes Web Passwords, Active Directory accounts, Local Windows accounts, and Linux accounts.

## **View Licenses**

Allows a user to view, but not edit, the licenses in the system.

## **View Lists**

View lists and list contents in Admin > Lists.

## **View Nodes**

Allows a user to view, but not edit, the Secret Server web server nodes.

## **View OpenID Connect**

View OpenID Connect integration settings in the Configuration Login tab. This replaces the Delinea One equivalent.

## **View Password Requirements**

Allows a user to view character sets and password requirements.

## **View Pipelines**

Allows a user to view event pipeline policies and policy activities.

## **View Platform Integration**

Allows a user to view the Secret Server connection to the Delinea platform.

#### **View Remote Password Changing**

Allows a user to view, but not edit, Heartbeat and Remote Password Changing settings.

#### **View Reports**

Allows a user to view, but not edit, reports. See "Browse Reports."

#### **View Roles**

Allows a user to view roles in the system. Also allows a user to see which groups are assigned to which roles.

#### **View Scripts**

Allows a user to view PowerShell, SQL, and SSH scripts on the Scripts Administration page.

#### **View Search Indexer**

Allows a user to view, but not edit, search indexer settings.

#### **View Secret**

Allows a user to only view which Secrets exist in the system.

**Note:** Prior to version 11.4, this controlled if a user could launch a secret. It has been supplanted with Secret Launch and Secret Launch Remote Access (Platform) for launching.

#### **View Secret Audit**

Allows a user to view Secret Audit.

#### **View Secret Password and Private Key History**

Allows a user to see the history of passwords, private keys, or passphrases in both old and new UI.

#### **View Secret Policy**

Allows a user to view, but not edit, Secret Policies.

#### **View Secret Templates**

Allows a user to view, but not edit, Secret Templates.

#### **View Security Analytics**

Allows a user to view, but not edit, settings for Privilege Behavior Analytics.

#### **View Security Hardening Report**

Allows a user to view the Security Hardening Report.

#### **View Session Monitoring**

Allows a user to view active launcher sessions.

## **View Session Recording**

Allows a user to view recorded sessions within Secret Server.

## **View SSH Menus**

Allows a user to view existing SSH Menus, used in allow-listing commands that can be used on a SSH session.

## **View System Log**

Allows a user to only view the System Log, which shows general diagnostics information for Secret Server.

## **View Teams**

Users can view all teams. This is essentially a read-only Administer Teams.

## **View User Audit Report**

Allows a user to view, but not edit, the User Audit Report.

## **View Users**

Allows a user to view which users exist in the system.

## **View Workflows**

View (not edit) workflows used for multi-tier secret-access approvals and secret erase requests.

## **Web Services Impersonate**

Allows a user to send an approval request to act as another user within their organization when accessing Secret Server programmatically. Administrators do not have this permission by default.

## Secret Checkout

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

The Secret Server *checkout* feature forces accountability on secrets by granting exclusive access to a single user. If a secret is configured for check out, a user can then access it. If **Change Password on Check In** is turned on, after check in, Secret Server automatically forces a password change on the remote machine. No other user can access a secret while it is checked out, except unlimited administrators. This guarantees that if the remote machine is accessed using the secret, the user who had it checked out was the only one with proper credentials at that time.

**Note:** The exception to the exclusive access rule is unlimited administrators. If Unlimited Administration is enabled, users with Unlimited Administrator role permission can access checked out secrets.

**Note:** Secrets with a doublelock cannot be configured for check out.

Each secret must be individually set to require check out:

1. From the **Secret View** page, click the **Security** tab to modify a secret's **Check Out** setting.
2. You must configure RPC before **Change Password on Check in** can be set.
3. Enable **Require Check Out** to force users to check out the secret before gaining access.
4. Enable **Change Password on Check In** to have the password change after the secret is checked in.



## Overview

In addition to changing the password on check in, secret owners can also specify administrator-created PowerShell scripts, called *hooks*, to run before or after checkout and check in. These are accessed from the **Hooks** tab of the secret, which only shows if checkout is enabled and PowerShell scripts have been created by an admin.

To specify a before- or after-checkout hook, click **Create New Hook** and specify the following settings:

- **Before/After:** Whether the PowerShell script should run before or after the event action.
- **Event Action:** The hook runs at either check in or checkout.
- **Name:** A descriptive name for the hook.
- **Description:** An extended description for the purpose of the hook.
- **PowerShell Script:** Administrator-created PowerShell script to run.
- **Arguments:** Any command line arguments to pass to the PowerShell script.
- **Stop on Failure:** If enabled, Secret Server prevents the event action if the script returns an error. For example, if "Stop on Failure" is selected for a checkout action, then Secret Server prevents the user from checking out the secret if the script fails.
- **Privileged Account:** If needed, the script can run as another secret's identity.

## Checkout User Variables for Scripts

Checkout user variables for scripts are special code variables that return information about the user or automated task making the checkout request, rather than system or secret information. For example, the \$USERNAME variable returns one or more user IDs related to a specific secret, whereas the \$SECRETSERVERUSERID checkout user variable returns the user ID of the logged-on user or automated task.

**Note:** These variables may also be useful for Active-Directory-related scripts.

The variables are:

**Table:** Checkout User Variables for Scripts:

\$SECRETSERVERUSERID	Logged-on user's ID	-1
\$SECRETSERVERUSERNAME	Logged-on user's name	"System"
\$SECRETSERVERDISPLAYNAME	Logged-on user's display name	"System"
\$SECRETSERVEREMAILADDRESS	Logged-on user's email address	Empty string


[Unexpected Link Text](#)


**Note:** You can find the regular "system" variables in the [Editing Custom Commands](#) subsection of the Custom Password Changers section.


To configure password checking on check in, navigate to the **Remote Password Changing Administration** page and set **Enable Password Changing on Check In**. If RPC is turned off, enable it before configuring checkout. Once RPC and checkout are enabled, secrets can be configured for interval that specifies how long a user has exclusive secret access.


**Remote Password Changing Configuration**


Enable Remote Password Changing	Yes
Enable Password Changing on Check In	Yes
Check Out Interval	30 minutes
Enable Heartbeat	Yes


 Back

 Edit

 Configure Password Changers

 Configure Dependency Changers

 Distributed Engine Configuration

 View Audit

Any user attempting to view a checked-out secret is directed to a notification dialog informing them when the secret is available. Secret Server automatically checks in secrets after either 30 minutes or the interval specified on the secret. Users can check in the secret earlier from the secret's page.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Checkout expiration notifies users with a checked-out secret via their Secret Server inbox and inbox rules when a defined checkout period percentage has elapsed. For example, setting checkout expiration to 80% notifies users when 20% of the checkout interval remains.

This setting is available under "user experience" in the configuration page. To set checkout expiration:

1. Go to the **Admin** menu item and click > >. The Admin slideout appears.
2. Type *configuration* in the search text box and click the link when it appears below. The Configuration page appears.
3. Click the User Experience link at the bottom of the page. The User Experience page appears:
4. Click the **Edit** button.
5. Click the **Checkout Notification Threshold** spinner to select or enter a notification threshold percentage between 0 and 99. This sets what percentage of the checkout period elapses before an expiration notification occurs. That is, if set to 70, a notification is sent when 30% of the checkout period is left.
6. Click to select the **Enable Secret Check Out Extension** check box. The Max Check Out Extension Time setting appears. This sets the maximum time a secret check out can be extended in minutes. This does not include initial check out time, only the amount of time the check out is extended.
7. Click the dropdowns to set the day, hours, or minutes.
8. Click the **Save** button. The setting now appears on the read-only page.

## Secret DoubleLocks

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.


Secret Server's *doublelock* is a feature that provides an additional security layer by protecting secret data using asymmetric encryption (a public/private key pair) where the private key is a human-generated password. This feature is independent of regular permissions, Secret Server login access, or physical access to the machine running Secret Server.

A shortcut way of thinking about doublelocks is as an extra password for secrets that is held by a set group of users. In addition, both the password and the group of users are reusable for other secrets.

1. Navigate to the secret you wish to doublelock by clicking **Secrets** on the main menu.
2. Either drill down to the desired secret in the folders on the main menu, or click the secret in the **All Secrets** table to arrive at the secret's page:

Personal Folders > Will > Mudfin Gmail ☆

General
Security
Audit
RPC
Dependencies
Sharing
Settings

Secret Name *	Mudfin Gmail	Edit
Template	Web Password	Edit
URL *	https://mail.google.com	Edit
UserName *	smedlymufin	Edit
Password *	***** Show	Edit
Notes		Edit
Launchers	 Web Password Filler	

Show Advanced
Edit all fields

3. Click the **Security** tab.

Personal Folders > Will > Mudfin Gmail ☆

General Security Audit RPC Dependencies Sharing Settings

CHECK OUT [Edit](#)

Require Check Out No

APPROVAL [Edit](#)

Require Approval No

OTHER SECURITY [Edit](#)

Require Comment No  
Users will be prompted for comment and ticket number when accessing a Secret.

Enable DoubleLock No

Hide Launcher Password No

- Click the **Edit** link for the **Other Security** section. The section becomes editable:

OTHER SECURITY

Require Comment ☐  
Users will be prompted for comment and ticket number when accessing a Secret.

Enable DoubleLock ☐


Hide Launcher Password ☐

[Cancel](#) [Save](#)

- Click to select the **Enable DoubleLock** check box. The DoubleLock dropdown list appears.
- Click to select the doublelock you created earlier.


**Important:** Enabling doublelock on this secret only grants users access if they have access to to the doublelock and enter their doublelock password. Enabling doublelock disables the RPC features for the secret.


- Click the **Save** button. The doublelock is now enforced for the secret.


1. Click the  icon at the top right of Secret Server. Your My Profile page appears:


## My Profile


GENERAL


Display Name	Will
User Name	Will
Email	
Domain	Local
Last Login	Mon, 13 May 2019 15:26:42 GMT


 Account Settings  
*Notifications, theming, password masking, and language settings.*


 Change Password  
*Change local Secret Server user password.*


 Change DoubleLock Password  
*Change the doublelock password associated to this user account*


 Reset DoubleLock Password  
*Reset the doublelock password associated to this user account*


 Manage Secret Access Requests  
*Approve or deny Secret access requests.*

 Application Access Requests  
*Manage applications requesting access to Secret Server on your behalf.*

 Sessions  
*View all active sessions for the current user.*

 Notifications  
*View all alert notifications for the current user.*


 View in Classic UI  
*Switch to use a classic Secret Server theme.*

 Logout  
*Log the current user out of Secret Server*

2. Click the **Change DoubleLock Password** button. The Change DoubleLock Password page appears:




**Change DoubleLock Password**


 Please enter a new DoubleLock password and press the Change Password button. This will allow you to access Secrets with DoubleLock.

Current Password \*

New Password \*

Confirm Password \*

 **Change Password**

 **Cancel**

3. Type your current doublelock password in the **Current Password** text box.

**Note:** You cannot create a doublelock password until you are associated with a doublelock. When you access your first doublelock, you are prompted to create a password.

4. Type your desired doublelock password in the **Password** and **Confirm Password** text boxes.

**Important:** It is critical that you remember or securely store this password. It cannot be recovered.

5. Click the **Change Password** button. The password is created.

1. Navigate to **Admin > See All**. The Administration page appears:

What are you looking for?

Search for an admin option



[Simplified View](#) ▾



## Actions

Secret Server features that perform important jobs



## Setup & System Maintenance

Setup your Secret Server system and keep it running with Licensing, Backups, Imports, Networking options, and more



## Users, Roles, Access

These features help you organize users & permission settings within Secret Server



## Diagnostics, Logs, Security

Reference options for diagnostics, logs, and security features



## Tools & Integrations

Find Secret Server tools and other product integrations here

2. Type and then click **DoubleLock** in the search text box. The DoubleLock Management page appears:

Admin > DoubleLock Management

DoubleLocks
Audit

Manage DoubleLock Password
Create New DoubleLock

DOUBLELOCK GROUP MANAGEMENT
Show Inactive

DOUBLELOCK GROUP NAME	NUMBER OF SECRETS	NUMBER OF USERS	CREATED	ACTIVE
Main DoubleLock	1 Secrets	1 Users	11/11/2019	✓
System Admin DoubleLock	1 Secrets	1 Users	1/31/2001	✓
Test DoubleLock	3 Secrets	1 Users	11/11/2019	✓

3. Click the desired doublelock. Its page appears:

Admin > DoubleLock Management > My DoubleLock

Doublelock Information

Summary information for this DoubleLock including when it was created and whether or not it is active / enabled. Once a DoubleLock is disabled any associated Secrets will be unable to be accessed.

DoubleLock Name My DoubleLock Edit

Date Created 11/14/2019

Enabled Yes Edit

Associated Secrets 0

Assign Users Add or Remove

Defines the users that are able to access Secrets using this DoubleLock or assign this DoubleLock to other Secrets. Note that only users who have already created a DoubleLock password can be added to a DoubleLock. Users must be part of a DoubleLock group to edit the users in the group. A user can not remove themselves from the DoubleLock

Users Assigned to DoubleLock

Accessible Secrets Associated with DoubleLock

Secrets that can only be accessed by using this DoubleLock. Note: Only Secrets to which you have access will show in this list.

No Secrets are currently using this DoubleLock.

4. Click the **Add or Remove** link in the **Assign Users** section. An Add Users to DoubleLock section appears:

**Add Users to DoubleLock**

All Search

No users / groups match the search criteria that have created DoubleLock passwords. If a user is expected, ensure that they have created a DoubleLock password.

Cancel Save

5. (Optional) Click the dropdown list to limit the user search to a specific domain.
6. Type the user's name in the search text box. The matching users appear below the search text box:

**Add Users to DoubleLock**

john

☐ John Smith

Cancel Save

7. Click to select the check box next to the desired user. The users that appear do not already have a doublelock assigned to them.
8. Repeat the process for other users.
9. Click the **Save** button.

1. Navigate to **Admin** > **See All**. The Administration page appears:

What are you looking for?

Search for an admin option



[Simplified View](#) ▾



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2. Type and then click **DoubleLock** in the search text box. The DoubleLock Management page appears:

Admin > DoubleLock Management

DoubleLocks
Audit

Manage DoubleLock Password

Create New DoubleLock

DOUBLELOCK GROUP MANAGEMENT

Show Inactive

DOUBLELOCK GROUP NAME	NUMBER OF SECRETS	NUMBER OF USERS	CREATED	ACTIVE
Main DoubleLock	1 Secrets	1 Users	11/11/2019	✓
System Admin DoubleLock	1 Secrets	1 Users	1/31/2001	✓
Test DoubleLock	3 Secrets	1 Users	11/11/2019	✓

- Click the **Create New DoubleLock** button. If you have never created a doublelock before, you will have to create a doublelock password first:

Enter DoubleLock Password

Password \*

Enter Doublelock Password

Confirm \*

Confirm Doublelock Password

Forgot DoubleLock Password?

Cancel

Verify Password

**Important:** It is critical that you remember or securely store this password. It cannot be recovered.

Type the doublelock password in the **Password** and **Confirm** text boxes, and then click the **Verify Password** button.

Otherwise, you go directly to the Create New DoubleLock popup page because you already have a doublelock password in the system:



### Create New DoubleLock

**Name**

CancelOK

**Note:** Because it is a secondary password, your doublelock password does not have to (but can) meet the same strong requirements as regular Secret Server passwords (as defined by your admin). Think of it as more of a PIN than a password.

**Note:** A new doublelock and doublelock password are created together. In fact, it is impossible to create a doublelock password without immediately assigning it to a doublelock. For an existing doublelock, you are assigned access to it by its creator. Upon first accessing it, you must create *your* doublelock password for it. At least one other user will already have created their password for the same doublelock—the creator plus anybody else they granted access to.

4. Type the new doublelock's name in the **Name** text box.
  5. Click the **OK** button. The new doublelock's page appears:
-

Admin > DoubleLock Management > My DoubleLock

WS

### Doublelock Information

Summary information for this DoubleLock including when it was created and whether or not it is active / enabled. Once a DoubleLock is disabled any associated Secrets will be unable to be accessed.

DoubleLock Name

My DoubleLock

Edit

Date Created

11/14/2019

Enabled

Yes

Edit

Associated Secrets

0

### Assign Users [Add or Remove](#)

Defines the users that are able to access Secrets using this DoubleLock or assign this DoubleLock to other Secrets. Note that only users who have already created a DoubleLock password can be added to a DoubleLock. Users must be part of a DoubleLock group to edit the users in the group. A user can not remove themselves from the DoubleLock

Users Assigned to DoubleLock

### Secrets Associated with DoubleLock

Secrets that can only be accessed by using this DoubleLock. Note: Only Secrets to which you have access will show in this list.

No Secrets are currently using this DoubleLock.

**Important:** It is critical that you remember or securely store this password. It cannot be recovered.

6. Click the **Create Password** button. The password is created, and the DoubleLocks page reappears.

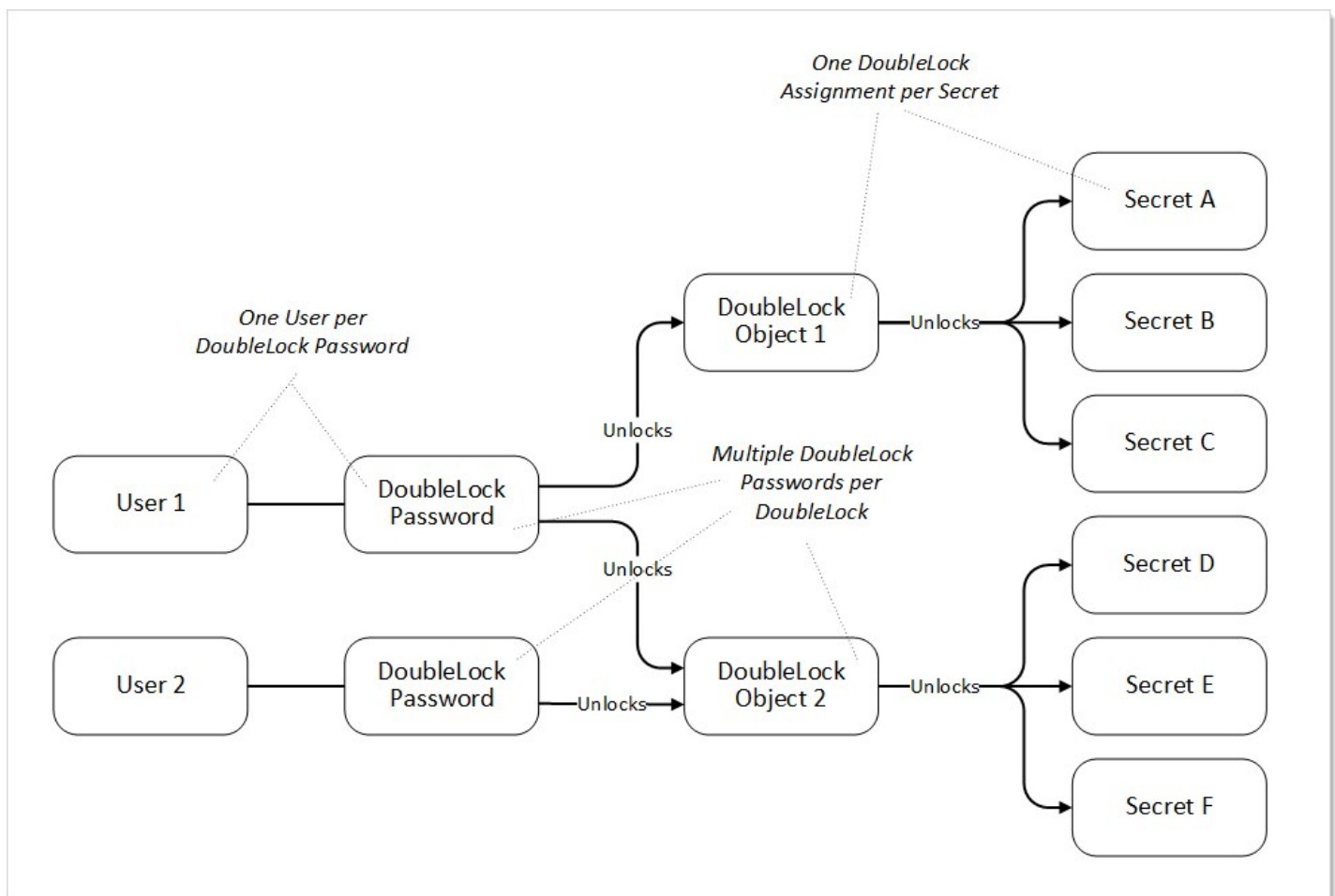
**Note:** The newly created doublelock does **not** appear on the page.

**Note:** A new doublelock and doublelock password are created at the same time. In fact, it is impossible to create a doublelock password without immediately assigning it to a doublelock. For an existing doublelock, you are assigned access to it. Upon first access, you must create a doublelock password if you do not already have one.

The doublelock system is a group of interrelated objects (see the following diagram):

- **Doublelock object:** A named object that is associated with one or more secrets and one or more users (via password objects). Doublelock objects, or simply *doublelocks*, point to secrets (what can be accessed) and doublelock password objects (who can access it).
- **Doublelock password object:** An encrypted password that is associated with one user. The same doublelock password object, or simply *doublelock password*, is used for all doublelocks to which a user has access. Once a user is assigned to a doublelock, that user has access to any secret using that doublelock, using a single password. A doublelock password has nothing to do with the user's Secret Server access password.
- **Secret:** A secret that has a single doublelock assigned to it. Multiple secrets can have the same doublelock assigned to them.
- **User:** A Secret Server user, which can have a single doublelock password assigned to it.

**Figure:** DoubleLock Object Relationships



Because users with access to a given doublelock each have their own separate password. Users that forget their doublelock password cannot simply ask another person using that doublelock for the password. Instead, one of the other users must reassign that forgetful user to the doublelock, and the user must choose a new password. This must occur for every doublelock the user was associated with. If no other doublelock users are available for the assignment to a given secret (there is only one associated doublelock password), the forgetful user is out of luck, and the secret will be destroyed when the user receives a new doublelock password.

When users forget their doublelock passwords, there are multiple steps and considerations. Data loss may or may not result from resetting:

1. When you forget your doublelock password, you typically come to that realization when attempting to access a secret protected by that doublelock:

DoubleLock - Mudfin Gmail

Please enter your DoubleLock password to gain access to the requested resource.

Password \*


[Forgot DoubleLock Password?](#)

Cancel

Continue

2. Click the **Forgot DoubleLock Password?** link. The Reset DoubleLock Password page appears:


Reset DoubleLock Password



Resetting your forgotten DoubleLock password is irreversible and could result in permanent loss of the data. In the case you are the only user with access to the DoubleLocked Secrets, the data will be lost and the Secrets deleted. If another user has access to the Secret, they will need to re-assign you to the DoubleLock. Please review the DoubleLocks and Secrets that will be impacted on reset.

DOUBLELOCKS

Will



No one will have access to these Secret(s). The data will be permanently lost and Secrets deleted.

NAME	TEMPLATE	FOLDER	CREATED
Mudfin Gmail	Web Password	Will	2019. 05. 07.

Please enter your login password to confirm the DoubleLock reset, and acknowledge the Secrets will be lost.

Login Password

✓ Reset DoubleLock Password

✗ Cancel

3. At this stage, there are two possibilities:
  - You are the only one with access to the doublelocked secret: When you reset the doublelock password, the secret and its data is deleted. **This is permanent.**
  - Others have access to the secret via that doublelock: You can reset the doublelock, and you lose access to the secret, but it is not deleted. You must ask one of those others to re-assign you to the doublelock after you reset it.
4. Type your main Secret Server password in the **Login Password** text box.

5. Click the **Reset DoubleLock Password** button. The password is reset, and if you are the only one with access to it, the secret is deleted.
6. (Optional) Ask one of the others with the doublelock password to re-assign you to the doublelock.

As an admin, to use doublelocks on a secret, you must first create complete these steps for a new doublelock:

1. One time: Create a doublelock password (one time per user). This is automatically required of you when you create a doublelock or access a secret with an existing one (that somebody else assigned to you). You can also create one manually ahead of time.
2. One time: Create a doublelock, which can be used on multiple secrets by multiple users.
3. One or more times: Assign the doublelock to a secret or secret template.
4. One time per user: Assign the user to that doublelock. Users without an existing doublelock password are required to create one.
5. Unlimited times: A user unlocks the doublelock with his doublelock password, which in turn gives the user access to the secret associated with the doublelock (every time the user wants access to the secret).

## Secret Heartbeats

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server's *heartbeat* feature allows secrets to have their entered credentials automatically tested for accuracy at a given interval. Using heartbeat on secrets ensures those credentials are up-to-date and can alert administrators if the credentials are changed outside of Secret Server. Heartbeat helps manage secrets and prevent them from being out of sync.

To maximize compatibility across versions of Windows when a heartbeat fails Secret Server makes a second attempt to use the Secret via SMB when **Use SMB heartbeat fallback** is checked. When **Use SMB heartbeat fallback** is not selected this second attempt will not be made.



On the **Preferences** page, the **Send Email Alerts when Heartbeat Fails for Secrets** setting can be enabled to email the user when heartbeat fails for any secret the user has view access to.

Heartbeat is configured from the secret template designer. The heartbeat interval determines how often the secret credentials are tested.

To enable heartbeat, ensure it is enabled on the **Remote Password Changing Configuration** page:

1. Navigate to **Admin > Remote Password Changing**.
2. Click the **Edit** button.
3. Click to select the **Enable Heartbeat** check box.
4. Click the **Save** button.

**Note:** Heartbeat must also be enabled on the secret template by setting the **Enable Remote Password Changing Heartbeat** setting.

The heartbeat logs for a specific secret can be accessed by clicking the **View Audit** button on the **Secret View** page and clicking to enable the **Display Password Changing Log** check box. The heartbeat logs for all secrets can be accessed by navigating to **Administration > Remote Password Changing** and scrolling down to the second set of logs.

- **Failed:** The credentials in the secret failed authentication with the target system.
- **Success:** The credentials in the secret authenticated successfully with the target system.
- **UnableToConnect:** Secret Server was unable to contact the target system. Ensure that the domain, IP address, or hostname is correct and resolvable from the server that Secret Server is installed on.
- **UnknownError:** Check the Heartbeat log on the Remote Password Changing page for details, and contact [Support](#) for assistance.

For the most up-to-date list of account types supported by RPC, see [Password Changer List](#).

Heartbeat runs in a background thread to check each secret where it is enabled. If the credential test fails, the secret is flagged as heartbeat failed and out of sync. To avoid locking out the account, heartbeat no longer run on that secret until the secret items are edited by the user. If the machine is determined to be unavailable, the secret is flagged as heartbeat unable to connect and the secret continues to be checked on the heartbeat interval.

To manually use heartbeat to check the credentials, the **Secret View** page has a **Heartbeat Now** button. The button marks the password as heartbeat pending. The background thread processes the secret in the next 10 seconds, and when the page is refreshed the heartbeat status is updated.

**Note:** Heartbeat does not work on Windows accounts on the server that is running Secret Server. These accounts are flagged with an "Incompatible Host" status.

To run heartbeat for a secret:

1. From **Dashboard**, click the secret you would like to test.
2. Click the **View** button. The **Last Heartbeat** field of the secret shows the last date and time that Heartbeat ran for this secret.
3. To run Heartbeat once more, click **Run Heartbeat** at the bottom of the Secret.
4. Monitor the **Last Heartbeat** field to see the updated status. This may take a few seconds to complete.

If you receive any Heartbeat status code aside from Success, you can check the Heartbeat log for details. To view the entry, Go to **Admin > Remote Password Changing** and then search for the secret name in the **Search** field of the **Heartbeat Log**.

## Secret Import and Export

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secrets are imported or exported as a comma-separated-value (CSV) file or as XML:

- The CSV file is easily read and edited in Excel or other spreadsheet application. The file is grouped by secret template and each cluster of secrets has a header row that contains the template text-entry field names followed by all exported secrets based on that template.
- The XML file is useful for migrating data from one Secret Server installation to another or even from a third-party application to Secret Server.

Secrets are exported in the exact same structure as a secret Import.

This topic has three subtopics:

- [Exporting Secrets](#)
- [Importing Secrets](#)
- [Secret Server Migration Tool](#)

Import and export include:

- Folders (and their permissions)
- Secret templates
- Secrets (and their permissions)

The import or export does **not** include users, groups, launchers, configuration, and others.

**Note:** Folders and secret templates are only exportable from Secret Server 10.0 and later.

**Important:** To ensure permissions are applied correctly, you must recreate your users and groups on the target Secret Server before importing.

The following secret template settings **are** transferred with the export or import:

- Edit requires
- Field slug names
- Hide on view
- Is required?
- Keep secret name history
- One-time password settings
- Secret template icons
- Type descriptions
- Validate password requirements on create or edit

The following secret template settings are **not** transferred:

- Associated secrets
- Launcher settings
- Password changing settings
- Session recording enabled



If you use XML import and export to migrate from Secret Server on-premises to cloud, the major release version (x.x) must be the same. Otherwise, you need to upgrade before you can migrate. Additionally, the **Allow Duplicate Secret Names** check box on the **General** tab of the **Admin Configuration** page should be disabled in Secret Server Cloud before importing.

You can use XML import and export to transfer between on-premises and cloud editions.

This feature allows you to automatically export secrets on a schedule to an external location in an encrypted, password-protected archive.

The secret export settings and XML export format matches the existing Export/Import tool (Admin > Export / Import). This feature lets you automate that export process.

To access this feature, your user must have at least one automatic export permission where you can then find it at **Admin > Automatic Export**.

The export is performed using the permissions of the user last that set up the automatic export, this means only secrets that user can access can be exported.

All actions, successful or not, related to this feature are audited and logged.

## Export Process

**Note:** The actual export of secrets to XML is exactly the same as the standard Export / Import tool—only the triggering differs.

The automatic export follows this process in order:

1. Either a user clicks the Run Export button on the Automatic Export tab or the configured frequency days have passed.

**Note:** Users can manually run the automatic export to determine if the export performs as desired.

2. Secret Server determines if the user who set up the automatic export has either the Run Automatic Export or Administer Run Automatic permission.
3. Secret Server exports secrets to XML, subject to your export settings.
4. Secret Server compresses the XML export into an encrypted, password-protected ZIP archive. The filename for both the XML file and the zipped XML file includes the export date and time—both are named the same, except the file extension. The encryption is 256-bit AES, and the password comes from the Export Password configuration setting.
5. Secret Server saves the archive to the export path (on-premises customers) or to cloud storage (cloud customers).
6. Secret Server logs the results, successful or not, noting any errors. You can view the logs on the Automatic Export Log tab.

## Considerations and Settings

### Configurations and Returned Data

The Automatic Export page shows the following information and configurations:

Those unique to automatic exports:

- **Enabled:** Whether the feature is enabled.
- **Last Exported:** The last time an automatic export successfully ran.
- **Export Path:** The path the export archives are saved to.

**Note:** On-premises Secret Server customers must have write permissions to the directory.

- **Export User:** The user the secret export runs as. Thus, only secrets this user has access to can be exported. This setting is updated automatically to the last user who saved automatic export configuration changes.

- **Frequency (Days):** Number of days between automatic exports.

Those in common with the secret export tool:

- **Export Child Folders:** Whether the export should include child folders, performing a recursive export.
- **Export Folder Paths:** Whether the export should include folder paths.
- **Export Password:** The secret whose password value will be used to password-protect the export archive.
- **Export TOTP Settings:** Whether the export should include Time-based One-Time Password (TOTP) settings.
- **Folder:** The folder the exported secrets are in. If no folder is selected, all secrets are exported. If Export Child Folders is enabled, the folder's subfolder's secrets are included.

## Export Storage

Once the XML export is encrypted and archived in a ZIP file, the file is stored at an external location, which differs for on-premises customers and cloud customers. Only the 10 most recent exports are retained. Older export archives are purged as new exports are stored. This applies to both on-premises customers and cloud customers.

On-Premises storage export archives are saved in the directory in the Export Path configuration. Secret Server must have write permissions to this folder.

Cloud export archives are listed for viewing and downloading on the Automatic Export Storage tab. You can automate downloading these export archives using the REST API Automatic Export. See the [REST Web Services API Reference](#).

## Security

Because this feature moves sensitive data outside of Secret Server, it is very important to understand that **anyone with access to the export archive and the export password has access to all exported secrets**. This bypasses Secret Server security features and may result in a user having access to secrets they would not have access to in Secret Server.

The export archive is a password protected, 256-bit AES-encrypted zip file. Thus, the only thing preventing a possible breach is the password, so it is important you use a cryptographically strong password to foil brute force attacks.

## Permissions

The following permissions relate to automatic secret export:

- **Administer Automatic Export:** The user can do everything the other permissions allow *and* edit the automatic export configuration.
- **Download Automatic Export:** The user can view all of the automatic export tabs *and* download exports from cloud storage (cloud customers only).
- **Run Automatic Export:** The user can view all of the automatic export tabs *and* run the export manually by clicking the Run Export button.
- **View Automatic Export:** The user can view all of the automatic export tabs.

## Event Subscriptions

The following automatic export events are available for event subscriptions:

- **Download:** When an export archive is downloaded (cloud customers only).
- **Edit:** When changes are made to the automatic export configuration settings.

- **Export:** When an automatic export executes, automatically or manually.

**Note:** This event also triggers when a *fatal* error occurs during the export causing the export to fail. Non-fatal errors do not trigger this event, but they are logged on the Automatic Export Log tab.

- **Run Export:** When an automatic export is executed manually by a user clicking the Run Export button.

**Note:** If you subscribe to both this event and the Export event, both events trigger at once.

To set up an automatic export:





**Note:** Only the secrets the user has view access to are exported.

**Important:** File attachments on the original secret are not exported into the XML file and require using the API to migrate. Secret audits and history are not preserved during the migration.

Note: If you later use the export to import into another Secret Server instance, be sure to first create the AD groups and users using the permissions on the secrets in the original Secret Server instance. Otherwise, they will not be created when the secrets are imported into the new instance.

1. Create a new secret to store the export password in.
2. Go to **Admin > See All**. A popup menu appears.
3. Click the **Automatic Export** link. The Automatic Export (configuration) tab appears:

**Admin > Automatic Export**



[Automatic Export](#) [Log](#) [Audit](#)


**Automatic Export** [Edit](#)

Run Export

Setup an automatic Secret export to XML that is encrypted and password protected then stored at the specified location.

The export is performed using the permissions of the export user, this means only secrets they can access will be exported.

**The export user is set as the last user to save configuration changes here.**

[Automatic Export Documentation](#) 

<b>Enable Automatic Export</b>	No
<b>Last Exported</b>	Never
<b>Export User</b>	(not set)
<b>Export Path *</b>	None
<b>Export Password *</b>	No Secret Selected
<b>Folder</b>	< All Folders >
<b>Export Folder Paths</b>	Yes
<b>Export Child Folders</b>	Yes
<b>Export TOTP Settings</b>	Yes
<b>Frequency (Days)</b>	7

- Click the **Edit** link next to **Automatic Export**. The page becomes editable:

Run Export

Enable Automatic Export

☐

Last Exported

Never

Export User

(not set)

Export Path \*

Export Password \*

No Secret Selected

Folder

No Folder Selected

Export Folder Paths

☒

Export Child Folders

☒

Export TOTP Settings

☒

Frequency (Days)

Cancel

Save

- Click to select the **Enable Automatic Export** check box.
- There is no need to set the export user—Secret Server automatically notes who is logged on when you save the export.
- Type the path to export the secret to in the **Export Path** text box (on-premises users only). On-premises Secret Server customers must have write permissions to the directory.
- Click the **No Secret Selected** link. The Select Secret popup appears.
- Click the secret you want to store the password in. Your choice appears as a link next to Export Password:

Export Password \*

[My Test Secret](#)  
[Clear](#)

- Click the **No Folder Selected** link to choose a folder to export. By default, all secrets are exported if a folder is not selected. The Select Folder popup appears. Click on the desired folder. Your chosen folder appears as a link:

Folder
My Folder Clear

11. (Optional) Click to select the **Export Folder Paths** check box. This adds the full folder path to the export. Folder paths in the export file provide organizational structure if secrets need to be imported later.
12. (Optional) Click to select the **Export Child Folders** check box. This option includes any subfolders of the one you chose earlier.
13. (Optional) Click to select the **Export TOTP Settings** check box if you want to include time-based one-time password settings in the export.
14. Type the number of days between automatic exports in the **Frequency (Days)** text box.
15. Click the **Save** button. Any error messages, such as secrets with doublelocks, appear. The page leaves edit mode, and the Run Export button appears.
16. Click the **Run Export** button to text the export. A confirmation popup appears:

### Confirm Run Automatic Export Now

Are you certain you want to run this Automatic Export?

Cancel
Run Now

17. Click the **Run Now** button. A notification appears:

Running export, check the log for results
Run Export

And then disappears.

18. Click the **Log** tab to confirm the export worked:

Automatic Export			
Log		Audit	
EXPORT DATE	SUCCESSFUL	NOTES	
7/15/2021 12:30 PM	Yes	Successfully automaticall...	

19. Using the stored password, open the zip file to confirm its contents.

## Overview

If you use Secret Server Cloud, you can use a REST API to download exports and view your export storage list.

The automatic export feature has the following endpoints available for cloud customers only. API usage is fully audited.

A typical use of these API endpoints is to automate downloading exports to your backup solution outside of Secret Server (for redundancy).

**Note:** Any permission errors when using the API will return a 403 forbidden status code and an `API_AccessDenied` error message.

## Viewing the Storage List

Get a list of the exports currently in storage. Your session must be authenticated, and the authenticated user must have Automatic Export view permissions.

### Sample Request

GET: `http://sample.secretservercloud.com/api/v1/configuration/auto-export-storage`

### Sample Response

```
{
  "records": [
    {
      "id": 123,
      "autoExportConfigurationId": 1,
      "storageDate": "2021-07-01T07:00:02.27",
      "filename": "secret-server-export-20210707070002",
      "canDownload": true
    },
    ...
  ],
  ...
}
```

The response is a JSON object with a `records` property whose value is the list of all the exports in storage. Each list entry has the following properties:

- **id:** The ID for this export in storage, which is used with the Download Export endpoint to download the export.
- **autoExportConfigurationId:** The ID for the automatic export configuration this export belongs to. This may be useful in the future if we support multiple export configurations, but for now it is only used internally.
- **storageDate:** The date and time the export was stored.
- **filename:** The filename for the export archive and the export XML file inside it.
- **canDownload:** Whether the user can download this export archive.

## Downloading Secret Exports

Download an export in storage by its ID. Your session must be authenticated and the authenticated user must have automatic export download permissions.

### Sample Request

GET: `http://sample.secretservercloud.com/api/v1/configuration/auto-export-storage/item/{id}`



Where is the ID of the export you want to download. This value is obtained from the **Storage List** endpoint.

## **Sample Response**

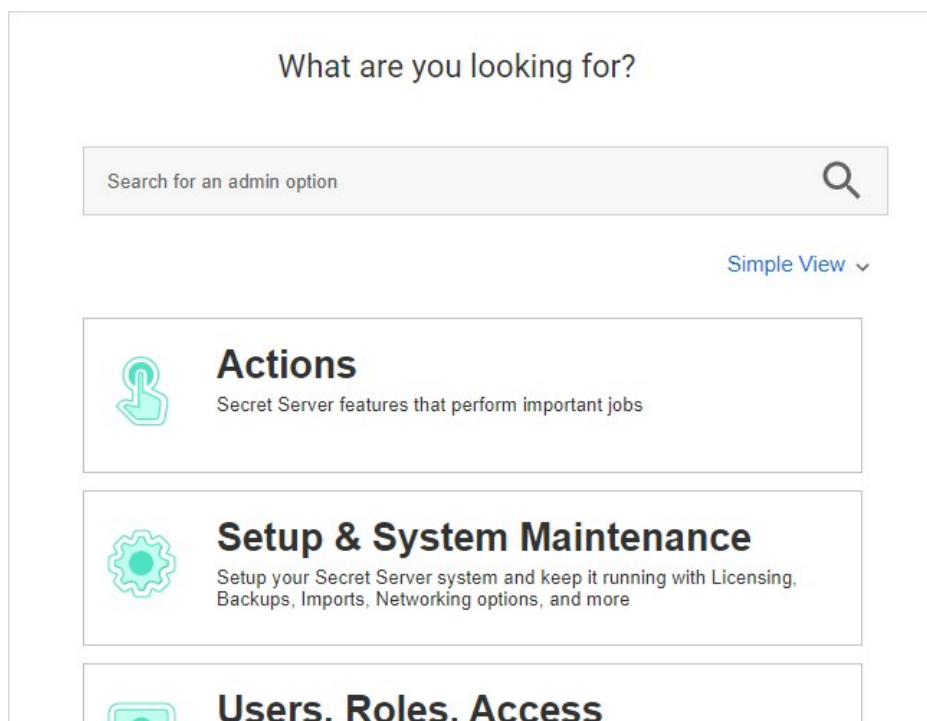
A stream of bytes representing the export archive.

To export a secret, either CSV or XML:

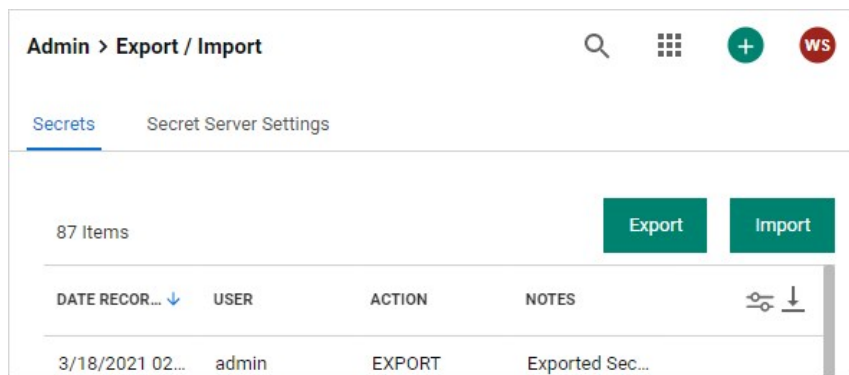
**Note:** Only the secrets the user has view access to are exported.

**Imported:** File attachments on the original secret are not exported into the XML file and require using the API to migrate. Secret audits and history are not preserved during the migration. Be sure to first create the AD groups and users using the permissions on the secrets in the original Secret Server instance. Otherwise, they will not be created when the secrets are imported into the new instance.

1. Go to **Admin > See All**. The admin menu appears:



2. Hover the mouse pointer over the **Setup and System Maintenance** panel and select **Export / Import**. The Export / Import page appears:




3. Click the **Export** button on the **Secrets** tab. The Export page appears:

## Export

Please enter your password for security purposes.

Folder


[< All Folders >](#)

Password

\*

Export with Folder Path

☒

Export Child Folders

☒

Export TOTP Settings

☒

Export Format

☒ CSV
 ☐ XML

Enter any additional notes or explanations for the export.

➔ Export

4. Click the folder icon to choose a folder to export. By default, all secrets are exported if a folder is not selected.
5. Type your password in the **Password** text box. The administrative password must be entered, as it is a security measure to verify the permission of the user performing the export.
6. (Optional) Click to select the **Export with Folder Path** check box. This adds the full folder path to the export. Folder paths in the export file provide organizational structure if secrets need to be imported later.
7. (Optional) Click to select the **Export Child Folders** check box. This option includes any subfolders of the one you chose earlier.
8. (Optional) Click to select the **Import with TOTP Settings** check box if you want to include time-based one-time password settings in the export.
9. Click the **Export Format** selection button to choose the type of export. CSV is for Excel and the like, and XML is for migrating to other Secret Server instances.
10. Click the **Export** button. The Export Secrets popup appears. Any error messages, such as secrets with doublelocks, appear.
11. Click the Close button. When the exportation is finished, an `export.csv` file appears in your browser's queue:

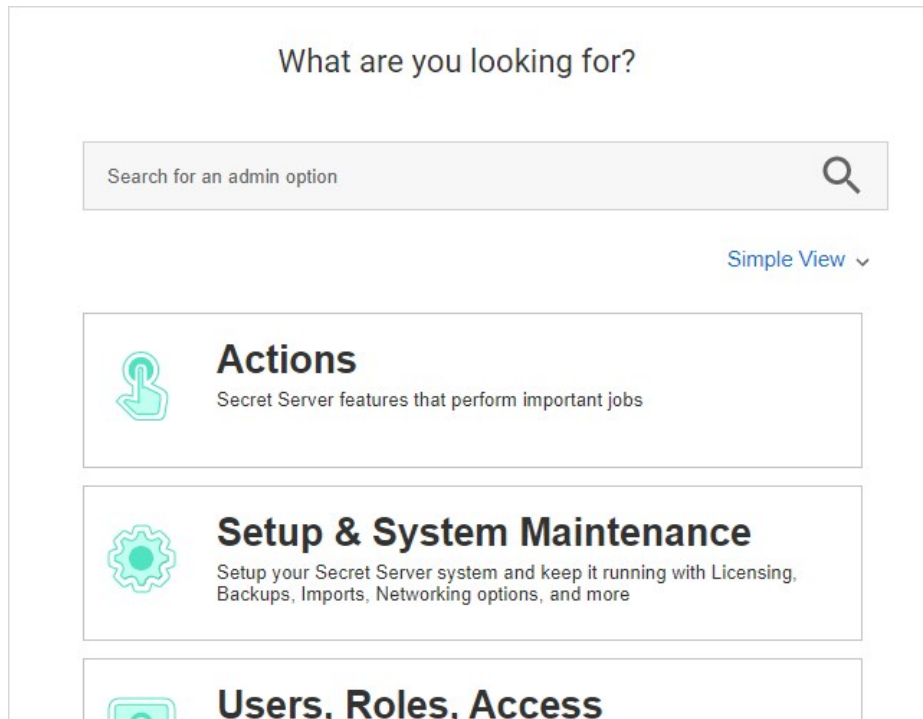


**Important:** Take care with the file—it contains unencrypted passwords.

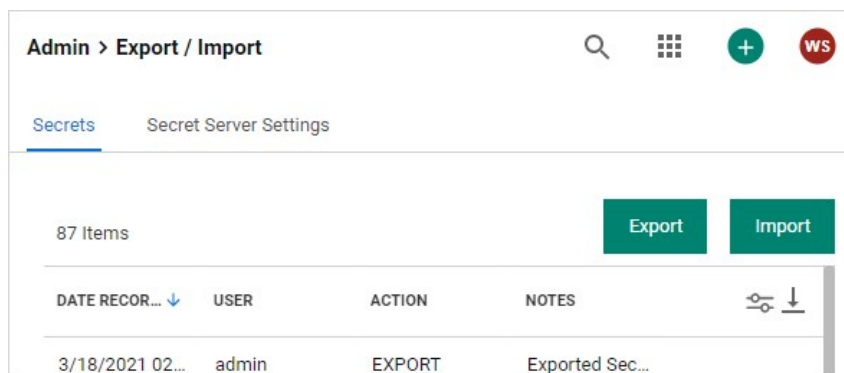
Secret Server's importation feature simplifies integration with legacy systems and allows users to easily add large numbers of secrets from an Excel or comma-separated values (CSV) file. Secrets are batch imported by template, so multiple types of input data need to be imported in several batches. The [Secret Server Migration Tool](#) supports easy addition of existing passwords from other third-party password-storing applications.

## Importing CSV Data

1. Go to **Admin** > **See All**. The admin menu appears:



2. Hover the mouse pointer over the **Setup and System Maintenance** panel and select **Export / Import**. The Export / Import page appears:



3. Click the **Import** button on the **Secrets** tab. The Choose Secret Template page appears:

### Choose Secret Template

What type of Secret do you want to import?

< Select >

▼ \*

↶ Back


↷ Continue

#### Additional Options

[Download](#) the Secret Server Migration Tool.  
[Upload XML File](#) for an advanced import to add Folders, Secret Templates, and Secrets.

- Click the **What type of Secret...** list box to select the type of secrets you intend to import.
- Click the **Continue** button. The Import Secrets page appears:

### Import Secrets



Paste your Secrets directly from Microsoft Excel® or in comma/tab separated format and click 'Next'.  
 Do not include a header line.  
 Secret Name must be included but others fields can be blank.  
 Fields containing commas or tabs must be surrounded with double quotes.  
 It is permissible to include quotes if they are escaped with a \ (for example, pa\"word comes out as pa"word)  
 Fields must be in the following order:  
**Secret Name,Full Name,Card Number,Expiration Date,Card Type,Notes**

↶ Back

↷ Next

☐ Allow Duplicate Secrets
 ☐ Import With Folder
 ☐ Import With TOTP Settings

- Paste the secrets for importation from MS Excel or a CSV file directly into the text box in the **Import Secrets** page. The order of the imported fields is based on the template selected. Consider the following:
  - Do not include a header line. The field names are determined by the order, not a header line.
  - The fields **must** be in this order: Secret Name, AccessKey, SecretKey, Username, SecretId, and Trigger.

- Secret names must be included, but other text-entry fields can be blank unless the secret template indicates that the text-entry field is required
  - Fields containing commas or tabs must be surrounded with double quotation marks
  - If you have to include double quotation marks inside your data, escape all of them with a \ character so the importer does not get confused.
7. Click to select the **Allow Duplicate Secrets** check box if you wish to import a secret with the same name as an existing one.
  8. Click to select the **Import with Folder** check box if you included an additional field in the importation text with a fully qualified folder name for the secret to be created in.
  9. Click to select the **Import with TOTP Settings** check box if you want to include time-based one-time password settings in the import.
  10. Click the **Next** button. Secret Server displays a preview.
  11. If you are happy with what you see, click the **Yes, Import these Secrets** button.

## Importing Secrets with XML

Advanced XML importation adds folders, secret templates, and secrets based on an XML file. Permissions can be specified on the folders and secrets or the default is to inherit permissions. This import can only be done by administrators with proper role permissions.

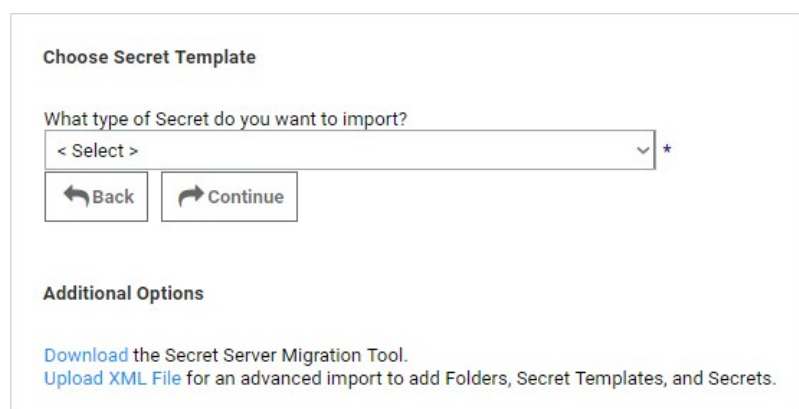
**Important:** Migration is **not** supported by Delinea Technical Support.

### Procedure

1. Ensure your XML is formatted correctly. If coming from a Secret Server export, you should be good to go. See [Example XML File](#).

**Important:** Do not edit the XML file with Windows Notepad. Instead, use Notepad++, Visual Studio Code, or Atom to make your edits. Windows Notepad can add invisible characters that can prevent importation.


2. Go to **Admin > See All**.
3. Click the **Import Secrets** link. The Import page appears:



The screenshot shows a web interface titled "Choose Secret Template". It contains a dropdown menu with the text "What type of Secret do you want to import?" and a placeholder "< Select >". Below the dropdown are two buttons: "Back" with a left arrow and "Continue" with a right arrow. At the bottom, there is a section titled "Additional Options" with two links: "Download the Secret Server Migration Tool." and "Upload XML File for an advanced import to add Folders, Secret Templates, and Secrets."

4. Click the **Upload XML File** link. The Advanced Import page appears:

## Advanced Import




The Advanced Import will add Folders, Secret Templates, and Secrets using data in the xml file. Permissions can be specified on the Folders and Secrets. Items without permissions specified in the xml, will have permissions set based upon the option chosen in the 'Secrets without permissions' dropdown. For details on the XML file, see KB Article [Advanced Import with XML](#).

Secrets without permissions

Inherit Permissions from folder

Browse...
No file selected.

 Import XML File

- Click the **Secrets without permissions** dropdown list to choose how you want secrets without permissions to get them assigned.
- Click the **Browse** button to choose the XML file.
- Click the **Import XML File** button.

### Example XML File

The XML file should look like the example below, the comments are for explanation only and may be removed before importing, if desired.

**Important:** Migration is **not** supported by Delinea Technical Support.

### Notes

- Leaving the <Permissions> tag empty for a folder will cause that folder to inherit permissions from its parent folder.
- Leaving the <Permissions> tag empty for a secret will cause it to inherit permissions from its folder.
- To add a line-break within a Notes field use ##BR##.

**Note:** Please do **not** edit the XML file with Windows Notepad. Use Notepad++, Visual Studio Code, or Atom to make your edits. Using Notepad increases you chances of importation failure.

### Sample XML

```
<?xml version="1.0" encoding="utf-16"?>

<ImportFile xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema";

<Folders>
  <Folder>
    <FolderName>Customers</FolderName>
    <FolderPath>Customers</FolderPath>
    <Permissions>
      <Permission>
        <View>true</View>
        <Edit>true</Edit>
        <Owner>true</Owner>
        <UserName>admin</UserName>
      <!-- Either UserName or GroupName is required in permissions -->
      </Permission>
      <Permission>
        <View>true</View>
        <Edit>false</Edit>
        <Owner>false</Owner>
        <GroupName>Auditors</GroupName>
      </Permission>
    </Permissions>
```

```

</Folder>
<Folder>
  <FolderName>Customer A</FolderName>
  <FolderPath>Customers\Customer A</FolderPath>
  <Permissions />
<!-- Empty Permissions will cause folder to inherit from parent -->
</Folder>
</Folders>
<!-- Groups are optional -->
<Groups>
  <Group>
    <GroupName>Other Administrators</GroupName>
    <GroupMembers>
      <GroupMember>
        <UserName>admin2</UserName>
      </GroupMember>
      <GroupMember>
        <UserName>DomainAdmin</UserName>
        <Domain>http://testdomain.test.com</Domain>
      </GroupMember>
    </GroupMembers>
  </Group>
  <Group>
    <GroupName>Domain Administrators</GroupName>
    <Domain>http://testdomain.test.com</Domain>
    <GroupMembers>
      <GroupMember>
        <UserName>DomainAdmin</UserName>
        <Domain>http://testdomain.test.com</Domain>
      </GroupMember>
    </GroupMembers>
  </Group>
</Groups>
<SecretTemplates>
<!-- You can have multiple secret type entries -->
<secrettype>
  <name>Windows Account</name>
  <active>true</active>
  <fields>
    <field isexpirationfield="false">
      <name>Resource URL</name>
      <mustencrypt>false</mustencrypt>
      <isurl>false</isurl>
      <ispassword>false</ispassword>
      <isnotes>false</isnotes>
      <isfile>false</isfile>
      <passwordlength>0</passwordlength>
      <historylength>0</historylength>
      <isindexable>false</isindexable>
    </field>
    <field isexpirationfield="false">
      <name>Username</name>
      <mustencrypt>false</mustencrypt>
      <isurl>false</isurl>
      <ispassword>false</ispassword>
      <isnotes>false</isnotes>
      <isfile>false</isfile>
      <passwordlength>0</passwordlength>
      <historylength>0</historylength>
      <isindexable>false</isindexable>
    </field>
    <field isexpirationfield="false">
      <name>Password</name>
      <mustencrypt>true</mustencrypt>
      <isurl>false</isurl>
      <ispassword>true</ispassword>
      <isnotes>false</isnotes>
      <isfile>false</isfile>
      <passwordlength>12</passwordlength>
<!-- Use this number for 'All' history -->
      <historylength>2147483647</historylength>
      <isindexable>false</isindexable>
    </field>
    <field isexpirationfield="false">
      <name>Notes</name>
      <mustencrypt>false</mustencrypt>

```



```

    <isurl>false</isurl>
    <ispassword>false</ispassword>
    <isnotes>true</isnotes>
    <isfile>false</isfile>
    <passwordlength>0</passwordlength>
    <historylength>0</historylength>
    <isindexable>true</isindexable>
  </field>
</fields>
<expirationdays>0</expirationdays>
</secrettype>
</SecretTemplates>
<Secrets>
  <Secret>
    <SecretName>Test Secret</SecretName>
    <SecretTemplateName>Windows Account</SecretTemplateName>
    <FolderPath>Customers\Customer A</FolderPath>
    <Permissions>
      <Permission>
        <View>true</View>
        <Edit>true</Edit>
        <Owner>false</Owner>
        <GroupName>IT Admins</GroupName>
      </Permission>
      <Permission>
        <View>true</View>
        <Edit>true</Edit>
        <Owner>true</Owner>
        <UserName>admin</UserName>
      </Permission>
    </Permissions>
    <SecretItems>
      <SecretItem>
        <FieldName>Resource URL</FieldName>
        <Value>10.10.0.25</Value>
      </SecretItem>
      <SecretItem>
        <FieldName>Username</FieldName>
        <Value>Administrator</Value>
      </SecretItem>
      <SecretItem>
        <FieldName>Password</FieldName>
        <Value>D*KGY#$5</Value>
      </SecretItem>
      <SecretItem>
        <FieldName>Notes</FieldName>
        <Value>Just some notes##BR##...and some more notes on a new line. </Value>
      </SecretItem>
    </SecretItems>
  </Secret>
  <Secret>
    <SecretName>Another Test Secret</SecretName>
    <SecretTemplateName>Windows Account</SecretTemplateName>
    <FolderPath>Customers\Customer A</FolderPath>
<!-- Empty Permissions causes secret to inherit from folder -->
    <Permissions />
    <SecretItems>
      <SecretItem>
        <FieldName>Resource URL</FieldName>
        <Value>10.10.0.25</Value>
      </SecretItem>
      <SecretItem>
        <FieldName>Username</FieldName>
        <Value>JSmith</Value>
      </SecretItem>
      <SecretItem>
        <FieldName>Password</FieldName>
        <Value>DKud3()DS</Value>
      </SecretItem>
      <SecretItem>
        <FieldName>Notes</FieldName>
        <Value>This line has an empty line##BR####BR##in between this line.</Value>
      </SecretItem>
    </SecretItems>
    <SecretDependencies>
<!-- Secret dependencies are optional, and there can be multiple ones -->

```

```
<SecretDependency>
  <Active>true</Active>
  <Restart>true</Restart>
  <Description>Some Dependency</Description>
  <MachineName>192.168.99.1</MachineName>
  <DependencyName>Some Service</DependencyName>
  <Type>Windows Service</Type>
<!-- Leave this blank to not use a PrivilegedAccount -->
  <PrivilegedAccount>Some Account</PrivilegedAccount>
  <WaitBeforeSeconds>10</WaitBeforeSeconds>
</SecretDependency>
</SecretDependencies>
</Secret>
</Secrets>
</ImportFile>
```

Secret Server offers a migration utility for importing secrets from other applications. Currently, the migration tool supports to following applications:

- KeePass (version 1 and 2)
- Password Corral
- Password Safe
- Passwords MAX

**Note:** This is done with another exportation tool that creates a single XML file. Please contact Delinea Support for details.

[Download the Tool](#)

## Secret Launchers and Protocol Handlers

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

A secret *launcher* launches applications on end-user machines and automatically logs on using credentials stored in Secret Server. In general, there are three types of launchers: RDP, SSH, and Custom. This provides a convenient method to open RDP and PuTTY connections, but it also circumvents users needing to know their passwords—a user can still gain access to a needed machine but it is not required to view or copy the password out of Secret Server. A Web launcher automatically logs into websites using the client's browser.

A *protocol handler* is an application on an end-user's machine. It enables communication between Secret Server and that client machine. It also provides the files needed by launchers. When a Secret Server user starts a launcher:

1. The protocol handler bootstraps the client-side application.
2. The protocol handler communicates with Secret Server over HTTP(S) to ensure that it is the latest version. If not, it begins an upgrade process.
3. The protocol handler bootstraps the target launcher type and begin the process of securely logging in the user. Beyond HTTP(S) transport protection, credentials are retrieved securely from Secret Server using signed AES-256-encrypted messages.

Secret Server has a convenience feature that eliminates the need to manually enter a su or sudo command's password when using a proxied SSH session to a Unix or Linux server. When a user manually types a su or sudo command with a valid secret ID, the SSH proxy automatically provides the username and password to use. The user does not need to know either.

For su, the connection procedure is as follows:

1. Secret A is created to contain the username and password for the su privilege elevation. Any potentially elevated users must have access to this secret.
2. Using secret B, a user (with access to secret A) starts a Secret Server proxied SSH session.
3. When the user types su at the command prompt, the SSH proxy detects it, determines the user has access to secret A, and augments the command with the secret ID for secret A via a command line argument. Any other arguments the user may have typed are left as is.
4. The user runs the su command, and the secret ID is replaced with the user and credential from secret A.
5. With the elevated permissions (temporarily as another user) from secret A, the user completes the desired tasks.
6. When finished, the user uses an exit command to return to their non-elevated status based on secret B.

**Note:** The added argument appears as `--secret-id <secret ID>` OR `-id <secret ID>`, such as `su --secret-id ElevationSecret`, which is replaced by a username and password when the command runs.

**Note:** Sudo does not take either secret argument and automatically types the current user's password.

Secret Server launchers, supported by protocol handlers, come in three primary types:

- **Remote Desktop:** Launches a Windows Remote Desktop session and automatically authenticates the user to the machine.
- **PuTTY:** Opens a PuTTY session and authenticates the user to a Unix system.
- **Web Password Filler:** Uses a Chrome extension to automatically log the user into a website with secret credentials.
- **Web Launcher:** An alternative method to automatically log on websites. See [Web Launchers](#).

## Problem

When a Remote Desktop Launcher fails to log into a machine, it is sometimes because the machine is configured to have a default domain name (other than the local machine name). To determine whether the machine is configured to have such a default domain name, check one of the following:

**Registry Setting:** HKLM\Software\Microsoft\Windows NT\CurrentVersion\Winlogon\DefaultDomainName

**Group Policy** (Windows 2008 and higher): "Assign a default domain for logon" under Computer Configuration\Administrative Templates\System\Logon

## Solution

Add a key to web-appSettings.config that will cause the RDP launcher to use the machine name as the domain name when authenticating using a local Windows account.

1. Run a text editor as an administrator on the server running Secret Server.
2. Open the web-appSettings.config file located in the Secret Server application directory (typically C:\inetpub\wwwroot\secretserver).

3. Add the following key within <AppSettings>

```
<add key="RDPUseComputerForDomain" value="true" />
```

4. Perform an IIS reset
5. Test the launcher.

The following instructions describe how to set up a custom launcher using SecureCRT:

## Step 1: Creating the Custom Launcher

1. Navigate to **Administration > Core Actions > Secret Templates**.
2. Click the **Launchers** tab.
3. Click the **Create** button. The Launcher page appears.
4. Click the **Launcher Type** dropdown list box and select one of the first two of the following:
  - **Process:** If you want to use secret credentials to connect directly to the remote host. This choice launches the process on the user's machine and replaces \$ parameters with values from the secret and its associated secret.
  - **Proxied SSH Process:** If you have SSH Proxy enabled. This prevents Secret credentials from being passed to the client by connecting to Secret Server's proxy to interact with the remote host. When the SSH Proxy Server is running, launched SSH sessions are proxied through the server.
  - **Batch File:** Not used for this task. Launches the indicated batch file on the user's machine. Allows the script to launch multiple processes using information from the server. Recommended only for advanced users.
  - **Session Connector Launcher:** Not used for this task. Allows for downloading and running an RDP file to launch into a Remote Desktop Server with protocol handler installed, so end-user client machines do not need to install anything. Recommended only for advanced users.

**Note:** Depending on what launcher type you chose, all the steps below may not apply. The steps are in the order they appear in the UI, so if you do not see the item mentioned in the instruction in the interface, you can simply ignore it.
5. Type the name Secure CRT Proxied Process in the **Launcher Name** text box.
6. Click to select the **Active** check box to enable the launcher.
7. Click to select the **Use Additional Prompt** check box to add another field to the prompt. A text box appears to type the name of the field. You can reference the value in the arguments with the \$ prefix.
8. Click to select the **Track Multiple Windows** check box to track child windows of the initial window.
9. Click to select the **Use Custom Image** check box to enable and select a custom image for the launcher—a 100×95 pixel PNG image.
10. Click to select the **Wrap custom parameters with quotation marks** check box to prevent parameter injection in Process Arguments field. When selected, quotation marks are inserted around custom parameters prior to launch. For example: \$USERNAME becomes "\$USERNAME".
11. Type a comma delimited list of the names of other processes that are not started or terminated by the launcher that you want tracked in the **Record Additional Processes** text box.
12. Click to select the **Use SSH Tunneling with SSH Proxy** check box to enable mapping a host and port field when associating this launcher with secret templates, which enables using \$HOST and \$PORT in the process arguments. When launched, a tunnel is opened to the appropriate SSH Proxy if enabled, and \$HOST and \$PORT are updated with the tunnel connection information. This cannot be used with the Additional Prompt Field Name option.
13. Click to select the **Preserve SSH Client Process** check box to keep SSH client processes running after the launched process terminates. This is to support tabbed SSH clients and only applies to proxied SSH processes.



14. Click to select the **Use SFTP Tunneling with SSH Proxy** check box to enable using multiple SFTP data connections. Many SFTP clients require that this is enabled.
15. Ignore the **Batch File Choose File** button, which is not used for this task.
16. Type the location and filename of the executable (C:\program files\acme software\clients\securecr.exe) in the **Process Name** text box in the **Windows Settings** section. The location must be on the client machine (the machine that will run the launcher).
17. Type the following custom command-line parameters in the **Process Arguments** text box:

```
/ssh2 /AUTH keyboard-interactive /PASSWORD $PASSWORD /P $PORT /L $USERNAME $HOST
```

**Note:** See [Custom Launcher Process Arguments](#)

18. Click to select the **Run Process As Secret Credentials** check box to use the fields mapped to username, domain, and password to start the process on the client machine.
19. Click to select the **Use Operating System Shell** check box for processes that require UAC confirmation.
20. Click the **Advanced** link if you need to escape any characters.
21. Click the **Save** button. The new launcher appears.

## Step 2: Creating a Custom Secret Template (optional)

See [Creating and Editing Secret Templates](#) for details on creating a custom secret template.

## Step 3: Associating the Launcher with a Secret Template

1. Navigate to **Administration > Secret Templates**.
2. Click the link for the desired template. That template's page appears.
3. Click the **Mapping** tab.
4. Click the **Add Mapping** button. A popup appears.
5. Click the **Mapping Type** dropdown list to select your custom launcher. Domain, host, password, port, and username controls appear.
6. Leave the **Domain** set to **<blank>**.
7. Click the **Host** dropdown list to select **Machine**.
8. Click the **Password** dropdown list to select **Password**.
9. Click the **Port** dropdown list to select **<use default>**.
10. Click the **Username** dropdown list to select **Username**.
11. Click the **Save** button. You can now launch SecureCRT whenever you use the launcher for secrets based off of this template.

In addition to the built in PuTTY and Remote Desktop launchers, Secret Server supports custom launchers. You can customize these process launchers to work with any application that can be started by command-line. Custom launchers pass values to the command-line from the secret text fields. For process launchers to work, the client machine needs to have the program installed and typically needs the program folder in the PATH environment variable.

**Note:** For more information on launcher arguments see [Custom Launcher Process Arguments](#).

Like the built in launchers, custom launchers run on the users machine not on the web server. Launcher Processes can be set to run either using the credentials of the logged in user or the credentials of the secret. The "Run Process as Secret Credentials" check box is used to switch between these two options.

There are three types of custom launchers to choose from:

- **Process:** Launch a process on the client machine that connects directly to the target system from the client.
- **Proxied SSH Process:** Launch a process on the client machine that proxies its connection to the target system through Secret Server. This applies to an SSH client other than PuTTY (which is a built-in launcher), for example, SecureCRT.

**Note:** See [Configuring SSH Proxies for Launchers](#).

- **Batch File:** Launch a batch file from the client machine that uses Secret Server information.

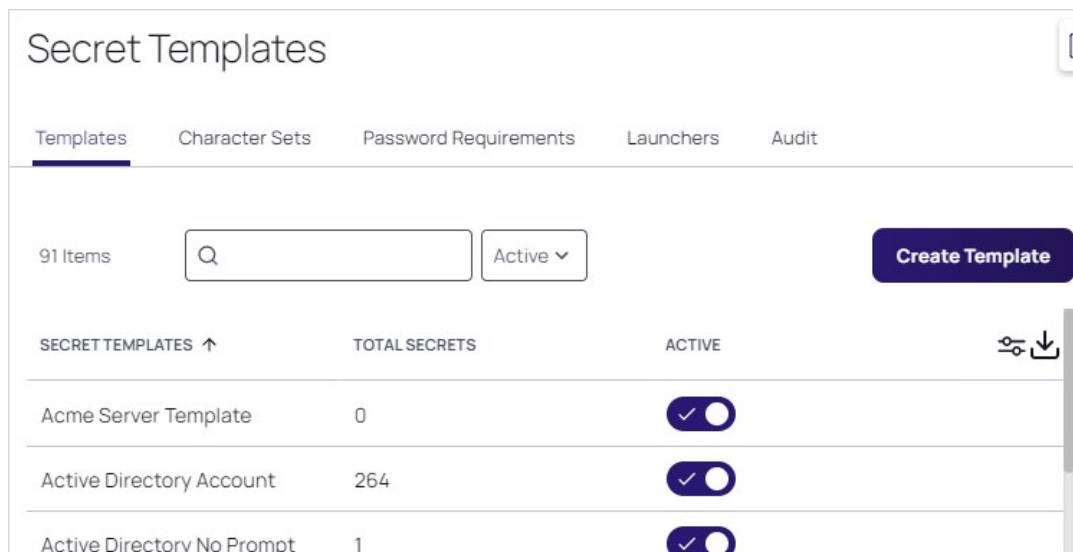
## Creating Custom Launchers

### Procedure

**Note:** See [Custom Launcher Errors](#) if errors arise.

To create a new custom launcher:

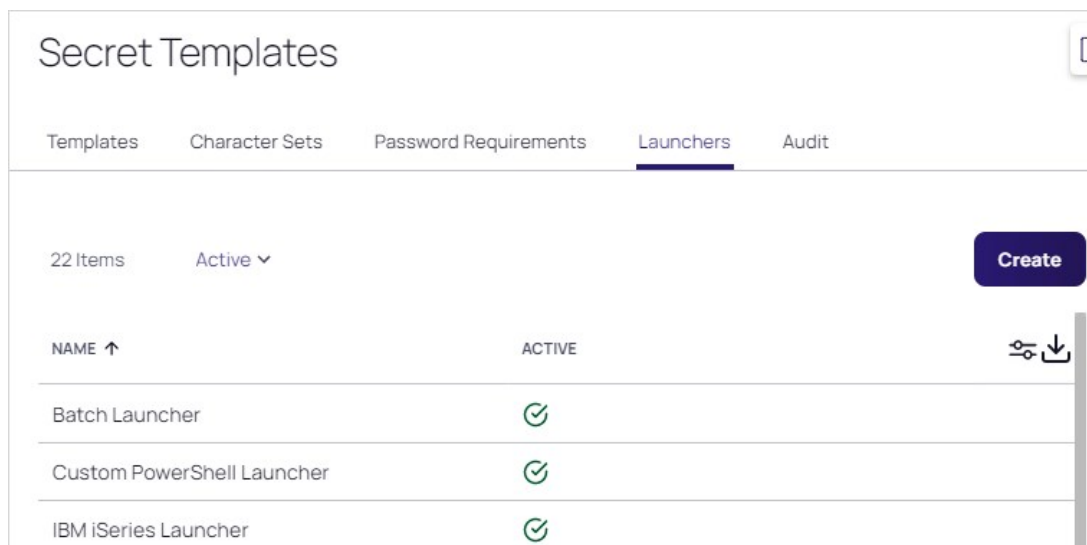
1. Select **Secret Templates** from the **Admin** main menu item. The Manage Secret Templates page appears:



The screenshot shows the 'Secret Templates' management page. The 'Templates' tab is selected, showing a list of secret templates. The page includes a search bar, a filter for 'Active' status, and a 'Create Template' button. The table below lists the templates and their status.

SECRET TEMPLATES ↑	TOTAL SECRETS	ACTIVE
Acme Server Template	0	<input checked="" type="checkbox"/>
Active Directory Account	264	<input checked="" type="checkbox"/>
Active Directory No Prompt	1	<input checked="" type="checkbox"/>

2. Click the **Launchers** tab:



The screenshot shows the 'Secret Templates' management page with the 'Launchers' tab selected. The page displays a list of launchers. The table below shows the launchers and their status.

NAME ↑	ACTIVE
Batch Launcher	<input checked="" type="checkbox"/>
Custom PowerShell Launcher	<input checked="" type="checkbox"/>
IBM iSeries Launcher	<input checked="" type="checkbox"/>

3. Click the **Create** button. The Launcher page appears:



The screenshot shows the 'Launcher' page, which is currently blank except for the title 'Launcher' at the top.

## GENERAL SETTINGS

Launcher Type

Process

Launches the process on the user's machine and replaces \$ parameters with values from the Secret and its associated Secret. For more information see [this KB Article](#)

Launcher Name

\*

Active



Use Additional Prompt



Track Multiple Windows



Launcher Image

☐ Use Custom Image?



To prevent parameter injection in **Process Arguments** fields below, quotation marks can be inserted around custom parameters.



Example:

\$USERNAME becomes "\$USERNAME" prior to launch.

Wrap custom parameters with quotation marks



Record Additional Processes

Use SSH Tunneling with SSH Proxy



## WINDOWS SETTINGS

Process Name

ex. powershell

How do I configure process arguments?

Process Arguments

ex. -user \$USERNAME -pwd \$PASSWORD -f

Run Process As Secret Credentials



Use Operating System Shell



Advanced

## MAC SETTINGS

Process Name

ex. /Applications/TextEdit.app

How do I configure Mac process name and arguments?

Process Arguments

ex. -user \$USERNAME -pwd \$PASSWORD -f



Save



Cancel

4. Configure the page. See the following section for details on the settings.

5. Click the **Save** button.

## Settings

**Note:** Not all of the following are available for all types of launchers.

### General Settings

The following settings are available in the General Settings section:

- **Active:** Whether the launcher is active for use.
- **Additional Prompt Field Name:** Name of the text field that is prompted for when the user uses the launcher. This value can be referenced in the process arguments with a \$ prefix.
- **Launcher Image:** Upload a custom image for the launcher.
- **Launcher Name:** Name of the launcher that is displayed to the user.
- **Launcher Type:** Select Process, Proxied SSH Process, or Batch File.
- **Record Additional Processes:** Add a comma-separated list of additional process names to record if they are running. When a launcher is in progress and recording, any visible windows from the listed processes are also recorded. This only applies to processes running in your session—other users running the same process are not recorded. The processes themselves are not affected—they remain running after the launch is finished. This setting is only active if Record Multiple Windows is enabled too.
- **Track Multiple Windows:** Tracks all visible windows of the primary process, not just the primary window of the primary process. This helps record applications with multiple windows or dialog boxes. In addition, if the primary process (or one of its children) spawns child processes, any visible windows are recorded too. For example, if you run the cmd.exe process (the command prompt and then run notepad.exe (Notepad) from the command prompt (cmd.exe), notepad is recorded along with the command prompt. This check box is enabled by default. Enabling this setting is a prerequisite for Record Additional Processes.
- **Use Additional Prompt:** User is prompted for additional information when using the launcher. When selected, the "Additional Prompt Field Name" text box appears. This option is mutually exclusive with "Use SSH Tunneling with SSH Proxy."
- **Use SSH Tunneling with SSH Proxy:** When enabled and the launcher is mapped to a secret template, the user can select host and port fields, and you can provide a default port, which can be referenced using \$HOST and \$PORT in the process arguments. If the launching secret has proxying enabled and a Secret Server SSH proxy is available, those process arguments are replaced with with SSH tunnel values (localhost [127.0.0.1] and a random port).

This causes the launched process to connect to the local tunnel, and traffic then flows from the client to the Secret Server SSH proxy, which connects to the real endpoint. This is useful when users are not allowed to directly connect to the endpoint but Secret Server or distributed engines can. The check box is disabled by default. This option is mutually exclusive with "Use Additional Prompt."

**Note:** To use this feature, you must first map the host and port fields when you map the launcher to a template. To do so, edit the secret template and click Configure Launcher.

- **User Secret Server RDP Client:** Use the RDP client.
- **Wrap Custom Parameters with Quotation Marks:** Wraps the variables in the process arguments fields with quotation marks. This is a security and disambiguation feature. For example:

Given these process arguments:

```
--host=$HOST --port=$PORT --username=$USERNAME --password=$PASSWORD
```

With no quotation mark wrap, the process arguments for a launcher mapped to a secret might look like this:

```
--host=xyz --port=123 --username=user --password=x x x
```

The final parameter would be ambiguous—the last three characters might be misinterpreted with the process thinking a single "x" is the password. Also, text could be injected, causing the value to be interpreted as another parameter, causing a security issue. Wrapping the parameter values fixes these potential problems:

```
--host="xyz" --port="123" --username="user" --password="x x x"
```

The check box is selected by default.

## Windows Settings

The following settings are available in the Windows Settings section:

- **Batch File:** As an alternative to opening a process, upload a .bat file that is downloaded and executed on the client when the user runs a launcher. The file is deleted from the client after execution.
- **Process Arguments:** Process arguments depend on the process that is being launched. View the built-in SQL Server launcher for examples on how the text-entry fields are substituted. For greater flexibility, other secrets can be linked on the Launcher tab on the secret. The text-entry field values from those secrets can also be used in the process arguments using the same prefix `$(1)[FieldName]` syntax as the SSH custom commands. There is a launcher specific token `$SESSIONKEY` that can be passed to the command line. This passes an identifier to the customer launcher that can be used to anonymously check in the secret using the `CheckInSecretByKey` Web service method. Example: `-user $USERNAME -pwd $PASSWORD -f`. See [Custom Launcher Process Arguments](#) for details.
- **Process Name:** Name of the process that is launched. Example: `powershell`
- **Run Process as Secret Credentials:** The process authenticates with the secret credentials (username, domain, and password) instead of the client user that is using the launcher. This can be overridden at the secret level to use a privileged account to run the process.
- **Use Operating System Shell:** Use the OS shell for the launcher. Useful for processes requiring UAC confirmation.

The following settings are available in the **Advanced Windows Settings** section, which is accessible by clicking the **Advanced** link:

- **Escape Character:** The character to use as an escape character in passwords. Escape characters are required to allow the use of characters that are otherwise not allowed in passwords because they have special meaning to the launcher's target application.
- **Characters to Escape:** The characters that require escaping for the target application.

## Mac Settings

The following settings are available in the Mac Settings section:

- **Process Name:** Name of the process that is launched. Example: `/Applications/TextEdit.app/Contents/MacOS/TextEdit`
- **Process Arguments:** Process arguments depend on the process that is being launched. View the built-in SQL Server launcher for examples on how the text-entry fields are substituted. For greater flexibility, other secrets can be linked on the Launcher tab on the secret. The text-entry field values from those secrets can also be used in the process arguments using the same prefix `$(1)[FieldName]` syntax as the SSH custom commands. There is a launcher specific token `$SESSIONKEY` that can be passed to the command line. This passes an identifier to the customer launcher that can be used to anonymously check in the secret using the `CheckInSecretByKey` Web service method. Example: `-user $USERNAME -pwd $PASSWORD -f`. See [Custom Launcher Process Arguments](#) for details.

## Custom Launcher Errors

Common errors when creating custom launchers:

### **The process (process name) was not found**

The application has not been installed on the machine. If the application was installed, the program folder will need to be added to the path.

### **The stub received bad data (1783)**

The process is set to launch as the credentials of the secret but the username or domain is not correct on the secret or the client machine cannot find the user or domain credentials specified.

### **Error(740): The requested operation requires elevation**

When using "Run process as Secret credentials," even though the credentials have admin privileges, the process cannot be run with elevated privileges from the command prompt using runas. Instead, configure the process launcher as follows (substituting your .exe for program.exe):

- Process Name: cmd.exe
- Process Arguments: /C start /B program.exe /wait

## Custom Launcher Process Arguments

Custom launcher process arguments can use a combination of parameters from:

- A field value from the secret.
- A field value from a linked secret.
- User input obtained from a prompt prior to launching.
- \$Host and \$Port (for use with a proxied SSH process or SSH tunneling)

**Note:** For more information, see the [Dependency Token List](#).

### Syntax

Parameters are prefixed with a dollar sign \$. To obtain a value from the secret being launched, use \$FieldName. To obtain a value from a prompt, use \$PromptName. To obtain a value from a linked secret being launched, use \${n}\$FieldName (where n represents the nth linked secret). Linked secrets can be configured in the Launcher tab.

### Examples

```
-user $UserName -color ${1}$Color -Location $LocationPrompt
```

```
-ssh $UserName@$Host -pw $Password -P $Port
```



## Creating a Custom TOAD Launcher

You can create a custom launcher for TOAD by entering custom command line parameters in the "Process Arguments" field.

1. Navigate to **Admin > Secret Templates**,
2. Click **Configure Launchers**,
3. Click **New**,
4. Select a Launcher Type:
  - Use **Process** if you would like to use Secret credentials to connect directly to the remote host.
  - Use **Proxied SSH Process** if you have SSH Proxy enabled, to prevent passing Secret credentials to the client by connecting to Secret Server's proxy to interact with the remote host.

## Launcher

### GENERAL SETTINGS

Launcher Type

Process

Launches the process on the user's machine and replaces \$ parameters with values from the Secret and its associated Secret. For more information see this [KB Article](#)

Launcher Name

\* TOAD

Active


☒

Use Additional Prompt

☐

Launcher Image

☐ Use Custom Image?



To prevent parameter injection in **Process Arguments** fields below, quotation marks can be inserted around custom parameters.

**Example:**  
\$USERNAME becomes "\$USERNAME" prior to launch.

Wrap custom parameters with quotation marks

☒

Record Multiple Windows

☒

Record Additional Processes

### WINDOWS SETTINGS

Process Name

C:\Del\Toad for Oracle\Toad.exe

ex. powershell

[How do I configure process arguments?](#)

Process Arguments

-C \$USERNAME/\$PASSWORD@\$SERVER:\$PORT/\$DATABASE

ex. -user \$USERNAME -pwd \$PASSWORD -f

Run Process As Secret Credentials

☐

Use Operating System Shell

☐

[Advanced](#)

- Enter a **Launcher Name** of your choice.
- For **Process Name**, enter the location and the Toad executable. The location must exist on the client machine that will run the Toad launcher.
- For **Process Arguments**, enter your own custom command line parameters, or the following:  
-C \$USERNAME/\$PASSWORD@\$SERVER:\$PORT/\$DATABASE
- When finished, click **Save**.

## Creating and Implementing an Ultra VNC Custom Connection Launcher

Follow the steps below to create an Ultra Virtual Network Computing (VNC) custom connection launcher using Secret Server on a Windows machine.

### Create an Ultra VNC Custom Connection Launcher

1. Open Secret Server and click, **Admin > Secret Templates > Configure Launchers**

#### Manage Secret Templates

Active Directory Account

☐ Show Inactive

Back

Edit

Create New

Export

View Audit

Active Templates

Password Requirements

Character Sets

Configure Launchers

Configure Secret Template Permissions

2. Click the **+New** button at the bottom of the window.

LAUNCHER TYPE NAME	ACTIVE
Remote Desktop	Yes
PuTTY	Yes
Website Login	Yes
Powershell Launcher	Yes
SQL Server Launcher	Yes
Sybase isql Launcher	Yes
z/OS Launcher	Yes
IBM iSeries Launcher	Yes
Secure CRT Proxied Process	Yes
Putty With Port Prompt	Yes
Secure CRT (Proxied)	Yes
Custom PowerShell Launcher	Yes

☐ Show Inactive

Back

+ New

3. Under **General Settings**, enter the settings as described below, then click **Save**.

**Launcher Type:** Process

**Process Arguments:** \$USERNAME \$PASSWORD \$HOST

**Process Name:** C:\Program Files (x86)\UltraVNC\vncviewer.exe

**Parameters:** /user \$USERNAME /password \$PASSWORD -connect \$HOST

**Note:** You may need to change the Process Arguments if the names of these fields in your Secret Template are something other than "Username" "Password" and "Machine"

## GENERAL SETTINGS

Launcher Type

Process ▼

Launches the process on the user's machine and replaces \$ parameters with values from the Secret and its associated Secret. For more information see this [KB Article](#)

Launcher Name

\* VNC

Active



Use Additional Prompt



Launcher Image

☐ Use Custom Image?



To prevent parameter injection in **Process Arguments** fields below, quotation marks can be inserted around custom parameters.

Example:

\$USERNAME becomes "\$USERNAME" prior to launch.

Wrap custom parameters with quotation marks



Record Multiple Windows



Record Additional Processes

## WINDOWS SETTINGS

Process Name

ex. powershell

[How do I configure process arguments?](#)

Process Arguments

ex. -user \$USERNAME -pwd \$PASSWORD -f

Run Process As Secret Credentials



Use Operating System Shell



[Advanced](#)

## MAC SETTINGS

Process Name

C:\Program Files (x86)\UltraVNC\vncviewer.exe

ex. /Applications/TextEdit.app

[How do I configure Mac process name and arguments?](#)

Process Arguments

\$USERNAME \$PASSWORD \$HOST

ex. -user \$USERNAME -pwd \$PASSWORD -f



Save



Cancel

## Assign the Launcher to a Template

Assign the new launcher to an appropriate existing template. To build a new template specifically for VNC connections, see [Creating or Editing Secret Templates](#))

1. Open the template and click the "Configure Launcher" button.



2. Click **+Add New Launcher**



3. Select the VNC custom launcher you just created
4. Map the username and password fields accordingly.
5. Click **Save**.

## Overview

A Common Access Card (CAC) or Personal Identity Verification (PIV) smart card is a physical card with an embedded electronic chip that uses a certificate-key pair to authenticate users. The certificate is issued by an authorized organization. The user has a PIN that should be known only to that user, which serves a second factor for two-factor authentication—access requires physical possession of the card, as well as the PIN. The user inserts the card into a card reader, which prompts for the PIN.

Secret Server launchers can pass smart card credentials through Remote Desktop Protocol (RDP) sessions. This is useful when a user needs to authenticate through an RDP session to a resource that requires smart card authentication, for example, a secured network drive that the user attempts to open while using the RDP session.

Currently, you can enable this either globally, via user settings, or per secret:

### Enabling Globally with User Settings


1. In Secret Server, click the user icon and select **User Preferences**. The User Preferences page appears.
2. Click the **Settings** tab.
3. In the **Launcher Settings** section, click to enable the **Allow Access to Smart Cards** toggle. The change is automatically saved.

### Enabling on a Specific Secret

1. On a Secret with an RDP launcher, click the **Settings** tab.
2. Click the **Edit** link on the **Under RDP Launcher – Personalized User Settings** title bar. The page changes to edit mode.
3. Click to select the **Allow Access to Smart Cards** check box.
4. Click the **Save** button.

## Introduction

By default, the launcher is enabled by the **Enable Launcher** setting under **Admin > Configuration**.

The launcher (protocol handler) can be deployed in two ways—with the ClickOnce (the default) or MSI-installable applications. This can also be set in the configuration settings. The latter method allows the launcher to be used in virtualized environments or any environment in which the user does not have access to a Windows Temp directory. The Protocol Handler can be downloaded by clicking the  button on the Dashboard and selecting **Launcher Tools**:

**Note:** A ClickOnce application is any Windows Presentation Foundation (.xbap), Windows Forms (.exe), console application (.exe), or Office solution (.dll) installed with ClickOnce technology in one of three ways: from a Web page, from a network file share, or from media. See [ClickOnce Security and Deployment](#) for details.

Launcher Tools

LOGIN ASSIST CHROME EXTENSION

Preferred solution for logging into websites from Chrome.

Offers similar functionality to the Web Password Filler, but for a wider range of websites.

Install the Login Assist extension by adding it to the browser from the Chrome web store:  
[Chrome Web Store - Secret Server Login Assist](#)

WEB PASSWORD FILLER

Quick, Convenient and Secure logging into Websites.

Install the Web Password Filler by adding this link to your web browser's bookmark bar:  
[Secret Server Web Password Filler](#)

- Log into most websites with a single click.
- Click while on a website.
- Automatically fill in the Username and Password.

PROTOCOL HANDLER INSTALLER


Allows launcher to function in virtualized environments. For more information [click here](#).

The MSI can be installed directly or through group policy. A reboot may be necessary on certain operating systems.

[Download Protocol Handler MSI \(64 bit\)](#)

[Download Protocol Handler MSI \(32 bit\)](#)

[Download Protocol Handler PKG \(Apple OSX\)](#)

 Back

## MSI Installer

To use the MSI installer (protocol handler installer) following steps below:

1. Go to **Admin > Configuration**.
2. Click the **General** tab.
3. Set the **Launcher Deployment Type** to "**Protocol Handler**".
4. Go to **Tools > Launcher Tools** to download the launcher application.
5. Click the **Download Protocol Handler MSI** link for the operating system you want to install on.
6. Run the MSI file with admin privileges.

**Note:** The session is kept in check for security reasons with the session process pinging back to Secret Server to ensure it is still valid. This checks secret settings, such as checkout and secret access. If that check fails or the callback times out, Secret Server errs on the side of security and kills the sessions, ensuring access is not allowed.

## Installing by Group Policy

The Protocol Handler application runs without requiring any input from the user. The installation may be pushed to your network without any special configuration. For details, see [Installing Protocol Handler through Group Policy](#) (KBA).



**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Adding a Program Folder to the Windows PATH

If a launcher does not automatically add the program's folder to the Windows PATH:

1. Right click on **Computer** and go to **Properties**.
2. In the Properties window, click Advanced System Settings.
3. On the **Advanced** tab, click the **Environment Variables** button.
4. In the **System Variables** section scroll to **Path**.
5. Click **Edit** then at the very end of the text box, paste the full path to the folder where the program file is located, but make sure not to replace any existing entries. The list is semi-colon separated.
6. Click **OK** to close the dialogs.

## Common Launcher Errors

Two of the most common launcher errors:

- **The process (process name) was not found:** The application has not been installed on the machine. If the application was installed, the program folder needs to be added to the path.
- **The stub received bad data (1783):** The process is set to launch as the credentials of the secret but the username or domain is not correct on the secret or the client machine cannot find the user or domain credentials specified.

## Configuring Launchers on the Secret

Custom and SSH launchers provide additional settings on the Launcher tab of the secret for customizing authentication to the target.

- **Run Launcher using SSH Key:** If there is an SSH key set on the secret, it is used by default for authenticating to the target. Alternatively, you can specify a key from a different secret.
- **Connect As:** When an SSH secret is proxied, you can choose to connect as another user and then do an **su** to the current secret's user. This is a common practice for connecting with a lower privileged account and then switching to the root user.

## Configuring SSH Proxies for Launchers

Launchers using an SSH connection can alternatively use Secret Server as a proxy rather than the launcher connecting directly to the target system from the machine it is being launched from.

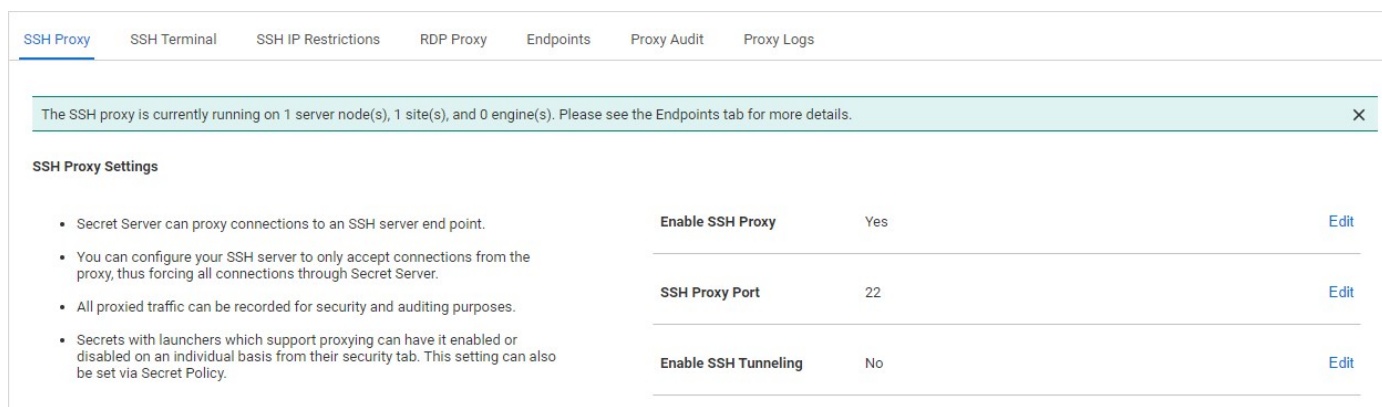
**Note:** Remote Desktop Services (RDS) is a special version of Secret Server Protocol Handler (SSPH) that can record keystrokes on its own, if configured in Secret Server. See [Session Connector](#) for details.

When proxying is enabled, all RDS sessions are routed through Secret Server. You can configure your SSH server to only accept connections from the proxy, thus forcing all connections through Secret Server. All proxied traffic can be recorded for security and auditing. You can enable or disable proxying for individual launchers. You can also do this using a secret policy.

In Secret Server Cloud, the distributed engine service also supports acting as a proxy for session launchers for greater network flexibility and offloading connections from the Secret Server instance.

To configure this:

1. Select **Admin > Proxying**. The SSH Proxy tab of the Proxying page appears:



SSH Proxy Settings	Setting	Value	Action
Secret Server can proxy connections to an SSH server end point.	Enable SSH Proxy	Yes	<a href="#">Edit</a>
You can configure your SSH server to only accept connections from the proxy, thus forcing all connections through Secret Server.	SSH Proxy Port	22	<a href="#">Edit</a>
All proxied traffic can be recorded for security and auditing purposes.	Enable SSH Tunneling	No	<a href="#">Edit</a>

The settings are on the right:

Enable SSH Proxy	Yes	<a href="#">Edit</a>
SSH Proxy Port	22	<a href="#">Edit</a>
Enable SSH Tunneling	No	<a href="#">Edit</a>
Proxy New Secrets By Default	No	<a href="#">Edit</a>
Enable SSH Proxy Inactivity Timeout	No	<a href="#">Edit</a>
SSH Proxy Banner	===== BE A COOL KID AND USE TERMINAL NEXT TIME =====	<a href="#">Edit</a>
Hide passwords from SSH keystroke capture	No	<a href="#">Edit</a>
SSH Proxy Host Fingerprint	SHA1 - d1:0a:f6:0c:be:7c:4a:7a:7b:f1:cc:a8:b6:c2:81:5e:4e:c3:39:66 SHA512 - ed:35:ac:3c:be:ab:7a:ca:2f:61:77:be:1c:7a:d3:1c: da:f1:de:d0:d9:70:94:2a:e4:7c:bf:a8:27:8b:10:57: 55:ce:c1:74:b3:e9:d7:b5:cb:f8:1e:65:5e:4f:95:af: 1c:21:01:95:2d:54:82:b5:91:b8:ce:dd:4f:14:d3:5c MD5 - 04:40:47:4d:51:38:72:b2:78:a9:b7:d3:34:a9:cd:ce	<a href="#">Edit</a> <a href="#">Generate</a>
Days to Keep Operational Logs	30	<a href="#">Edit</a>

2. Scroll down and click the desired **Edit** links to enter your SSH proxy configuration settings.

The **SSH Proxy Settings** are:

- **Enable Proxy:** Enable or disable SSH proxying.
- **SSH Proxy Port:** The port to proxy through. Changing this setting closes all active SSH proxy connections.
- **Enable SSH Tunneling:** SSH Tunneling allows Remote Desktop Sessions to be proxied using the same proxy configuration settings.
- **Proxy New Secrets by Default:** Enable proxying for applicable secrets when you create them.
- **SSH Proxy Banner:** Users connecting through SSH proxy see this text banner. This is not the same as the SSH Terminal Banner.
- **Hide Passwords from SSH Keystroke Capture:** By default proxying records keystrokes. This disables that.
- **SSH Proxy Host Fingerprint:** The Secret Server SSH private key. This can be generated using the **Generate** link.
- **Days to Keep Operational Logs:** Number of days to store operational audit logs.

The **SSH Block List Settings** are:

- **Enable Block Listing:** Block incoming SSH proxy clients that connect and fail to authenticate.
- **Auto Block Max Attempts:** How many times authentication can fail before the connection is blocked.
- **Auto Block Time Frame (minutes):** How long to block connections after authentication tries are exhausted.

**Note:** Once the period has passed, the address must still be manually removed from the blocked list.

The **Client Override IP Address Ranges** are IP address ranges that you can configure to always allow or always block the incoming connection. Click the **Add** link to add one. Examples:

- 192.168.3.12
- 192.168.42.147-192.168.42.194
- 192.168.3.52/22

## Default Launcher Requirements

- **IBM iSeries Launcher:** For Secret Server itself, nothing is required. For distributed engines, the `ws3270.exe` file, found in the Secret Server directory, must be copied to the distributed engine folder on the engine, which is typically found at `C:\Program Files\Thycotic Software Ltd\Distributed Engine`.
- **PowerShell Launcher:** Requires PowerShell to be installed. When installed, the program is automatically added to the PATH.
- **SQL Server Launcher:** Requires SQL Server Management Studio to be installed. When installed, the program is automatically added to the PATH.
- **Sybase iSQL Launcher:** Requires that `isql.exe` is installed.
- **z/OS Launcher:** For Secret Server itself, nothing is required. For distributed engines, the `ws3270.exe` file, found in the Secret Server directory, must be copied to the distributed engine folder on the engine, which is typically found at `C:\Program Files\Thycotic Software Ltd\Distributed Engine`.

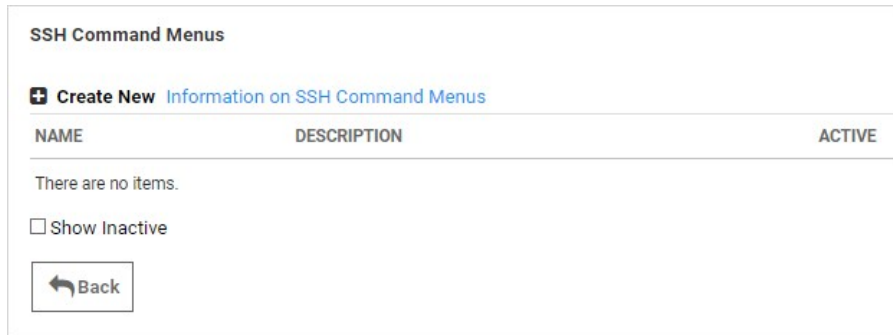


## Managing Superuser Privilege

Administrators can create command menus for use with a proxied SSH connection to restrict what commands can be run by users or groups on the connected server. This feature requires an additional license. To add a command menu:

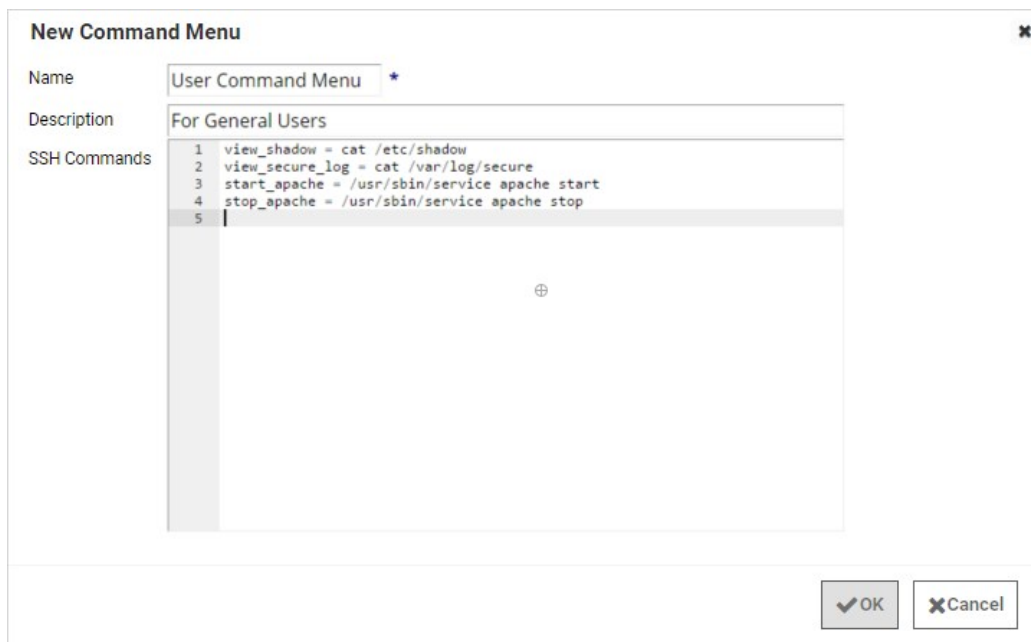
**Note:** For details, see [SSH Command Menus](#).

1. Navigate to **Admin > All**.
2. Click the **SSH Command Menus** button.



The screenshot shows the 'SSH Command Menus' management page. At the top, there is a 'Create New' button and a link to 'Information on SSH Command Menus'. Below this is a table with columns 'NAME', 'DESCRIPTION', and 'ACTIVE'. The table is currently empty, with a message 'There are no items.' and a 'Show Inactive' checkbox. A 'Back' button is located at the bottom left.

3. Click the **Create New** button.
4. Type a name, description and the SSH commands:



The screenshot shows the 'New Command Menu' dialog box. It has three main input fields: 'Name' (containing 'User Command Menu'), 'Description' (containing 'For General Users'), and 'SSH Commands' (containing a list of commands: 'view\_shadow = cat /etc/shadow', 'view\_secure\_log = cat /var/log/secure', 'start\_apache = /usr/sbin/service apache start', and 'stop\_apache = /usr/sbin/service apache stop'). At the bottom right, there are 'OK' and 'Cancel' buttons.

Once one or more command menus have been created, access can be controlled to individual Unix SSH secrets.

On the **Security** tab of a secret that can use a proxied PuTTY session, proxy must be enabled as well as command menu restrictions. If **Allow Owners Unrestricted SSH Commands** is enabled, any user who is an owner of the secret has unrestricted use of the PuTTY session, that is, that user is able to type in commands as in a normal session. Additionally, other groups can be assigned the Unrestricted role as well.

In the following example, the "admin" group is unrestricted, while everyone who is not in the admin group is restricted to only being able to run the commands that are enumerated in the user command menu, created above.

### SSH Unix Secret (Unix Account (SSH))

General
Personalize
Expiration
Launcher
**Security**
Dependencies

Require Check Out
☐

Enable DoubleLock
☐
  
*(You have not created a DoubleLock password.)*

Enable Requires Approval for Access
☐

Require Comment
☐

Enable Proxy
☒

Hide Launcher Password
☐

Enable SSH Command Restrictions
☒

Allow Owners Unrestricted SSH Commands
☒

Name	SSH Command Menu		
admin	Unrestricted		
Everyone			

Add New

--Groups--

Customize Password Requirement
☐

Save
Cancel

A user who is subject to SSH Command Restrictions are presented with a screen similar to the following when connecting to an SSH session:

```
Using username "729ddaef-38d0-48e0-b9dc-d4911e76d0c1".

1. User Command Menu

    ?. Show Command Menus
    exit. Exit session
Last login: Thu Mar 17 12:38:46 2016 from 192.168.60.153
[runscripts@centostestserver ~]$
```

The user simply enters the number of the command menu to see available commands, or types "?" to display the options again.

```
Using username "729ddaef-38d0-48e0-b9dc-d4911e76d0c1".

1. User Command Menu

    ?. Show Command Menus
    exit. Exit session
Last login: Thu Mar 17 12:38:46 2016 from 192.168.60.153
[runscripts@centostestserver ~]$ 1

1. view_shadow = cat /etc/shadow
2. view_secure_log = cat /var/log/secure
3. start_apache = /usr/sbin/service apache start
4. stop_apache = /usr/sbin/service apache stop

    up. Return to Command Menu selection. You may also type ..
    ?. Show Commands
    exit. Exit session

[runscripts@centostestserver ~]$
```

Only the commands listed can be run by this user. The user can either enter the number of the command to be run, or the name of the command, which is the word to the left of the equal (=) sign. Other options are available (as shown) to navigate through the available command menus, display help, or exit the session.

## Session Recording and Launchers

Session recording provides an additional level of security by recording a user's actions after a launcher is used. Session recording works for any launcher, including PuTTY and SSH, Windows Remote Desktop, Microsoft SQL Management Studio, and custom executables. The resulting movie is viewable from the secret audit. Session recording can be toggled on or off globally on the Configuration page and set for individual secrets on the Security tab. Detailed information on supported codecs can be found in [Session Recording](#). When a user launches a session with session recording enabled, a brief message is displayed to inform the user that their actions are recorded.

**Note:** When multiple Launchers are enabled for a secret template, enabling session recording for a secret applies the setting to all launchers for that secret.

## Special Argument Handling

### IBM iSeries Launcher

Username and passwords can run into length issues during the automated login process initiated by a launcher. The issue stems from the behavior in the client—when a user logs in and enters a username of 10 characters, the client automatically tabs to the next field (the password field). The launcher's automated login process automatically inserts a tab, which can cause improper behavior in the headless client.

If this behavior is observed, we added a parameter to the launcher's configuration to resolve it:

**Note:** If your client adds a different number of tabs, replace 10 with that number.

1. Go to **Administration > Secret Templates > Launchers > IBM iSeries Launcher**.
2. Edit the value "Process Arguments," adding the `-SSAutoTab 10` parameter: For example:

WINDOWS SETTINGS	
Process Name	wc3270.exe
<a href="#">How do I configure process arguments?</a>	
Process Arguments	-loginmacro "String(\"\$USERNAME\") Tab() String(\"\$PASSWORD\") Enter()" \$MACHINE:\$PORT -SSAutoTab 10
Run Process As Secret Credentials	No
Load User Profile	No
Use Operating System Shell	No

On the Secret View page, clicking the Launcher icon launches the Remote Desktop, PuTTY, or custom session directly from the browser or log into the website. The mapped text fields are passed to the launcher for automatic authentication.

If the machine is set for Remote Desktop, the console launches and allows the machine to be specified from the RDP dialog.

If the Host is set to <user>, a prompt asks for the specific machine before launching the PuTTY session.

For some browser security levels, you might need to click **Allow** for the launcher application to open.

**Note:** The View Launcher Password permission can be removed to prevent users from viewing the credentials but can still use the authentication session to access the computer.

The settings under the Launcher tab are used for secrets that are enabled for SSH and custom launchers.

**Note:** This capability applies to Secret Server 10.9 or later. That is Secret Server Protocol Handler 6.0.0.28 or later.

You can limit the domains that a launcher connects to. If this is not set, then nothing changes—the launcher can connect to any domain. If it is set, however, Secret Server refuses to connect to any domains that are not explicitly allowed.

This setting is done via a Windows Group Policy Object (GPO) administrative template XML file (.admx). The file specifies the registry key that are changed when the GPO is edited. Download that file here: [LimitLauncherDomainPolicyDefinitions.zip](#).

For details on using these files, see [How to create and manage the Central Store for Group Policy Administrative Templates in Windows](#) on the Microsoft site. The settings are present in both user and machine configurations in the group policy editor. If both are specified, then only the machine configuration is used (the user configuration is completely ignored). This is because the user configuration is stored in part of the registry that does not require administrator access to edit, so the machine configuration should be used in most cases.

The Group Policy valid values are just domain names, like `example.com`, or IP addresses, like `192.168.1.2`. No port should be specified, and no scheme. A value like `https://example.com` is not valid, because it has `https://` in the front. Ports are also invalid, so `example.com:885` will not match. The correct value would simply be `example.com`. Wildcards are not supported, but subdomains matter, so a value of `example.com` will not match `something.example.com`.

In an organization running multiple instances of Secret Server, some users might find themselves having to repeatedly uninstall and reinstall different versions of the protocol handler to match the different instances of Secret Server.

To enable Secret Server to simultaneously support multiple versions of the protocol handler, you just need to disable the protocol handler auto-update function using the procedure below.

**Note:** Disabling auto-update for forward and backward compatibility is supported on the protocol handler only. The ClickOnce launcher and the Mac protocol handler do not support disabling auto-update.

## Prerequisites

- Secret Server Cloud 10.8+
- Secret Server On-Premises 10.8+
- Protocol Handler 6.0.0.23 or higher on your PC

## Setup Steps and Configuration

1. In Secret Server, click **Admin > Configuration**, then click the **General** tab.
2. Scroll to the bottom of the page and click **Edit**.
3. In the **Launcher Settings** section, uncheck the box next to **Enable Protocol Handler Auto-Update**.

LAUNCHER SETTINGS (RUNTIME)	
The settings in this section apply only to launchers that connect to this server. To change the Protocol Handler from this server, see the next section.	
Enable Launcher	<input checked="" type="checkbox"/>
<a href="#">Launcher Deployment Type Explanation</a>	
Launcher Deployment Type	Protocol Handler ▼
Enable Protocol Handler Auto-Update	<input type="checkbox"/>
Send Secret URL to Launcher	<input checked="" type="checkbox"/>

4. Click **Save**.
5. Ensure that the **Enable Protocol Handler Auto-Update** function is now labeled, **No**.




LAUNCHER SETTINGS (RUNTIME)	
The settings in this section apply only to launchers that connect to this server. To the Protocol Handler from this server, see the next section.	
Enable Launcher	Yes
Launcher Deployment Type	Protocol Handler
Enable Protocol Handler Auto-Update	No

You can re-enable protocol handler auto-update at any time by following the steps above and re-checking the box next to **Enable Protocol Handler Auto-Update**. When you re-enable auto-update, users will be required to install the latest instance.

**Note:** While protocol handler auto-update is disabled, each user must manually update their installed protocol handler as necessary on a machine-by-machine basis. The MSI can be installed directly or through Group Policy. A reboot may be necessary on certain operating systems.


## Manually Updating Protocol Handler

1. In Secret Server, click **Admin > See All**. A page opens with **What are you looking for?** at the top.
2. Click **Tools & Integrations**, then **Launcher Tools**



### Diagnostics, Logs, Security

Reference options for diagnostics, logs, and security features



### Tools & Integrations

Find Secret Server tools and other product integrations here

TOOLS & INTEGRATIONS

- Launcher Tools
- Connection Manager
- SDK Client Management
- Privilege Manager
- Privileged Behavior Analytics
- DevOps Secrets Vault
- Slack Integration

3. On the **Launcher Tools** page, click **Download Protocol Handler (64-bit)** to download the file.

The MSI can be installed directly or through Group Policy. A reboot may be necessary on certain operating systems.

[Download Protocol Handler \(64-bit\)](#)

[Download Protocol Handler \(32-bit\)](#)

[Download Connection Manager PKG \(macOS\)](#)

[Download Protocol Handler Group Policy Templates](#)

[Hashes](#)

4. Follow the steps in the installation wizard.

The Secret Server protocol handler has several administrative settings that you can configure through Microsoft's Group Policy Objects (GPOs) or through Secret Server itself.

**Important:** We **strongly** recommend using GPOs instead of Secret Server.

## Available Settings

### Allowed Secret Server Domains

This setting controls which domains or IP addresses the protocol handler installation may connect to. If the setting is unset or disabled, then the protocol handler is allowed to connect to any domain. If one or more comma-separated values are provided, then the protocol handler is blocked from accessing any domains or IP addresses not included in the list.

The protocol handler performs a string match against the URL it receives. It does not attempt to resolve domain names to IP addresses. Values in this list should match only the domain or IP address portion of the actual URL used to access Secret Server. For example, if users access your installation via `https://example.com/SecretServer`, then `example.com` should be added to the list. If `example.com` resolves to the IP address `192.168.1.5`, then adding that IP address *will not* allow access to the domain if users actually access it via `example.com`.

Wildcards are not supported, but subdomains do matter. The above entry for `example.com` would not allow `www.example.com`; the two may need to be added separately depending on your configuration. Ports and protocols are also unnecessary—only the domain portion is checked. For example, do not include an entry in the list like `https://example.com` or `example.com:885` as both are invalid. Simply using `example.com` covers these scenarios.

### Disable Auto-Update

This setting ensures protocol handler will never auto-update itself, even if told to by the Secret Server installation that it connects to. When the setting is enabled, protocol handler installations need to be updated either manually or as part of your organization's regular program-update process.

## Configuration Methods

### Choosing the Configuration Method

**Important:** If your domain is configured to use GPOs, we **strongly recommend** using that to configure the protocol handler.

Why use GPOs instead of Secret Server?

- GPOs are more resilient, as Windows reapplies settings if they are deleted from the registry. Settings applied through Secret Server have no such resilience.
- GPOs are centrally managed along with other settings for machines in your domain.
- For security reasons, Secret Server's configuration can only be applied during the initial installation of Secret Server. If you change these settings within Secret Server, users must reinstall the program before they will be applied. GPOs do not have this restriction.

### Configuring GPOs

You can download GPO definitions for your version of Secret Server from the Launcher Tools page of the Admin section of Secret Server. For details about using these policy definition files, see [How to create and manage the Central Store for Group Policy Administrative Templates in Windows](#). Both machine and user configurations are available as needed, but machine configurations will always override user configurations—if a machine configuration is configured, the user configuration is completely ignored.

Settings are available in the group policy editor under **(Computer/User) Configuration > Administrative Templates > Secret Server Protocol Handler**.

## Configuring Settings During Secret Server Installation

If you do determine that using Secret Server's settings are necessary, you can configure them via the Configuration page in the Admin section of Secret Server, in the "Protocol Handler Settings (Install-Time)" section. Enabling these settings causes downloads to generate a zip rather than an MSI file. The zip file contains a batch file that configures the install-time settings. These settings only update when the protocol handler is manually reinstalled or updated—changing them later on through Secret Server has no effect on protocol handlers that are already installed on user machines.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Adding Remote Desktop Launchers

1. Click **Add New Launcher** to add a launcher to the template.
2. On the following page, select a launcher type from the drop-down menu. The text-entry fields below reflect the text-entry fields necessary to map to the launcher. In the case of a custom launcher, these text-entry fields are used to run the launcher process if the launcher is configured to run as secret credentials.
3. Choose a secret text-entry field in the drop-down menu on the right to map to each launcher value on the left. See the following section for further details on editing launcher configuration.
4. Click the **Save** button to add the launcher to the template.

## Browser Configuration

Remote Desktop (RD) launchers require the following:

- **Firefox Configuration:** Firefox requires a helper add-on application to run the RD and PuTTY launchers. The Microsoft .Net Framework Assistant add-on and .NET framework version .NET 4.8+ needs to be installed.
- **Chrome Configuration:** If using ClickOnce, Chrome requires a Helper Add-on application to run the RDP and PuTTY Launcher. The ClickOnce add-on for Google Chrome Add-on needs to be installed. The launcher requires .NET framework version .NET 4.8+ as well.
- **SSL Certificates:** SSL must be set up properly for the RD launcher to work correctly. If Secret Server is using SSL certificates, they must be trusted at the user's computer. This is only an issue with self-created certificates.

## Editing RD Launchers

Click **Edit** to modify the settings for a launcher that has already been added to the template. For a launcher to work properly, Secret Server requires credentials to be taken from secret text-entry fields. Fields must be assigned their corresponding credentials from the list. In addition to the secret fields, the domain can be mapped to <blank>, which passes an empty string to be used with local accounts, and the machine or host can be mapped to <user input>, which prompts the user for a specific machine to be used with domain accounts.

In cases where there are multiple endpoints to connect to, such as with a domain account, the machines can be restricted to a set list. Under the **Advanced** section of the secret template launcher configuration, enable **Restrict User Input**. When that option is on, the launcher shows a drop down of machines to connect to, based on a comma-separated list in the specified secret field.

## Enforcing a Secret's RDP Launcher Policy

As a secret owner, you can create an RDP launcher policy to control who changes RDP launcher settings, such as clipboard access, drives, and more for that secret. The policy applies to all users of the secret. In prior versions, users with access to a secret could set their own preferences for RDP launcher settings. Secret owners can now implement a consistent access policy for all users.

To enforce RDP settings for all users of your secret:

1. Click the desired secret name link for a secret you own on the default **All Secrets** page. The General tab appears for that secret:

Personal Folders > > My RDP Launcher ☆

General
Security
Audit
Sharing
Settings
List Fields
Metadata
Options

Basic Information

Contains general information, such as the secret's template type, the domain, the username and password, and other basic information. Depending on permissions, you may not be able to see or edit these fields.

Secret Name \*

My RDP Launcher

Edit

Secret Template

Windows Account RDP Launcher (Prompt, White List)

Edit

Computer

Test

Edit

Username

Test

Edit

Password

\*\*\*\*\*

Edit

Notes

None

Edit

Edit All

Launchers

Provides a launcher to easily access an account using your secret's credentials.

RDP Launcher

No Active Sessions

Expiration and Heartbeat

Sets when a secret's credentials are confirmed to work (heartbeat) and must be changed (expiration). Administrators use these settings to enforce your organization's security policy. Expiration is set in the secret template.

Expiration

Expires in 29 days. (Expires every 30 day(s))

2. Click the the **Settings** tab:



General
Security
Audit
Sharing
Settings
List Fields
Metadata
Options ▼

### Email Notifications [Edit](#)

Choose your personalized email settings for this specific Secret.

Send Email When Viewed	No
Send Email When Changed	No
Send Email When Heartbeat Fails	No

### RDP Launcher [Edit](#)

RDP launcher settings can be configured under user preferences and per Secret. The settings defined will be passed to the launcher to configure the RDP session.

Enforce these RDP Settings for All Users	No
Connect to Console	No
Allow Access to Printers	No

- Click the **Edit** button In the **RDP Launcher** section. The settings become editable:

### RDP Launcher

RDP launcher settings can be configured under user preferences and per Secret. The settings defined will be passed to the launcher to configure the RDP session.

Enforce these RDP Settings for All Users	<input type="checkbox"/>
Connect to Console	<input type="checkbox"/>
Allow Access to Printers	<input type="checkbox"/>
Allow Access to Drives	<input type="checkbox"/>
Allow Access to Clipboard	<input checked="" type="checkbox"/>
Allow Access to Smart Cards	<input type="checkbox"/>
Use Custom Window Size	<input type="checkbox"/>

Cancel
Save

- Click to select the **Enforce these RDP Settings for All Users** check box.

**Note:** If you do not see this check box, you are not an owner of the secret.

- Enable or disable the RDP Launcher settings as desired for the secret. "Use Custom Window Size" displays additional text boxes for

entering dimensions.

6. Click the **Save** button. Now, those restrictions are applied to all using the secret.

When RDP Launcher settings are enforced for all users, all non-owner users of the secret see the settings defined by the owner but are unable to edit them. These settings are applied to the RDP session when launched using the default RDP launcher.

## Setting Up Secret Templates for RD Launchers

Launchers can be accessed from any secret created from a properly configured template.

By default, the templates Windows Account, Active Directory Account, Cisco Account (SSH), HP iLO Account (SSH), Unix Account (SSH), Web Password, and SQL Server Account have the launcher configured.

Secrets can be configured for the launcher from within the Secret Template Designer page.

Clicking **Configure Launcher** displays the options available.

To upgrade or apply a fix to the Secret Server Mac Launcher, you must remove the version that is already installed. But first you must prevent the launcher from restarting, and terminate all processes related to the Delinea Launcher.

1. Open **Terminal** and type `launchctl remove com.thycotic.thycoticD`

This step should remove the ThycoticDaemon and prevent the launcher from restarting, but you might need to perform the step more than once.

2. Open **Activity Monitor**.
3. Force Quit the **ThycoticLauncher** process and all related processes. See [Quit an app or process in Activity Monitor on Mac](#).
4. Open **Finder**.
5. Navigate to **Application > Delinea**.
6. Right-click **ThycoticLauncher** and select **Move to Trash**.
7. Empty your trash.

Overview

Normally, Secret Server requires installing additional software such as Connection Manager or Secret Server Protocol Handler (SSPH) on the end-user computers to launch secrets, such as RDP, SSH, or custom, and optionally record the session.

With Secret Server Session Connector (SSSC) installed on a Remote Desktop Services (RDS) server, anyone who can download and launch a standard Remote Desktop Protocol (RDP) shortcut file can have the same experience. The RDS server itself runs a special SSPH for RDS—SSPH (RDS) as a remote app to record the sessions, so end-users do not need to install any additional software.

The SSSC feature is largely scalable and can be set up using a single RDS server, a load-balanced cluster of RDS servers, or multiple load-balanced clusters of RDS servers. Before you set up the SSSC feature, there are some baseline requirements for those RDS servers and on your domain.

**Note:** SSPH (RDS) is sometimes referred to as RDPWin in this topic. RDPWin is the main executable that SSPH runs to launch and record sessions.

Table: Terms and Definitions

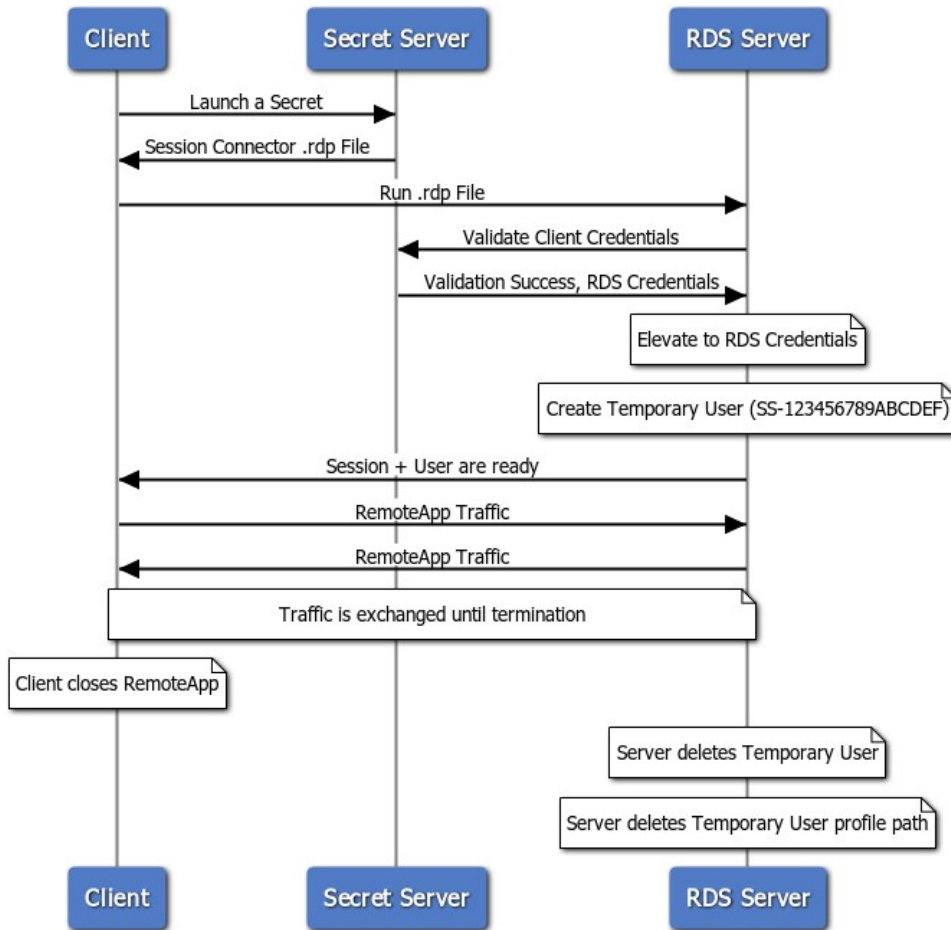
RDP	Remote Desktop Protocol. A Microsoft protocol for remote control of computers.	
RDPWin	The primary executable for SSPH.	
RDS	Remote Desktop Services. Remote control services (using RDP) provided by a dedicated server or servers.	
SSPH	Secret Server Protocol Handler. SSPH is an application on an end-user's machine. It enables communication between Secret Server and that client machine. It also provides the files needed by secret launchers.	*Secret Server *
SSPH (RDS)	Secret Server Protocol Handler, RDS Version. A special SSPH for use with SSSC that enables optional keystroke recording.	
SSSC	Secret Server Session Connector. SSSC is the subject of this topic.	

[Unexpected Link Text](#)

Connection Sequences

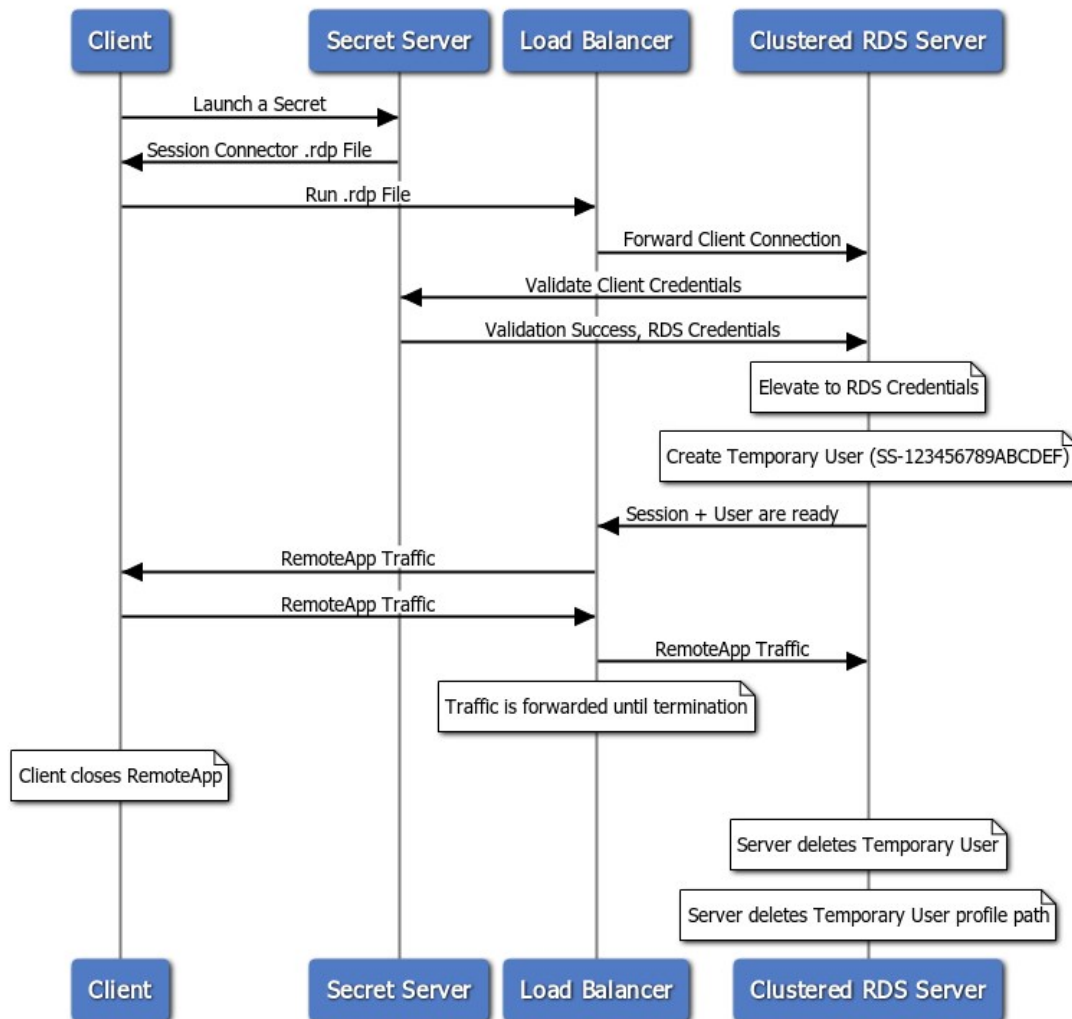
Figure: Session Connector Connection Sequences for an RDS Server.

## Session Connector Connection Sequence



**Figure: Session Connector Connection Sequences for Clustered RDS Servers.**

## Session Connector Connection Sequence



## Download

Session Connector is downloaded separately from Secret Server. Go to [Session Connector Downloads](#) for download links and hashes.

## Configuration

**Note:** To comply with Microsoft licensing requirements, there is an additional constraint on which Microsoft Windows Server version you can use as the RDS server for session connector.

If you use Microsoft User Client Access Licenses (CALs), you cannot use Windows Server 2019. You must use Windows Server 2012 or 2016. If you use Microsoft Device CALs, you can use any supported version of Windows Server.

### Task 1: Reviewing RDS Server Prerequisites

- Each RDS server should be a 64-bit installation of Windows Server 2012 or later.
- You **MUST** have access to the console session (non-RDP) to install the SSSC integration. This is in case of any of any errors during

installation, which may disable RDP access to the server.

- Each RDS server must be domain joined. Configuration of the RDS feature requires being logged in as a domain user.
- Each RDS server needs to have a recent version of the C++ redistributable installed (v14.26.28720 or higher, May 2020):
  - Download: [https://aka.ms/vs/16/release/vc\\_redist.x64.exe](https://aka.ms/vs/16/release/vc_redist.x64.exe)
  - More info: [The latest supported Visual C++ downloads](#)
- Each RDS server needs to have a credential available to manage temporary users. This credential should be able to create and delete local users and add users to the Remote Desktop Users group. If you plan to use one or more load-balanced clusters of RDS servers, this credential should be a domain user and will be used for all servers inside of a cluster. We recommend one domain user per cluster. This credential will be referred to as the **RDS Credential**
- Each RDS server needs to have the RDS Session Host Windows feature installed. See the next section.

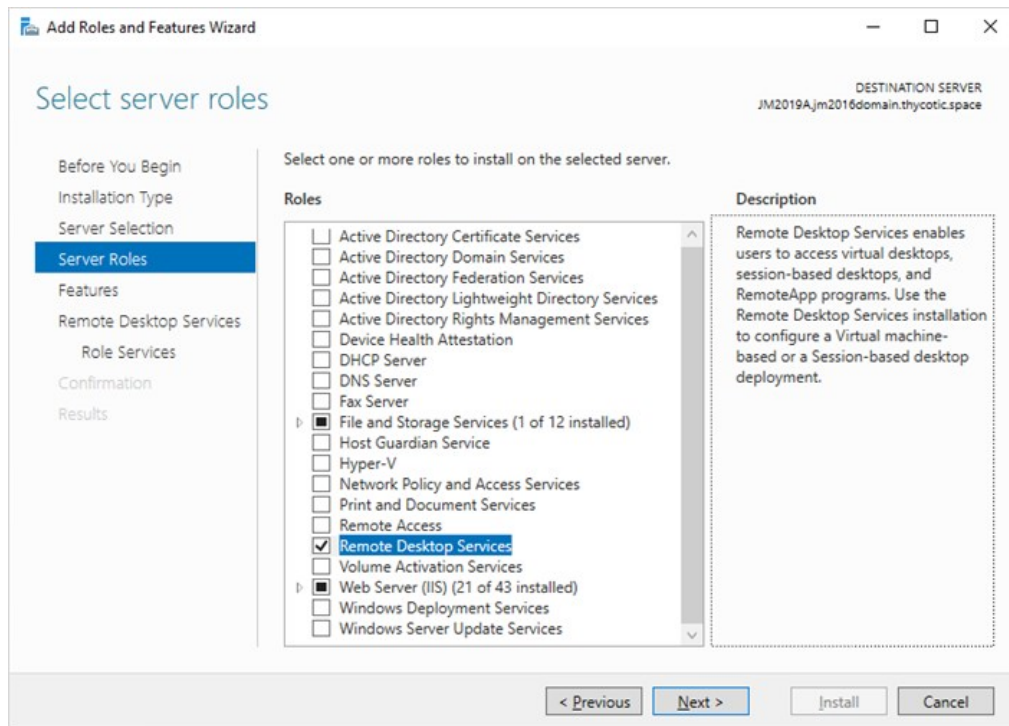
## Task 2: Setting up RDS Services

### Step 2.1: Installing Remote Desktop Services—Remote Desktop Session Host

**Note:** SSSC cannot function without this feature and will refuse to install if it is not present. **RDS requires additional remote desktop licensing from Microsoft.** This may also require installing the remote desktop licensing feature if you do not already have a licensing server available in your environment. See [Activate the Remote Desktop Services license server](#) for details.

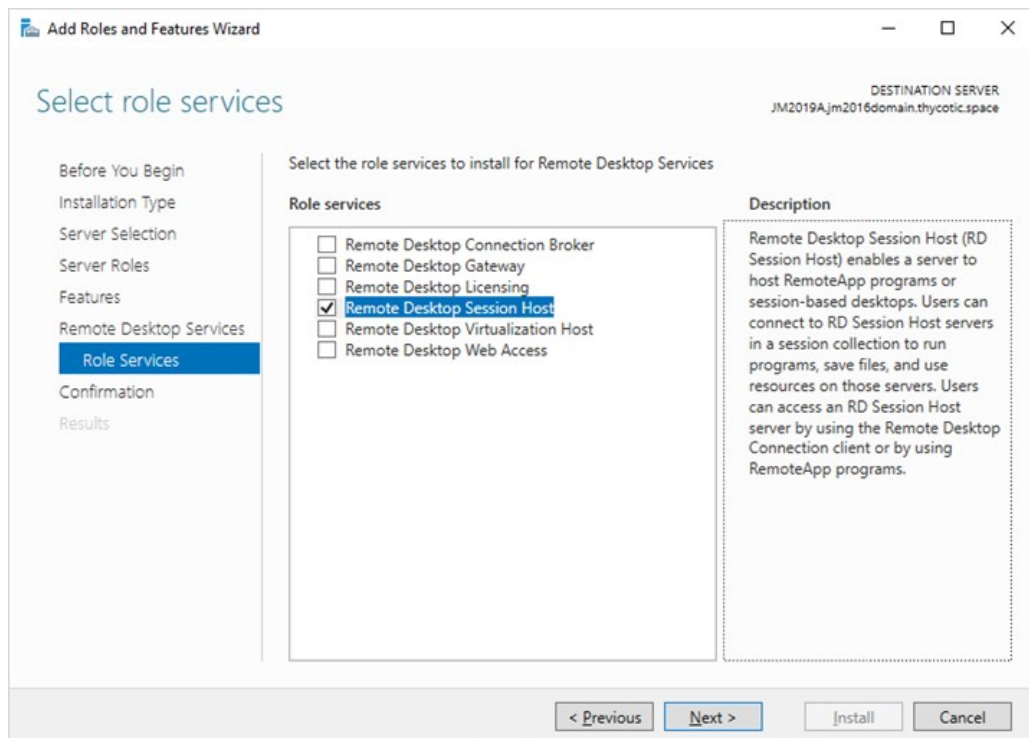
1. In Server Manager, click **Add roles and Features**. The Add Role and Features wizard appears.
2. Click the **Next >** button. The Installation Type page appears.
3. Select **Role-based or feature-based installation**.
4. Click the **Server Roles** menu item (or press **Next >** twice). The Select server roles page appears:





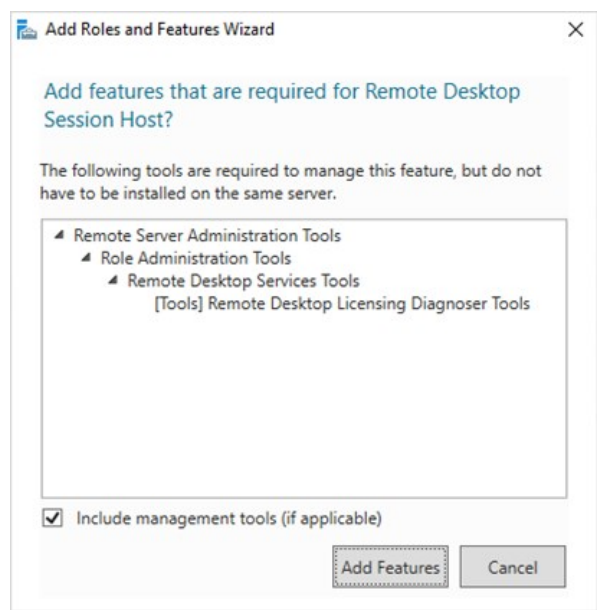
5. Click to select the **Remote Desktop Services** check box.

6. Click the **Next >** button. The Select role services page appears:



7. Click to select the **Remote Desktop Session Host** check box.

8. Click the **Next >** button. The Add features... page appears:



9. Click the **Add Features** button. A "Confirm installation selections" page appears.

10. Click the **Install** button.

## Step 2.2: Configuring Session Connector Settings

Enable SSSC:

1. Go to <https://<your Secret Server location>/ConfigurationAdvanced.aspx>.

2. Click the **Edit** button at the bottom of the page.

**Important:** Do not change any other settings on this page without consulting Delinea Support. Your Secret Server installation could malfunction.

3. Set **Session Connector** to **True**.

4. (Optional) Set **Session Connector Session Timeout** if you do not want to use the 900-second default (15 minutes). SSSC .RDP files are valid for this many seconds (only for a single use). If set to 0 or below, the default is used.

5. (Optional) Set **Session Connector Allow Connection Sharing** to **True**. This changes the value of "disableconnectionssharing" in the output SSSC RDP files. If true, this speeds up concurrent launches into the same RDS server quite a bit by re-using the existing Windows sessions, at the risk of sometimes causing errors if launching a new session while an old session is in the middle of closing. The default is false.

6. Click the **Save** button.

## Step 2.3: Setting up RDS in Secret Server

1. Enable the **Session Connector** advanced configuration setting. For more instructions on this please follow the steps under **Configuring Session Connector Settings** below.

2. Go to **Admin > Configuration > General** tab.
3. Ensure the **Secret Server Custom URL** setting is set to a valid URL for your Secret Server. This URL is given out to SSPH launches (including SSSC and RDS SSPH) to ensure it knows how to connect back to Secret Server. Use HTTPS for maximum security. In fact, as of Secret Server version 10.9, SSPH and SSSC both refuse to connect to HTTP.
4. Create a Secret for the **RDS Credentials** mentioned above. If the credential is a local account, use a Windows Local Account secret, and if it is a domain user, use an Active Directory secret.
5. Create application users in Secret Server, one for each of the RDS server machines. See **Creating RDS Application Accounts** for details.
6. Share the secret created for the RDS credential mentioned above with the RDS application accounts that will be used by the RDS server(s). See **Application Account RDS Credential Sharing**.
7. Create SSSC custom launchers. For example, if you wanted to run an RDP session on the RDS server, you should configure a custom SSSC launcher that uses the built-in RDP launcher as its child launcher. See **Configure Session Connector Custom Launchers**.
8. Assign your SSSC custom launchers to the secret templates you want to launch from. See **Assign Session Connector Custom Launchers to Secret Templates**.
9. Configuration and setup is finished for Secret Server, but there are still some things you need to do inside of the RDS servers before setup is complete.

## Task 3: Setting up RDS

### Step 3.1: Installing the Secret Server RDS Protocol Handler

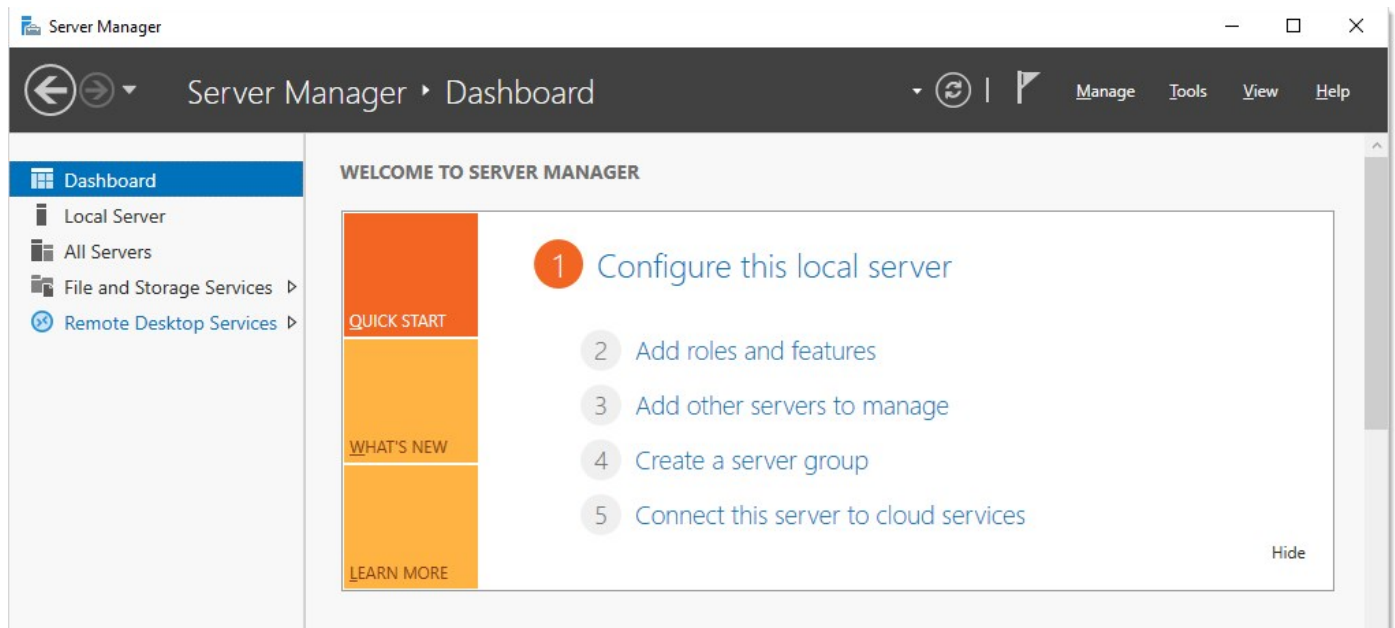
1. Go to the [Session Connector Downloads](#) page.
2. Download the SSPH (RDS) installer file, SSProtocolHandlerRDS.msi .
3. (Optional) Ensure the listed hash value matches that for the file.

**Note:** SSPH (RDS) is a special version of SSPH that can record keystrokes on its own, if configured in Secret Server. Due to this optional keystroke recording, you may need to allowlist the RDPWin.exe file (the primary executable for SSPH) in any antivirus software running on the server. This is not currently necessary with Windows Defender.

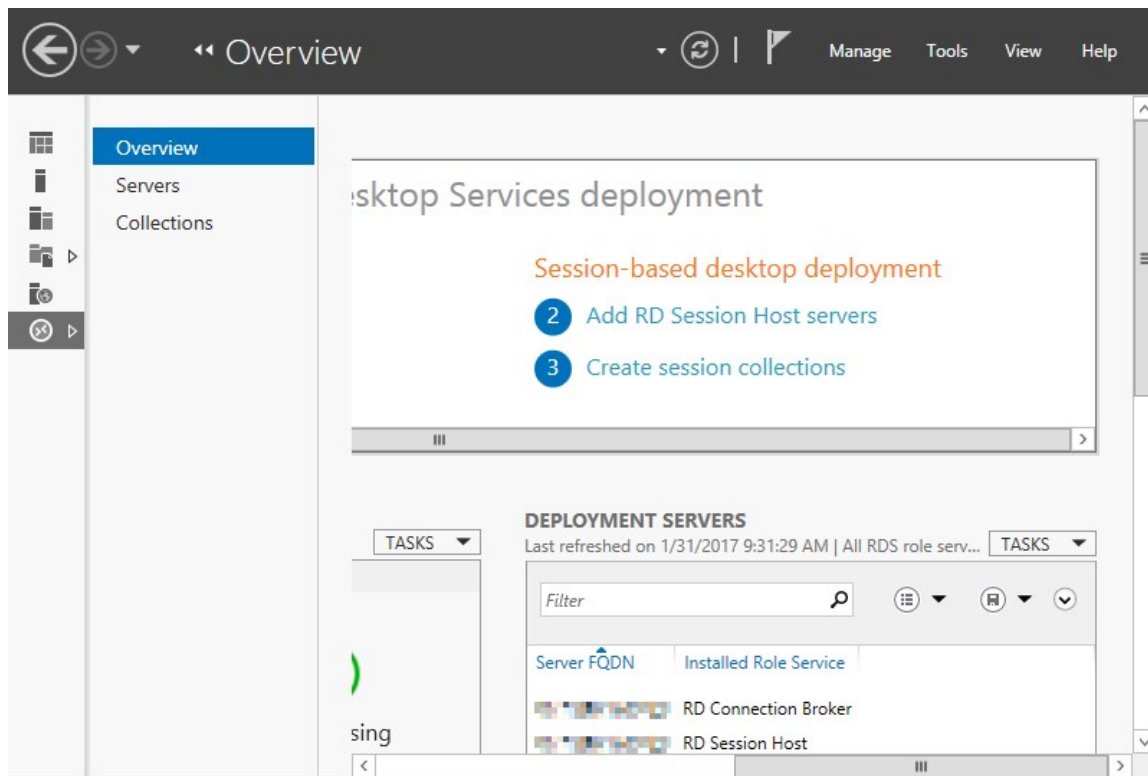
**Note:** SSPH (RDS) does not auto-update itself, unlike SSPH, because this could cause problems with multiple users running it at once on a single RDS server. Older SSPH (RDS) versions will continue to work with new Secret Server releases until updated, but a manual update is required on the RDS server(s) to take advantage of any future SSPH (RDS) features.

### Step 3.2: Adding the Remote Desktop Collection and Application

1. While logged in as a domain user, go to Server Manager:
-



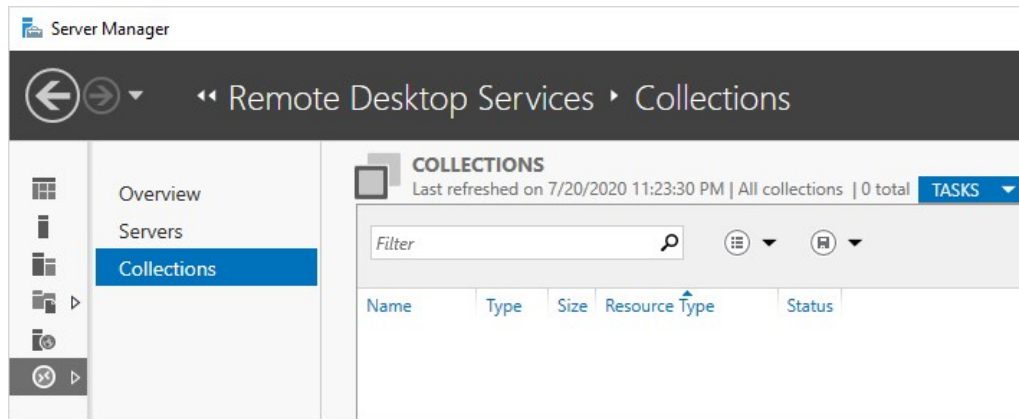
2. Click the **Remote Desktop Services** menu item on the left. The Overview page appears:



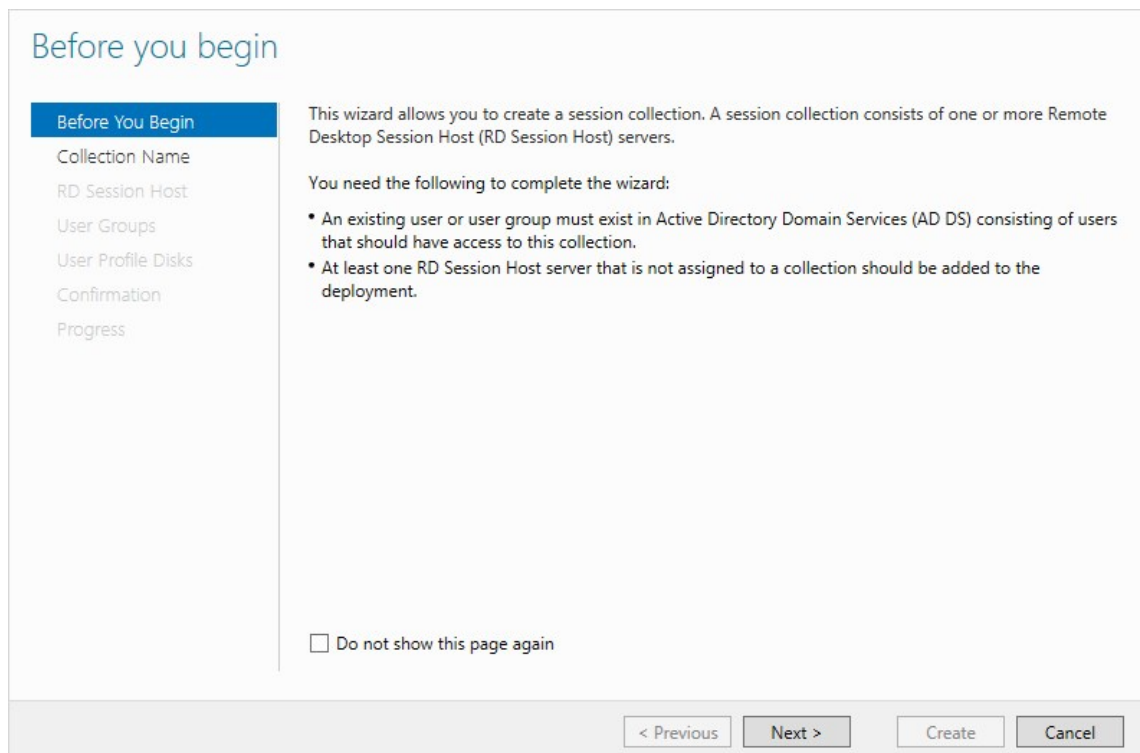
**Note:** If you logged on as a local user, you will see this error and be unable to configure RDS. You must be logged on as a domain user.

You are currently logged on as local administrator on the computer. You must be logged on as a domain user to manage servers and collections.

- Click the Collections menu item. The Collections page appears:



- Click the **Tasks** dropdown list and select **Create Session Collection**. The **Create Collection** wizard appears on the Before You Begin page:



- Click the **Next >** button to arrive at the Collection Name page:

## Name the collection

Before You Begin

**Collection Name**

RD Session Host

User Groups

User Profile Disks

Confirmation

Progress

A session collection name is displayed to users when they log on to a Remote Desktop Web Access server.

Name:

Description (optional):

< Previous   **Next >**   Create   Cancel

6. Type Session Connector in the **Name** text box.
7. Click the **Next >** button. The Specify RD Session Host Servers page appears:

## Specify RD Session Host servers

Before You Begin

Collection Name

**RD Session Host**

User Groups

User Profile Disks

Confirmation

Progress

Select the RD Session Host servers from the server pool to add to this collection.

**Server Pool**

Filter:

Name	IP Address	Operating S

1 Computer(s) found

**Selected**

Computer

1 Computer(s) selected

< Previous   **Next >**   Create   Cancel

8. Add the local server from the left side (**Server Pool**) to the right side (**Selected**).

9. Click the **Next >** button. The User Groups page appears:

Specify user groups

Before You Begin  
Collection Name  
RD Session Host  
**User Groups**  
User Profile Disks  
Confirmation  
Progress

Add the user groups that should have access to connect to the collection.

User Groups:

Add...  
Remove

< Previous   Next >   Create   Cancel

10. Select **Domain Users** in the **User Groups** list. This is not actually used by SSSC (it creates temporary local users), but RDS requires that something is selected.

11. Click the **Next >** button. The User Profiles page appears.



## Specify user profile disks

- Before You Begin
- Collection Name
- RD Session Host
- User Groups
- User Profile Disks**
- Confirmation
- Progress

User profile disks store user profile settings and data in a central location for the collection.

☐ **Enable user profile disks**

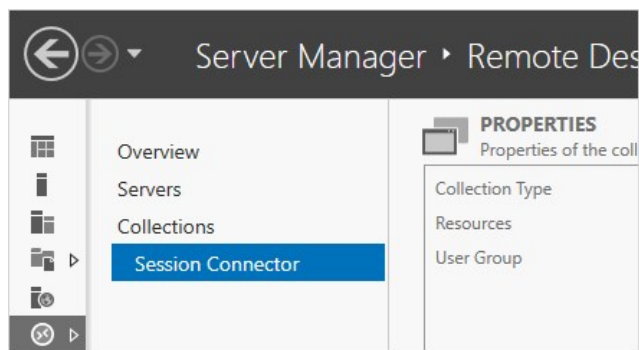
Location of user profile disks:

Maximum size (in GB):  
20

**i** The servers in the collection must have full control permissions on the user profile disk share, and the current user must be a member of the local Administrators group on that server.

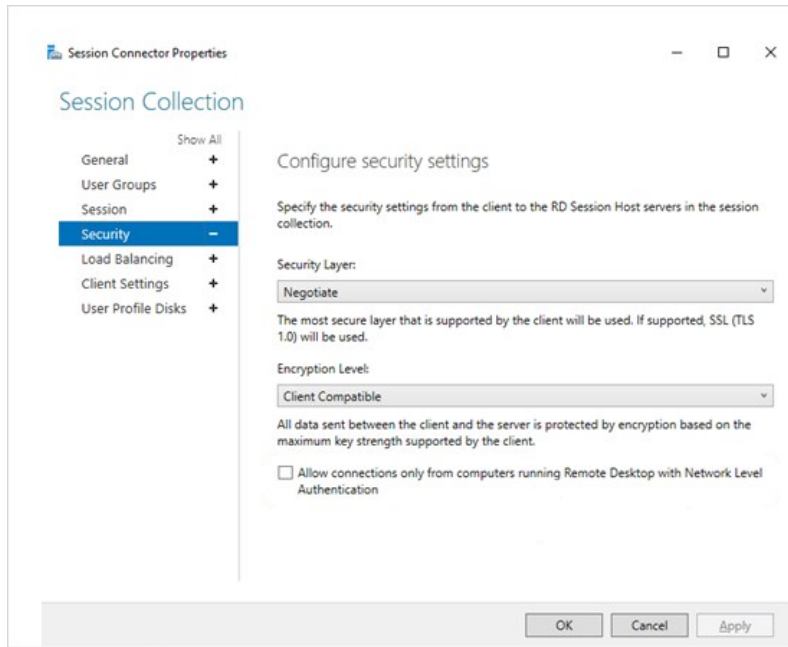
< Previous   Next >   Create   Cancel

- Click to select the **Enable user profile disks** check box. SSSC does not use user profile disks. We select the check box to enable the Create button.
- Click the **Create** button. The collection is created, and the wizard disappears. The SSSC is now listed under Collections:

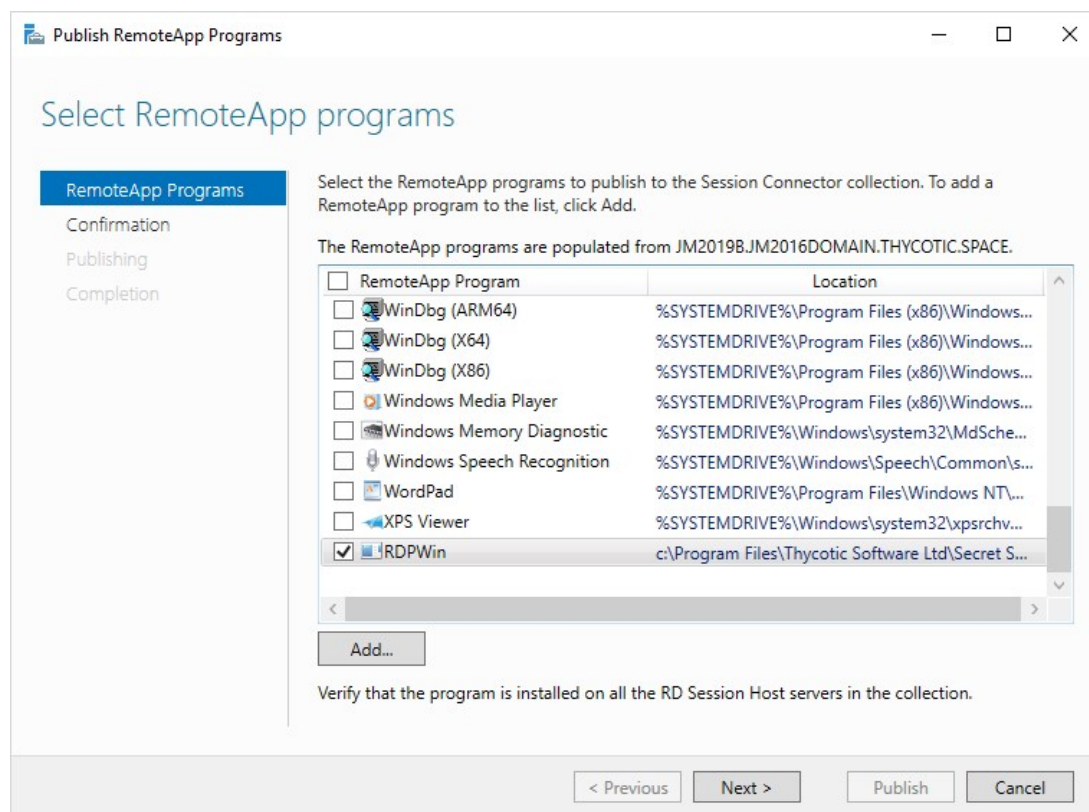


- Click the **Tasks** dropdown list in the **Properties** section and select **Edit Properties**. The Properties popup appears.
- In the left menu, click **Security**:





16. Click to deselect the **Allow connections only from computers...** check box. This necessary because SSSC uses temporary one-time use local users that do not exist until a connection is authenticated with Secret Server, making them incompatible with network-level authentication.
17. (Optional) If you want to restrict what can be mapped at the server level, such as drives, you can do so on the **Client Settings** tab. This is also configurable in Secret Server on each secret.
18. Click the **OK** button. The popup disappears.
19. Click the collection name in the menu on the left.
20. In the **RemoteApp Programs** section, click the **Tasks** dropdown and select **Publish RemoteApp Programs**.
21. Click the **Add...** button to add the RemoteApp for RDS protocol handler. A dialog box appears.
22. Navigate to C:\Program Files\Thycotic Software Ltd\Secret Server Protocol Handler.
23. Select RDPWin.exe.
24. Click the **Open** button. The dialog closes, and RDPWin (SSSH (RDP)) is now selected in the list:



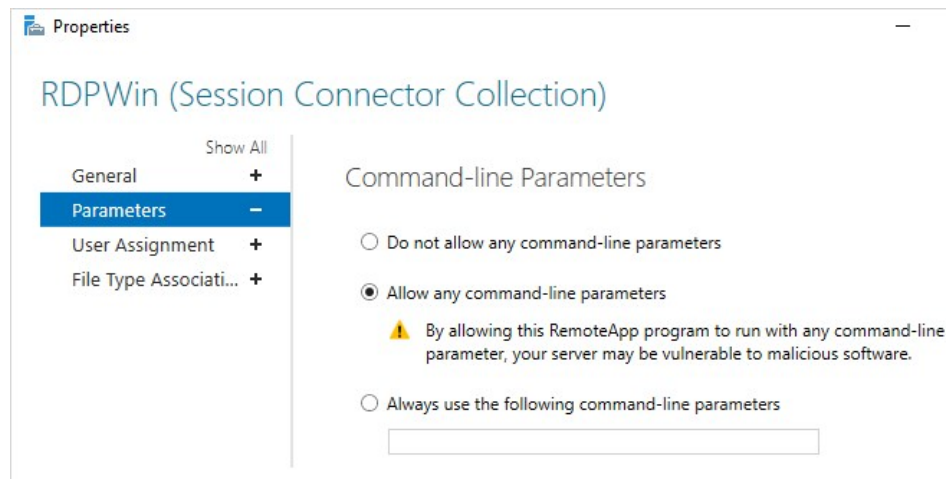
25. Click the **Next >** button. The Confirmation page appears.

26. Click the **Publish** button to save.

27. Click the **Close** button.

28. On the RemoteApp Programs page, right click **RDPWin RemoteApp** and select **Edit Properties**. A property page appears.

29. Click the Parameters menu item on the left:



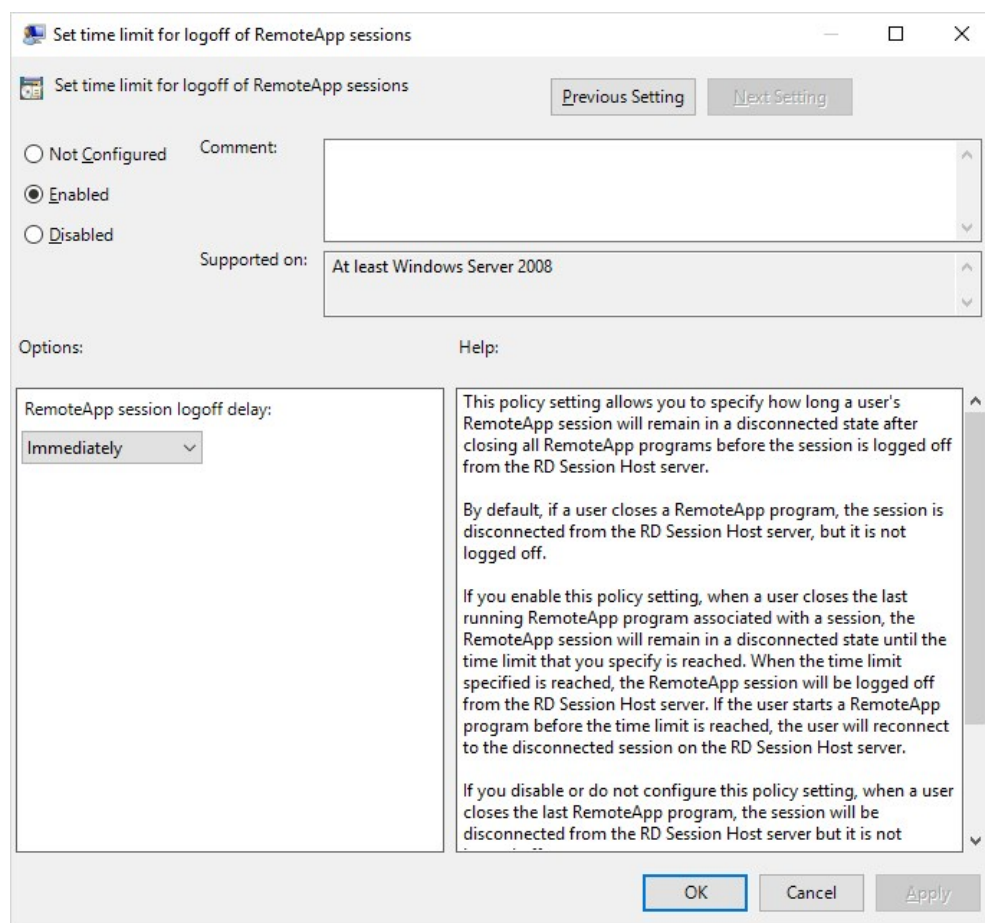
30. Click to select the **Allow any command-line parameters** selection button.

31. Click the **OK** button.

### Step 3.3: Configuring RDS-related Group Policy Settings

To configure on a single server:

1. Run the Group Policy Editor (gpedit.msc).
2. Go to **Computer Configuration > Administrative Templates > Windows Components > Remote Desktop Services > Remote Desktop Session Host > Session Time Limits**.
3. Click **Set time limit for logoff of RemoteApp sessions** to edit it. Its properties appear:



4. Click the selection buttons to select **Enabled**.
5. Click the **RemoteApp session logoff delay** dropdown list and select **Immediately**.
6. Click the **OK** button to save.

### Task 4: Installing the Secret Server Session Connector

1. Go to the [Session Connector Downloads](#) page.
2. Download the SSSessionConnector.msi SSSC installer file.

3. (Optional) Ensure the listed hash value matches that for the file.
4. Run the file.
5. When prompted, type the Secret Server URL and application account username and password you previously configured. The Secret Server URL must start with `https://` for security reasons, or the installer will not proceed.
6. When the installation is finished, you are prompted to reboot the server. This is to restart all of the remote desktop and terminal service services.
7. Once the server reboots, it will be a SSSC listening on the RDP port (TCP 3389). You can now use the SSSC custom launchers connected to it.

## Task 5: Updating API Credentials

The credentials for the SA application account are saved encrypted in the registry. The credentials are restricted to the NETWORK SERVICE account, which Remote Desktop runs under using DPAPI-NG.

If those application account credentials change in the future, follow these steps to update them:

1. Run the Windows Registry Editor, `Regedit.exe`.
2. Navigate to `HKLM\SOFTWARE\Thycotic\SessionConnector`.
3. Set **CredentialsEncrypted** to 0.
4. Set **SecretServerUsername** to the plain text new username.
5. Set **SecretServerPassword** to the plain text new password.

These credentials are encrypted upon their first use, either the next time someone launches a SSSC session that hits this server, or if you reboot the entire server. Once this happens, returning to the Registry Editor, `CredentialsEncrypted` will be set back to "1," and an encrypted version of the username and password will be visible.

## Task 6: Launching Session Connector Sessions

Now that it has been configured and installed, you should be able to launch SSSC sessions.

Once configured, the SSSC custom launchers appear just like any other launcher on the associated secret template types. When clicked, a Remote Desktop shortcut (.RDP) file is downloaded. This .RDP file can then be opened by standard Remote Desktop clients, such as `mstsc.exe` in Windows or RoyalTS in OSX.

When launched, the end-user will connect to the RDS host configured on the SSSC custom launcher. The RDS host then launches the RDS protocol handler and connects to the actual destination machine.

## Subprocedures

### Creating RDS Application Accounts

1. Go to **Admin > Users**.
2. Click the **Create New** button. The Edit User page appears:

**Edit User**

User Name

Display Name

Email Address

Domain

Local

▼

Password

Confirm

Two Factor

< None >

▼


Enabled


☒

Locked Out

☐

[Advanced](#)

 Save

 Cancel

3. Type in or set the account details.
4. Ensure that the **Enabled** check box is selected.
5. Click the **Advanced** link. Additional parameters appear:

## Edit User

User Name


Display Name

Email Address

Domain


Local

Password

Weak 

Confirm

Two Factor

< None > 

Enabled

☒

Locked Out

☐


Advanced


Application Account


☒

As an application account, the user will only be able to log in through [Article](#))

Managed By

User Administrators 

 Save

 Cancel

**Note:** Leave the Two Factor and Managed By controls set to their defaults, < None > and User Administrators. Because this account is for SSSC and not a human being, 2FA is not appropriate.

- Click to select the **Application Account** check box. As an application account, the user can only log on through the application account API and does not require a separate user license.

**Note:** We recommend application account users because only API access is required by SSSC, and they do not consume regular user licenses. You may want to name the users to make it obvious which server they belong to. We recommend one user per RDS server for auditing purposes and to avoid one server with invalid credentials locking out the user, impacting all the other servers. See [REST Web Services API Reference and Download](#) for more about the API.

- Click the **Save** button.
- Repeat this process for each RDS server if you are clustering more than one.

## Enabling Application Account RDS Credential Sharing

Each RDS application account must have view access to the RDS Credential that the RDS server(s) use to manage the temporary Windows local accounts:

- Go to the RDS credential secret you created earlier.
- Click the **Sharing** tab:

RDS Credentials ☆

General
Security
Audit
Dependencies
**Sharing**
Settings

SHARE SECRET

SHARED WITH		
admin	Owner ▼	<a href="#">Remove</a>
RDSAppUser01	View ▼	<a href="#">Remove</a>

Add Groups / Users

Search for groups or users

Cancel
Save

- Grant view access to the applicable application account users. That is usually one Secret Server user account per RDS server. If you are using a cluster, this secret would be an Active Directory secret for a domain credential that all the RDS servers can use, and you would share it with each of the RDS application accounts for each RDS Server in the cluster using in their SSSC configuration.

## Configuring Session Connector Custom Launchers

You must create a custom launcher for each combination of and RDS server cluster and custom launcher type:

- Go to **Admin > Secret Templates**.
- Click the **Configure Launchers** button. The Launcher Types page appears.
- Click the **New** button. The Launcher page appears:

Launcher

GENERAL SETTINGS

Launcher Type

Session Connector Launcher

Allows for downloading and running an RDP file to launch into a Remote Desktop Server with Protocol Handler installed, so end-user client machines do not need to install anything. Recommended only for advanced users. For more information see this [KB Article](#)

Launcher Name

\*

Active

☒

Record Keystrokes

☒

Child Launcher Type

Remote Desktop

RDS Server Hostname

\*

RDS Server Port

\*

RDS Server Credentials

[RDS Credentials](#)

[Clear](#)

[Create New Secret](#)

Save

Cancel

4. Type or set the parameters as follows:

- **Launcher Type:** Session Connector Launcher. This launcher type will not be visible until the Configuration Advanced Setting is enabled.
- **Active:** Ensure this is selected.
- **Record Keystrokes:** Check to record keystrokes in addition to video on related secrets with session monitoring enabled.
- **Child Launcher Type:** Click to select the launcher type, such as Remote Desktop or PuTTY. This is the real launcher type that runs on the RDS server to connect to the secret.
- **RDS Server Hostname:** IP or hostname for the RDS server or cluster.
- **RDS Server Port:** Type the port. The default RDP port is TCP 3389.
- **RDS Server Credentials:** Click the **RDS Credentials** link to pick the Secret configured above for credentials that can create and delete local users. If RDS Server Hostname points to a cluster, all servers must be able to use these credentials.

5. Click the **Save** button.

## Assigning Session Connector Custom Launchers to Secret Templates

1. Go to **Admin > Secret Templates**. The Manage Secret Templates page appears:



## Manage Secret Templates

Windows Account

☐ Show Inactive

Back

Edit

Create New

Export

View Audit

Active Templates

Password Requirements

Character Sets

Configure Launchers

Configure Secret Template Permissions

Other Templates


Configure Dependency Templates

Configure Scan Templates

- Click the unlabeled dropdown to select a secret template that you want to allow SSSC to launch from.
- Click the **Edit** button to view that secret template. The Secret Template Designer page appears:

## Secret Template Designer


SETTINGS

Secret Template Name	Windows Account
Secret Template Icon	
Active?	<input checked="" type="checkbox"/>
Expiration Enabled?	<input checked="" type="checkbox"/>
Expiration Days	30
Expiration Field	Password
Validate Password Requirements On Create?	<input type="checkbox"/>
Validate Password Requirements On Edit?	<input type="checkbox"/>
Field Displayed on Basic Home	Folder Name
One Time Password Enabled	No

Edit

- Click the **Configure Launchers** button at the bottom of the page to open the launcher mappings. The Secret Template Edit Launcher Configuration page appears:

### Secret Template Edit Launcher Configuration





**Launcher Type to use** Remote Desktop



**Computer** Machine

**Domain** <blank>

**Password** Password

**Username** Username

 Edit
  Delete

 Back
  Add New Launcher

- Click the **Add New Launcher** button. A page of the same name appears:

### Secret Template Edit Launcher Configuration

**Launcher Type to use** Remote Desktop

**Computer** <user input>



**Domain** <blank>

**Password** Machine

**Username** Machine

#### ADVANCED SETTINGS

**Restrict User Input** ☐ ?

 Save
  Cancel

- Click to select the desired parameters for the launcher:

### Secret Template Edit Launcher Configuration

Launcher Type to use

RDS RDP

Computer

Machine

Domain

<blank>

Password

Password

Username

Username

#### ADVANCED SETTINGS

Restrict User Input ☐ [?](#)

Save

Cancel

7. All secrets using this template are now ready to run SSSC launches.

When launching a downloaded .RDP file, if SSSC rejects the session due to any issues (including being expired based on the "Session Connector Session Timeout" setting), the user's Remote Desktop client will receive a generic error about the RemoteApp being invalid.

In the ss.log file, you can search for "SessionConnector" to find details about why sessions may have been rejected.

Session Connector will also log to the file C:\Program Files\Thycotic Software Ltd\Secret Server Session Connector\log\SS-SC.log on each RDS server. That is, If the RDS server has trouble using the supplied RDS credential to create a local user, it is logged to this file

Secret Server Session Connector can be removed from "Add/Remove Programs" or "Apps & Features." Once uninstalled, a reboot is required to restore the default Remote Desktop behavior.

Any related SSSC custom launchers need to be un-associated with any secret templates they were previously tied to.

**Note:** It is not currently possible to delete a custom launcher in Secret Server, but if it is unassociated with all secret templates, it will not appear on any secrets.

**Note:** The install files (.msi) are zipped to make them more download friendly All hashes listed below are run on the install files, not the zips of those files.

## Session Connector

File:

[SSSessionConnector.msi](#) (v1.0.0.0)

SHA1 Hash:

C9A4B274455159FFB792AB6C497B752399921EC8

SHA256 Hash:

3ED64AB39FDAE0E0DD99513C395FE7690BFDAD0D6CA26DD77844AFFEDA7ADDF0

## SSPH (RDS)

**Note:** SSPH (RDS) is a special Remote Desktop Services version of Secret Server Protocol Handler that can record keystrokes on its own, if configured in Secret Server. See [Session Connector](#) for details.

**Note:** .NET Framework 4.8 is required for SSPH (RDS).

File: [SSProtocolHandlerRDS.msi](#) (v6.0.3.11)

SHA1 Hash:

E32C60C91286354E35653871250E8618667243BF

SHA256 Hash:

A072C24C36C322BD67825DFAC61D5E59320FFA44127A674E413E7B24D9A05E54

## Overview

Connect As Command is an advanced setting for the PuTTY launcher type where SSH proxy automatically runs the su command for a Unix root account secret after the user launches a PuTTY session. This provides a user elevated privileges without allowing a remote root connection or giving the user direct access to the credentials.

The connection procedure is as follows:

1. An admin uses this instruction to set up secret A (a Unix root account secret) to use secret B (a regular Unix account secret) as its "connect as" secret.
2. A user launches secret A.
3. SSH proxy connects using secret B's credentials.
4. SSH proxy issues the su command to switch the user back to secret A.

The procedure is performed once at the beginning of the session.

As noted, to implement this feature, you typically use a Unix *root* account secret and a Unix *regular* account secret. The session usually launches as the Unix *regular* account secret that is specified in the **Secret To Use** field on a Unix *root* account secret's **Settings** page.

## Setting up SSH Proxy to Use the Connect As Feature

This procedure explains how to set a "connect as" secret when using SSH Proxy to allow connecting with a less privileged account and then using sudo or su to elevate privileges.

1. Make sure SSH proxy is enabled in Secret Server's global configuration settings.
2. Open a secret based on a template with SSH proxy enabled that specifies PuTTY as the launcher type to use.

**Note:** For this feature, we recommend building a custom secret based on a copy of the built-in **Unix Root Account (SSH)** template, and associating the PuTTY launcher with it.

3. Click the secret's **Settings** tab.
4. Next to **Connect Using**, select **Credentials on another Secret**.
5. Next to **Secret to Use**, click **No Selected Secret**.

General
Security
Audit
RPC
Dependencies
Sharing
Settings

EMAIL NOTIFICATIONS

Send Email When Viewed

No

Send Email When Changed

No

Send Email When Heartbeat Fails

No

SSH LAUNCHER

Connect Using

Credentials on another Secret

Secret To Use

No Secret Selected

Cancel
Save

- Navigate to **Admin > Secret Templates**.
- Select a template from the drop-down and click **Edit**.
- Scroll down the page and click **Configure Launcher**.
- Locate the PuTTY launcher type and click **Edit**.
- Verify that the commands in the **Connect As Command** field are correct.
- If you change anything, click **Save**.

Connect As Command

su - \$USERNAME

?

Connect As Command Response

Password:\$PASSWORD

?

Line Ending

New Line (\n)

?

Save

Cancel

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Web launchers are a separate login method from the Web password filler and provide a convenient click to automatically log on simpler websites. Web launchers do not work on complex login pages that rely on JavaScript. For those login pages, use the browser extension for the Web password filler. By default, Web launchers are enabled on the Web Password Secret template, but they can be enabled on custom templates as well, as described in [Enabling Launchers](#).

## Configuring Web Launchers for Secrets

Once enabled on the template, a Web launcher needs to be configured for the secret. Each website login is unique and requires the secret text-entry fields to be mapped to the form controls. For a new secret the Launcher icon appears and clicking on it takes the user to a configuration screen. The user can also view and access the configuration screen from the Launcher tab. Depending on whether other secrets with the same website have been configured, the user has different options.

**Note:** Configuring the Secret for use with the Web Launcher requires the user to have Owner permission on the Secret.

First, there is the option of downloading the setting from Delinea.com. When the Configure Web Launcher page is loaded, Secret Server checks online at Delinea.com for pre-approved matching websites. If any are found, they are downloaded and made available to pick from in the dropdown list.

**Note:** This functionality can be disabled in Secret Server in the Configuration Settings.

The list displays all downloaded configurations and other secrets' configuration for the same domain that the user has permission to view. Select one from the list and click **Next** to create a copy of the settings for the secret.

There is also an option to create a configuration that allows the Web launcher to be used on most websites and not rely on published configuration settings. To use this, select the last item in the dropdown list and click **Next**. The next section discusses the create process.



## Creating a Configuration

When configuring the Web Launcher:

- **Entering the Login URL:** Secret Server needs to know the exact URL used to login to be able to figure out the controls and perform the automatic login. Some example login URLs:

- <https://login.yahoo.com/config/login>
- <https://MyServer/Billing/login.aspx>
- <https://firewall07/login/>

**Note:** The Login URL is typically a secure site with a prefix of `https://`. If allowed to access the site, Secret Server automatically detects if https should be used to ensure the credentials are passed securely.

- **Providing the Page Source:** If Secret Server is not allowed access to sites, or the login URL is not accessible by an external site, the page source needs to be provided for the Web launcher controls to be obtained. Ensure the login URL is correct when the page source is taken. If the site can be accessed by Secret Server the page source is automatically obtained and this step is not present.
- **Choosing the Form:** The page is read, and the exact login form needs to be identified. The page forms are listed in the list with the most likely selected. If no forms or no likely forms are found, the user needs to update the URL or page source, as configuration must have at least one textbox and one password box.
- **Wiring Up the Fields to Controls:** In most cases, Secret Server automatically wires up the Username and Password text fields to the correct page controls. If not, the user completes the control mapping on the Launcher tab.

## Launching to a Website

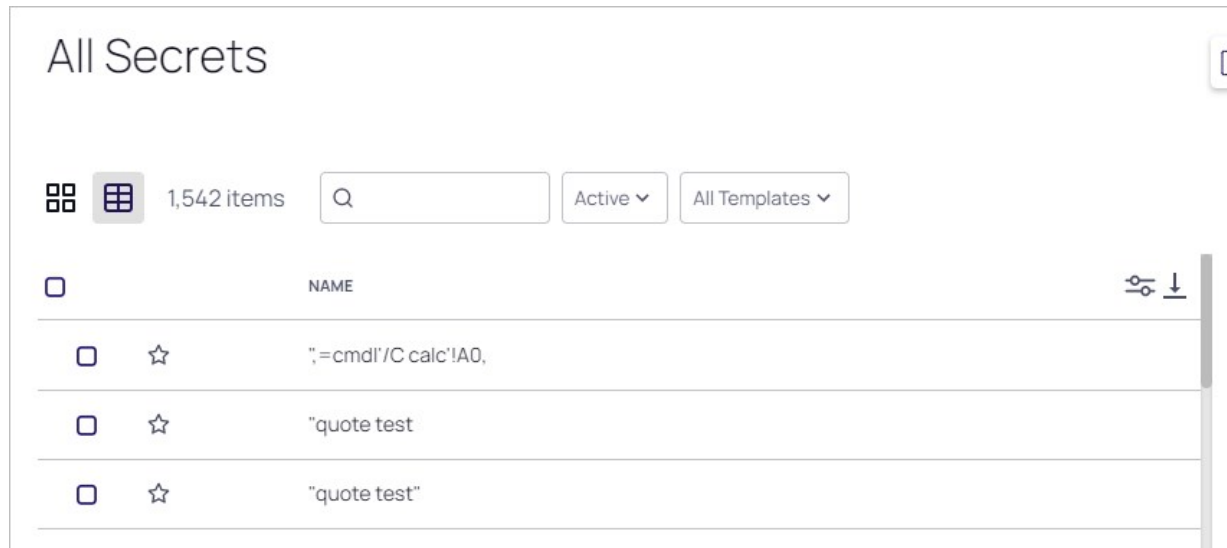
The Web launcher can be used by clicking the Launcher icon on the Secret View page. The Web launcher opens a new window in the browser, which attempts to login to the site using the credentials on the secret. The launcher can also be used with the Test Launcher button on the Launcher tab. Testing the Launcher creates a dialog to offer troubleshooting help and means to upload the configuration to Delinea.com. The uploaded configuration is reviewed and published by Delinea for all Secret Server customers to use with the check online feature. No secret or identifiable information is uploaded to Delinea.com. Only the website URL and control names are sent.

## Secret Management

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.


*Secrets* are individually named sets of sensitive information. Secrets address a broad spectrum of secure data, each type represented and created by a *secret template*. You can centrally manage secret security through sharing settings for each secret. Additionally, using folder structure, you can allow one or more secrets to inherit permissions from their parent folder. All secret text-entry field information is securely encrypted before being stored in the database, including a detailed audit trail for access and history.

All Secrets is a master table of the secrets stored on Secret Server. It is a one-stop, searchable location for examining the status and properties of secrets. It is a supplement to, not a replacement for, the [secret folder-tree panel](#). It lists and you can sort by secret template, heartbeat status, sync status, machine, access date, username, and much more.



Click the **Secrets** menu item in the left menu to see the All Secrets Page. Click the > > icon to see the All Secrets folder tree.

## Secret Columns

You can customize which columns are displayed by clicking the  on the right side of the title bar. The sortable columns available are (the ones displayed by default are bolded):

- Auto Change Enabled
- Checked Out
- Checkout Enabled
- Created
- Days until Expiration
- Deleted
- DoubleLock Enabled
- **Folder**
- **Heartbeat**
- Hide Password
- Inherits Permissions
- **Last Accessed**
- Machine
- **Name**
- Notes
- **Out of Sync**
- Requires Approval
- Requires Comment
- **Secret Template**
- Username

## Quick Launch and Actions

You can quickly access several secret actions from the All Secrets table by hovering the mouse pointer over the secret's row:

- Quick Launch: Secrets that display a rocket icon have secret launchers associated with them. Click the icon and a Select Launcher page appears. Click on the desired launcher from the list.
- More Actions: Click the ... icon to
  - Audit: Brings you to the Audit tab of the secret's page.
  - Details: Brings you to the General tab of the secret's page.
  - Enter Comment: Brings you to a page for entering a comment before you are allowed to view the secret. Comment ask for information such as reason for viewing and ticketing system.
  - Share: Brings you to the Sharing tab of the secret's page.

## Other Features

The All Secrets page also allows you to:

- Select multiple secrets for [bulk actions](#) by clicking the secret's check box. You can also download multiple secrets in a CSV file by clicking the download icon at the top of the table.
- Select the secret as a favorite by clicking the star icon.
- View supplemental information about the secret by clicking any blank area on the secret's row.
- Click the secret's name to go to that secret's page.
- Filter the secrets shown in the table by template, search text, or activity status.
- Click the [Secret Navigation Slideout](#).

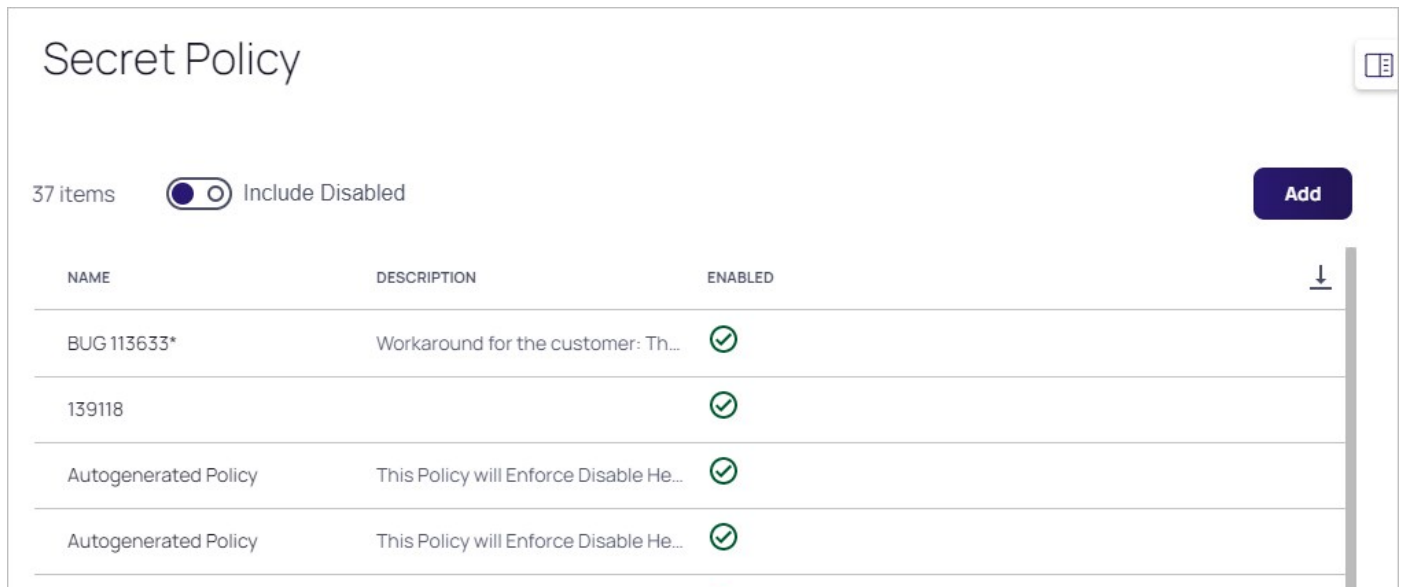
**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Creating Secret Policies

A secret policy is a set of rules that you can apply all at once to multiple secrets. For example, a secret policy could include rules about remote password changing or security settings, and you could apply all of the rules as a single policy to multiple secrets, whether the secrets reside in the same folder or different folders.

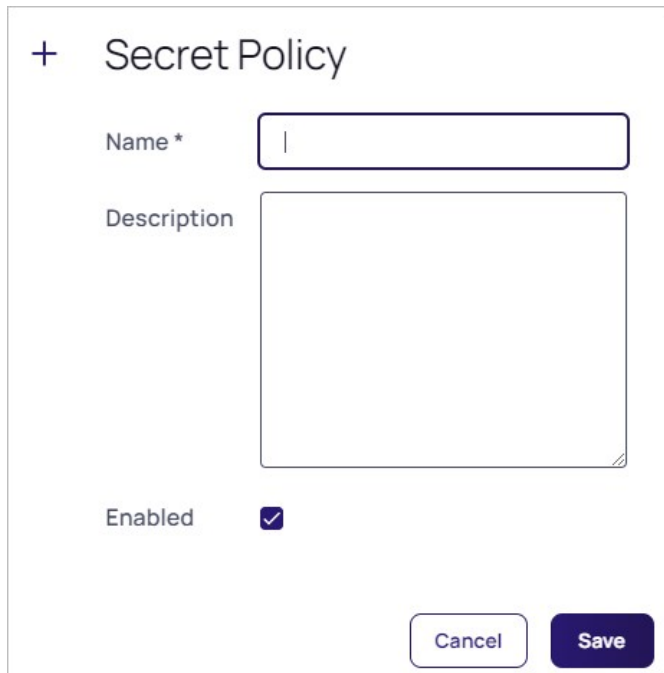
Follow the procedure below to create a secret policy:

1. Click **Administration > Secret Policies**. The Secret Policy page appears:



NAME	DESCRIPTION	ENABLED
BUG 113633*	Workaround for the customer: Th...	✓
139118		✓
Autogenerated Policy	This Policy will Enforce Disable He...	✓
Autogenerated Policy	This Policy will Enforce Disable He...	✓

2. In the **Secret Policy** window, click the **Add** button. A popup appears:



**+ Secret Policy**

Name \*

Description

Enabled ☒

3. Type a **Secret Policy Name** and **Description** for your new security policy.
4. Click to select the **Enabled** check box.
5. Click the **Save** button. The new policy's page appears on the Policy tab and Summary subtab:

## My Secret Policy

Policy
Audit

Summary
General
Security
Remote Password Changing
Launcher

### Secret Policy Summary

The name of the Secret Policy will show for users when assigning a policy to a Secret or folder. Disabling a Secret Policy will not change values on any Secrets. Default policy values will only be assign when creating a new Secret. Removing a Secret Policy from a Secret will not revert values on the Secret.

Edit

Name *	My Secret Policy
Description	Mine, all mine.
Enabled	Yes

Because you are creating a brand-new secret policy, the value in the setting column for many policy items is *(Not Set)*.

6. Click each subtab in turn and click the **Edit** button to set which parameters are enforced. See the various topics for specifics about each parameter.



## Creating Secrets

To create a secret:

1. Click the **+** icon and select **New Secret**. The Create New Secret page appears:

+

Create New Secret

This folder is for work related Secrets only. Do not store personal non-work Secrets, such as your Online Banking password, in this folder.

Personal Folders/Will Sprunk

Change

Clear

Choose a Secret Template

Search for template name

[GTS] Unix Account - SUDO SU (SSH)

1-Bug AD Copy

A Small Template

Active Directory Account

Active Directory Account (Custom Launchers)

Active Directory Account RDP Launcher (No Prompt, No Restrictions)

Active Directory Account RDP Launcher (Prompt, Black List)

Active Directory Account RDP Launcher (Prompt, Black List, Exclude Dependency)

Active Directory Account RDP Launcher (Prompt, No Restrictions)

Active Directory Account RDP Launcher (Prompt, White List)

Active Directory Account RDP Launcher (Prompt, White List, Exclude Dependency)

Active Directory with Allow List

Active Directory with Lists

AD BugCopy

AD Template CC

Cancel

Create Secret

2. Click the **Choose a Secret Template** list or type a template name in the **Search for template name box** to choose a template from which to create the secret .

**Note:** If you do not find a suitable template available, you can create a custom template.

3. Click the **Create Secret** button. A Create New Secret page appears.

**Note:** These pages differ significantly, based on the secret template you chose. For this instruction, we chose the frequently used Web Password template.

+
Create New Secret

This folder is for work related Secrets only. Do not store personal non-work Secrets, such as your Online Banking password, in this folder.

Secret Template	Web Password <a href="#">Change</a>
Folder	Personal Folders/Will Sprunk <a href="#">X</a>
Secret Name *	<input type="text"/>
URL *	<input type="text"/>
Username *	<input type="text"/>
Password *	<input type="password"/> <span>👁</span> <input type="button" value="Generate"/>
Notes	<div></div>
Site	Local <span>▼</span>
Auto Change Enabled	<input type="checkbox"/>

- Complete the text boxes and selection controls on the page.

**Note:** The password generator is governed by a password requirement, which is usually set via the secret template. However, you can override the template for this secret and set the requirement to something different in the Password Requirements section of the Security tab, *after* you create the secret.

- Click the **Generate** button to create a strong password that meets the requirements for that type of secret. You can also add your own.

**Note:** Click the eyeball icon to see a list of the current requirements and what you have already typed. The maximum

password length is 1024.

The bar below the text box indicates the strength of the password you enter—it stays red but gets longer as the password quality

improves.

As you meet each requirement, a green checkmark appears next to it.

Once you have met all the requirements, the color bar is full length and green.


6. Click the **Sites** dropdown list to select a site the secret belongs to.
7. (Optional) Click to select the **Auto Change Enabled** check box to enable automatic remote password changing (RPC) for the secret.
8. Click the **Create Secret** button. The new secret's page appears.
9. Click any of the tabs to further configure the secret.

**Note:** It is possible to import data as secrets. See [Importing Secrets](#).

## Customizing the All-Secrets Page

On the main menu, there is a **Secrets** folder tree. When you click on the root or any subfolder, you see a list of all the secrets in that folder with multiple columns. You can customize what you see in one of three ways:

### Customizing Visible Columns

You can display additional columns on the grid by clicking the  icon. This data can be either secret metadata or template text-entry fields that have been set to be available for viewing. To select additional columns to display, click the **Advanced** link and then the **Column Selection** link. You can display the following metadata fields:

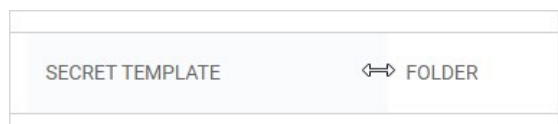
- Auto Change Enabled
- Checked out
- Checkout Enabled
- Created
- Days until Expiration
- Deleted
- Double Lock Enabled
- Expiration Field Changed
- Folder
- Inherits Permissions
- Heartbeat
- Hide Password
- Last Accessed
- Machine
- Notes
- Requires Approval
- Requires Comment
- Secret Template
- Username

### Filtering Search Results

You can filter secret search results by selecting a folder on the left, either by clicking it or using the search text-entry field above the folder tree. On the right side of the widget, secrets can be filtered further by specifying search criteria in the top text box. The Advanced section allows filtering by secret template and status, as well as the option to include secrets contained in subfolders. Advanced criteria only remain in effect while those options are expanded (visible).

### Sizing Columns

You can resize any of the columns by hovering the cursor over the border between them till it turns into a double arrow:



Click and drag to resize the column.

## Deactivating and Reactivating Secrets

**Note:** Deactivating (previously called "deleting") a secret is *not* the same as erasing one—the former hides it but it can still be viewed or undeleted by administrators—the latter is a permanent removal of data and requires more effort, including an access request. Deleting secrets is common. Erasing them is rare, only needed in special circumstances. See [Erasing Secrets](#) for details.

**Important:** We strongly recommend against deactivating or erasing large numbers of secrets, both of which negatively affect performance over time. Secret Server is not a transactional system—it is not designed to handle large numbers of deactivations or erasures. Deactivated or erased secrets continue to use database table resources forever. Even erased secrets leave a database record even though the secret data is permanently deleted. Erasure is for regulatory compliance and not database clean up.

To deactivate a secret:

1. Navigate to the secret **View** page by searching or drilling down the folder tree.
2. Click the **Options** dropdown list and select **Deactivate**. A confirmation appears.
3. Click the **Confirm Deactivate** button.
4. The secret is logically deleted and hidden from users who do not have a role containing the View Deactivated Secrets permission.

**Note:** Secret Server uses deactivations to maintain the audit history for all data. However, deactivated secrets are still accessible by administrators (like a permanent Recycle Bin) to ensure that audit history is maintained and to support recovery. A user must have the View Deactivated Secrets permission in addition to Owner permission on a secret to access the secret View page for a deactivated secret. For more information about these permissions, see [Roles](#) and [Sharing a Secret](#).

To reactivate a secret:

1. Navigate to the secret view page.
2. Click the **Active** menu link and select **Inactive**. The secret list now shows inactive secrets.
3. Click the name link for the desired secret. Its secret page appears.
4. Click the **Options** button and select **Activate**.

**Note:** Secrets can also be deactivated and reactivated in bulk. See [Running Dashboard Bulk Operations](#).

## Duplicating Secrets

The secret duplication function allows for easier, automatic secret duplication. Any user with the Owner Secret permission on a secret can click to select **Duplicate** in the **Options** dropdown list to create a new secret with information based on the original secret. Secret text-entry field information, launcher settings, secret settings, double locks, email settings, and permissions are copied over. Audit records are written to the source secret and target secret to indicate that a copy operation took place. Currently, file attachments are not copied.

## Editing Secrets

**Note:** If using the Dashboard, see [Secret Server Dashboard](#).

To edit a secret:

1. Navigate to the secret's **View** page by searching or drilling down the folder tree.
2. Click the desired tab for the secret configuration.
3. Click the **Edit All Fields** link. All text-entry fields become editable.

**Note:** The password generator is governed by a password requirement, which is usually set via the secret template. However, you can override the template for this secret and set the requirement to something different in the Password Requirements section of the Security tab after you create the secret.

4. For passwords, you can create a random password with the **Generate** button (on the General tab). This generates a password according to the rules set at the template level (see secret templates for more information about password requirements).
5. Click the **Save** button.

## Erasing Secrets

**Note:** Deactivating (previously called "deleting") a secret is *not* the same as erasing one—the former hides it but it can still be viewed or reactivated by administrators—the latter is a permanent removal of data and requires more effort, including a secret erase request. Deactivating secrets is common. Erasing them is rare, only needed in special circumstances. See [Deactivating and Reactivating Secrets](#) for related information.

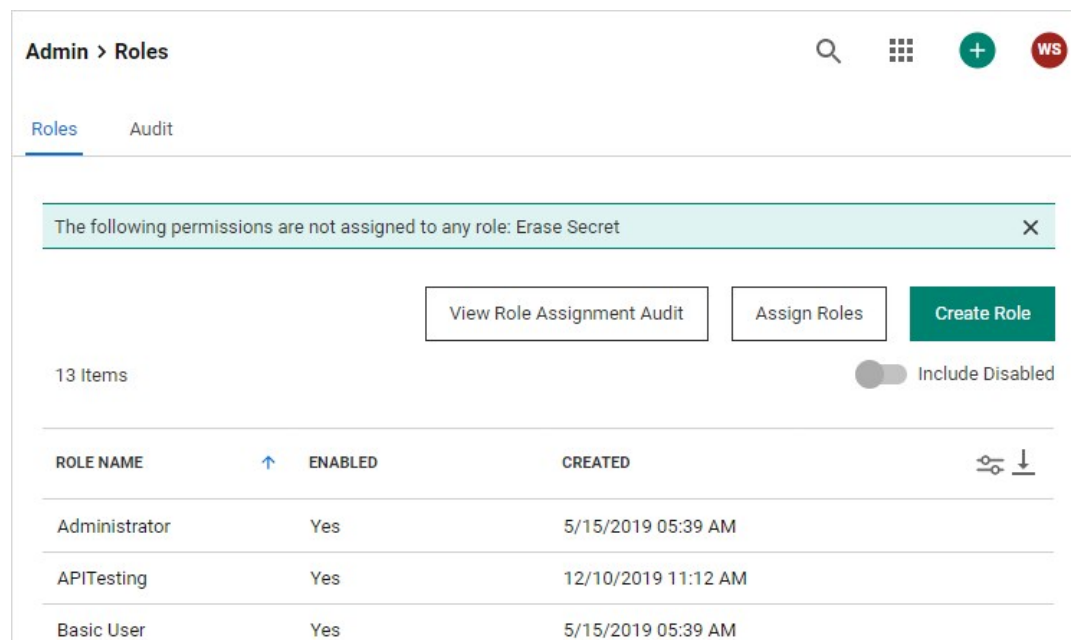
**Important:** We strongly recommend against deactivating or erasing large numbers of secrets, both of which negatively affect performance over time. Secret Server is not a transactional system—it is not designed to handle large numbers of deactivations or erasures. Deactivated or erased secrets continue to use database table resources forever. Even erased secrets leave a database record even though the secret data is permanently deleted. Erasure is for regulatory compliance and not database clean up.

**Note:** This instructions assumes you know the basics of access requests, groups, roles, and permissions. We also suggest reading the introductory material for [Workflows](#) if you are not familiar with it.

### Task 1: Configuring Secret Erase

**Note:** If secret erasure is already configured on this server and you are in the Secret Erasers group, you can skip to Task 2.

1. Ensure that you have a workflow license for Secret Server.
2. Go to **Admin > Roles** in Secret Server:



Admin > Roles

Roles Audit

The following permissions are not assigned to any role: Erase Secret

View Role Assignment Audit Assign Roles Create Role

13 Items Include Disabled

ROLE NAME	ENABLED	CREATED
Administrator	Yes	5/15/2019 05:39 AM
APITesting	Yes	12/10/2019 11:12 AM
Basic User	Yes	5/15/2019 05:39 AM

3. Create a new role named "Secret Erase Requester" or "Secret Erase Administrator" (see [Creating Roles](#) for details), assigning it the "Erase Secret" permission:

**Note:** You can name the role anything you desire, but we recommend the above for clarity.



## Role Edit

Role Name \*

Enabled
☒

Created

### Permissions Assigned

Erase Secret

### Permissions Unassigned

Access Offline Secrets on Mobile  
Add Secret  
Add Secret Custom Audit  
Administer Active Directory  
Administer Automatic Export  
Administer Backup  
Administer Configuration  
Administer Configuration Proxying  
Administer Configuration SAML  
Administer Configuration Security  
Administer Configuration Session Recording  
Administer Configuration Two Factor  
Administer Configuration Unlimited Admin  
Administer ConnectWise Integration  
Administer Create Application Accounts

<<

<

>

>>

Save

Cancel

The "Erase Secret" role permission allows users with the role to create secret erase requests and view secret erase administration pages.

- Go to **Admin > Groups**. The Groups tab of the User Management page appears:

Admin > User Management

Groups

Users

Audit

Manage Directory Groups

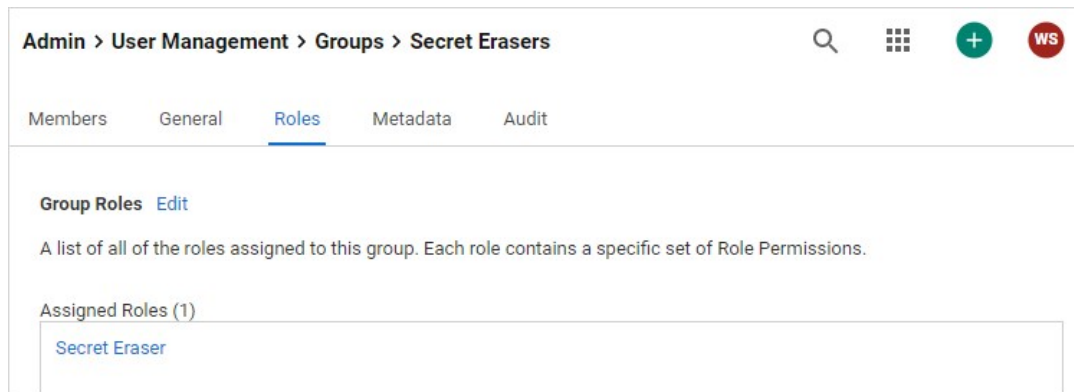
Create Group

78 Items
All Domains

Include Disabled

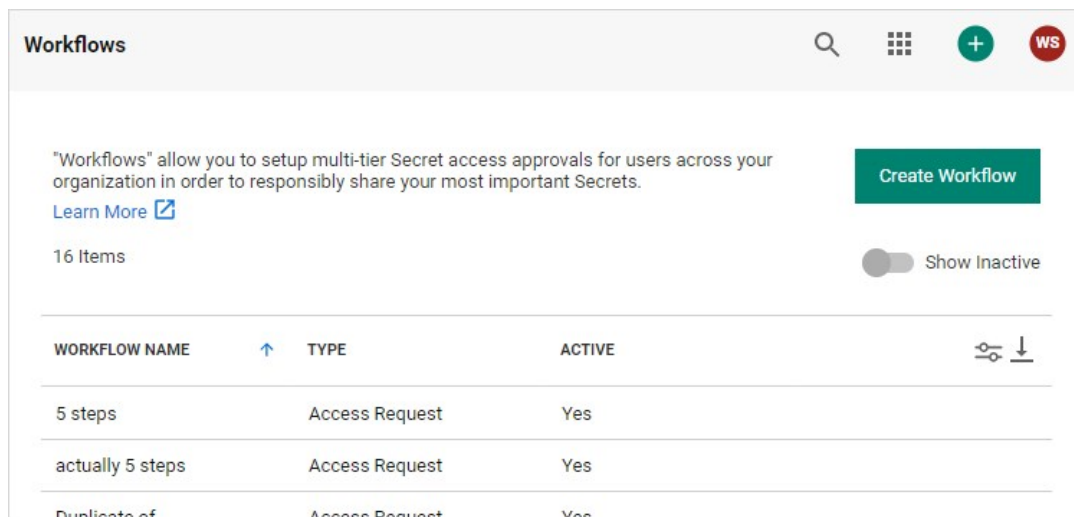
GROUP NAME	ENABLED	MEMBER COUNT	CREATED
(lol)	Yes	25	13 days, 1 hour ago
Access Control As...	Yes	0	1 year, 11 months ...
Account Operators	Yes	0	1 year, 11 months

- Create a group named "Secret Erasers" and give it the "Secret Eraser" role:



6. Click the **Members** tab to add yourself to the **Secret Erasers** group.

7. Go to **Admin > Workflows**:



8. Create a "Secret Erase Requests" workflow template, assigning it the Secret Erase Request type. The Designer tab for the new workflow appears:

Workflows > Secret Erase Requests

WS

Duplicate

Deactivate

Designer

Audit

Workflow Designer

Workflow Type

Secret Erase

Name \*

Secret Erase Requests

Description

Active

☒

- Assign one or more users or groups as approvers by typing each in the search text box in the **Add Groups / Users** section and then clicking your choice when it appears. It then appears in the Approvers list box.

**Note:** We chose to have the approvers be the same group as those that can make the requests, but you can choose any groups or users you like or make a group just for approvals. The important thing is the same *user* cannot both make the request and approve it—that way, a single person cannot make an irreversible, potentially very harmful, mistake.

- Click the **Save** button. The result looks like this:

Workflows > Secret Erase Requests

[Designer](#)
[Audit](#)

Workflow Designer [Edit](#)

Workflow Type	Secret Erase
Name *	Secret Erase Request
Description	None
Active	Yes

Step 1

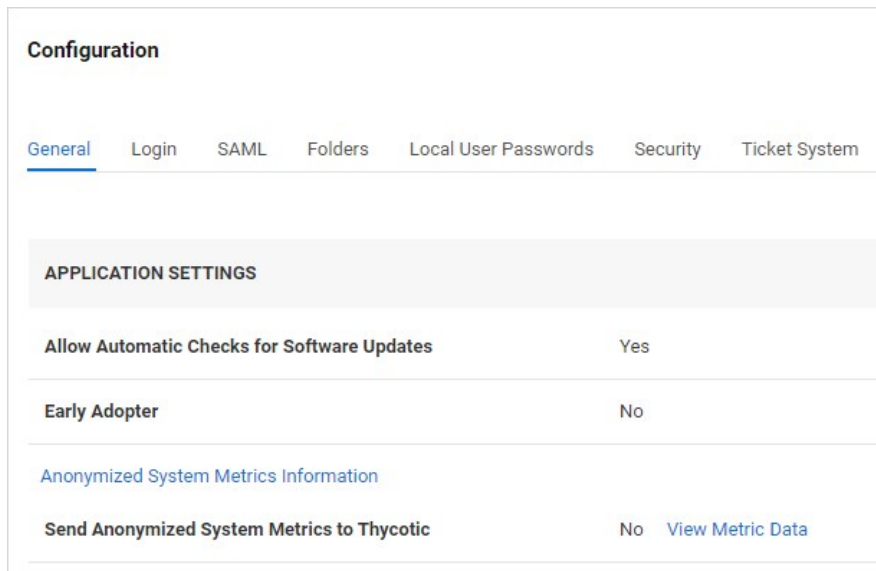
Name	Step 1
------	--------

Approvers

[Secret Erasers](#)

Number of approvers required	1
If approved	Approve The Request

11. Go to **Admin > Configuration:**



**Configuration**

General Login SAML Folders Local User Passwords Security Ticket System

**APPLICATION SETTINGS**

Allow Automatic Checks for Software Updates	Yes
Early Adopter	No
<a href="#">Anonymized System Metrics Information</a>	
Send Anonymized System Metrics to Thycotic	No <a href="#">View Metric Data</a>

12. Click the **Security** tab.
13. Click the **Edit** button at the bottom of the page. The page becomes editable.
14. Click to select the **Enable Secret Erase** check box in the **Secret Erase** section. The Secret erase Workflow dropdown list appears:



**SECRET ERASE**

Enable Secret Erase	<input checked="" type="checkbox"/>
Secret Erase Workflow	< None > ▼

 Save  Cancel

15. Click the **Secret Erase Workflow** dropdown list and select **Secret Erase Request**.
16. Click the **Save** button. Secret Erase is now set up.

## Task 2: Erasing a Secret

1. Ensure the following requirements are met for the secret you intend to erase—ensure the secret:
  - Is inactive
  - Is owned by you
  - Does not have a pending secret erase request
  - Is not double-locked
  - Is not checked out by another user
  - Is not a discovery secret
  - Is not a domain sync secret

- For purposes of this instruction, create a secret for testing in your personal folder. For now, do not use an existing one to ensure all the requirements are met.
- You can erase the secret via a dashboard bulk operation or from the **Options** button on the **General** tab of the secret itself. For a bulk operation, erase is accessed by the **More Bulk Options** button. **Erase Secrets** is in the **Security** section of the **More Bulk Options** popup. See [Running Dashboard Bulk Operations](#).

**Note:** If the "Erase Secrets" link does not appear in the Security section (when erasing from the dashboard) or "Erase" is not available on the Option button (when erasing from the General tab) you may have not properly configured secret erase (see Task 1) or the secret might not meet one of the requirements above.

- When you click the **Erase Secrets** link, the Erase Secrets popup appears:

Erase Secrets

Permanently delete all data from the selected Secrets.

Deletion will occur once the Erase After time has passed.

Secrets Selected

1

Erase After Date \*

7/15/2021

2:30 PM

Reason \*

Cancel

Erase

Here, you are essentially setting up a erase secrets request. The access request is sent to the users or user group you designated earlier.

- Use the calendar and time widgets to set the **Erase After Date**. It must be minimum of 24 hours away to give the erase secrets request time to process. If you set it to less than that, you cannot continue the process.
- Type your reasoning for permanently erasing the secret or secrets in the **Reason** text box. This is not tedium—the granter will need this to decide whether to let you take this irreversible, destructive action. Specifically, explain why a deactivation is not sufficient.
- Click the **Erase** button. A confirmation popup appears:

### Confirm Secret Erase

You have selected 1 Secret to erase.

This will delete all data from the selected Secrets.

**ERASED SECRETS CANNOT BE RESTORED.**

CancelErase Secrets Forever

8. Pause a second, and make sure you are sure.
9. Click the **Erase Secrets Forever** button.
10. When the erase request is approved, the secret or secrets will be erased by an automated process after the "erase after" date and time arrives.

## Overriding the Secret Template's Password Requirements

All secrets inherit a set of password requirements (see [Template Password Requirements](#)) from their parent secret template. After you create a secret, you can choose to use a different password requirement for this one secret, which leaves other secrets based on the template as they were. To choose a different password requirement for the secret:

1. Navigate to the secret **View** page by searching or drilling down the folder tree.
2. Click the secret to open the secret's page.
3. Click the **Security** tab.
4. Click the **Edit** Link in the **Password Requirements** subsection in the **Other Security** section. The Edit Password popup appears.
5. Click the Password Requirement dropdown list to select the password requirement you desire.
6. Click the **Save** button.



## Setting Up Password Masking

Password masking prevents over-the-shoulder viewing of your passwords by a casual observer (passwords show as \*\*\*\*\*). For security, the number of asterisks does not relate to the length of the password.

As an administrator, you can force all the secret password text-entry fields in the system when viewed to be masked. To do this, enable the **Force Password Masking** setting in the **Configuration** settings. Only secret text-entry fields marked as a password text-entry field on the secret template is masked.

There is also a user preference setting that forces password masking on all secret password text-entry fields viewed by the user. This Mask passwords when viewing secrets setting is found in the **Profile > Preference** section for each user. If the configuration setting discussed above is enabled, this user preference setting is overridden and cannot be disabled.

## Sharing Secrets

Sharing passwords is crucial for information technology teams. Due to the sensitive nature of sharing secure information, Secret Server ensures shared passwords are tracked and guarded.

### Permissions

There are three permission levels to choose from when sharing secrets with another user or group:

- **View:** User may see all secret data, such as username and password, and metadata, such as permissions, auditing, history, and security settings.
- **Edit:** User may edit the secret data. Also allows users to move the secret to another folder unless the Inherit Permissions from Folder setting is turned on, in which case the user needs Owner permissions to move the secret.
- **List:** User may see the secret in a list, such as a list returned by running a search, but not to view any more details about a secret or edit it.
- **Owner:** User may change all the secret's metadata.

**Note:** Password text-entry fields are not visible if a secret has a launcher and the Hide Launcher Password setting is on or the user does not have the View Launcher Password role permission. See the table below.

Secrets can be shared with either groups or individual users. The Secret Sharing section allows secrets to be configured for access.

### Password Visibility

Password visibility in the password text box depends on secret access permission, role permissions, and secret security policy settings. The following table shows the possible combinations and their password visibility result.

**Table:** Password Visibility Determinants

Owner	No	On	No
Owner	Yes	On	<b>Yes</b>
Owner	Yes	Off	<b>Yes</b>
Owner	No	Off	<b>Yes</b>
Edit	Yes	On	No
Edit	No	On	No
Edit	Yes	Off	<b>Yes</b>
Edit	No	Off	<b>Yes</b>
View	Yes	On	No
View	No	On	No
View	No	Off	No

View	Yes	Off	<b>Yes</b>
List	Yes	On	No
List	No	On	No
List	Yes	Off	No
List	No	Off	No

## Procedure

To add or remove secret sharing:

**Note:** To simplify the sharing process, new secrets automatically inherit the settings from the folder they are stored in. That is, we enable the **Inherit Permissions from Folder** check box on the **Sharing Edit** page by default, so secrets inherit all the parent folders' sharing settings. As long as this check box is selected, you cannot set the permissions for the secret. For more on folder security, see the [Folders](#) section.

1. [View the secret](#) you want to share.
2. Click the **Sharing** tab.

General		Security	Audit	RPC	Dependencies	Sharing	Settings	Options ▼		
<div>SHARE SECRET <span>Edit</span></div> <div> Inherit Permissions from folder <div>No</div> </div> <div>SHARED WITH</div> <table border="1"> <tr> <td>Will</td> <td>Owner</td> </tr> </table>									Will	Owner
Will	Owner									

3. Click the **Edit** link. The page becomes editable:

**SHARE SECRET**

☐ Inherit Permissions from folder

SHARED WITH		
Will	Owner ▼	<a href="#">Remove</a>

**Add Groups / Users**

Search for groups or users 🔍

Cancel Save

4. Click the **Remove** link next to any share you want to delete.
5. Type any user or group you want to share with in the **Add Groups / Users** search text box.
6. When the user or group appears in the dropdown list, click to select it. The user or group appears in the **Shared with** table.
7. Click the unlabeled permission dropdown list box to select the desired permission.
8. Repeat the process for additional users or groups.
9. Click the **Save** button to commit the changes.

You can also modify sharing settings for users or groups that already have sharing enabled for the secret. If a user or group is not displayed, they do not have access to the secret.

## Viewing Secrets

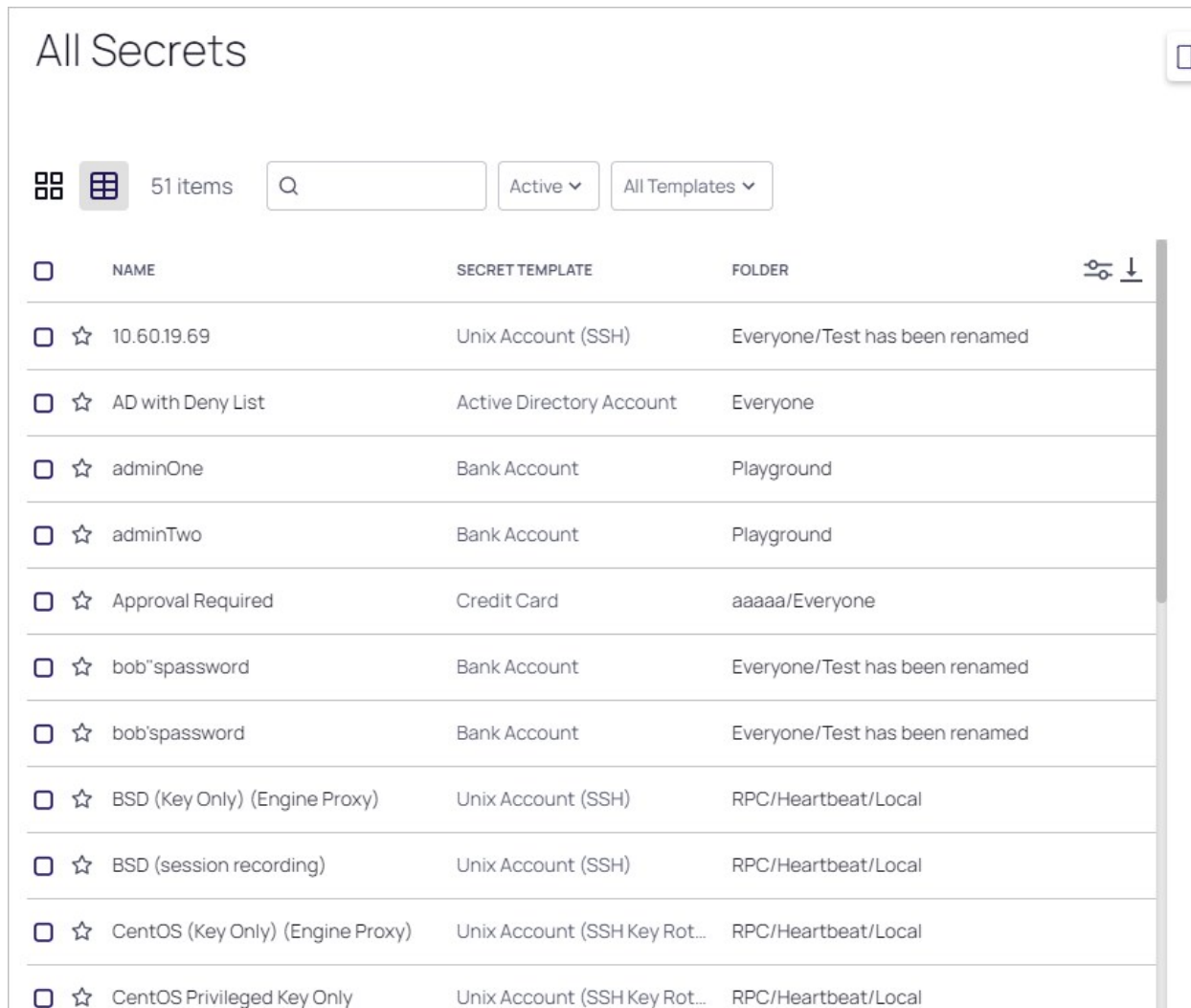
To view the information contained in a secret:

1. Locate the desired secret in one of these ways:
  - On the main menu, drill down the folders tree to select the secret.
  - Click the **Secret** menu item on the main menu and find the secret in the **All Secrets** table. You can filter the list or click the magnifying glass icon to search for the secret.
2. Click on the secret's name link. The secret's view page opens to the General tab.
3. Click the desired tab to view specific information. For example, click the General tab and go to the Expiration and Heartbeat section to see if the secret's password has expired and what its expiration interval is. You can check the history of the secret by clicking the Audit tab.
4. [Edit the secret](#) if desired.


## Searching for Secrets

To search for secrets:

1. Click the **Secrets** menu item in the main menu. The All Secrets page appears:



<input type="checkbox"/>	NAME	SECRET TEMPLATE	FOLDER
<input type="checkbox"/> ☆	10.60.19.69	Unix Account (SSH)	Everyone/Test has been renamed
<input type="checkbox"/> ☆	AD with Deny List	Active Directory Account	Everyone
<input type="checkbox"/> ☆	adminOne	Bank Account	Playground
<input type="checkbox"/> ☆	adminTwo	Bank Account	Playground
<input type="checkbox"/> ☆	Approval Required	Credit Card	aaaaa/Everyone
<input type="checkbox"/> ☆	bob'spassword	Bank Account	Everyone/Test has been renamed
<input type="checkbox"/> ☆	bob'spassword	Bank Account	Everyone/Test has been renamed
<input type="checkbox"/> ☆	BSD (Key Only) (Engine Proxy)	Unix Account (SSH)	RPC/Heartbeat/Local
<input type="checkbox"/> ☆	BSD (session recording)	Unix Account (SSH)	RPC/Heartbeat/Local
<input type="checkbox"/> ☆	CentOS (Key Only) (Engine Proxy)	Unix Account (SSH Key Rot...	RPC/Heartbeat/Local
<input type="checkbox"/> ☆	CentOS Privileged Key Only	Unix Account (SSH Key Rot...	RPC/Heartbeat/Local

2. Type the secret name or other text in the unlabeled search text box at the top of the page.
3. Click the  button. The All Secrets table only displays matching secrets. Searches search for all text-entry fields that are configured as searchable on the secret's template if the extended search indexer is enabled.

**Important:** If the search indexer is not enabled, searches are only performed on the **Secret Name** text field.

## Search Indexer

The *search indexer* allows searching on all text-entry fields set to searchable on the template. To enable and configure the search indexer:

1. Click the **Admin** button on the main menu.
2. Click the > > icon to view the Admin slideout.
3. Type and then click Search Indexer in the Search text box. The Indexing Service page appears:

## Secret Search Indexer

[General](#)
[Log](#)

### Secret Search Indexer

Secret fields can be indexed to allow for better searching and to allow for searching against encrypted fields.

Enabled	Yes	<a href="#">Edit</a>
Index Mode	Standard	<a href="#">Edit</a>
Days to Keep Operational Logs	30	<a href="#">Edit</a>
Indexing Separators	<div> <div>.</div> <div>;</div> <div></div> <div>/</div> <div>\</div> <div>\t</div> <div>\n</div> <div>\r</div> <div>COMMA</div> </div> <div> <div>?</div> <div>!</div> <div>@</div> <div>#</div> <div>(</div> <div>)</div> <div>[</div> <div>]</div> <div>{</div> <div>}</div> <div>'</div> </div> <div> <div>"</div> </div>	<a href="#">Edit</a>

4. Click the **Edit** link next to it to ensure the **Enabled** check box is selected. Click **Save** in the popup if you changed anything.
5. Click the Edit link for the Index Mode. A popup appears:

## Edit Secret Search Indexer

### Index Mode

Standard or Extended index mode. Extended will yield better matches with searching but will take more time to reindex.

Standard

▼

Cancel

Save

6. Click the dropdown list to select either **Standard** or **Extended**:

- *Standard search mode* is the default and searches on whole words in a field value. For example, a field value of "My AWS Secret" would match when you search for *My AWS Secret*, *My*, or *Secret*.
- *Extended search mode* searches for whole words or a partial words by up to twelve characters. For example, a field value of "My AWS Secret" would match when you search for *My AWS Secret*, *My*, *Secret*, *WS*, or *ecret*. This is more useful, but may impact search performance and creates a larger index table.

**Note:** Indexing separators are used to split the text text-entry fields into search terms. By default, the separators are semi-colon, space, forward slash, back slash, tab (\t), new-line (\n), return (\r), and comma. Changes to the indexing separators require a full rebuild of the search index.

7. Click the **Save** button.

8. Click the Edit link to change the **Days to Keep Operational Logs** spinner to set the period to keep indexing-related logs that might contain PII. Secret Server automatically deletes logs older than that (in days).

9. Click the **Save** button. The Indexing Service page reappears, and the indexing begins in the background. Depending on the size of the Secret Server installation, it may take awhile. Progress is shown on the Progress bar.

10. If you changed the indexing separators, click the **Rebuild Now** link.



## Common Configuration Options

These are the configuration options that are common to every secret:

- **Convert Template:** Change which template is being used to store and display information in this Secret.
- **Copy Secret:** Create a duplicate copy of the secret, which may also be renamed and modified.
- **Delete:** Delete the secret.
- **Edit:** Edit the secret parameters.
- **Favorite:** Click the star from the Dashboard or check this box on the Secret View page to mark the Secret as a favorite. It then displays in the Favorite Secrets widget.
- **Folder:** Folder location of the secret. The secret inherits permissions of this folder, depending on the Default Secret Permissions setting in the Secret Server Configuration options.
- **Share:** Configure the sharing settings, or permissions, for the secret.
- **View Audit:** View the secret audit log to see which users have accessed the secret and the actions that have been performed.

## Advanced Configuration Options

These are the buttons, fields, and icons that are available for more advanced secrets:

- **Expire Now:** Expire the secret manually.
- **RDP Launcher Icon:** Click to open the Remote Desktop Protocol (RDP) Launcher. See further details in the Launcher section.
- **Run Heartbeat:** Initiate heartbeat, which attempts to verify that the secret credentials can authenticate.
- **Site:** Edit the secret to set the distributed engine site. This determines where password changing, heartbeat, and proxied sessions run from.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret expiration is a core Secret Server feature. Any template can be set to expire within a fixed time interval. For a secret to expire, a text field must be selected as the target of the expiration. For example, a secret template for Active Directory accounts might require a change on the password text field every 90 days. If the password remains unchanged past the length of time specified, that secret has expired and appears in the Expired Secrets panel on either the Dashboard's Expired secrets widget or the Home page.

Secret expiration provides additional security by reminding users when sensitive data requires review. This assists in meeting compliance requirements that mandate certain passwords be regularly changed. When expiration is combined with RPC, Secret Server can completely automate the process of regularly changing entire sets of passwords to meet security needs.

## Forcing Expirations

To force expiration:

1. Navigate to the **Secret View** page for the desired secret.
2. Click the **Expire Now** button. This forces the secret to expire immediately regardless of the interval setting. The expiration date displays "Expiration Forced."

## Resetting Expired Secrets

To reset an expired secret, you must change the text field that has expired and is required to change. For example, if the text field set to expire is the password text field and the current password is "asdf," then a change to "jklh" resets the expiration interval and thus removes the expiration text on the Secret View page.

If you do not know which text field is set to expire:

1. Go to the secret template that the secret was created from.
2. Navigate to **Admin > Secret Template**.
3. Select the template.
4. Click the **Edit** button.
5. On the next page, click the **Change** link. In the **Change Required On** text box you can see the text field that is set to expire.

## Setting up Secret Templates for Secret Expiration

To set up expiration on a secret, you must first enable expiration on the template from which the secret is created.

To enable secret expiration for a secret template:

1. Navigate to **Admin > Secret Templates**.
2. On the **Secret Templates** page, click the template name. The page for that template appears.
3. Scroll down to the **Template Expiration** section.
4. Click the **Edit** button.
5. On the **Secret Template Designer** page, click on the **Change** link. The **Expiration Enabled?** check box appears.
6. Click to select the check box. Two more fields appear.
7. Type the number of days desired in the **Days until Expiration** text box.
8. Click the Change Required on dropdown list to select which parameter you want updated upon expiration. Your choices are:
  - Computer
  - Domain
  - My Server List
  - Password
  - Server
  - Username
9. Click the **Save** button.

**Note:** You can override the interval setting for individual secrets.

**Note:** Enabling expiration for a template enables expiration for all the secrets that were created using that template.

## Setting up Secrets

Once you enable expiration for the template, expiration is also enabled for secrets that were created using that template as well as secrets created in the future. The Expiration tab appears on the Secret View page and requires the user to have Owner permission on the secret.

To set a custom expiration at the secret level, you adjust the expiration interval for the secret by clicking the **Expiration** tab in the **Secret View** page. There, you can set the secret to expire using the template settings (default), a custom interval, or a specific date in the future.

The Secret Navigation Slideout is a set of useful links to secret. Its tab appears on the right side of all top-level pages:



Click the tab and the slideout appears:

⋮	☆	Favorites	▼
⋮	🕒	Recent	▼
⋮	👑	Most Used Secrets	▼
⋮	🔗	Shared With Me	▼

There are four dropdowns:

**Favorites**

These are the secrets you set as favorites by clicking the star icon on the secret's row on the All Secrets table.

**Dropdown Quick List**

When you click the dropdown, you see a list of your favorite secrets:

⋮	☆	Favorites	^
00 - Use Custom Ticketing System (PowerShell) 009	★	▼	
\Secret Workflow\Ticket System\Custom Ticketing System (PowerShell)			
00 - Use Custom Ticketing System (PowerShell) 010	★	▼	
\Secret Workflow\Ticket System\Custom Ticketing System (PowerShell)			

The initial view shows the folder path to the secret and a "favorite" toggle icon. You may need to hover over the blank space to see an unselected toggle.

**Note:** Some changes may require you to refresh the list by clicking the stacked dots icon.

Each list item has its own dropdown. When you click it, a set of information about the secret appears, including a list of users or roles with access to (shared with) the secret.

**Note:** You may also have to enter a comment or check out the secret.

Most of the datums can be copied with a single click of the copy icon next to each. You can hover the mouse pointer over the "Shared with" list to see the type of access for that user or role, or you can click "See All" to see the entire list.

Favorites Page

Alternatively, in the slideout, you can click the Favorites title to navigate to the full Favorites page.

Favorites

3 items

Q

Active

All Templates

	NAME	SECRET TEMPLATE	FOLDER	
<input type="checkbox"/>	★ 00 - Use Custom Ticketing System ...	Simple Template	Sec.../Custom Ticketin	
<input type="checkbox"/>	★ 00 - Use Custom Ticketing System ...	Simple Template	Sec.../Custom Ticketin	
<input type="checkbox"/>	★ GCP Rotate For Me Service Account	Google IAM Service Accou...	RPC/Heartbeat/GCP IA	

Recent

These are the secrets you have opened recently. The dropdown provided for each list item is exactly the same as that provided in "favorites," as is accessing the Recent page via clicking the title.

Most Used Secrets

These are the secrets you have opened the most often. The dropdown provided for each list item is nearly the same as that provided in "favorites," as is accessing the Recent page via clicking the title. The only difference is each list item states the time since last access.

Shared with Me

These are the secrets others have shared with you. No folder path is provided.

The dropdown provided for each list item provides a shortcut to request approval for the secret:

Shared Secret 1

Shared Secret 1

This Secret requires approval to access.

Request Approval



Sharing passwords is crucial for information technology teams. Due to the sensitive nature of sharing secure information, Secret Server ensures shared passwords are tracked and guarded via permissions.

**Note:** Depending on your configuration, folder settings can affect the permissions of secrets contained in that folder (and subfolders). Secrets and folders are not visible to users that do not have at least View (can see details) or list (can see a list of secrets) permission. See [Secret Folder Permissions](#) for more information.

**Note:** To simplify sharing, new secrets automatically inherit the settings from the folder they are stored in. That is, we enable the "Inherit Permissions from Folder" check box on the "Sharing Edit" page by default, so secrets inherit all the parent folders' sharing settings. As long as this check box is selected, you cannot set the permissions for the secret. For more on folder security, see the [Folders](#) section.

There are four permission levels when sharing secrets with another user or group:

- **View:** User may see all secret data, such as username and password, and metadata, such as permissions, auditing, history, and security settings.
- **Edit:** User may edit the secret data. Also allows users to move the secret to another folder unless the Inherit Permissions from Folder setting is turned on, in which case the user needs Owner permissions to move the secret.
- **List:** User may see the secret in a list, such as a list returned by running a search, but not to view any more details about a secret or edit it.
- **Owner:** User may change all the secret's metadata.

**Note:** Password text-entry fields are not visible if a secret has a launcher and the Hide Launcher Password setting is on or the user does not have the View Launcher Password role permission.

Secrets can be shared with either groups or individual users. The Secret Sharing section allows secrets to be configured for access.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Secret Dependencies Tab

The settings inside the Dependencies tab are used for secrets that have RPC enabled.

See [Manually Adding Dependencies](#) for details.

## Secret Expiration Tab

Inside the Expiration tab, the expiration period can be modified. The following options are available:

- **Template Interval:** Default expiration period configured for new secrets based on the current template.
- **Custom Interval:** A custom expiration period in days.
- **Custom Date:** A custom expiration date in month/day/year format.

**Note:** See [Secret Expiration](#) for details.

## Secret Launcher Tab

The Launcher tab appears for secrets that use either a custom launcher or Web launcher.

If a custom launcher is associated with a secret template, a secret owner can configure associated secrets or a privileged secret to run the launcher process. The associated secret can be tied in to the command line parameters on the custom launcher, and the privileged secret is the identity that kicks off the launcher process.

If a Web launcher is associated with a secret template, the launcher tab displays how the Web launcher is configured for that secret. The following options are available:

- **Edit Fields:** Modify which secret text-entry fields are mapped to the HTML input controls on the target website.
- **Reconfigure Web Launcher:** Reset the Web launcher configuration.
- **Test Launcher:** Test the current Web Launcher configuration.
- **Use Web Password Filler:** Use the Web password filler rather than the Web launcher.

**Note:** See [Web Launcher](#) for details.

## Secret Personalize Tab

These settings only apply to the user who is editing the settings. They do not apply to the other users who have View, Edit, or Owner permission to the secret.

To use the settings in the Email Notifications section, you must have email configured correctly in your configuration settings. You also need a valid email address entered for each user account to use these settings. This can be set in the **Administration > Users** section.

The following email notification settings are available:

- **Send Email When Changed:** Email the user when the secret is edited by any user.
- **Send Email When Heartbeat Fails:** Email the user when a heartbeat function fails for the secret. The email contains the secret name, error code and details.
- **Send Email When Viewed:** Email the user when the secret is viewed by any user.

The Personalize tab also contains settings that pertain to the type of launcher configured for a secret. If the launcher type is Remote Desktop Protocol (RDP), the following settings are available:

- **Connect to Console:** Remote Desktop (RD) may connect to the console session.
- **Allow Access to Printers:** RD may access local printers.
- **Allow Access to Drives:** RD may access drives connected to the local machine.
- **Allow Access to Clipboard:** RD may access the clipboard of the local machine.
- **Use Custom Window Size:** Users may specify custom window height and width. Use Preferences refer to the user's settings under **Profile > Preferences** in the **Launcher** tab.

Users may enable or disable these settings or to defer to what is configured in their user settings by selecting **Use Preferences**.

## Secret RPC Tab

The settings inside the Remote Password Changing tab are used for secrets that are Remote Password Changing (RPC) enabled:

- **Auto Change:** Enable or disable auto change for the secret.
- **Next Password:** Specify the next password

**Note:** See [Remote Password Changing](#) for details.

## Secret Security Tab

The Security tab contains settings that can be enabled to increase security for a secret. The settings listed below may or may not be visible, depending on your configuration settings:

### Checkout

- **Require Check Out:** Only one user at a time has access to a secret. When enabled users must checkout a secret before they can access it. Checkout prevents other users from accessing the Secret while it is checked out. See [Secret Checkout](#) for details.
- **Check Out Interval:** The default time a checkout lasts.

### Approval

**Require Approval Type:** Require users to get approval before accessing this secret. Define whether standard users, editors, or everyone has to have approval and the workflow through which approval occurs.

### Password Requirements

- Defines which password rules apply to password fields on this secret. By default, a secret uses the password requirements as defined on the secret template and can be overridden per secret as needed.
- **Validation:** Lists requirements from the template.
- **Password:** Either confirms the default or lists the chosen override.
- **Private Key Passphrase:** The password required to access a private key. Either confirms the default or lists the chosen override.

### Application Hardening

Application hardening provides additional checks to ensure user records were not tampered with. If a user's record was modified by someone other than Secret Server, that user is blocked from logging in. We provide supporting event subscriptions that send alerts if tampering is detected. This feature is only available for Secret Server On-Premises.

### Other Security

- **Require Comment:** Users must enter a comment before being granted access to view the secret. The comment is stored in the audit log for that secret.
- **Enable DoubleLock:** User must enter a doubleLock password to decrypt and view a secret.
- **Enable Proxy:** Enable or disable proxying. When enabled, SSH and RDP launcher traffic passes through Secret Server.
- **Enable Session Recording:** Record the Launcher session. This applies to secrets with a launcher associated with the secret template.
- **Viewing Password Requires Edit:** To view the password, the user must have at least edit permission.



## Secret Server Cloud

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

This section contains information that is exclusive to Secret Server Cloud.

**Warning:** Managing your own encryption key or using a third-party provider, such as AWS KMS, has very serious ramifications if not carefully handled—you can lose access to your Secret Server data. When using AWS KMS, Secret Server requires access to the AWS KMS key for the website to be accessible and secrets to be available. If the AWS KMS key is deleted, Secret Server becomes permanently unable to decrypt any data—all access to secrets is lost. If the credentials that Secret Server uses to access the AWS KMS key are blocked or disabled, the Secret Server website becomes inaccessible until the prior credentials are restored by the customer.

## Introduction

### Overview

Secret Server protects your secrets using a master encryption key, as well as an additional intermediate encryption key that is unique for each secret. These effectively act as internal passwords that Secret Server itself needs to unlock your data, for example any time you view or update a secret.

Key Management in Secret Server Cloud (SSC) allows you to add an additional layer of encryption using a third-party provider to protect these encryption keys for added protection and control. To do this, you must first set up your own encryption key with a third party that you fully control, and then provide Secret Server limited access to it. This external encryption key is used to protect the Secret Server encryption keys. You can revoke Secret Server's access at any time if the need arises, rendering Secrets unusable.

**Important:** Once enabled, beware that if you delete your external third-party encryption key, or the credentials you gave Secret Server no longer work. *You will not be able to access your existing Secrets, and even Delinea will not be able to help!*

You can change your key management configuration through Secret Server's Web interface or by using the REST API. If key management has already been enabled, you can switch to a new configuration or disable key management completely. To make any change, your existing key management configuration **must still be valid**, so your secrets and the master encryption keys can be converted to the new configuration. Your new settings are validated before they can be saved.

Secret Server Cloud currently supports Amazon's Key Management Service.

### Amazon Key Management Service

Key Management Service (KMS) is a managed service provided by AWS that allows you to create, manage and use encryption keys for your applications and services. With KMS, you can create symmetric keys or asymmetric keys to encrypt and decrypt data. These keys can be used to protect sensitive data such as passwords, credit card numbers, or personally identifiable information (PII).

A KMS (Key Management Service) key is a cryptographic key used to encrypt and decrypt data stored in AWS (Amazon Web Services) services such as S3, EBS, or RDS. KMS keys are stored securely in the AWS Cloud, and you can control access to them by using IAM (Identity and Access Management) policies. You can also use KMS to audit key usage and generate key usage reports.

## Configuring Key Management

### Overview

To enable key management, you will first create an encryption key with your third-party provider, then an API account that Secret Server will use in order to access the key. After the external encryption key is setup, you will update Secret Server with the details.

**Important:** Changing your key management settings will trigger "maintenance mode" and a secret key rotation that will re-encrypt all your secret keys. No one will be able to access secrets until the rotation finishes, and it must finish successfully before further key management changes can be made.

Navigate to Secret Server's key management page by clicking **Admin > All > Key Management**.

Here you can change your key management settings, as well as view the audit history showing all key management updates.

## Key Management Providers

SSC currently supports one provider, AWS Key Management Service. More providers may be added over time. Azure's KeyVault service is not a viable provider at this time due to slow speed limits when using strong encryption keys (such as 4096-bit RSA with HSM).

## AWS Key Management Services Pricing

Please see [AWS Key Management Service Pricing](#).

SSC requires one AWS Key ("CMK"), and the number of requests per month will vary depending on how often secrets are accessed.

## Procedure

**Important:** Changing your key management settings triggers SSC maintenance mode and a secret key rotation that re-encrypts (or de-encrypts) all your secret keys! No one can access secrets until the rotation finishes, and it must finish successfully before further key management changes can be made.

### Task 1: Setting up the Encryption Key and IAM User in AWS

1. Log into the AWS Console website at <https://console.aws.amazon.com/>.
2. Under **Services**, search for **IAM** (Identity and Access Management). This is where you will configure both your encryption key and an IAM user for Secret Server to use to access the encryption key.
3. Click the **Users** button on the left menu.
4. Click **Add User** button.
5. Type a name (such as *SecretServerCloud*) in the **User Name** text box.
6. Click to select the **Programmatic Access** check box in the **Access Type** section.
7. Click the **Next: Permissions** button (on the Permissions page, no special permissions are needed). The Permissions page appears.
8. Click the **Next: Tags** button. The Tags page appears.
9. Click the **Next: Review** button (on the Permissions page, no special permissions are needed). The Review page appears.
10. Click the **Create User** button. A Success page appears confirming the user was created. Both the access key ID and the secret access key appear (click the **Show** link).
11. Click the **Download .csv** button to save the credentials

**Important:** Be sure to **save both the access key ID and the secret access key!** If you lose them, you can never view the secret access key again. Even after you enter them in SSC, you cannot retrieve the secret access key.

12. Once the download completes, click the **Close** button.
13. Under **Services**, search for **Key Management Service**.
14. Click the **Customer managed keys** link in the left menu.
15. Click the **Create Key** button. The Configure Key page, the first page of the Create Key wizard, appears:

KMS > Customer managed keys > Create key

Step 1  
**Configure key**

---

Step 2  
Add labels

---

Step 3  
Define key administrative permissions

---

Step 4  
Define key usage permissions

---

Step 5  
Review

---

## Configure key

**Key type** [Help me choose](#)

☒ **Symmetric**  
A single key used for encrypting and decrypting data or generating and verifying HMAC codes

☐ **Asymmetric**  
A public and private key pair used for encrypting and decrypting data or signing and verifying messages

**Key usage** [Help me choose](#)

☒ **Encrypt and decrypt**  
Use the key only to encrypt and decrypt data.

☐ **Generate and verify MAC**  
Use the key only to generate and verify hash-based message authentication codes (HMAC).

► **Advanced options**

Cancel **Next**

- Ensure the **Key type** selection button is set to **Symmetric**.
- Ensure the **Key usage** selection button is set to **Encrypt and decrypt**.
- Click the **Next** button. The Add Labels page appears:

KMS > Customer managed keys > Create key

Step 1  
Configure key

Step 2  
**Add labels**

Step 3  
Define key administrative permissions

Step 4  
Define key usage permissions

Step 5  
Review

## Add labels

### Alias

You can change the alias at any time. [Learn more](#)

Alias

### Description - optional

You can change the description at any time.

Description - optional

### Tags - optional

You can use tags to categorize and identify your KMS keys and help you track your AWS costs. When you add tags to AWS resources, AWS generates a cost allocation report for each tag. [Learn more](#)

This key has no tags.

Add tag

You can add up to 50 more tags.

Cancel

Previous

Next

19. Type SecretServerCloud in the **Alias** text box.
20. (Optional) Type a description in the **Description** text box.
21. (Optional) Click the **Add** tab button to add KMS tags. Click the **Learn More** link for more about tags.
22. Click the **Next** button. The Define Key Administrative Permissions page appears:

KMS > Customer managed keys > Create key

Step 1  
Configure key

Step 2  
Add labels

Step 3  
**Define key administrative permissions**

Step 4  
Define key usage permissions

Step 5  
Review

## Define key administrative permissions

### Key administrators

Choose the IAM users and roles who can administer this key through the KMS API. You may need to add additional permissions for the users or roles to administer this key from this console. [Learn more](#)

< 1 >

<input type="checkbox"/>	Name ▾	Path ▾	Type ▾
<input type="checkbox"/>	SecretServerCloud-Key	/	User
<input type="checkbox"/>	AWSServiceRoleForSupport	/aws-service-role/support.amazonaws.com/	Role
<input type="checkbox"/>	AWSServiceRoleForTrustedAdvisor	/aws-service-role/trustedadvisor.amazonaws.com/	Role

### Key deletion

☒ Allow key administrators to delete this key.

Cancel

Previous

Next

Leave the page as is.

23. Click the **Next** button. The Define Key Usage Permissions page appears:

KMS > Customer managed keys > Create key

Step 1  
Configure key

Step 2  
Add labels

Step 3  
Define key administrative permissions

Step 4  
**Define key usage permissions**

Step 5  
Review

## Define key usage permissions

**This account**  
Select the IAM users and roles that can use the KMS key in cryptographic operations. [Learn more](#)

< 1 >

	Name	Path	Type
<input checked="" type="checkbox"/>	SecretServerCloud-Key	/	User
<input type="checkbox"/>	AWSServiceRoleForSupport	/aws-service-role/support.amazonaws.com/	Role
<input type="checkbox"/>	AWSServiceRoleForTrustedAdvisor	/aws-service-role/trustedadvisor.amazonaws.com/	Role

**Other AWS accounts**

Specify the AWS accounts that can use this key. Administrators of the accounts you specify are responsible for managing the permissions that allow their IAM users and roles to use this key. [Learn more](#)

Cancel Previous **Next**

24. Click to select the check box next to the SecretServerCloud-Key name in the table to give that user access to the key.

**Important:** Do **not** give access to the user you created earlier for SSC. It is unnecessary for Secret Server to have administrative access to the key.

25. Click the **Next** button. The Review page appears:

KMS > Customer managed keys > Create key

Step 1  
Configure key

Step 2  
Add labels

Step 3  
Define key administrative permissions

Step 4  
Define key usage permissions

Step 5  
**Review**

## Review

### Key configuration

Key type Symmetric	Key spec SYMMETRIC_DEFAULT	Key usage Encrypt and decrypt
Origin AWS KMS	Regionality Single-Region key	

**You cannot change the key configuration after the key is created.**

### Alias and description

Alias SecretServerCloud	Description Optional description here.
----------------------------	-------------------------------------------

### Tags

Key	Value
No data No tags to display	

### Key policy

To change this policy, return to previous steps or edit the text here.

```

1 {
2   "Id": "key-consolepolicy-3",
3   "Version": "2012-10-17",
4   "Statement": [
5     {
6       "Sid": "Enable IAM User Permissions",
7       "Effect": "Allow",
8       "Principal": {
9         "AWS": "*"
10      },
11      "Action": "kms:*",
12      "Resource": "*"
13    },
14    {
15      "Sid": "Allow use of the key",
  
```

Cancel Previous **Finish**

26. Ensure the settings are as desired.
27. Click the **Finish** button. The new key appears in your Encryption Keys list.
28. Click to select the new key in the list. The Summary section on the key's page appears.
29. Copy and save the contents of the read-only **ARN** text box. You will need it later.

**Note:** AWS supports automatically rotating this key every year. You can change that setting on this page in the **Key Rotation** section (select the "Rotate this Key every year" check box). Once rotated, the key management settings in Secret Server will not require further changes, and your existing secrets can still be accessed by the old encryption settings. However, only new secrets will be created under the new version of the encryption key, and you must perform a secret key rotation inside SSC if you want to update all secrets to use the new version of the AWS key.

**Note:** As a security best practice, we recommend performing a secret key rotation inside of SSC on a regular basis to refresh the



encryption keys on your Secrets. Go to **Admin > Configuration > Security**, and click **Rotate Secret Keys**.

## Task 2: Adding Encryption Key and User Details in Secret Server

1. In SSC, go to **Administration > Key Management**. The Key Management page appears.
2. Click the **Edit** button. The page becomes editable.
3. Click the **Key Management Type** dropdown list to select **Amazon KMS**.
4. Type your AWS key details that you saved earlier in the remaining four text boxes.
5. Click the **Save** button.

## Task 3: Secret Key Rotation

1. Once you save your changes, your new settings are validated and a secret key rotation is triggered.
2. View the progress of the rotation:
  1. Go to **Admin > Configuration**.
  2. Click the **Security** tab.
  3. Go to the **Key Rotation** section.
3. Later you can repeat the process to change the AWS encryption key, or you can select **None** for the **Key Management Type** to disable it completely.

## Secret Server Key Management via the REST API

SSC has a REST API for retrieving or updating your key management configuration. For details:

1. Log on your SSC instance.
2. Click the question mark icon in the top right corner and select **Secret Server REST API Guide**.
3. Click on the **Documentation for REST API** document link for your authentication style, normal tokens or Windows Integrated Authentication.
4. Search for **KeyManagement** to view that section of our API.

**Important:** When changed via the API, maintenance mode and a secret key rotation still occur.

## Overview

This topic contains an unedited log of changes written by developers. The intent is to quickly provide information, not polished prose. The log is a release notes supplement for a technical audience, not a replacement for the release notes.

**Note:** The line-item numbers are for internal tracking. They provide a unique reference when talking to Delinea support.

## Saturday, June 3, 2023

### Bug Fixes (15)

- 412112 - Corrected error that could occur when converting a Secret from a Secret Template with a file field to a Secret Template without one.
- 436208 - Fixed an issue where a secret template could be saved without RPC mappings configured.
- 461327 - Improvement: The PowerShell script timeout no longer defaults to 90 seconds. Instead, it now uses the value from the Event Pipelines Maximum Script Run Time (Minutes) setting in advanced configuration.
- 477807 - Fixed an issue where the API endpoint `api/v1/secrets//fields//` logged an audit that the password was displayed when the actual password was not returned to the user due to hide launcher password being enabled.
- 484847 - Fixed an issue where the SubscriptionName condition for a notification rule would display the event subscription ID instead. It now correctly uses the name when the user has the appropriate roles to list the subscriptions.
- 486876 - Fixed conditions that prevented users from being removed from a group due to the system incorrectly identifying that they would be unable to complete the same operation.
- 501435 - Corrected unique key constraint error for categorized lists that could occur very rarely.
- 502290 - Improvement: Added validation messages to password requirement rules for when password requirements are too complex to reliably generate a password.
- 503010 - Fixed an issue where all event subscriptions did not fire for secrets in subfolders of the target folder.
- 506363 - Fixed an issue with negative numbers exporting incorrectly when exporting a CSV.
- 508013 - Fixed an issue with secret search producing SQL errors for customers with a lot of secret templates.
- 509838 - IBM password tooltip background color adjusted
- 510446 - Fixed an issue where links on the Session Monitoring page while in grid mode would not correctly link to Secret Server Cloud with authentication.
- 511141 - Fixed an issue to improve Platform integration user sync if duplicate usernames were already in Secret Server.
- 511779 - Event notifications now show "Event Time" which is the time at which the event occurred.

### Improvements (13)

- 501153 - Improvement: Introduced a new Launch Secret role permission, which is needed to use launchers. This permission is automatically granted to roles with the View Secret permission, which previously controlled this behaviour.
- 508756 - Improvement: There is now a pending RPC screen and a timer that checks you back in, blocking seeing secret info indefinitely.
- 508758 - Improvement: Users can no longer access secrets that have failed processing a password change. Instead, they are shown a message stating the change failed.
- 508759 - Improvement: We now allow a secret owner with the Force Check In role permission when checking in to take ownership of a checkout session that is currently in a failed password change state. The existing checkout is ended, and a new checkout is created for the owner.
- 509354 - Removes External Mappings to other identity providers when the user has PII removed for that user.
- 509527 - Fixed issues with user and group syncing between Secret Server Cloud and Platform.
- 510401 - Improvement: Added a Managed field to the Discovery Network view to show when a discovery item is managed.

- 510684 - Fixed usability on specific UI areas for a better user experience.
- 510773 - Improvement: Discovery service accounts detail page now shows services that run as the directory account as well as the computers on which that service runs
- 510792 - Improvement: Added a Quick Access link to see all Secrets you currently have checked out.
- 510819 - Improvement: The new folder icon in the secret panel no longer shows if the user does not have the Administer Folders role permission.
- 511645 - Improvement: Added integration support for Platform users matching local SS users that do not have an @ in their name. If platform user is username@local or username@tenantname then the username portion will be used to match local users on the SS side.
- 511851 - Updated Createuser.aspx to redirect to the new user management.

## Tuesday, May 23, 2023

### Bug Fixes (3)

- 477780 - Fixed issue where LDAP sync via Distributed Engine would not work when the base DN was different from DC.
- 479769 - Added support for LDAP RFC2307 group membership, used in OpenLDAP.
- 510446 - Links on the Session Monitoring page while in grid mode now correctly link to Secret Server Cloud with authentication.

### Improvements (4)

- 509527 - Improvements to user and group syncing between Secret Server Cloud and Platform.
- 510089 - Under Secrets > Admin > Platform Integration and then the Logs tab, there is now more detailed information for why a specific user could not access Vault (Secret Server Cloud). Common Cases:
  - DuplicateUserMappedToDifferentProviderName - this user was initially setup to a different Platform source, the URL changed, or potentially a different userid (Provider Key) indicating the original use was deleted.
  - MaxLicensedUsersException - Vault has reached the number of licensed users so additional cannot be added.
- 510684 - Fixed usability on specific UI areas for better user experience.
- 510819 - The new folder icon in the secret panel no longer shows if the user does not have the "Administer Folders" role permission.

## Friday, May 12, 2023

### Bug Fixes (7)

- 502104 - The Platform opt-in modal now populates the platform region dropdown list when navigating between steps via the step headers.
- 504867 - Fixed an issue where DR email alerts were not being sent out.
- 508479 - The CSS Styles for the Platform Opt In Modal have been adjusted to align with Angular15.
- 509400 - SecretItemValueTransitionHistory.aspx has been removed and replaced with an API endpoint .
- 510008 - Extended fields are properly exported to csv.
- 508507 - Fixed an issue with Secret Template name validation message not being shown.
- 509974 - Fixed an issue with new Platform trials not creating Personal Folders in Secret Server.

### Improvements (5)

- 508760 - Within the details of the Syslog message, there will be a Username field with the value of the mapped username for the launcher.
- 508761 - Within the details of the Syslog message, there will be a Host field with the value of the mapped host for the launcher.

- 509475 - RPC heartbeat and password change log are now full screen instead of a dialog.
- 509947 - Passphrase can be configured as required for user public SSH keys.
- 508853 - Secret Server/Platform: Distributed Engines no longer need Directory Services enabled to perform Discovery.

## Saturday, May 6, 2023

### Bug Fixes (20)

- 446416 - Fixed an issue where an HSM could not be disabled.
- 461669 - Newly added columns to most grids will now default to 80px width
- 462179 - Updated the advanced session recording agent version label on the agent issues page to correctly state that it is the minimum required version, not the current version.
- 465660 - Fixed issue with the password compliance report updating very slowly or not refreshing after either a template or direct PasswordRequirement password field change.
- 470505 - Fixed issue with Session Connector where if switching windows, keystrokes can be missing from the session monitor.
- 481850 - Fixed an issue where OpenLDAP directory services group-search filter was not working.
- 490213 - Secret template names are now required to be unique.
- 490565 - Fixed an issue where trying to use autoCheckout and secretPath in the API could result in the call failing.
- 491424 - Addressed an issue where "additional" email addresses on an Event Subscription were sometimes not respected.
- 491675 - Fixed an issue where event pipeline email notifications were not sent if the email task had an email template selected.
- 501129 - A bug was fixed where certain advanced syslog options could not be saved unless the server or port was changed as well.
- 501142 - Fixed a bug where the Secret Name was not triggering a Viewed Edit audit.
- 501226 - Fixed a bug where the Event Pipeline Send Email Task was not getting the correct email template. Removed the notification rule requirement and fix the issue where the activity would not complete after a Send Email Task.
- 501227 - Fixed an issue where the pipeline activity status stopped updating after the "Send to Email" task
- 503652 - Fixed replication to allow duplicate names to be replicated individually during disaster recovery. Groups with the same name will still be consolidated during replication when they share values for AD Guid, IsPersonal, IsPlatform, and DomainId.
- 504130 - Fixed an issue where Secret PasswordComplianceCode was not updated after password field/PasswordReq change.
- 504453 - Permissions for root personal folder for Everyone group are replicated as part of Disaster Recovery.
- 504867 - Fixed an issue where DR email alerts were not being sent out.
- 505028 - RDProxy.MillisecondsToWaitCleanup is now correctly localized.
- 509144 - Fixed links to various areas within Secret Server from Platform.

### Improvements (5)

- 489422 - Addressed an issue where Thales Luna HSM deprecated CKM\_RSA\_PKCS in their newer firmwares.
- 491192 - Added a knowledge base link for Platform Regions as part of the Platform Optin Experience
- 491757 - Added a setting on the Platform Integration page that allows the "Platform Login" option on the login page to be hidden.
- 502767 - Updated the Disaster Recovery log summary to more accurately display status numbers.
- 502936 - Updated Disaster Recovery to transmit all file attachments when no folder filters are applied.
- 504529 - Disaster Recovery replication summary now shows the duration.
- 505934 - Angular asset files now cache bust, preventing out-of-date files from running against newer back end code following an upgrade.
- 506255 - Modified text that displays during provisioning to more clearly indicate customers should start with their Platform login.
- 507903 - This fix prevents the ProtoDeletedFoldersProvider from running on initial replication.
- 508509 - Password changer list page is now used and legacy page removed.
- 508645 - Grid alignment and row spacing is now more consistent.

## Wednesday, April 19, 2023

## Bug Fixes (6)

- 471317 - When searching you should be able to find all items under your current levels. However when looking at a level you only see that level.
- 482250 - Bulk move to folder now disables on submit.
- 503198 - CSS issue fixed for browse all folders text wrapping.
- 505054 - Addressed an issue where activating an Engine and assigning it to a new Site in the same step could result in an error.
- 503285 - Get Folders API call once again returns all decedents. To retrieve direct children only, use the new LimitToDirectDescendents parameter.
- 504385 - Unable to Check the Templates in Allowable Folder Templates Modal

## Improvements (5)

- 503363 - Upgrade to Angular 15
- 487132 - Unlimited admin page in configuration preview now has a link to open the unlimited admin audit.
- 491967 - Filter for discovery rule in network view functionality
- 502829 - Standardize login failure messages for various types of login attempts.
- 503925 - Configuration Items Appeared Twice in the new Configuration Preview

## Friday, April 14, 2023

### Bug Fixes (8)

- 479769 - Added support for LDAP RFC2307 group membership, used in OpenLDAP.
- 490228 - Data Retention under PII will no longer remove monitored recordings or user audits that are related to monitored recordings. Data Retention under Database Size Management will still remove monitored recordings and related user audit records.
- 502913 - The "Send Test Email" button can now function in read only mode.
- 488581 - SSH Proxy 'Tunnel RDP Connections' Degradation fix
- 501346 - Powershell Dependency Changer Arguments were not being passed into the script
- 503396 - The Preserve Client SSH Process should appear for process custom launchers
- 503714 - Show friendly error message launching a secret With Jumpbox Route with RDP that it is missing a SSH launcher
- 504491 - Bulk Action Applied to all Secrets when Select All is Checked but Template or Folder Filter is Applied.

### Improvements (4)

- 500822 - An Advanced Configuration setting was added (default 3 hours) so that a long-running DR process will detect the configured amount of elapsed time and end the DR process, forcing the end user to run it again manually
- 486971 - Web Password Filler needs the ability to retrieve secrets filtered by templates that have a URL field or URL List field
- 491208 - If Platform is enabled, give an extra user license for the Platform admin user, and if disable don't count native platform users against the license count.
- 503650 - Give hybrid status to Platform CloudAdmin

## Wednesday, April 5, 2023

### Bug Fixes (10)

- 474639 - When accessing certain URLs, the system presents a default error page instead of a more technical error.
- 477322 - In the secret policy, the SSH command section no longer features table header controls for download and full screen.
- 479424 - The secret audit grid date displays in the selected timezone when the server time differs from the client time.
- 480832 - The secret session search date now appears in the selected timezone in both the grid and card, and the grid includes a timezone picker when relevant.
- 481175 - When editing secret template fields of the file type, the drop-down options no longer appear.
- 486679 - Pressing the Alt button by the CM link changes the "Create new Secret" page.

- 501098 - The Test Syslog button is located in the Configuration Preview.
- 502594 - If more than 1,000 folders are accessed and UAM is enabled, the folder tree will not disappear.
- 502670 - Creating a new onboarding rule no longer requires a Client SDK IP address. The "Details" field has been renamed to "Allowed IP Ranges."
- 503520 - The secret search in the grid now utilizes the v2 endpoint for template filtering.

## Tuesday, March 28, 2023

### Bug Fixes (1)

- 502132 - Left nav max folders default limit increased to 1,000. Setting dialog added to set the user preferred limit, folder browser now loads 100 records at a time on scroll instead of just 30.

## Friday, March 24, 2023

### Bug Fixes (19)

- 442059 - The column folderName is now bound to the secret grid instead of folderId as this allows folderName to be the value that is downloaded instead of folderId.
- 470930 - Discovery logs will now export more than 250 records
- 471679 - Logging into Terminal with an Azure Active Directory account using SSH Key Integration is now possible. AAD logins to Terminal via password cannot be done.
- 486557 - Addressed an issue with Disaster Recovery replication where replicated Custom Launchers would not be visible on their associated Secrets.
- 489896 - Bulk actions now disable the submit button to prevent multiple clicks
- 490686 - Handled Issue when replicating data for Disaster Recovery where pre-existing users on the Replica that do not exist on the Source could lose their Everyone group membership.
- 490974 - A link to the public SSH keys was added, when enabled, on both the user preference page and the administration tools section
- 491921 - Fixed issue where Secret field data over a certain length may be rejected by the database upon replication.
- 495567 - Fix several buttons in the new Configuration Preview
- 500538 - Optimizations to displaying large numbers of Folders
- 501141 - Expanded the User Setting size to resolve issue for some customers with lots of columns for a grid.
- 501322 - Data retention page background color fixed
- 485440 - DR Fix for Role to Group replication
- 485550 - Fix to allow Heartbeats even if the Secret has Checkout enabled
- 500545 - DR Fix for Password Requirement Character Set replication
- 501144 - Fix for database error when saving User Preferences

### Improvements (4)

- 488666 - Discovery import added to new network viewer
- 491970 - Discovery rules and dependencies grid can now be filtered by discovery source. Rule grid now also has discovery source available as a column.
- 500816 - Allow Read-Only mode to be enabled in Cloud on the Disaster Recovery Configuration page.
- 501316 - Local Admin column added to new Discovery network view

## Friday, March 17, 2023

### Bug Fixes (13)

- 418329 - Discovery specific OUs now returns results when the page is initially loaded.
- 475003 - License server activation grid updated to resolve layout clipping issues.
- 478852 - Lookup Folders (api/v1/folders/lookup), and Search Folders (api/v1/folders) will not return only direct children when searching

by parent ID. They will not longer return grandchildren.

- 478994 - Enabling heartbeat for the first time on a secret template will no longer subtract 1 minute the first time.
- 489232 - The secret search API now returns the folder path on the secret. Secret grid download now includes folder path on all records accordingly.
- 489480 - Fixed an issue with folder name collisions in Disaster Recovery synchronization.
- 491763 - The secret checkout page now specifies a page title.
- 500237 - MEK Rotation: support rotating Azure Active Directory domain Client Secrets.
- 482308 - All Secrets View Column Preference Once Saved Doesn't Stay After Page is refreshed.
- 488759 - DR: Intermittent Transaction Has Aborted Errors When Replicating Large Amount of Secrets with Custom Date.
- 490031 - Terminate launcher session from Platform is causing a 403.
- 490554 - X-AspNetMvc-Version header discloses .NET version.
- 500289 - Platform lint build error - Argument of type MonoTypeOperatorFunction

## Improvements (8)

- 489755 - The password changers list / grid has been updated to the latest design.
- 490562 - Converted list options ss-grid to thy-grid. Allows for resizing of columns
- 492078 - The secret detail page now includes a button to copy the current url to the clipboard with rich text including the secret id and secret name.
- 484033 - Upgrade System.Linq.Dynamic
- 489754 - Convert CustomLauncherView.aspx to angular
- 491586 - Remove report.aspx pages
- 492049 - Remove unused legacy code (folders, doublelock, ip address)
- 492116 - Remove redirects to dashboard.aspx on login

## Tuesday, March 14, 2023

### Bug Fixes (3)

- 490188 - Platform + SS + WPF launcher fix.
- 491879 - Secret Log length UI validation fix.
- 492041 - Initial Platform user should have full admin access in Secret Server.

## Friday, March 10, 2023

### Bug Fixes (21)

- 442402 - Folder permission now correctly shows "None" in secret role drop down when in edit mode.
- 447460 - After changing field properties on a secret template the UI cache is cleared to allow selectable columns in grids to be updated without requiring a browser refresh.
- 448752 - This bug occurred when there was a secret policy on a secret and it was converted or duplicated. Both the policy and the copy or convert template would try to apply secret settings for launchers multiple times which resulted in a UX constraint violation. The settings code constraint issue was resolved with bug 448486. This also helps usability with clarifying the new secret name on converting a single secret template.
- 448975 - An audit entry is made for the user that enabled maintenance mode during an upgrade (on prem only).
- 460309 - console diagnostics log level label made more clear to help indicate that it is the level of logging and not a filter for the grid.
- 466521 - Configuration Retention setting section description added
- 475215 - Secret dependency API variable name changed from id to secretDependencyId to help clarify which parameter is needed.
- 477458 - Deleting folders will now also indicate that subfolders will be removed as well.
- 480833 - The duration field on session monitoring now shows as a friendly time duration instead of just total seconds.
- 482562 - FOLDERPATH parameter now works with report schedules and running a report
- 484093 - Directory services icon alignment corrected and loader properly displays now.
- 484677 - The heartbeat status colors for pending are now more distinguishable on the dashboard overview doughnut chart.



- 485232 - Edit inbox rule condition dialog title now says "Edit Condition" instead of "Add Condition"
- 486497 - The password is cleared on secret export if the dialog is opened subsequent times.
- 487156 - Saving event subscriptions without making any changes no longer clears all events defined.
- 487290 - When there are more than 30 subfolders the expand row chevron will now show and load the subfolders 100 at a time. There is also a "Load More" and a "Load All" button
- 488530 - The report SQL editor no longer has options to download or configure columns on the report as it is not supported in that mode.
- 489226 - The most used secrets grid on dashboard overview now downloads the folder path instead of the folder id.
- 489896 - Bulk actions now disable the submit button to prevent multiple clicks
- 490388 - Creating and updating password requirement now requires unique names for password requirements.
- 490568 - The secret details view would show empty in some browsers after a checkout or approval and would require the user to click the tab to see the details. This would happen when the browser did not detect the route change from /secret to /secrets.

## Improvements (4)

- 480100 - Save buttons are no longer disabled when a form is invalid. Clicking the button will show and trigger form validation messages now.
- 482897 - Color palette updated to improve accessibility and brand.
- 484891 - Launcher icons updated on secret general and inline secrets.
- 488666 - Discovery import added to new network viewer.

## Friday, March 3, 2023

### Bug Fixes (8)

- 469860 - Event subscription publishes the event for when a user is enabled or disabled.
- 478837 - The endpoint that returned the report name, description, category, and other details is now protected by dual control. The actual report data was always protected.
- 487523 - Clicking cancel when sorting event pipelines in a policy now exits sort mode
- 488612 - Disaster Recovery data replication errors caused by out of sync encryption keys are now automatically resolved properly.
- 489427 - version.xml is no longer available via HTTP to avoid exposing the version of the application.
- 489477 - Resolved an issue with Disaster Recovery folder synchronization selection. Personal folders can now be selected for either allow or block lists.
- 489766 - User audit is obfuscating properly after grid was updated.
- 490244 - Fixed older character sets that failed to replicate when running Disaster Recovery

### Improvements (8)

- 468023 - Refactoring handling of Secret ACLs in Disaster Recovery to be more efficient and less error-prone.
- 468837 - Cloud diagnostic logging will now correlate the Datadog telemetry trace for easier support troubleshooting.
- 472665 - DR: Secret Items from the Source are combined with ones from the replica when they have matching SecretIDs and SecretFieldIds
- 482898 - Added option to duplicate a discovery scanner
- 486793 - Secret panel is now always open when on any Secret section page
- 487334 - Secret configuration audit converted to standard grid
- 488665 - Unlimited admin chip will show on aspx pages when it is enabled
- 489530 - SDK Client Management pages have been converted
- 486751 - Platform Opt-in Region Improvements
- 487261 - Add menuid to every thy-context-button to assist with automation testing
- 488523 - Show more helpful error message creating a discovery source name that already exists
- 489734 - Fix for Secret Export of a specific folder not exporting child folder secrets if selected.

## Friday, February 24, 2023



## Bug Fixes (5)

- 418167 - A purge of inactive sessions longer than 3 minutes was occurring when the Sessions Monitoring page was displayed. It did not take into account the SSH proxy timeout. The page now obeys the timeouts.
- 434346 - Changed Export Secrets to become an Async Job. The export now kicks off a job and polls until the job is complete. User should wait for job to complete before navigating away from the page. This mitigates the issue with timeouts.
- 482044 - Updated Secret object to treat CheckOutTime as a nullable value so that DR can handle it properly and prevent checkout consumer errors after DR.
- 488594 - Corrected issue where certain accounts would not show correctly in the new network view.
- 488772 - Addressed issue where the Secret grid's total count would incorrectly include subfolders when searching.

## Improvements (1)

- 1488801 - Converted user audit to the standard grid component.

## Friday, February 17, 2023

### Bug Fixes (4)

- 482255 - Added documentation in a tooltip to point users to audit on Proxy page
- 484939 - Inline row added to secret dependency log dialog to expand
- 480944 - "Automatic Sudo or Su Privilege Elevation" was fixed to work with Solaris
- 486982 - Fixed an issue with New UI Configuration option searching

### Improvements (3)

- Discovery converted to New UI
- 487097 - A new checkbox is added which enables requiring all users who log in through Platform to have used Platform's multi factor authentication when logging in.
- 430883 - Disaster Recovery: Replica cannot be a higher version than Primary

## Saturday, February 11, 2023

### Bug Fixes (11)

- 422242 - Fixed an issue with excessive CPU usage for RDPWin.exe. We no longer track or record processes using WMI. Instead, we use native Windows calls, reducing the CPU usage of the Windows WMI Provider. However, if "Run as secret credentials" is used, we still use the WMI process tracking.
- 468584 - Fixed an issue where manual backup did not work in maintenance mode.
- 477382 - Added a layer of backwards compatibility so that releases to the cloud ahead of installed updates will not break.
- 478174 - The maximum allowable default checkout time is now 365 days (previously 9999 days).
- 478490 - Bulk changing permissions no longer checks for permissions on the first server selected. If the user lacks access to any secret that was selected, they receive an error message upon completion of the bulk change.
- 483400 - The add permission button, when editing role permissions, no longer gets clipped off screen.
- 483522 - Resolved a situation where, after an upgrade, the page would give an error 500 and require an iisreset to continue.
- 483909 - Buttons now correctly align on configuration pages in the platform.
- 483912 - Any error present in the sync log coming back from an AAD sync is treated as no action regarding disabling groups.
- 484059 - The default layout for the admin page is by category.
- 484288 - Added a check to ensure that the user calling the affected endpoint has access to the secretId being passed in.
- 486488 - Improved performance impact of retrieving custom SSH algorithms in Discovery.

### Improvements (8)

- 436107 - Added endpoints for Update Password Type Auth, Get Password Type Auth, and Create Password Type Auth. These allow you to create and update records for the command arguments on RPC command set up.
- 477562 - CEF Timestamp format added to Configuration > Application. This sets the format of the timestamps at the beginning of syslog messages. The Syslog format is the default for updates, while the ISO format is selected for new installs. The syslog implementation might format the timestamp in Syslog format regardless of the format of the header sent over the wire. You can confirm this by running a trace on the syslog port.
- 482856 - Updated the Discovery scanner secret search filter settings selection UI.
- 483107 - Updated the process for updating credentials on a Discovery scanner UI.
- 483864 - Display a banner message informing the user that engines with a specific version range are unable to auto-update.
- 484670 - Adjusted the Opt In Flow to calculate the value for Platform region based on Secret Server Cloud's top-level domain.
- 484842 - The "Generate API Token" option on the user preferences page now correctly audits that a token was generated.
- 486287 - Updated the REST API documentation.

## Friday, January 20, 2023

### Bug Fixes (7)

- 464914 - Bulk edit share now has a "None" permission, which will allow removing permissions.
- 465303 - Updated logging around Azure AD Sync to make it clearer when the sync stops due to configured groups missing in Azure AD.
- 466186 - A configuration option to disable the SMB heartbeat fallback check was added.
- 466323 - Folder permissions once again can no longer be saved if there is no user or group with Secret Owner permission.
- 468425 - Failing Syslog/SIEM messages do not respect updated Syslog Server configuration.
- 477833 - Addressed an issue with the SearchSecretsByFieldValue SOAP API function that caused it to return a 500 error.
- 480672 - Heartbeat status by day shows incorrect values.
- 481005 - Corrected logic that allowed password requirement consumer to bypass non-replicated Secrets.
- 481676 - OIDC Platform Connection Fails for previously imported users after domain change.
- 482041 - Platform 2 - Customers with samaccountname username in Secret Server do not get linked to Platform UPN-based user.
- 482064 - Adjusted the logic related to generating the platform URL to account for a trailing forward slash.

### Improvements (3)

- 432222 - Distributed Engine Sites now have an Enable FIPS setting on a per-site basis.
- 467244 - Publish Audit Data from Event Subscriptions to the Platform Audit Service.
- 478600 - Add an option to sort the admin menu alphabetically.
- 481388 - Adjusted the Auto Pilot Test gate to have the agent clear the workspace folder prior to each run.

## Friday, January 13, 2023

### Bug Fixes (2)

- 481152 - Repeating Opt-in on for an SS instance causes connections from Platform to SS to permanently break for that instance.
- 481335 - RAS Launcher is not showing in grid for secret expand.

## Improvements (1)

- 478709 - Added an alternative splash screen on the All Secrets page within platform/vault targeting the cloudadmin user. Triggering a Platform instance provisioning via the Opt-In flow will now create a corresponding audit log entry.

## Monday, January 9, 2023

### Bug Fixes (2)

- 472793 - Added in logic to split larger Secret Item Values back into ItemValue and ItemValue2 fields on save to database.
- 475160 - Now setting domain id of replicated duplicate user to null domain so it can be reassigned with found domain later during replication.

### Improvements (5)

- 478703 - Text copy for Opt-In provisioning step has been adjusted.
- 478706 - Text copy for the first step of Platform Opt-In flow has been adjusted.
- 478707 - Text copy for step two and three of the Opt-In flow was updated.
- 478708 - Platform Admin Username has been added as a copyable field on the Opt-In success modal.
- 480814 - The logic to determine the Platform login url has been adjusted to account for both url patterns.

## Tuesday, January 3, 2023

### Bug Fixes (1)

- 480099 - Fixed an issue where OIDC logins would display "Session Expired" when AllowRememberMe was enabled and the user was configured with 2FA.

### Improvements (0)

## Friday, December 30, 2022

### Bug Fixes (5)

- 472820 - Session recordings which are invalid due to no data will be recorded as an error to prevent failure upon playback.
- 476779 - Prevent 500 errors when calling healthcheck.aspx for instances that are scheduled for deletion in cloud.
- 476929 - User permissions on replica instances will no longer be removed erroneously when data replication runs.
- 478168 - Improve mapping logic between Platform and Secret Server so that unique emails are no longer required.
- 478497 - Addressed assembly load error in Azure AD processing.

### Improvements (1)

- 478458 - Adjusted the opt-in button to display the text NEW! and its tooltip to display Experience the next generation of Secret Server.

## Friday, December 16, 2022

### Bug Fixes (3)

- 447140 - Mitigated a possible error in SSH Proxy command processing
- 475159 - Created an update to more efficiently handle bulk deletion within DR replication.
- 476818 - Fixed an issue with editing a file in single-edit dialogs.

### Improvements (7)

- 466705 - We now include character sets in DR replication.
- 467244 - We now support publishing audit data to the audit service when enabled.
- 475117 - Improved users logging into Secret Server through Platform—the Platform settings for MFA are now used and Secret Server MFA settings are ignored.
- 476799 - Corrected the capitalization of "Active Directory" in the opt-in flow.
- 477383 - The secret audit and general log windows now use an updated preview panel component. This allows for keyboard navigation to switch records in the grid.
- 477846 - We now optionally support a SSH key without a passphrase in bulk change passwords.

## Thursday, December 8, 2022

### Bug Fixes (7)

- 435312 - Updated discovery to handle messages coming back without the stdout marker
- 474320 - Local-site advanced settings can now be edited while distributed engine is off.
- 474429 - Corrected situation that could cause a null reference error when resolving the FQDN.
- 474819 - Resolved an issue within the Secret Folder navigation panel on Platform where clicking "Add Folder" would result in an error.
- 474820 - Resolved an issue in the Secret Folder navigation panel where changing to the "All Secrets" pin did not update the selected pin name.
- 475131 - Corrected confusing error message related to SMTP servers when creating event subscriptions.
- 475301 - Addressed issue where saving a specific folder permission could return "Invalid Request"

### Improvements (6)

- 163844 - Increased the max length of SecretNameShort.
- 418207 - Updated the new UI to allow new generated SSH keys with a blank passphrase to match legacy UI functionality.
- 471343 - We now automatically back up the key management configuration file when saving a new key management configuration
- 473076 - Site Connectors are now configurable per site in Secret Server Cloud, however you can't configure a site connector if it already has 250 sites in cloud.
- 475958 - New configuration setting "Allow Files without Extension" has been added to the configuration preview.
- 476777 - Legacy UI disabled the weekend of December 10th 2022.

## Overview

Secret Server Cloud (SSC) is a scalable, multi-tenant cloud platform that provides the same features as the on-premise Secret Server Professional edition. With the SSC platform, all backend services, databases, and redundancy are securely managed by Delinea and hosted on the Microsoft Azure platform. Customers do not have direct access to the databases or application file system.

## Cloud Versus On-Premise Secret Server

For documentation purposes, SSC is the same as the corresponding on-premise edition. However, there are some feature differences:

- **Site Connectors:** On-premise versions can use multiple site connectors to manage engine connections, such as RabbitMQ or MemoryMQ. The cloud version manages this for you as an Azure service and is not configurable.
- **CRM Integration:** On-premise versions can integrate with CRMs via direct database connections or the ConnectWise API. This is not currently available in SSC.

## Getting Started

This section walks you through an initial configuration of your cloud instance. To see additional documentation for Secret Server features, please refer to the support resources section at the end of this document.

## System Requirements

A distributed Engine server is required to communicate with SSC. Distributed engine server recommended specifications:

- Windows Server 2012 or Above
- CPU: 4-core 2 GHz (minimum)
- Memory: 4 GB of RAM (minimum)

## Engine Connectivity

[SSC's Architecture Diagram](#) shows the network topology of your cloud instance. Your on-premises distributed engines do not need any inbound TCP/IP ports open (unless using RADIUS authentication). If you do not have outbound firewall policies in place, no firewall configuration is necessary. If you do, the distributed engines need outbound access to:

- SSC's multi-tenant front-end Web server
- A shared service bus
- A customer-specific service bus
- A Content Delivery Network (CDN)

The protocols and endpoint details are in the architecture diagram mentioned above.

## Initial Setup

After you sign up for a trial, you can choose your URL name and provision your instance:

**Note:** To see additional documentation for Secret Server features, please refer to the support resources section at the end of this document.

1. After you sign signed up for a SSC trial, you received an email from Delinea Sales titled "Secret Server Cloud Trial." Click the **Cloud Portal** link in that email to begin your setup. The Setup Page appears in your browser.
2. Choose your location in the **Cloud Environment** dropdown list.

3. Click the **Continue** button. The Delinea One Portal appears.
4. Create the password for your first user account with administrator credentials. This account will be assigned to the email address you entered to request the trial.
5. After confirming the password, click the **Set Password and Login** button. The Delinea log on page appears.

**Note:** This is the backup admin account that you may need in a "break the glass" or unlimited admin situation. Delinea recommends you store the password in a secured physical location such as a safe or locked file cabinet. You can reset the password using an email reset, but **if this password is forgotten or you no longer have access to the email account, Delinea cannot reset this password.**

6. Click the blue button that matches the location you just chose. A setup page appears.
7. Type a name for your subdomain. Do not use special characters or spaces.
8. Read the End User License Agreement.
9. Click to select the check box to signify agreement.
10. From the dropdown, select **Yes** or **No** to signify your organization's oversight of EU information.
11. Click the **Accept** button. It may take several minutes for your new SSC to spin up.
12. When initialization is complete, click go to your SSC URL and click the **Login with Delinea One** button. You are automatically redirected to your new SSC dashboard.

## Distributed Engine

All interaction between the SSC tenant and your on premises network uses our distributed engine service to communicate. The work tasks that distributed engine completes includes Active Directory authentication, password changing, and heartbeat. The machine where the engine is installed must be able to communicate outbound on port 443.

**Note:** For more information, see the [Distributed Engine Overview](#).

To install the Distributed Engine:

1. Navigate to **Admin > Distributed Engine**
2. Click the **Download Engine Installer** button for either 64-bit or 32-bit.

**Note:** You can install distributed engine on your workstation or laptop for testing purposes, but for production installs, the distributed engine server should be installed on a server. Secret Server uses the distributed engine to communicate with your domain, so if your machine is turned off, users cannot log on with their domain accounts, and heartbeat and remote password changing will fail.

3. Run setup.exe as an administrator to install the engine service. This will install into Thycotic Software Ltd\Distributed Engine.
4. Go to **Admin > Distributed Engine**.
5. Click **Manage Sites**.
6. Click **Manage New Engines**. There should be a new engine available.
7. Click the **Assigned Site** dropdown list and select **Default**.
8. Approve it by clicking the check box to the right.

9. Validate the engine's connectivity:

1. Go to **Admin > Distributed Engine > Manage Sites**.
2. Click the Default site.
3. Click the **Validate Connectivity** button to test the communication between the engine and Secret Server. It may take several minutes for the engine to register. If it does not immediately validate wait a few minutes and try again.

## Configure Active Directory Integration

Active Directory integration allows users to log in with their domain credentials. Connections to your domain are routed through the distributed engine service running in your network.

1. On the dashboard, create a new Active Directory secret from the create secret widget in the upper right hand corner.  
  
**Note:** The domain account should be able to read users and groups from the domain you want to sync. For detailed information on the rights required, please see [Active Directory Rights for Synchronization Account](#).
2. Type the domain, username, and password in the **Create Secret** form.
3. Save the secret.
4. Navigate to **Admin > Active Directory**.
5. Click **Edit** and check the boxes for **Enable Active Directory Integration** and **Enable Synchronization of Active Directory**.
6. Click the **Save** button.
7. Click the **Edit Domains** button.
8. Click the **Create New** button.
9. Type your FQDN and a friendly domain name that users will see on the login page.
10. Click **Sync Secret** to select the secret you just created.

**Note:** The domain site is set to default. This means that the Active Directory authentication and synchronization will run through the distributed engine service installed on your network.

**Note:** Do **not** select "Enable Login from AD." If you do, you cannot set the domain groups later in this instruction.

11. Click the **Save and Validate** button.
12. Click the **Back** button.
13. Click the **Edit Synchronization** button. The Synchronization Edit page appears.
14. In the **Available Groups** list, click each domain group that you want to log on in the SSC instance and click the the ◀ button to move the group to the **Synchronized Groups** list.
15. Click the **Save** button.
16. Click the **Synchronize Now** button to start the user and group synchronization immediately. The synchronization process runs automatically, but to get immediate results, you can start it manually.

## Test Heartbeat and Remote Password Changing

Heartbeat ensures the secrets you have stored have the correct password, and Remote Password Changing (RPC) changes passwords on demand or a schedule.

1. Navigate to **Admin > Remote Password Changing**.
2. Click the **Edit** button.
3. Click to select the **Enable Remote Password Changing** and **Enable Heartbeat** check boxes.
4. Click the **Save** button.
5. Click the **Run Now** button in the **Remote Password Changing and Heartbeat Log** sections. This runs the heartbeat and RPC processes immediately.
6. Go to the secret you created for domain synchronization in the previous section or create a new test secret to use.
7. A brand new secret's **Last Heartbeat** status should be pending or processing. Once heartbeat completes you should see one of these statuses:
  - **Unable to Connect:** Secret Server could not reach the target machine. This could be a firewall issue or the machine name or IP address is wrong.
  - **Failed:** Secret Server could connect but could not authenticate. This likely means the password on the secret is incorrect.
  - **Success:** Secret Server successfully connected with the username and password.
8. You can test password changing by viewing a secret and clicking the **Change Password Remotely** button.

**Note:** This will change the password on the target system.
9. You can view the status of password changes and heartbeats in the log at **Admin > Remote Password Changing**.

## Next Steps

- Add another user to the Administrator role in Secret Server. This allows you to have another administrator besides the initial user account created. To assign roles, go to **Admin > Roles** and click the **Assign Roles** button.
- Add a folder and share it with the group you synchronized from Active Directory. Create and edit folders from the Folder Tree View on your Dashboard.
- Create a secret in that folder for other users to see. When creating a secret, you can click the **Folder** link to save it to another folder.
- Have other users log on. Any users synchronized to Secret Server through the domain synchronization can log on with their domain credentials.
- Enable Google two-factor authentication by going to **Admin > Users**, editing the specific user, and assigning a two-factor option.

## Troubleshooting and Resources

### Get Error: "Site (Default) engines are not currently online" When Saving Domain

This can occur when Secret Server was not able to complete a round trip with the installed engine service. This validation may take several minutes for Secret Server to perform after the engine has been approved and assigned to the site. To address the issue:

1. On the server you installed engine on, check the logs in the install directory C:\Program Files\Thycotic Software Ltd\Distributed Engine\log.
2. If you see a message for "Could not configure, trying in 30 seconds" or a "Bus Broken Down Error" verify that the engine is approved and assigned to your default site.
3. Go to the site under **Admin > Distributed Engine > Manage Sites**.
4. Click the **Validate Connectivity** button.



5. If a success message appears and the engine status shows as online, try saving the domain again.

## Secret Server End User Guide

This guide is for regular, non-administrative, users of Secret Server. It is mostly a set of links to a subset of the greater corpus of Secret Server documentation. For Secret Server Cloud, see the [Secret Server Cloud Quick Start](#).

Secret Server is a comprehensive Privileged Access Management (PAM) solution designed to protect, control, and manage privileged accounts and credentials within an organization. It offers a secure, centralized vault to store sensitive information, such as passwords, keys, and certificates, while ensuring that access to these critical assets is granted only to authorized personnel.

Equipped with advanced features like access control, auditing, and automated password rotation, Secret Server enables organizations to maintain a strong security posture, reduce the risk of data breaches, and comply with regulatory requirements.

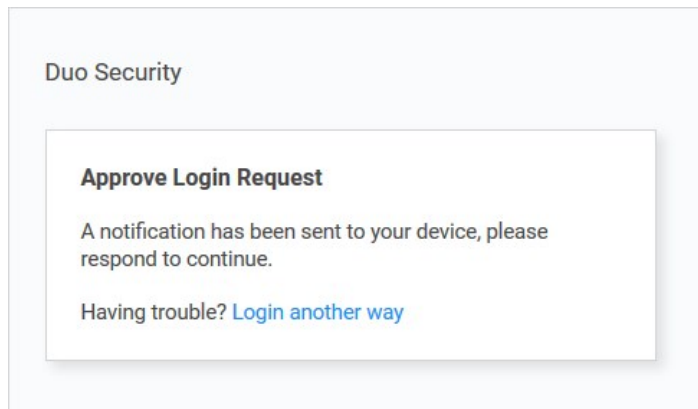
Secret Server is a powerful, advanced product with a wide range of capabilities. Even so, it is very easy to use for regular day-to-day operations for non-technical people. The key to this is knowing what to ignore and understanding the bits you do need to know. This guide is designed to help you do just that. It provides links to only what you need to know. You can add other topics later as needed.

- Technical Support: Please contact your organization's help desk.
- [Self-Help Resources](#)
- [Document Conventions](#)

**Important:** When using this User Guide, it is easy to get lost in the ocean of Secret Server documentation. To avoid that, we recommend using **<Ctrl> + click** to access the links here. That way, the page you are going to will open to a new browser tab, leaving this one as is, making it much easier to get back to. You can also simply use the browser back button to return, but that can get tiresome because many pages link to others.

Depending on how your administrators configured Secret Server, you can log on with either your Active Directory account or a local account.

1. In your browser, go to the URL for your organization's Secret Server.
2. On the **Pick Your Account** popup, select your Active Directory account. The Enter Password popup appears. If you do not have an AD account, you may need to enter your local or domain information.
3. Click the **Sign In** button. If you have Duo two-factor authentication, this appears:



Your cell phone receives a notification you have to approve to access Secret Server.

**Note:** Secret Server also supports other two-factor authentication methods (depending on what your organization configured), such as text or email codes that Secret Server prompts you for.

**Note:** After you log on with your local account for the first time, you are immediately prompted to change your password.

4. Click the **Login** button. The Secret Server All Secrets page appears.

*Secrets* are individually named packets of sensitive information, such as passwords. Secrets address a broad spectrum of secure data, each type represented and created by a *secret template* that defines the parameters of all secrets based on it. Secrets are very powerful and provide many ways of controlling and protecting their data, such as:

- Ensuring passwords are long, complex, and frequently changed.
- Relieving users of having to remember numerous complex passwords or when to change them. You only need to remember your password to access Secret Server. All of your secret passwords are managed for you.
- Automatically changing passwords at set intervals with no user intervention.
- Defining who has access to the secret.
- Ensuring the person accessing Secret Server or a secret is indeed you.
- Recording who actually accessed a secret.

All secret text-entry field information is securely encrypted before being stored in the database, including a detailed audit trail for access and history.

Some important basic information about secrets:

- [Viewing Secrets](#) (includes checking expiration and history)
- [Creating Secrets](#)
- [Secret Configuration Options](#)
- [Editing Secrets](#) (includes manually changing passwords, instead of waiting for expiration)
- [Deactivating and Reactivating Secrets](#)

*Secret folders* allow you to create containers of secrets based on your needs. They help organize your customers, computers, regions, and branch offices, to name a few. Folders can be nested within other folders to create sub-categories for each set of classifications. Secrets can be assigned to these folders and sub-folders. Folders allow you to customize permissions at the folder level, and all secrets within can inherit the folder's permissions. Setting permissions at the folder level ensures future secrets placed in that folder have the same

permissions, simplifying management across users and groups.

- [Creating Folders](#)
- [Adding and Moving Secrets Between Folders](#)

Please set up Web Password Filler (WPF) in the following order:

1. Ensure you can log in to Secret Server the conventional way.
2. If necessary, create a folder in Secret Server where the WPF secrets will reside.
3. [Install the WPF browser extension](#).
4. [Configure WPF to point to Secret Server](#).
5. [Login to Secret Server via WPF](#).

The Secret Server *check-out* feature grants exclusive access to a single user. If a secret is configured for check out, a user can then access it. No other user can access a secret while it is checked out, except unlimited administrators. This guarantees that if the remote machine is accessed using the secret, the user who had it checked out was the only one with proper credentials at that time. See [Secret Checkout](#) for details.

Secret Server records specific events, including expired secrets, and optionally sends you alerts when they happen. See the [Inbox](#) and [Creating Event Subscriptions](#) for details.

We created a [Getting Started Tutorial](#) for technical users. While it covers many things you do *not* need to know right now, you may later find it helpful if you want to get a deeper understanding of Secret Server.

## Secret Templates

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret templates are used to create secrets and allow customization of the format and content of secrets to meet company needs and standards. Examples include: Local Administrator Account, SQL Server Account, Oracle Account, Credit Card and Web Password. Templates can contain passwords, usernames, notes, uploaded files, and drop-down list values. New Secret templates can be created, and all existing templates can be modified.

A custom password-exclusion dictionary is a list of words that you do not want users to choose as part of a password, for example, your company name. The dictionary becomes an option when creating or editing a password requirement object. Those, in turn, appear as options when creating a secret template. Finally, when a secret is created based on that template, the words in the dictionary are not allowed when creating a password (the "weak" warning appears).

## Creating a Custom Dictionary

To create a new custom password-exclusion dictionary for use by secret templates:

1. Create a text file containing the words you want to exclude, one word per line. These words cannot be used as part of a password on applicable secrets.
2. Go to **Admin > Secret Templates**. The Manage Secret Templates page appears:

### Secret Templates

[Templates](#)
[Character Sets](#)
[Password Requirements](#)
[Launchers](#)
[Audit](#)

92 Items
Active ▾
Create Tem

SECRET TEMPLATES ↑	TOTAL SECRETS	ACTIVE	
Acme Server Template	0	<input checked="" type="checkbox"/>	
Active Directory Account	265	<input checked="" type="checkbox"/>	
Active Directory No Prompt	1	<input checked="" type="checkbox"/>	
AD Test Template	1	<input checked="" type="checkbox"/>	
Amazon IAM Console Password	1	<input checked="" type="checkbox"/>	
<a href="#">Amazon IAM Key</a>	1	<input checked="" type="checkbox"/>	
API User Credentials	0	<input checked="" type="checkbox"/>	
AS/400 IBM iSystem	0	<input checked="" type="checkbox"/>	
Azure AD Account	0	<input checked="" type="checkbox"/>	
Bank Account	15	<input checked="" type="checkbox"/>	
Cisco Account (SSH)	0	<input checked="" type="checkbox"/>	

3. Click the **Password Requirements** button. The Password Requirements page appears:

## Secret Templates



Templates Character Sets **Password Requirements** Launchers Audit

5 Items Custom Dictionaries Create

NAME ↑	DESCRIPTION	DEFAULT	
Default	The default password requirement, which uses the ...	Yes	
FSQA		No	
Mainframe	Mainframe Password Requirement	No	
My PW Requirement		No	
SAP	SAP Password Requirement	No	

4. Click the **Custom Dictionaries** button. The Password Dictionaries page appears:

## Password Dictionaries



Add Password Dictionary

1 item

Test	Upload Updated Version	Download	Delete
------	------------------------	----------	--------

5. Click the **Add Password Dictionary** button. The Add Dictionary popup page appears:

### Add Dictionary

Name \*

File \* [Change](#)

Cancel Upload

6. Type the name of the dictionary in the **Name** text box.
7. Click the **Change** link to locate your dictionary text file. The name of the file appears on the popup.
8. Click the **Upload** button. The popup disappears, and the file appears on the Password Dictionaries page:

## Password Dictionaries

[Add Password Dictionary](#)

1 item

Test

[Upload Updated Version](#)[Download](#)[Delete](#)

**Note:** Now, when defining a password requirement, the custom dictionary you created ("test") appears as a prevention option:

**PASSWORD VALIDATION**

☒ Prevent Username In Password

☐ Prevent Common Dictionary Words

☐ Prevent Dictionary Words from Dictionary 'Test'

☐ Prevent Spatial Terms In Password

☐ Prevent Sequences In Password

When a user attempts to include one of the excluded words in the dictionary in a secret based on the template using the password requirement, the "weak" warning appears and the user cannot save the password. For example, our dictionary contains the word (string) xxyy. The user enters a strong password that contains the string, and Secret Server rejects it anyway:

**Note:** The excluded words are not case sensitive. xxyY would have triggered a password rejection too.

Secret Template

Web Password Copy

Secret Name

My Secret

URL

UserName

Password

0329!@#0IUYjwlrjufdopisufxxyy

[Generate](#)

Notes

Weak

When you hover the mouse pointer over the password strength bar, the disallowed string appears in red:



Password should include:

- ✓ At least 12 characters.
- ✓ At least 1 Lower case letters (a-z)  
abcdefghijklmnopqrstuvwxyz
- ✓ At least 1 Symbols (Symbols)  
!@#\$\$%^&\*()
- ✓ At least 1 Numbers (0-9)  
1234567890
- ✓ At least 1 Upper case letters (A-Z)  
ABCDEFGHIJKLMNOPQRSTUVWXYZ

Password should exclude:

- ✓ Dictionary words
- ✓ Password includes: 'xxyy'
- ✓ Username

Editing a Custom Password-Exclusion Dictionary

To edit a custom password-exclusion dictionary for use by secret templates:

- 1. Go to **Admin > Secret Templates**. The Manage Secret Templates page appears:

### Secret Templates

Templates

Character Sets

Password Requirements

Launchers

Audit

92 Items

Q

Active

Create Tem

SECRET TEMPLATES ↑	TOTAL SECRETS	ACTIVE	:
Acme Server Template	0	<div>✓</div>	
Active Directory Account	265	<div>✓</div>	
Active Directory No Prompt	1	<div>✓</div>	
AD Test Template	1	<div>✓</div>	
Amazon IAM Console Password	1	<div>✓</div>	
<a href="#">Amazon IAM Key</a>	1	<div>✓</div>	
API User Credentials	0	<div>✓</div>	
AS/400 IBM iSystem	0	<div>✓</div>	
Azure AD Account	0	<div>✓</div>	
Bank Account	15	<div>✓</div>	
Cisco Account (SSH)	0	<div>✓</div>	

2. Click the **Password Requirements** button. The Password Requirements page appears:

Secret Templates

Templates Character Sets Password Requirements Launchers Audit

5 Items

Custom Dictionaries Create

NAME ↑	DESCRIPTION	DEFAULT
Default	The default password requirement, which uses the ...	Yes
FSQA		No
Mainframe	Mainframe Password Requirement	No
My PW Requirement		No
SAP	SAP Password Requirement	No

3. Click the **Custom Dictionaries** button. The Password Dictionaries page appears:

Password Dictionaries

Add Password Dictionary

1 item

Test	Upload Updated Version	Download	Delete
------	------------------------	----------	--------

4. Click the **Add Password Dictionary** button. The Add Dictionary popup page appears:

Password Dictionaries

Add Password Dictionary

1 item

Test	Upload Updated Version	Download	Delete
------	------------------------	----------	--------

- 5. Click the **Download** link for the desired dictionary.
- 6. Save the file to your computer.
- 7. Edit the text file as desired. Do not change the name of the file.
- 8. Click the **Upload Update Version** link to locate and upload your dictionary text file. The existing dictionary, of the same name, is overwritten.



To use the privileged password security policy template, follow the steps below:

1. Download the privileged password security policy [template](#).
2. Open the template as a Microsoft Word document.
3. Remove the "About this Template" and "Customizing the Template" instructions and other author comments.
4. Replace the term "Company X" with the name of your organization.
5. Replace the current logo or add your company logo in the upper left corner.
6. Update all of the company-specific contact information (highlighted yellow).
7. Update the effective date.
8. Revise any policy guidelines to meet your organization's policies.
9. Revise the Violations section to meet your organization's policies.
10. Save your changes.
11. Obtain your management and auditors' approval of the completed policy.
12. Distribute the policy according to your management guidance.

Secret Server includes many pre-configured secret templates.

## **Built-in Secret Templates Available Out-of-the-Box**

- Active Directory Account
- Amazon IAM Console Password
- Amazon IAM Key
- Azure AD Account
- Bank Account
- Cisco Account (SSH)
- Cisco Account (Telnet)
- Cisco Enable Secret (SSH)
- Cisco Enable Secret (Telnet)
- Cisco VPN Connection
- Combination Lock
- Contact
- Credit Card
- DevOps Secrets Vault Client Credentials
- Generic Discovery Credentials
- Google IAM Service Account Key
- Healthcare
- HP iLO Account (SSH)
- IBM iSeries Mainframe
- MySql Account
- OpenLDAP Account
- Oracle Account
- Oracle Account (TCPS)
- Oracle Account (Template Ver 2)
- Oracle Account (Walletless)
- Password
- Pin
- Product License Key
- SAP Account
- SAP SNC Account
- Security Alarm Code
- Social Security Number
- SonicWall NSA Web Admin Account
- SonicWall NSA Web Local User Account
- SQL Server Account
- SSH Key
- Sybase Account
- Unix Account (Privileged Account SSH Key Rotation - No Password)
- Unix Account (Privileged Account SSH Key Rotation)
- Unix Account (SSH Key Rotation - No Password)
- Unix Account (SSH Key Rotation)
- Unix Account (SSH)
- Unix Account (Telnet)
- Unix Root Account (SSH)
- VMware ESX/ESXi
- WatchGuard

- Web Password
- Windows Account
- z/OS Mainframe

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Activating and Deactivating Templates

If a template is no longer relevant or outdated, it can be inactivated. This can be done from the specific template's Secret Template Edit page.

1. Go to **Admin > Secret Templates**.
2. Click the template name in the **Secret Templates** column. That template's page appears on the General tab.
3. Click **Edit** next to Template Status. The Secret Template Detail Status section enters edit mode:

### Template Status

Indicates how many Secrets use this template and whether or not the template is active.

Template Usage0

Active☒

Cancel

Save

### Template Settings

Configure settings for this template.

Secret Template Name \*My Secret Template

Name PatternNone

DescriptionNone

All HistoryNo

Secret Name History Length \*0

Validate Password Requirements On CreateNo

Validate Password Requirements On EditNo

4. To deactivate a template, uncheck the **Active** checkbox.
5. To activate a template, check the **Active** checkbox.

Templates can also be inactivated in bulk from the Manage Secret Templates page. Click the **Active Templates** button to navigate to the Set Active Secret Templates page. This screen displays all the secret templates in Secret Server. Each secret template can be set as active or inactive. Once the secret templates are chosen as active or inactive, then saving changes brings the secret templates into effect immediately. Inactivating a secret template does not inactivate any secrets using that secret template—those secrets still exist, but users are not able to create new secrets using an inactivated secret template.



## Changing a Secret's Template

To convert secrets from one secret template to another:

1. View a secret and click on the **Convert Template** button.
2. Click to select the target template from the **Secret Template** list.
3. Map each text-entry field to a new field:
  1. Go through each list and select the target text-entry field for each source text-entry field on your secret.
  2. If you want to remove the value for a text-entry field instead of converting it, then select the <Remove> option on the list for that text-entry field.
  3. When you are done selecting, you can choose a folder.
4. Click **Save**.

The Convert Template button is only available to users and groups with the "Owner" permission to the secret.

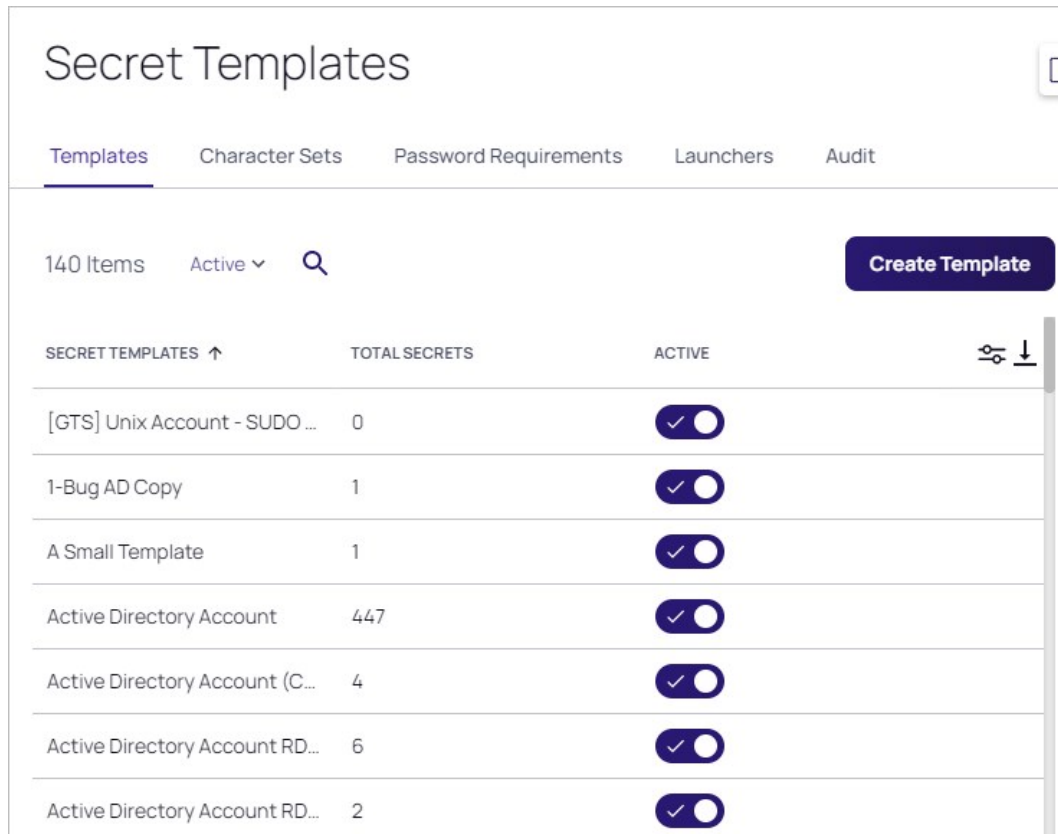
**Note:** To preserve audit data, when a secret is converted from one type to another, the old secret is deleted, and a new secret is created. An admin can view old secret by searching for deleted secrets on the dashboard. A user needs "Add Secret," "Edit Secret," "Delete Secret," and "Own Secret" role permissions in order to convert a secret to a new template.

## Configuring Secret Template Permissions

You can assign users and groups to specific secret templates so they can either manage or create secrets based on those templates. This allows you to have more granular control over what secret templates are seen by users and groups when they are managing the templates or creating secrets. To configure permissions:

**Note:** Secret template access is dependent on configuration in **Groups / Everyone / Secrets**. Without modifying this, the group or user assignment on secret templates changes nothing.

1. Select **Admin > Secret Templates**. The Secret Templates page appears:



SECRET TEMPLATES ↑	TOTAL SECRETS	ACTIVE
[GTS] Unix Account - SUDO ...	0	<input checked="" type="checkbox"/>
1-Bug AD Copy	1	<input checked="" type="checkbox"/>
A Small Template	1	<input checked="" type="checkbox"/>
Active Directory Account	447	<input checked="" type="checkbox"/>
Active Directory Account (C...	4	<input checked="" type="checkbox"/>
Active Directory Account RD...	6	<input checked="" type="checkbox"/>
Active Directory Account RD...	2	<input checked="" type="checkbox"/>

2. Click the name of the template for which you wish to configure permissions. The Secret Template Detail page appears on the General tab:

Active Directory Account

General

Fields

Mapping

Permissions

Audit

Export

Duplicate

Template Status

Indicates how many Secrets use this template and whether or not the template is active.

Secret Templates

447

Yes

Template Settings

Configure settings for this template.

3. Click the Permissions tab:

Active Directory Account

General

Fields

Mapping

Permissions

Audit

Export

Duplicate

Secret Template Permissions

Configure any specific permissions to allow creating specific types of Secrets or owning and editing the template definition.

0 Items

4. Click the **Edit** button in the **Secret Template Permissions** section. The Secret Template Permissions section enters edit mode:

## Secret Template Permissions

Configure any specific permissions to allow creating specific types of Secrets or owning and editing the template definition.

Add

Add users or groups by selecting the add button. This will define who can create Secrets of this type or manage this Secret template.

Cancel

Save

- To change the permissions of a user or group that has already been assigned permissions, select a new permission from the **Administrator** drop-down list. Template Create Secret allows a user or group to create secrets based on the selected secret template. Template Owner allows a user or group to edit a secret template and create secrets based on the selected secret template. By default, the Everyone group that targets all users of Secret Server can create secrets based on any secret template.

**Note:** User's secret template permissions are based on the permissions directly assigned to them, as well as the permissions assigned to all of the groups the user belongs to. If a user or group does not have Template Create secret or Template Owner permissions, they are unable to create a secret based on that secret template or see that it exists in Secret Server.

- To add permissions for a new user or group, click the **Add** button. The Users popup appears:

## Users

Search...

All ▾ Users & Groups ▾

0 selected

- ☐ #symbolgroup (testparent.thycotic.com)
- ☐ (lol) (testparent.thycotic.com)
- ☐ /groups
- ☐ \ leading spaces (testparent.thycotic.com)
- ☐ \_test
- ☐ a1
- ☐ a10
- ☐ a11

Cancel

Add

7. Click to select the check box for the user or group.
8. Click the **Add** button.

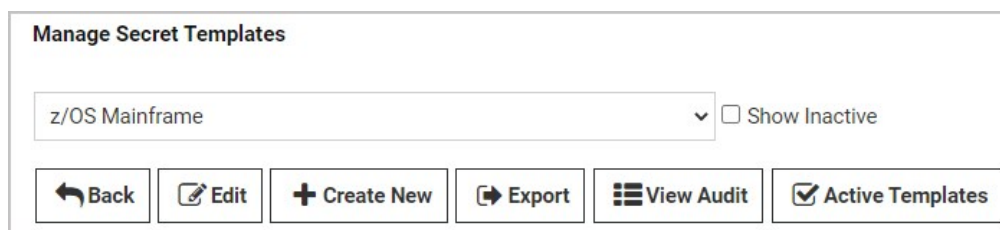
## Create and Customize an IBM iSystem (AS/400) Template to use the new IBM iSeries (AS/400) Password Changer

The IBM iSeries (AS/400) Terminal password changer is based on the z/OS Mainframe password changer. It uses the 5250 terminal connection and scripting to perform the password change and heartbeat. You can modify the script for any advanced configuration requirements, and Delinea Professional Services is available to help you.

**Note:** You can also change passwords on the AS/400 using SSH. See [Creating a Custom Password Changer for IBM AS/400](#).

### Create an AS/400 Secret Template

1. Navigate to **Admin > Secret Templates**.
2. On the **Manage Secret Templates** page, select the **z/OS Mainframe** template from the drop-down list.
3. Click the **Edit** button.

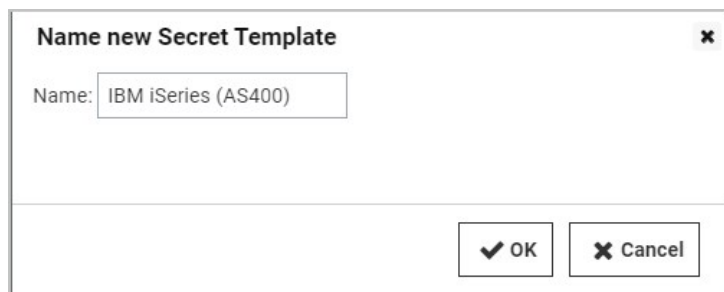


**Manage Secret Templates**

z/OS Mainframe ☐ Show Inactive

[Back](#) [Edit](#) [+ Create New](#) [Export](#) [View Audit](#) [Active Templates](#)

4. On the **Secret Template Designer** page, click the **Copy Secret Template** button.
5. On the popup page, type IBM iSeries (AS400) in the **Name** text box.

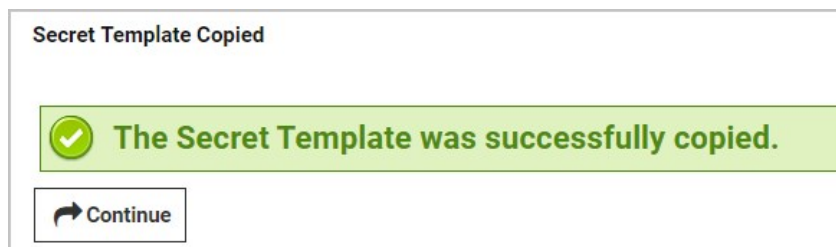


**Name new Secret Template** ✕

Name:

[✓ OK](#) [✕ Cancel](#)


6. Click the **OK** button.
7. On the confirmation page, click the **Continue** button.



**Secret Template Copied**

[✓](#) **The Secret Template was successfully copied.**

[Continue](#)

Optional: on the **Secret Template Designer** page, you can deactivate the **Passphrase** field by clicking the deactivate icon  to the right of the **Passphrase** row. Unlike the z/OS, the iSeries does not need an additional passphrase and will not have an option for it unless adjusted. Unless your environment specifically requires the passphrase text-entry field, we recommend deactivating it.

## Modify Your AS/400 Secret Template to use the AS/400 Password Changer

1. On the **Secret Template Designer** page, click the **Configure Password Changing** button.
2. On the **Secret Template Edit Password Changing** page, click the **Edit** button. The page becomes editable.

### Secret Template Edit Password Changing

Enable Remote Password Changing	Yes
Retry Interval	2 hours
Maximum Attempts	12
Enable Heartbeat	Yes
Heartbeat Check Interval	1 day

#### Password Type to use z/OS Mainframe

PASSWORD TYPE	SECRET FIELD	SCRIPT VARIABLE
Machine Name	Machine	\$machine
Passphrase	Passphrase	\$passphrase
Password	Password	\$password
Port	Port	\$port
User Name	Username	\$username

Back
Edit

3. Next to **Password Type to Use**, click the drop-down list and select **IBM iSeries Mainframe**.

### Secret Template Edit Password Changing

Enable Remote Password Changing

☒

Retry Interval

Days

0

Hours

2

Minutes

0

Maximum Attempts

12

Enable Heartbeat

☒

Heartbeat Check Interval

Days

1

Hours

0

Minutes

0

Password Type to use

IBM iSeries Mainframe

Machine Name

Machine

Password

Password

Port

Port

User Name

Username

Save

Cancel

- Make required changes, if any, to the text boxes and lists.
- Click the **Save** button. The page is no longer editable.
- Click the **Back** button.
- On the **Secret Template Designer** page, create secrets based on the new template as desired.

## Customize Your AS/400 Password Changer for Your Environment

**Note:** For the default IBM iSeries (AS/400) systems, the default password changer configuration requires no adjustment. However, additional parameters and connection string options are available.

- Navigate to **Admin > Remote Password Changing**.
- Click the **Configure Password Changers** button.
- On the **Password Changer Configuration** page, click the **IBM iSeries Mainframe** link.
- On the **IBM iSeries Mainframe** page, scroll to the bottom and click **Edit**.
- On the **Edit Password Changer** page, adjust ports and other parameters as desired.



### Edit Password Changer

Name

\*

IBM iSeries Mainframe

Line Ending

New Line (\n)

▼

Custom Port

23

(e.g. override the default value of 22 for SSH or 23 for Telnet with another value)

Request Terminal

☐

(If checked, the standard out and standard error data streams combine for \$\$CHECK\* commands, else \$\$CHECK\* will only check standard out and standard error will cause an error)

Connection String

Use SSL

☐

Active

☒

Valid for Discovery Import

☐

Save

Cancel

6. Click the **Save** button.

**Note:** The *trace* function can be a powerful tool for troubleshooting and debugging, especially for complex RPC implementations in unique environments. The trace function logs emulator input, mainframe output, and ASCII screenshots of what is happening on the terminal GUI. To write a trace file to the Secret Server website or engine, just add TRACE to the connection string.

## Additional Functions, Adjustments, and Parameters

For unique IBM iSeries environments, the IBM iSeries password changer offers extra features, options, adjustments and parameters for customization, including the commands in the table below. To implement these commands successfully, it helps to keep in mind that the password changer is emulating user input. Some of these commands are designed for very fine emulations of unique IBM iSeries environments, and Delinea Professional Services can help you with these. Other commands are implemented and tested on a base environment, so before implementing them in a production environment, you should verify that they are working as expected through testing or by using the trace function.

**Note:** The commands below are followed by an <ENTER> command by default. To prevent this, you must add ##NOENTER in the *comment* of the previous command. For example:

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	\$USERNAME	Username ##NOENTER	2000
2	<TAB>	Tab to password	2000
3	\$CURRENTPASSWORD	Password	2000

**Table:** Secret Template Commands

< Backtab >	Tab to the previous input field.
-------------	----------------------------------

< Clear >	Clear the screen.	Mostly used for trace.
< Close >	End the session to the mainframe.	
< Delete >	Delete a character under the cursor; can be used with < MoveCursor( #, # ) >	
< DeleteField >	Delete the entire text input or field.	
< DeleteWord >	Delete the current word if available, otherwise delete the previous word.	
< Disconnect >	Disconnect the password changer's connection to the mainframe.	
< Down >	Move cursor down.	
< Enter >	Send the Enter key press command.	
< Erase >	Erase previous character on a selected text input.	< Erase >
< EraseEOF >	Erase end-of-field of current text input.	< EraseEOF >
< Execute( ) >	Execute commands in shell.	< Execute(USRMGR) >
< HexString( # ) >	Insert a control character in a text field or string.	< HexString(41) >
< Key( # ) >	Execute named iSeries keys.	Execute unique keys via hex, character code, or key symbol.
< Left >	Move cursor left.	
< PF( # ) >	Execute program function.	Program function keys 1 to 24
< PA( # ) >	Execute program attention.	Program attention functions 1 to 3
< MoveCursor( #, # ) >	Move the cursor by row and column.	< MoveCursor(10,2) >
< Right >	Move cursor right.	
< Tab >	Tab to the next line.	
< Up >	Move cursor up.	

## IBM iSeries Mainframe

Username and passwords can run into length issues during remote password changing and heartbeat. The issue stems from the behavior in the client; when a user logs in and enters a username of 10 characters, the client will auto-tab to the next field (the password field). The heartbeat and remote password changing process automatically inserts this tab, which can cause improper behavior in the headless client.







when the username or password is 10 characters.

This can be avoided by setting three properties on the Custom Commands for the IBM iSeries Mainframe password changer:

- Username Length Before AutoTab on Login
- Password Length Before AutoTab, Password Change
- New Password Length Before AutoTab, Password Change

Go to **Remote Password Changing > Configure Password Changers > IBM iSeries Mainframe**.

Hide Advanced Settings

SETTING	VALUE	
Bypass Verify After Password Change	No	
Attempt Password Change with new password when error contains (regex)		
Advanced: Delay Verify After Password Change (seconds)		
Username Length Before AutoTab On Login	10	
Password Length Before AutoTab, Password Change	10	
New Password Length Before AutoTab, Password Change	10	

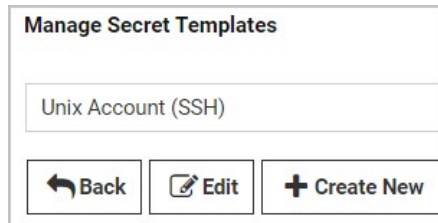
Typically, the console will auto-tab after 10 characters. If your environment behaves differently, note in the console how many characters are entered until auto-tab to the next field occurs, and enter that number into the proper field.

## Creating a Unix Account Secret Template that Uses Key Authentication Instead of a Password

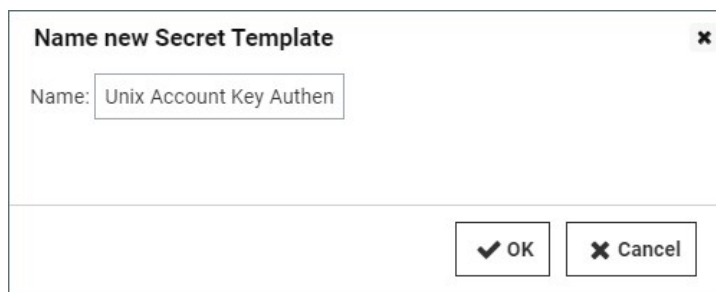
To create a Unix account secret template that uses key authentication only instead of a password, begin by using an existing **Unix Account (SSH)** template as a baseline.

### Create the New Template

1. Go to **Admin > Secret Templates**.
2. Select the built-in **Unix Account (SSH)** template from the drop-down menu and click **Edit**.



3. On the **Secret Template Designer** page, scroll to the bottom and click **Copy Secret Template**.
4. Give the new template an appropriate name, such as *Unix Account Without Password (SSH)* or *Unix Account Key Authentication Only (SSH)*.




5. Click **OK**.
6. On the **Secret Template Copied** confirmation page, click **Continue**.



7. On the **Secret Template Designer** page, scroll down to the **Fields** section and under **Field Name**, find the **Password** row.

FIELDS
FIELD NAME
Machine
Username
Password

- At the right end of the **Password** row, click the **Edit this field** icon .
- In the **Password** row under **IS REQUIRED**, uncheck the box. Optionally, you can also select **Not Editable** from the **Edit Requires** drop-down list.

IS REQUIRED
<input type="checkbox"/>

- At the right end of the **Password** field, click the **Save this field** icon .

You now have a Unix account (SSH) Secret template that displays key authentication fields instead of a password field.

## Disable

Your new template has inherited characteristics from the **Unix Account (SSH)** template you based it on, including having **Remote Password Changing** and **Heartbeat** enabled by default. But because your new template has no password, it cannot be remotely changed and heartbeat cannot validate on an empty password. Therefore, you must disable these features by editing your new template using the procedure below:

- In the **Secret Template Designer** window, scroll to the bottom and click **Configure Password Changing**.
- In the **Secret Template Edit Password Changing** window, click **Edit**.

### Secret Template Edit Password Changing

Enable Remote Password Changing	Yes
Retry Interval	1 hour
Maximum Attempts	10000
Enable Heartbeat	Yes
Heartbeat Check Interval	8 hours

**Password Type to use** Active Directory Account

PASSWORD TYPE	SECRET FIELD	SCRIPT VARIABLE
Domain	Domain	\$domain
Password	Password	\$password
User Name	Username	\$username
Domain Controller (DC)		\$domaincontroller
Default Privileged Account		< None >

Back
Edit

3. In the next **Secret Template Edit Password Changing** window:

1. Uncheck **Enable Remote Password Changing**.
2. Uncheck **Enable Heartbeat**.

### Secret Template Edit Password Changing

Enable Remote Password Changing

☐

Enable Heartbeat

☐

Save
Cancel

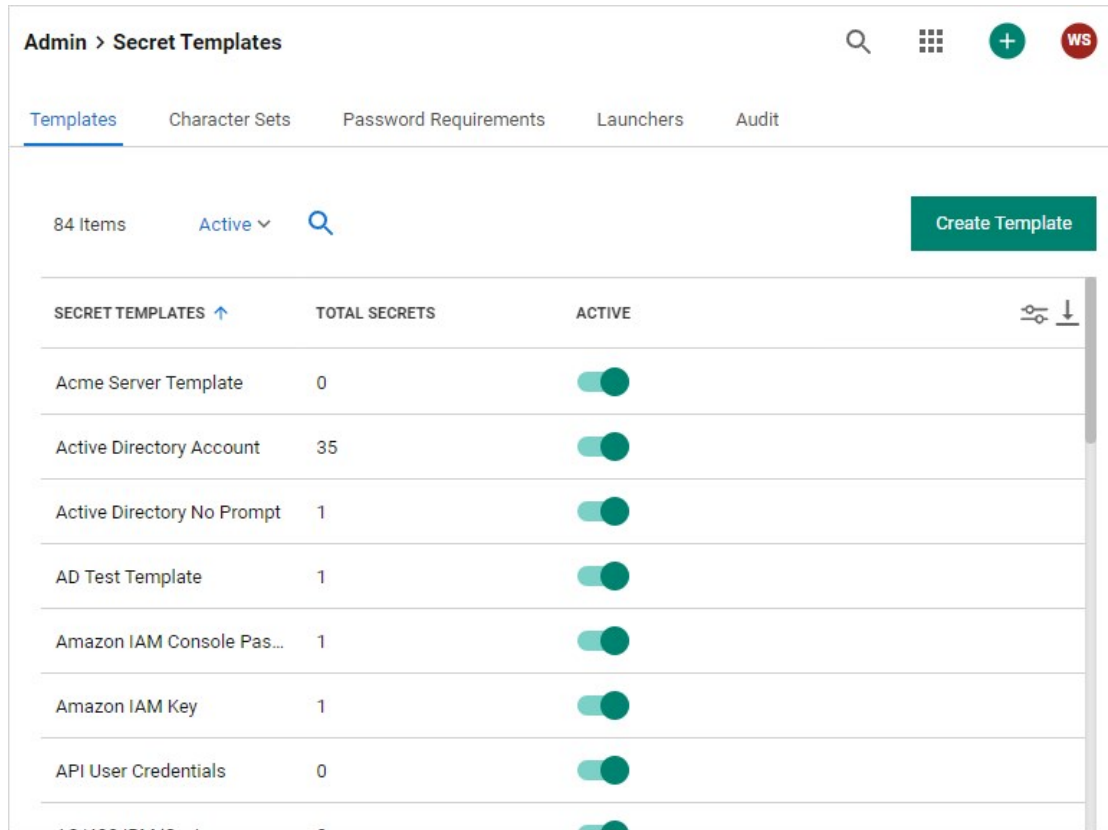
4. Click **Save**.

**Note** Some Secrets based on the **Unix Account (SSH)** might display the **Password** field as well as the **Private Key** and **Private Key Passphrase** (key authentication) fields. If a user signs in using this template with correct credentials in the key authentication fields but a blank or incorrect password in the Password field, the default PuTTY launcher will use key authentication to connect.

## Creating or Editing Secret Templates

### Editing Secret Templates

1. Select **Admin > Secret Templates**. The Secret Templates page appears:



The screenshot shows the 'Admin > Secret Templates' page. At the top, there's a breadcrumb 'Admin > Secret Templates' and a search icon. Below the breadcrumb, there are tabs: 'Templates' (selected), 'Character Sets', 'Password Requirements', 'Launchers', and 'Audit'. On the left, it says '84 Items' and 'Active' with a dropdown arrow. On the right, there's a 'Create Template' button. The main content is a table with the following columns: 'SECRET TEMPLATES' (with an upward arrow), 'TOTAL SECRETS', and 'ACTIVE' (with a toggle switch). The table lists several templates, all of which are active.

SECRET TEMPLATES ↑	TOTAL SECRETS	ACTIVE
Acme Server Template	0	<input checked="" type="checkbox"/>
Active Directory Account	35	<input checked="" type="checkbox"/>
Active Directory No Prompt	1	<input checked="" type="checkbox"/>
AD Test Template	1	<input checked="" type="checkbox"/>
Amazon IAM Console Pas...	1	<input checked="" type="checkbox"/>
Amazon IAM Key	1	<input checked="" type="checkbox"/>
API User Credentials	0	<input checked="" type="checkbox"/>

2. Click the template name in the Secret Templates column. That template's page appears:

Admin > Secret Templates > Acme Server Template

WS

General
Fields
Mapping
Permissions
Audit

Export

Duplicate

**Template Status**
[Edit](#)

Indicates how many Secrets use this template and whether or not the template is active.

[Secret Templates](#)

**Template Usage**
0

**Active**
Yes

**Template Settings**
[Edit](#)

Configure settings for this template.

**Secret Template Name \***
Acme Server Template

**Name Pattern**
None

- Click the desired tab for the configuration you want to change. See the Creating or Importing a New Template section for details.

## Creating or Importing a New Template

### Task 1: Creating the Template

- Select **Admin > Secret Templates**. The Secret Templates page appears:



Admin > Secret Templates

Templates Character Sets Password Requirements Launchers Audit

84 Items Active

Create Template

SECRET TEMPLATES <input type="checkbox"/>	TOTAL SECRETS	ACTIVE <input type="checkbox"/>
Acme Server Template	0	<input checked="" type="checkbox"/>
Active Directory Account	35	<input checked="" type="checkbox"/>
Active Directory No Prompt	1	<input checked="" type="checkbox"/>
AD Test Template	1	<input checked="" type="checkbox"/>
Amazon IAM Console Pas...	1	<input checked="" type="checkbox"/>
Amazon IAM Key	1	<input checked="" type="checkbox"/>
API User Credentials	0	<input checked="" type="checkbox"/>

1. Click the **Create Template** button. The Create Template pop-up page appears:

Create Template

Name your new Secret Template, or import one from an XML file.

New / Import \* ☒ New ☐ Import XML

Template Name \*

Cancel Save

2. If importing the template, click to select the **Import XML** selection button.
3. Type the name of the new template in the **Template Name** text box.
4. Click the **Save** button. The new template's setup page on the General tab appears:

Admin > Secret Templates > My Secret Template

WS

Export

Duplicate

General

Fields

Mapping

Permissions

Audit

Template Status

Edit

Indicates how many Secrets use this template and whether or not the template is active.

Secret Templates

Template Usage

0

Active

Yes

Template Settings

Edit

Configure settings for this template.

Secret Template Name \*

My Secret Template

Name Pattern

None

Description

None

All History

No

Secret Name History Length \*

0

Validate Password Requirements On Create

No

Validate Password Requirements On Edit

No

The page provides all the options for configuring a secret template, as well as which text-entry fields appear on any secret created from that template.

## Task 2: Adding General Settings and Setting an Expiration or One-Time Password

- On the **General** tab, click the **Edit** link in the **Template Settings** section. The section becomes editable:

Secret Template Name *	<input type="text" value="My Secret Template"/>
Name Pattern	<input type="text"/>
Description	<input type="text"/>
All History	<input type="checkbox"/>
Secret Name History Length *	<input type="text" value="0"/>
Validate Password Requirements On Create	<input type="checkbox"/>
Validate Password Requirements On Edit	<input type="checkbox"/>
<input type="button" value="Cancel"/> <input type="button" value="Save"/>	

2. Edit the setting as desired. They include:

- **Secret Template Name** text box.
- **Name Pattern** text box. See [Template Naming Patterns](#).
- **Description**: An optional description for the template.
- **All History** check box: If this check box is enabled, Secret Server keeps all entries for viewing. This feature creates a record of every name used when a new secret is created.
- **Secret name History Length** text box: If All History is disabled, Secret Server keeps this number of entries for viewing.
- **Validate Password Requirements on Create?** check box: Ensure requirements are met on secret creation.
- **Validate Password Requirements on Edit?** check box: Ensure requirements are met when editing secret.

3. Click the **Save** button.

4. Click the **Edit** link for the **Template Expiration** section:

<b>Template Expiration</b>	
Secret Expiration applies to one field of a Secret Template (most commonly the password field) and may trigger a password change for that Secret if Auto-Change is configured for Remote Password Changing.	<div>Expiration Enabled <input type="checkbox"/></div> <div> <input type="button" value="Cancel"/> <input type="button" value="Save"/> </div>

Secret expiration applies to one field of a secret template (most commonly the password field) and may trigger a password change for that secret if auto-change is enabled for RPC.

5. Click to select the **Expiration Enabled?** check box. New controls appear:

Expiration Enabled ☒

Days until Expiration \*

Change Required On \*

6. Type the days till expiration in the **Days until Expiration** text box.
7. Click the Change Required On dropdown list to select the field to choose the field the expiration is applied to.
8. Click the **Save** button.
9. Secret Server begins providing alerts if the secret text-entry field is not changed within the specified expiration requirements.
10. Click the **Edit** link for the **One Time Password** section if you want the secret to have a one-time password that the user must change:

One Time Password

Configure this secret for one time password.

One Time Password Enabled ☐

11. Click to select the **One Time Password Enabled** check box. Additional controls appear:

One Time Password Enabled ☒

One Time Password Length

One Time Password Duration

One Time Password Hash

12. Type or select the options.
13. Click the **Save** button.

### Task 3: Defining Fields for the Template

1. Click the **Fields** tab to add template fields as desired. See [Secret Template Fields](#).

**Note:** To use a custom SSH RPC port, add a field named "Port" to your secret template. Empty port fields are equivalent to

the default port, 22.

## Task 4: Mapping Launchers and RPC Type

1. Click the **Mapping** tab to configure launchers and RPC:

The screenshot shows the 'Admin > Secret Templates > My Secret Template' page. The 'Mapping' tab is selected. At the top right, there are buttons for 'Export' and 'Duplicate'. Below the tabs, there are buttons for 'Scan Templates' and 'Add Mapping'. The 'Password Changing' section has an 'Edit' link and a description: 'Enables heartbeat, remote password changing, and configures / maps the password changer type and fields.' To the right of this section are two toggle switches: 'Enable RPC' (set to 'No') and 'Enable Heartbeat' (set to 'No'). The 'Launchers' section has a description: 'A secret launcher launches applications on end-user machines and automatically logs on using credentials stored in SS. In general, there are three...'. To the right of this section is a message: 'This Secret template does not have any configured launchers. Please use the "Add Mapping" button at the top of this page.'

2. Click the Edit link in the **Password Changing** section to enable RPC on secrets based on this template. This enables heartbeat, RPC, and configures the password changer type and fields. For details, see [Remote Password Changing](#).
3. Click the **Add Mapping** button to add a secret launcher or extended mapping. The Add Mapping popup appears:

The screenshot shows the 'Add Mapping' popup dialog. It has a title 'Add Mapping'. Below the title is a 'Mapping Type' label and a search box with the placeholder text 'Search or pick one' and a dropdown arrow. At the bottom right, there are two buttons: 'Cancel' and 'Save'.

4. Click the **Mapping Type** combination list to search for or select a mapping type:

Launchers:

- Batch Launcher
- Custom PowerShell Launcher
- IBM iSeries Launcher
- Notepad
- PowerShell Launcher

- PuTTY
- PuTTY With Port Prompt
- Remote Desktop
- Secure CRT (Proxied)
- Secure CRT Proxied Process
- Secure CRT Proxied with Van Dyke File Path
- SQL Server Launcher
- Sybase iSQL Launcher
- Ultra VNC

Website Logins:

- OATH Secret Key
- Regex List
- Remote Server SSH Key for Validation
- SSH Private Key
- Username and Password
- z/OS Launcher

The popup changes to accommodate your choice. For example, for a Web server:

### Add Mapping

Mapping Type	Website Login
Password	Search or pick one
URL	Search or pick one
Username	Search or pick one

Cancel
Save

**Note:** A secret launcher launches applications on other machines and automatically logs on using credentials stored in Secret Server. In general, there are three types of launchers: RDP, SSH, and Custom. In addition to user convenience, launchers can circumvent users needing to know their passwords—a user can still gain access to a needed machine but it is not required to view or copy the password out of Secret Server. A Web launcher automatically logs into websites using the client's browser.

5. Click to select or type to search the desired dropdown lists.
6. Click the **Save** button.

## Task 5: Adding Permissions

1. Click the **Permissions** tab:

Admin > Secret Templates > My Secret Template

General Fields Mapping **Permissions** Audit

Export Duplicate

**Secret Template Permissions**

Configure any specific permissions for whether or not this user owns or can create specific types of Secrets.

Add

Add users or groups by selecting the add button. This will define who can create Secrets of this type or manage this Secret template.

Cancel Save

This defines who can create secrets of this type or manage this secret template.

2. Click the **Add** button. The Users popup appears:

Users

Search...

All ▾ Users & Groups ▾

0 selected

- ☐ (lol) (testparent.thycotic.com)
- ☐ Access Control Assistance Operators (gamma.thycotic.com)
- ☐ Account Operators (gamma.thycotic.com)
- ☐ Administrators (gamma.thycotic.com)
- ☐ Administrators (testparent.thycotic.com)
- ☐ Allowed RODC Password Replication Group (gamma.thycotic.com)
- ☐ Auditors
- ☐ Backup Operators (gamma.thycotic.com)

Cancel Add

3. Type the name of the user or group you want to add in the **Search** text box. Note that the groups are by domain.
4. Click to select the user or group's check box for those you desire.

- Click the **Add** button. The selected users or groups appear on the Permissions tab:

The screenshot shows a modal window with a green 'Add' button at the top right. Below it, there are two rows. The first row is labeled 'Auditors' and has a dropdown menu showing '< None >'. The second row is labeled 'Backup Operators (gamma.thycotic.com)' and also has a dropdown menu showing '< None >'. At the bottom of the modal are two buttons: 'Cancel' and 'Save'.

- Click the dropdown list next to each to define if the user or group has the Template Create Secret or Template Owner permission. More than one owner is allowed.
- Click the **Save** button the users or groups now appear in a small table, along with their roles (permissions).
- To remove a user or group:
  - Click the **Edit** link for the **Secret Template Permissions** section. The table of users and groups disappears, and the dropdown lists reappear.
  - Click the dropdown list for the user or group you want to delete and select **< None >**.
  - Click the **Save** button

## Task 6: Viewing the Template's Audit Trail

- Click the **Audit** tab to view activity on the secret template:

The screenshot shows the 'Audit' tab selected in a navigation bar. The tab bar includes 'General', 'Fields', 'Mapping', 'Permissions', and 'Audit'. To the right of the tabs are 'Export' and 'Duplicate' buttons. Below the tabs, it says '4 Items'. The table has the following columns: 'DATE' (with a sort icon), 'DISPLAY NAME' (with a user icon), 'ACTION', 'NOTES', and 'IP ADDRESS'. There is also a slider icon and a download icon on the right side of the table header.

DATE	DISPLAY NAME	ACTION	NOTES	IP ADDRESS
11/18/2021 01:33 PM	[User Icon]	OWNERS_MODIFI...	(Revoked access)...	172.25.115.98
11/18/2021 01:30 PM	[User Icon]	OWNERS_MODIFI...	(Revoked access)...	172.25.115.98
11/18/2021 01:27 PM	[User Icon]	OWNERS_MODIFI...	(Granted access) ...	172.25.115.98
11/17/2021 03:13 PM	[User Icon]	Create		172.25.115.101

You cannot drill down on the entries, but you can define what columns to see by clicking the slider icon on the right. You can also click the download icon to download a text file version of the table:



Download

Would you like to download this table data as a CSV file?

Export	All Data	▼
Date Format	ISO (1994-11-05T13:15:30.939Z)	▼
Time Zone	UTC	▼

Cancel
Download

## Settings for Specific Template Types

### Oracle Account as SYS

Settings for an Oracle Account secret template to work with Oracle connecting as SYS in SysDBA:

- Set **Oracle Account** as the type.
- Set **Oracle Account (AS SYS)** as the password type.
- Create a secret based on the new template to test the template.

### SQL Windows Authentication Account Secret Template and Launcher

Settings for an Active Directory template that is specifically for SQL:

**Note:** You can copy the existing AD template that you have. However, if you copy an existing template that has launchers attached to it, you may need to delete those launchers on the newly created template.

- Set **Active Directory** as the type.
- If necessary, create a field called **Server**.
- Add the following parameters for Windows settings (see [Creating Custom Launchers](#)):
  - Name: SQL Server Launcher - Windows Authentication
  - Active: Yes
  - Process Arguments: -E -S \$Server (\$Server should match the field name you created or observed earlier)
  - Run Process as Secret Credentials: Yes
  - Load User Profile: Yes
  - Use Operating System Shell: No
  - Use Additional Prompt (in General Settings): No

Secret Server now has three new (as of 11.4.000030) Oracle templates.

## Introduction


### Overview

Secret Server now has three new Secret Templates based off the Oracle Managed Data Access NuGet library. Unlike earlier Oracle Secret Templates, templates, using the NuGet library will not require `Oracle.ManagedDataAccess.dll` to be installed alongside Secret Server or its engines. Additionally, two of these templates support Oracle's TCPS connection protocol. You can run the new templates alongside the earlier Oracle secret templates, but we recommend using the new templates when creating new Oracle secrets.


### DataSource Field

All three new templates include an optional DataSource field. The DataSource field acts like a connection string to the Oracle database. When used, it is not necessary to fill out the Host, Database, Port, or SSL Server Cert DN fields. On the secret template's page, "none" appears in each of those fields.

Without DataSource:

Secret Name *	Oracle Walletless without DataSource
Secret Template	Oracle Account (Walletless)
Host	adb.us-ashburn-1.oraclecloud.com
Username *	walletless_local
Password *	***** 
Database	g62a2e091eede11_jjtest2_high.adb.oraclecloud.com
Port	1521
As System User? *	0
DataSource	None
SSL Server Cert DN	CN=adwc.uscom-east-1.oraclecloud.com, OU=Oracle BMCS US, O=Oracle Corporation, L=Redwood City, ST=California, C=US
Notes	None

With DataSource:

Secret Name *	Walletless with DataSource
Secret Template	Oracle Account (Walletless)
Host	None
Username *	walletless_with_datasource
Password *	***** 
Database	None
Port	None
As System User? *	0
DataSource	(description= (retry_count=20) (retry_delay=3) (address= (protocol=tcps) (port=1521) (host=adb.us-ashburn-1.oraclecloud.com)) (connect_data= (service_name=g62a2e091eede11_jjtest2_high.adb.oraclecloud.com)) (security= (ssl_server_dn_match=yes) (ssl_server_cert_dn="CN=adwc.uscom-east-1.oraclecloud.com, OU=Oracle BMCS US, O=Oracle Corporation, L=Redwood City, ST=California, C=US")))
SSL Server Cert DN	None
Notes	None

## As System User Field


All new templates also have the “As System User” field. It allows connections to the database as the system user. Setting this to “1” allows database connections with the SYSDBA privilege. Setting this to “0” connects with the default role.

## Templates


### Oracle Account (Template Ver 2)

Oracle Account (Template Ver 2) is the closest equivalent to the original Oracle Account template. It does not support Oracle TCPS, but it does use the Oracle Managed Data Access NuGet library. The fields on this secret template are the same as in the original Oracle Account template with a few exceptions. We added two new fields, the DataSource and “As System User” fields described above. Additionally, the “Server” field is called “Host” in the new template to more closely match the terminology in Oracle’s connection string.

Original template:

Secret Name *	Oracle Account 00
Secret Template	Oracle Account
Server *	OMEGACENTOS03.omega.thycotic.com
Port	1521
Database *	omegaora
Username *	CUST_OracleAccount00
Password *	***** 
Notes	None

New template:

Secret Name *	Oracle Account 00 with new template
Secret Template	Oracle Account (Template Ver 2)
Host	OMEGACENTOS03.omega.thycotic.com
Username *	CUST_OracleAccount00
Password *	***** 
Database	omegaora
Port	1521
As System User? *	0
DataSource	None
Notes	None

**Oracle Account (TCPS)**

**Overview**

You can make TCPS connections using the "Oracle Account (TCPS)" secret template and an Oracle Wallet. As described by Oracle, "Oracle Wallet is a container that stores authentication and signing credentials."

**Note:** See [Understanding Oracle Wallet](#) for more information, and refer to the documentation on your specific Oracle database for details on obtaining and using your wallet.

## Wallet Location

Prior to setting up Oracle Account (TCPS) secrets, you will need to place copies of your Wallet files on the same server(s) as your Secret Server site(s) where you will have Oracle Account (TCPS) secrets. Afterwards, use the "Wallet Location" field to note the location of your wallet files on your newly created secret. Note that you will need to ensure that the user running Secret Server's app pool (or engine when applicable) is granted permissions to access the directory where the wallet is located.

## TNS Admin

The "TNS Admin" field is optional. If you have a `tnsnames.ora` file, specify its containing directory in this field.

As with wallets, you should consult documentation specific to your Oracle database for information on using `tnsnames.ora`. However, in general, `tnsnames.ora` file is a configuration file containing network service names mapped to connect descriptors (for local naming method) or net service names mapped to listener protocol addresses.


**Note:** See [Local Naming Parameters in the tnsnames.ora File](#) for more information.

Thus, you can use the `tnsnames.ora` file as an alternative way to specify a connection string. First, put the directory of the `tnsnames.ora` file in the "TNS Admin" field. Second, format the contents of `tnsnames.ora` as `<ALIAS> = <CONNECTION STRING>`. Paste the desired alias from inside the `tnsnames.ora` files in the DataSource field of the secret. For example, if we had a file at `C:\Oracle\tnsnames.ora`, the contents might be as follows:

```
jjdb_high = (description= (retry_count=20)(retry_delay=3)(address=(protocol=tcps)(port=1522)(host=adb.us-ashburn-1.oraclecloud.com))(connect_data=
(service_name=g62a2e091e0de11_jjdb_high.adb.oraclecloud.com))(security=(ssl_server_cert_dn="CN=adwc.uscom-east-1.oraclecloud.com, OU=Oracle BMCS US,
O=Oracle Corporation, L=Redwood City, ST=California, C=US"))))

jjdb_low = (description= (retry_count=20)(retry_delay=3)(address=(protocol=tcps)(port=1522)(host=adb.us-ashburn-1.oraclecloud.com))(connect_data=
(service_name=g62a2e091e0de11_jjdb_low.adb.oraclecloud.com))(security=(ssl_server_cert_dn="CN=adwc.uscom-east-1.oraclecloud.com, OU=Oracle BMCS US, O=Oracle
Corporation, L=Redwood City, ST=California, C=US"))))
```

In this example, `jjdb_high` or `jjdb_low` are both aliases. We would choose one, say `jjdb_high`, and paste it into the DataSource field on my secret. I would include `C:\Oracle` in the TNS Admin field. My secret would appear as in the following screenshot:

Secret Name *	TNS Names example
Secret Template	Oracle Account (TCPS)
Host	None
Username *	some_user
Password *	***** 
Database	None
Port	None
As System User? *	0
DataSource	jjdb_high
SSL Server Cert DN	None
TNS Admin	C:\Oracle
Wallet Location	C:\Oracle\Wallet
Notes	None

## Oracle Account (Walletless)

Oracle has recently announced its support of TCPS without requiring the use of wallets. See [Securely Connecting to Autonomous DB Without a Wallet \(Using TLS\)](#) for details.

Because walletless connections utilize TLS instead of "mutual TLS," this is potentially less secure than a wallet-based authentication, so you should do your own research before deciding if this is the right approach for you. The advantage of the walletless template is that it allows a secure TCPS connection with the simplicity of the "Oracle Account (Template Ver 2)" template. No wallet files need to be deployed to a server.

The fields on this template are the same as Oracle Account (Template Ver 2) with the addition of the "SSL Server Cert DN" field, which can be found in the TLS connection string. Refer to documentation on your specific Oracle database about how to enable walletless connections, as well as how to obtain the TLS connection string to fill in fields on this secret template.

## Introduction

The "SAP SNC Account" secret template is an expansion on the original "SAP Account" secret template. It takes advantage of SAP's Secure Network Communication (SNC), which is a protocol that encrypts communication between Secret Server and an SAP Server. The SAP SNC Account template includes all the original fields from the SAP Account secret, adding a few more as well.

## New Template Fields

The following is an introduction to the new template fields (in addition to those also found in the SAP Account secret template):

**Note:** Please see the [SAP .NET Connector 3.0 Programming Guide](#) for additional information.

- **SNC Partner Name:** Matches the snc/identity/as value set in your SAP Server configuration.
- **SNC My Name:** For most SAP configurations, you can ignore this. See the connector programming guide for cases where it may be required.
- **SNC Quality of Service:** Dropdown list to select the service quality or protection used for SNC communication. Choose one of the following protection options:
  - Authentication Integrity (includes authentication)
  - Authentication Integrity Privacy (includes integrity protection and authentication)
  - Authentication Only
  - Default Protection
  - Maximum Protection
- **SNC Single Sign On:** Dropdown list to set to true if you wish to use single sign on. If you set this to false, you authenticate with your username and password on the secret.
- **X.509 Certificate:** Click the **Change** link to upload an X.509 certificate for authentication.

## Server-Side Setup

### Prerequisites

#### SAP Server Setup

Follow the latest SAP documentation for configuring the SAP server and your SAP users to use SNC. For example:

1. SSH into your SAP server.
2. Edit the configuration file: `/sapmnt/<SystemID>/profile/profilename.pfl`
3. Add the SNC settings to the end of this file. For example:

```
snc/enable = 1

snc/gssapi_lib = /usr/sap/NPL/SYS/exe/run/libsapcrypto.so

snc/identity/as = p:CN=vhcalnplci,OU=Test,O=Thycotic,C=US

snc/accept_insecure_cplic = 1

snc/accept_insecure_gui = 1

snc/accept_insecure_r3int_rfc = 1
```

```
snc/accept_insecure_rfc = 1
snc/permit_insecure_start = 1
snc/extid_login_diag = 1
snc/extid_login_rfc = 1
snc/data_protection/min = 1
```

4. Verify that the library file path exists on your server (make sure that `libsapcrypto.so` is actually in that directory).
5. Reboot your server.
6. When the server is finished, reconnect and restart the SAP server with these commands:

```
su npladm
startsap all
```

## SAP NCO Files

As with the original SAP Account template, you include the `SAPNCO.dll` and `SAPNCO_UTILS.dll` files in your Secret Server or distributed engine installation. See [SAP Heartbeat and Password Changing](#) for more information.

## SAP Cryptographic Library

In addition to the SAP NCO DLL files, you need to obtain the SAP Cryptographic Library. This should include the library DLL (`sapcrypto.dll`), the license ticket, and the configuration tool (`sapgenpse.exe`). Add the DLL file to your Secret Server or distributed engine installation following the same steps as the SAP NCO files. For more information on this library, see the [SAP Identity Management Configuration Guide](#).

## SAP Server Certificate

1. Open SAP Trust Manager (STRUST).
2. Download your SAP's server certificate from the STRUST transaction. Assuming you setup your SAP server correctly, this should be located in the **SNC SAPCryptolib** folder.
3. If nothing exists under SNC SAPCryptolib, right click on the folder and select **Create** to create a new PSE under **SNC SAPCryptolib**.
4. Open the PSE.
5. Enter a password if prompted. (If not, use the **Password** button to set a password).
6. Click the SNC SAPCryptolib folder.
7. Double click the **Subject** under **Own Certificate**.
8. Confirm the certificate details appear in the **Certificate** section.
9. Click the **Export Certificate** icon button at the bottom to open a dialog box, which allows you to download the certificate.

**Note:** If the button is not enabled, you may need to click the Display or Edit (pencil and glasses) button and click the Base64 selection button when prompted and then the green checkmark button to complete the download.

## Personal Security Environment Setup

As with your SAP server setup, you should consult the latest SAP documentation for more information when setting up your Personal Security Environment (PSE). These instructions are provided to illustrate the options to configure the SAP SNC Account secret template in



Secret Server, but SAP's documentation may provide more information about your options pertaining to the creation of a PSE. To set up your PSE:

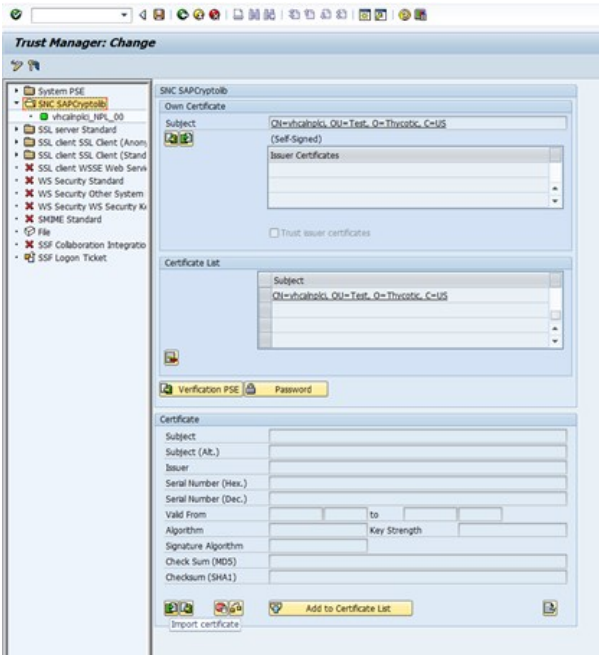
1. In your client environment (your Secret Server or distributed engine server), create a directory to stage your setup. For example, I used C:\SAPSNC.
2. Add the two SAP NCO files (sapnco.dll and sapnco\_utils.dll), the SAP Cryptographic library (sapcrypto.dll), your ticket license file, and sapgenpse.exe to this directory.
3. Copy the server certificate you exported from your SAP instance to this directory.
4. Add two system environment variables to your server:
  - SECUDIR should be the directory you just created (for instance C:\SAPSNC)
  - SNC\_LIB should be the full path of the SAP Encryption library (for instance C:\SAPSNC\sapcrypto.dll).
5. Following SAP's instructions, use SAPGENPSE (or other tools that SAP may provide) to generate the PSE, including the cred\_v2 file and the X.509 certificate. See [Configuring the Use of the SAP Cryptographic Library for SNC](#). For example, you could run these commands from a command prompt window with Administrator permissions in the C:\SAPSNC directory:
 

```
sapgenpse get_pse -p target.pse -x <PASSWORD> <DISTINGUISHED NAME>
sapgenpse seclogin -p target.pse -x <PASSWORD> -O <DOMAINUSER>
sapgenpse maintain_pk -a <CERT FILE FROM SAP GUI> -p target.pse -x <PASSWORD>
sapgenpse maintain_pk -v -l -p target.pse -x <PASSWORD>
sapgenpse export_own_cert -o target.crt -p target.pse -x <PASSWORD>
```
6. When you create the server credentials with the sapgenpse "seclogin" command, specify a Windows or Active Directory user for the credentials. You have two options here:
  - Specify the same user who runs your Secret Server or distributed engine as the one who is allowed to use the PSE you just setup. This is the easier option. Secret Server
  - Specify a different Windows or Active Directory user. If you choose this option, you need to also create a secret for that user in Secret Server as either a Windows or Active Directory secret. Add this secret to your SAP SNC secret's associated secrets.

**Note:** For more information about using the SAPGENPSE tool, see [Creating the Server's Credentials Using SAPGENPSE](#).

## Importing PSE information to the SAP GUI

1. As above, refer to SAP's documentation for details on getting your PSE recognized by your SAP server. This is just an example.
2. Import the certificate you created above ('target.crt' in my example) through the STRUST transaction in the SAP GUI:
  1. Go to **STRUST \> SNC SAPCryptolib**.
  2. Click the entry below the SNC SAP Cryptolib folder. In the example below it is vhcalnplci\_NPL\_00.

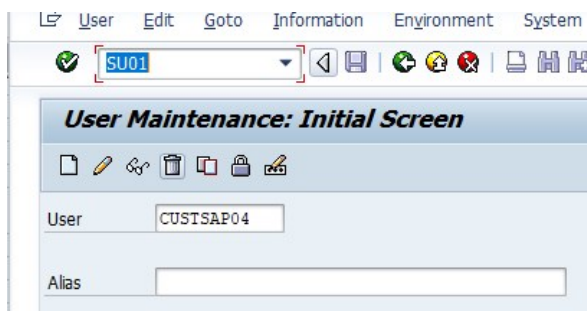


3. If prompted for a password, type it and then click the green checkmark button.
4. Click the Import Certificate icon on the far left on the bottom (hover over). The Import Certificate dialog box appears.
5. Type your certificate's file path.
6. Click the green checkmark button. The dialog disappears.
7. Confirm the certificate details are now in the **Certificate** section.
8. Click **Add to Certificate List**.

**Note:** If the button is not enabled, you may need to click the Display or Edit (pencil and glasses) button.

9. Confirm the certificate now appears in the **Certificate List** section.
10. Save and exit.

3. Go to the **SU01** function.
4. Type your SAP user's name in the **User** text box.



5. Click the pencil icon to edit.

- In the **SNC** tab, define the SNC name using the syntax: p:<YOUR USER'S DISTINGUISHED NAME>.

**Maintain Users**

User: IBARUC0001  
 Changed By: CUSTSAP02 29.04.2021 14:07:38 Status: Saved

Documentation Address Logon Data **SNC** Defaults Parameters Roles Profiles

**SNC Status**  
 SNC is active on this application server  
 Unsecured logon is generally permitted

**SNC Data**  
 SNC name: p:CN=vhcalnplci,OU=Test,O=Thycotic,C=US  
 Canonical name defined  
 Allow password logon for SAP GUI (user-specific)

**Administrative Data**  
 Created: CUSTSAP03 27.04.2021 19:37:13  
 Modified: CUSTSAP03 27.04.2021 21:05:32

Other SAP Users with Same SNC Names

Client	User	SNC name
001	INDIUM01	p:CN=vhcalnplci,OU=Test,O=Thycotic,C=US
001	INDIUM02	p:CN=vhcalnplci,OU=Test,O=Thycotic,C=US
001	OC	p:CN=vhcalnplci,OU=Test,O=Thycotic,C=US

- Save and exit the **SU01** transaction.
- Go to the **SM30** transaction.

**Edit Table Views: Initial Screen**


Find Maintenance Dialog

Table/View: VUSREXTID

**Restrict Data Range**  
☒ No Restrictions  
☐ Enter conditions  
☐ Variant

Display Maintain Transport Customizing

- Type VUSREXTID in the **Table/View** text box.
- Click the **Maintain** button. A dialog box appears:

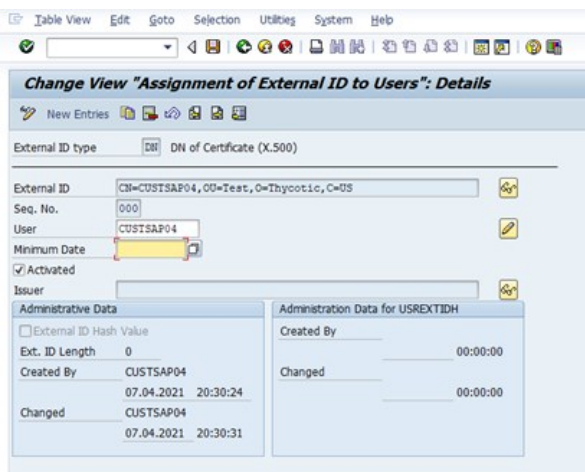


**Determine Work Area: Entry**

Field Name	Work Area
External ID type	DN

Further select cond. Append

11. Select **DN** as the work area.
12. Click the check mark icon button.



**Change View "Assignment of External ID to Users": Details**

New Entries

External ID type: DN DN of Certificate (X.500)

External ID: CN=CUSTSAP04,OU=Test,O=Thycotic,C=US

Seq. No.: 000

User: CUSTSAP04

Minimum Date: [Date]

☒ Activated

Issuer: [Issuer]

**Administrative Data**

☐ External ID Hash Value

Ext. ID Length: 0

Created By: CUSTSAP04

Changed: 07.04.2021 20:30:24







**Administration Data for USREXTIDH**

Created By: [Field]

Changed: 00:00:00

13. Click the **New Entries** button. The Change View "Assignment of External ID to Users" panel appears:

**Change View "Assignment of External ID to Users": Overview**

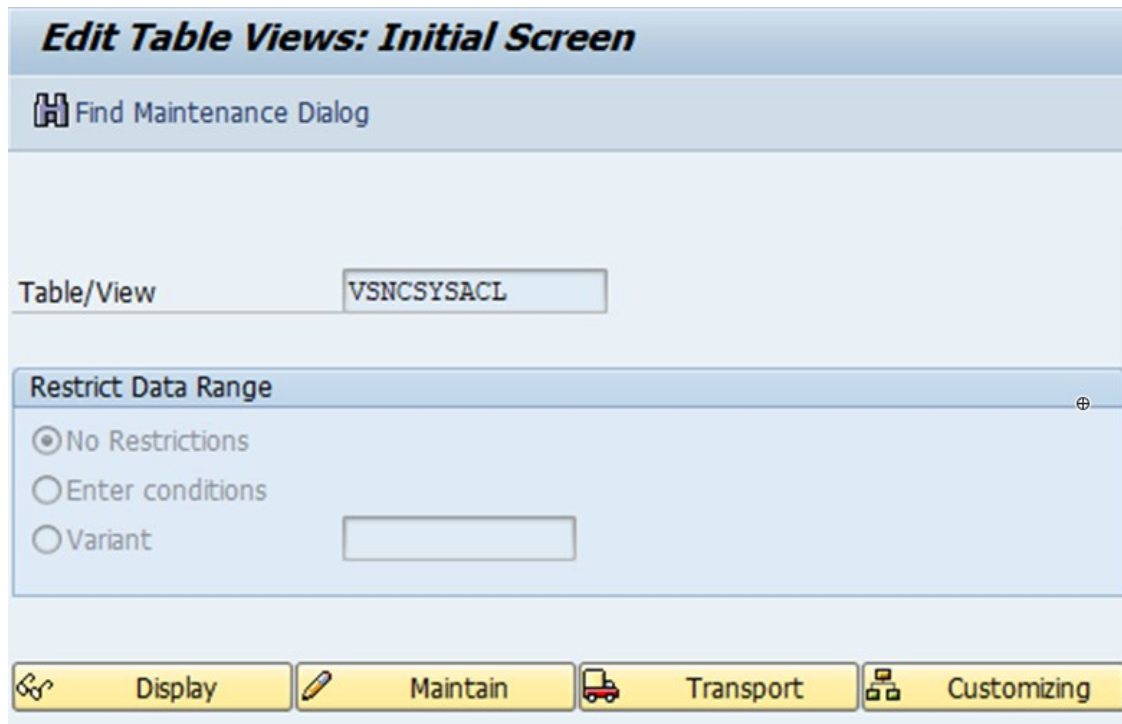
External ID type  DN of Certificate (X.500)

Assignment of External ID to Users

E.. External ID	User	Act.
<input type="checkbox"/> CN=INDIUM01, OU=Test, O=Thycotic, C=US	INDIUM01	<input checked="" type="checkbox"/>
<input type="checkbox"/> CN=OC, OU=Test, O=Thycotic, C=US	OC	<input checked="" type="checkbox"/>
<input type="checkbox"/> CN=OCX509, OU=Test, O=Thycotic, C=US	OCX509	<input checked="" type="checkbox"/>
<input type="checkbox"/> CN=target, OU=Test, O=Thycotic, C=US	PASS_NO_SSQ	<input checked="" type="checkbox"/>
<input type="checkbox"/> CN=target, OU=Test, O=Thycotic, C=US	CUSTSAP08	<input checked="" type="checkbox"/>
<input type="checkbox"/> CN=vhcalnplci, OU=Test, O=Thycotic, C=US	TEST123	<input checked="" type="checkbox"/>
<input type="checkbox"/> CN=vhcalnplci, OU=Test, O=Thycotic, C=US	INDIUM01	<input checked="" type="checkbox"/>
<input type="checkbox"/> CN=vhcalnplci, OU=Test, O=Thycotic, C=US	INDIUMADM	<input checked="" type="checkbox"/>
<input type="checkbox"/> CN=vhcalnplci, OU=Test, O=Thycotic, C=US	CUSTSAP05	<input checked="" type="checkbox"/>

Position... Entry 1 of 9

14. Click the Details (magnifying glass) icon. A details panel appears.
15. Fill out the fields as follows:
  1. Replace the **External ID** with your own
  2. Click to select the **Activated** check box.
  3. Type your SAP username in the User text box.
  4. Type a sequence number in the **Seq. No.** (sequence number) text box. For example, 000.
  5. Save and exit.
16. Return to the SM30 function.



**Edit Table Views: Initial Screen**

Find Maintenance Dialog

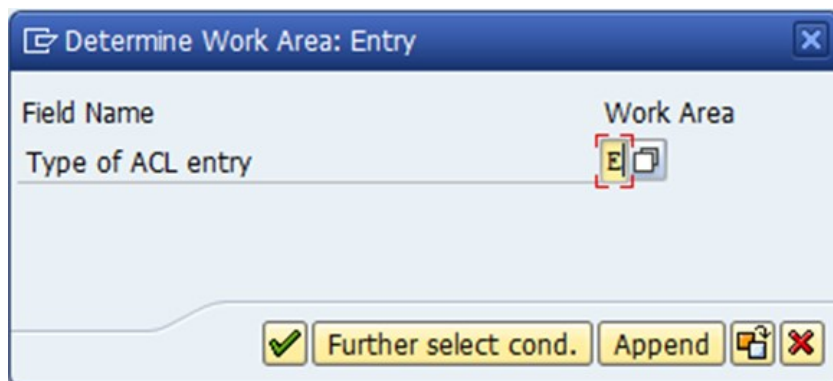
Table/View:

**Restrict Data Range**

☒ No Restrictions  
☐ Enter conditions  
☐ Variant

17. Type VSNCYSACL in the **Table/View** text box.

18. Click the Maintain button. A dialog box appears:



**Determine Work Area: Entry**

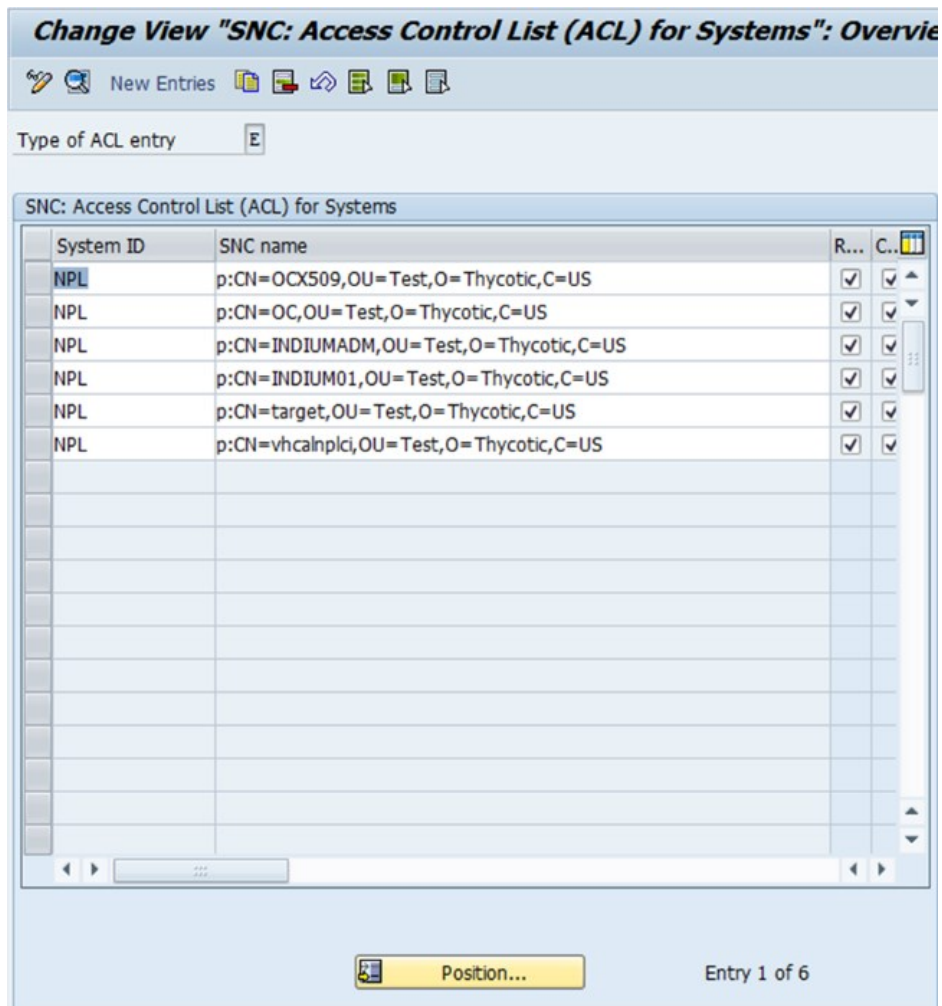
Field Name:

Work Area:

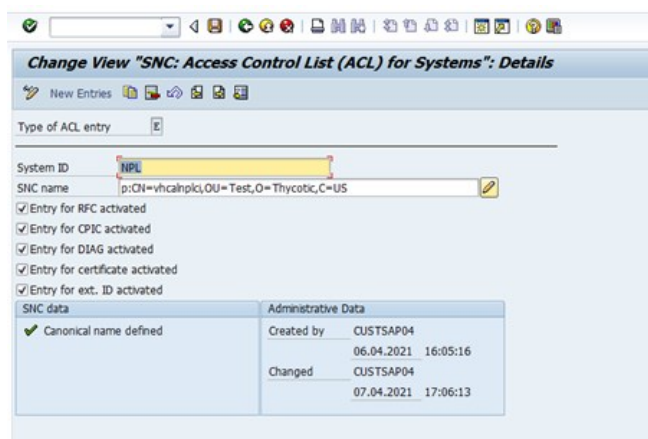
19. Select **E** as the work area.

20. Click the check mark icon button. The dialog box disappears.

21. Click the **New Entries** button. The Change View "SNC: Access Control List (ACL) for Systems" panel appears:



22. Click the Details (magnifying glass) icon. A details panel appears.



23. The **System ID** should match the system ID of your SAP instance. The **SNC name** should be the distinguished name of the server. There should only be one entry in this table for the server.



24. Confirm that a "Canonical name defined" message appears.

25. Save and exit

## Creating an SAP SNC Secret in Secret Server

SAP SNC Account secrets are created in the same way as the original SAP Account secrets but have additional fields, as described above. For details that apply to both the SAP Account and SAP SNC Account secrets, see [SAP Heartbeat and Password Changing](#).

If your PSE was created for a Windows or Active Directory user other than the one who runs Secret Server or distributed engine, you need to add that user to your SAP SNC Account secret's associated users. To do this, add your user as either a Windows Account or an Active Directory secret. Next, open your SAP SNC Account secret and navigate to the Remote Password Changing tab to add that secret as an Associated Secret

If you do not use single sign-on or if you choose to use the username and password without the X.509 certificate for authentication, the X.509 certificate may be omitted.

## Troubleshooting

### SAP Account Secret Work but SAP SNC Secrets Do Not

SNC uses port 4800 to communicate. If the original SAP Account secrets work but SAP SNC secrets do not, be sure that port 4800 is not blocked by your firewall or VPN.

### Client-Side Errors

If you experience client-side errors (such as generating a client certificate), right click on your SAP DLL files (sapcrypto.dll, sapnco.dll, or sapnco\_utils.dll), and make sure that they are not blocked by your OS.

### Distinguished Name Errors

If you run into an error message a distinguished name (DN) error, such as Exception: LOCATION CPIC (TCP/IP) with Unicode ERROR GSS-API(maj): No credentials were supplied Unable to establish the security context target="p:CN=vhcalnplci, OU=Test, O=Thycotic, check your spacing in the distinguished name. SAP can be strict about adding or removing the spaces after commas in the DN.



**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Field Slug Names

A *field slug name* in Secret Server is a unique human-readable identifier for a data field in a Secret Server template. The field slug name is available for integrating with third-party applications via API calls. Slug names are programmatically available for API calls but are not visible to template users (secret creators). Instead, they are displayed as references in secret templates.

**Note:** If you are not planning to access Secret Server with an API, slug field names are not for you—leave the suggested name as is.

**Figure:** Field Slug Name in a Secret Template

FIELDS		
FIELD NAME	FIELD SLUG NAME	FIELD DESCRIPTION
Public Key	public-key	The SSH public key.
Private Key	private-key	The SSH private key.
Private Key Passphrase	private-key-passphrase	The passphrase for decrypting the SSH private key.
Notes	notes	Any additional notes.
* <input type="text"/>	* <input type="text"/>	<input type="text"/>

Field slug names are automatically generated, based on the field name, when the field is created. For example, "User Name" became "user-name." Characters that are potentially problematic for programming, such as spaces, are swapped out. The automatically generated name is unchangeable by human users, unlike the field name. If API calls were based on the field name, human users with access to the template could break those calls, simply by changing the name.

With Secret Server 10.7.X+, The generated field slug names are now user-definable. You can edit the generated names to:

- Conform to a naming convention used in your API calls.
- Maintain the same name for a field across secret templates to simplify coding by developers.

The only requirement is that each slug field name is unique to that template.

**Note:** If you are wondering how Secret Server internally uniquely identifies fields, there is an internal ID that is not accessible by users or APIs. It is not available read-only (for API use) because we want to futureproof integrations from internal changes to Secret Server.

**Note:** The user-definable field slug names are also automatically generated when you upgrade from a version of Secret Server that did not have user-defined field slug names. If there are two fields with the same field name, the second (and later) generated field slug name has an incremented number appended to it.

## Secret Template Fields

**Note:** If you want to programmatically manipulate fields, see [Field Slug Names](#).

**Note:** To use a custom SSH RPC port, add a field named "Port" to your secret template. Empty port fields are equivalent to the default port, 22.




## Field Types

Template fields can be specified as one of several different types to enhance customization:

- **File:** File attachment link. File attachments are stored in the Microsoft SQL Server database.
- **General List:** Preconfigured selectable list for launcher enhancement or general use. See [Secret Template List Fields](#).
- **Notes:** Multi-line text-entry field.
- **Password:** Password type text-entry field.
- **Text:** Single-line text-entry field.
- **URL:** Clickable hyperlink.
- **URL List:** Preconfigured selectable list for general use. See [Secret Template List Fields](#).

## Editing Fields

The secret template designer provides several settings to customize secret template text-entry fields:

- To add a secret text-entry field, fill out the values and click the **+** button.
- To delete a text-entry field, click the  icon. There is a confirmation dialog box before deletion takes place.
- To edit a text-entry field, click the  icon. Click either the  icon to save or the **X** icon to discard the changes.

## Text-Entry Field and Control Settings

The settings available for text-entry fields are:

- **Field Name:** Name of the text-entry field. This name is used for the Create New drop-down list on either the Dashboard's Create Secret Widget or Home page.
- **Field Description:** Description of the text-entry field.
- **Field Type:** Type of the text-entry field. See below for a description of the different text-entry fields.
- **Is Required:** Whether the text-entry field should require a value. These check boxes are checked for correct content when the user attempts to create this secret. A validation error is displayed if not entered correctly.
- **History:** Number of values to keep in the text-entry field's history of values.
- **Searchable:** Whether that text-entry field should be indexed for searching. By default, passwords are not indexed. File attachments and history cannot be indexed for searching.
- **Edit Requires:** Minimum permissions on the secret needed in order to edit the value on the secret. The options are Edit, Owner and Not Editable. This enables the secret text-entry field to be locked down at a more granular level than other text-entry fields on the template.
- **Hide on View:** If checked, this text-entry field is not displayed to users when viewing the secret. The text-entry field is only be displayed when the secret is in Edit mode.
- **Expose for Display:** If checked, this text-entry field is available to be displayed as a Custom Column on the Secret Server Dashboard.

**Note:** All text-entry fields that are set to "Expose for Display" are **not** encrypted in the database. Only check this value if the secret text-entry field data is not considered privileged information.

The order of the text-entry fields in the Template Designer grid is the same as those that appear when the user views or edits a secret created from the template. The order can be modified through the up and down arrows on the grid.

Default values can be specified on each text-entry field by clicking the edit defaults  button. These added values appear as a list on any

secret created from this template.

## Secret Template List Fields

### Overview

With secret template list fields, administrators can create new lists that can be shared by multiple secrets. Clicking on an existing list goes to the details page for that list where the user can set the list's name, description, and the options available in the list.

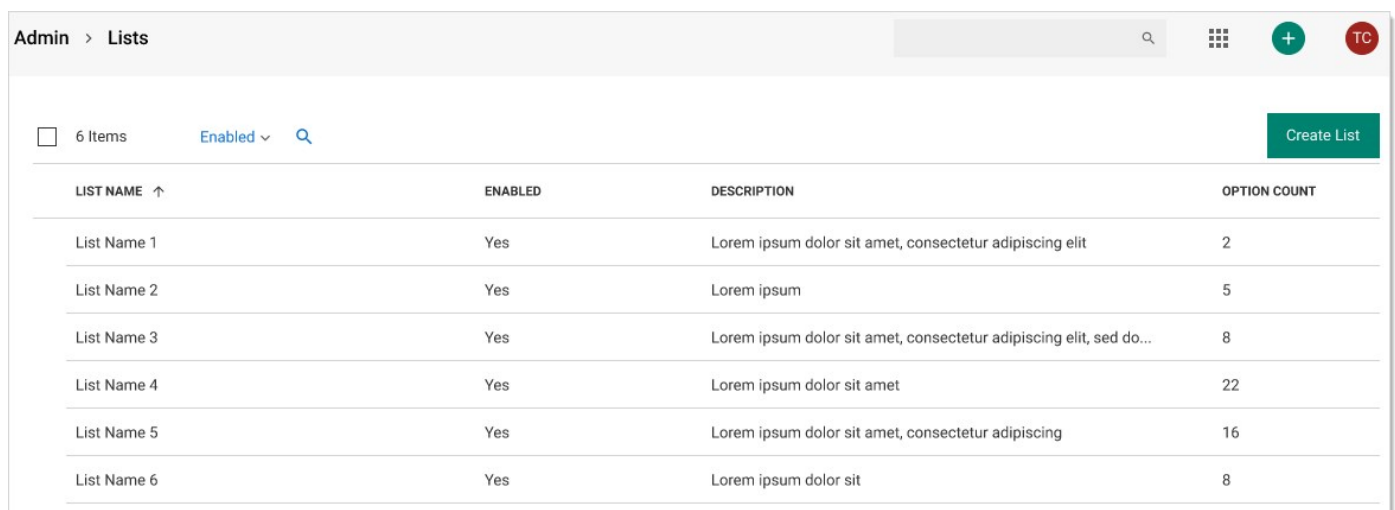
You can optionally group list options by category, which make using very large lists easier. For instance, a list of machines might have the machines categorized by function, such as "Web Server" or "Database Server." You could also use categories for locations, such as "London," "New York," or "Tokyo."

List categories are displayed on the secret and on the launcher dialog with the options sorted alphabetically within categories, which are also sorted alphabetically. Options can be duplicated in multiple categories and will show up in each one. In addition to manually adding categories and options, you can upload a file containing the list options. Teams (Admin > Teams) – The team details page

### Adding a New List Field

#### Task 1: Create the List

1. Go to **Admin > Lists**. The List page appears:



Admin > Lists			
<input type="checkbox"/> 6 Items   Enabled ▾   🔍			
<a href="#">Create List</a>			
LIST NAME ↑	ENABLED	DESCRIPTION	OPTION COUNT
List Name 1	Yes	Lorem ipsum dolor sit amet, consectetur adipiscing elit	2
List Name 2	Yes	Lorem ipsum	5
List Name 3	Yes	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do...	8
List Name 4	Yes	Lorem ipsum dolor sit amet	22
List Name 5	Yes	Lorem ipsum dolor sit amet, consectetur adipiscing	16
List Name 6	Yes	Lorem ipsum dolor sit	8

2. Click the **Create List** button. The Create List popup appears:

### Create List

Name \*

Description

Cancel

Save

3. Type the name in the **Name** text box.
4. (Optional) Type a description in the **Description** text box.
5. Click the **Save** button. The configuration page for the new list appears:

Admin > Lists > Web Servers

List Detail
Audit

List Status
Edit

Disable a list to prevent it from being used.

Enabled

Yes

List Detail
Edit

List name must be unique.

List Name \*

Web Servers

Description

None

List Options

Add options organized by category, or an uncategorized list of options can be created.

0 Items

Uncategorized

Add

No Items Found

There is no information available to display on this screen.

6. Click the **Add** button in the **List Options** section and select **Create Category**. The Create Category popup appears:

Create Category

Category \*

Cancel

Save

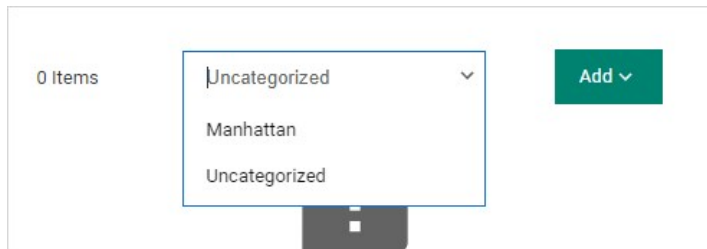
**Note:** If you want a list with no categories, choose Uncategorized for category, and follow these same instruction for

adding options.

**Note:** You can also create categories from a comma-delimited list in a text file. Select the **Add** button and select **Add from File**. This can be either a list of options, one option per line, or a list of comma-delimited values in the format option,category with one pair per line. Files can also combine these formats, and any line without a comma will be treated as a option without a category.

7. Type the name for the category in the **Category** text box. We typed "Manhattan."

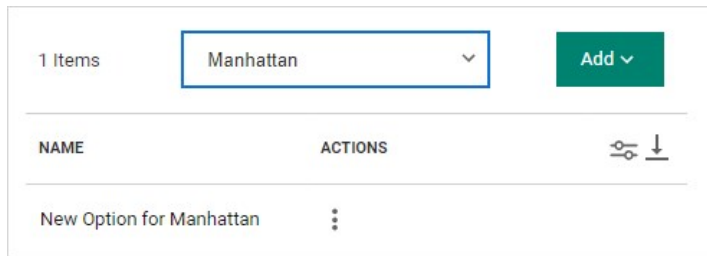
8. Click the **Save** button. The category name now appears in the dropdown list:



The screenshot shows a user interface with a dropdown menu. On the left, it says "0 Items". The dropdown menu is open, showing three options: "Uncategorized", "Manhattan", and "Uncategorized". To the right of the dropdown is a green button labeled "Add" with a downward arrow.

9. Add another category the same way. We added "Albany."

10. Click the dropdown list to select a category you just added. We chose "Manhattan." A table appears below the dropdown list:



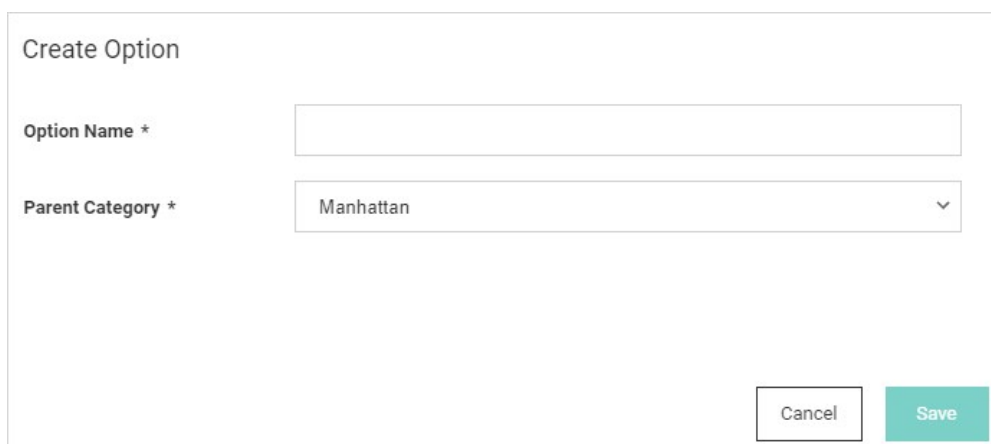
The screenshot shows the user interface after selecting "Manhattan". The dropdown menu now shows "1 Items". Below the dropdown is a table with the following structure:

NAME	ACTIONS
New Option for Manhattan	⋮

There are also icons for sorting and filtering to the right of the table header.

Note that there is no option (list item) listed.

11. Click the **Add** button and select **Create Option**. The Create Option popup appears:



The screenshot shows a "Create Option" popup form. It has two main input fields:

- Option Name \***: A text input field.
- Parent Category \***: A dropdown menu with "Manhattan" selected.

At the bottom right of the form are two buttons: "Cancel" and "Save".

12. Type the name for the Option in the **Option Name** text box. We typed "Web Server."

13. Click to select the category the new option will belong to in the **Parent Category** dropdown list. We selected "Manhattan."



14. Click the **Save** button. The new option appears in the list:

2 Items

Manhattan

Add

NAME	ACTIONS	
New Option for Manhattan		
Web Server		

15. Add another option the same way. We added "Database Server."

16. Repeat the process for the Albany category. The list new table looks like this:

3 Items

Albany

Add

NAME	ACTIONS	
Database Server		
New Option for Albany		
Web Server		

17. For future reference, click the three vertical dots button in the **Actions** column for one of the options. Three actions appear:

- Update Option: Rename the option
- Move to Category: Move the option to another category in the same list
- Delete Option: Remove the option from the category.

For now, we will not use any of them.

18. You now have a new categorized list available for secrets (via a secret template with the list).

**Note:** If you ever want to view past changes to a list or category, click the Audit tab for the list.

## Task 2: Create a Template Using the List

1. Go to **Admin > Secret Templates**. The Manage Secret Templates page appears:

**Manage Secret Templates**

Active Directory Account ☐

Show Inactive

Back

Edit

Create New

Export

View Audit

☒ Active Templates

Password Requirements

Character Sets

Configure Launchers

Configure Secret Template Permissions

2. Click the **Create New** button. The Create New Secret Template page appears:

**Create New Secret Template**

Name of the New Secret Template? \*

Create

Cancel

3. Type the template name in the **Name of the New Secret Template?** text box. We typed "Acme Server Template."
4. Click the **Create** button. The Secret Template Designer page for that new template appears:


## Secret Template Designer

SETTINGS

Secret Template Name

Acme Server Template

Secret Template Icon



Active?

☒

Expiration Enabled?

☐

Validate Password Requirements On Create?

☐

Validate Password Requirements On Edit?


☐

Field Displayed on Basic Home

Folder Name

One Time Password Enabled

No

 Edit

FIELDS

FIELD NAME	FIELD SLUG NAME	DESCRIPTION

5. Go to the **Fields** section:


FIELDS


FIELD NAME	FIELD SLUG NAME	DESCRIPTION	TYPE	IS
* <input type="text"/>	* <input type="text"/>	<input type="text"/>	Text <input type="button" value="v"/>	


- Complete the following steps for
- Type My Server List in the **Field Name** text box for the first (and currently only) field.
- Click the **Type** dropdown list for the field and select **List**.
- Click to select the **Is Required** check box.
- Click the **+** on the far right of the table row.
- Type Password in the **Field Name** text box for the second field.
- Click the **Type** dropdown list for the field and select **Password**.
- Click to select the **Is Required** check box.
- Click the **+** on the far right of the table row.

15. Type Username in the **Field Name** text box for the third field.
16. Click the **Type** dropdown list for the field and select **Text**.
17. Click to select the **Is Required** check box.
18. Click the **+** on the far right of the table row.
19. Type Computer in the **Field Name** text box for the forth field.
20. Click the **Type** dropdown list for the field and select **Text**.
21. Click to select the **Is Required** check box.
22. Click the **+** on the far right of the table row.
23. Type Domain in the **Field Name** text box for the fifth field.
24. Click the **Type** dropdown list for the field and select **Text**.
25. Click to select the **Is Required** check box.
26. Click the **+** on the far right of the table row.
27. Click the **Configure Launcher** button. The Secret Template Edit Launcher Configuration page appears:

**Secret Template Edit Launcher Configuration**

 There are no Launchers associated with this Secret Template.  
Click 'Add New Launcher' to create one.

 Back

 Add New Launcher

28. Click the **Add New Launcher** button. The Secret Template Edit Launcher Configuration page appears:

**Secret Template Edit Launcher Configuration**

Launcher Type to use: Remote Desktop ▼

Computer: <user input> ▼ \*

Domain: <blank> ▼ \*

Password: <blank> ▼ \*

Username: ▼ \*

**ADVANCED SETTINGS**

Restrict User Input ☐ ⓘ

Save Cancel

29. Click the **Launcher Type to Use** dropdown list and select **Remote Desktop**.
30. Click each of the four following dropdown lists and select the matching value.
31. Click to select the Restrict User Input check box. A new section appears:

**ADVANCED SETTINGS**

Restrict User Input ☒ ⓘ

In order to restrict user input the secret template must have at least one field of type "List"

Allow List: None ▼ ⓘ

Include Machines From Dependencies: ☐ ⓘ

Deny List: None ▼ ⓘ

32. Click the **Allow List** dropdown list to select **My Server List**.
33. Click the Save button.
34. Click the **Home** button in the main menu to return to the Secret Server dashboard.

### Task 3: Create a Secret

1. Click the **+** next to **Secrets** on the main menu to create a new secret based on the template you just created. The Create New Secret popup appears:

## Create New Secret

This folder is for work related Secrets only. Do not store personal non-work Secrets, such as your Online Banking password, in this folder.

Personal Folders/Will Sprunk
Change
Clear

Choose a Secret Template

- Acme Server Template
- Active Directory Account
- Active Directory No Prompt
- AD Test Template
- Amazon IAM Console Password
- Amazon IAM Key
- API User Credentials
- AS/400 IBM iSystem
- Bank Account
- Cisco Account (SSH)

Cancel
Create Secret

- Click the secret template you just created in the **Choose a Secret Template** list. Another Create New Secret popup appears:

## Create New Secret

This folder is for work related Secrets only. Do not store personal non-work Secrets, such as your Online Banking password, in this folder.

Secret Template

Acme Server Template [Change](#)

Folder

[Personal Folders/Will Sprunk](#) [Clear](#)

Secret Name \*

Server

Search or pick one ▾

Site

Local ▾

Cancel

Create Secret

- Note that one of the dropdown lists has the same name as the list field you created earlier. Click it, and you see the list categories you created. The list is available for that secret's launcher. In addition, you can use a list to provide the allow and deny lists for restricted user input based on the user's selection of the list in the secret.

With this Secret Server feature, admins can use private SSH keys for PuTTY launcher sessions as well as for RPC tasks (configurable through password changer settings) and Unix and Linux discovery. Passphrases can additionally be stored, if necessary, to decrypt the private keys for additional security. The Unix Account (SSH) secret template includes text-entry fields for the private key and passphrase by default:

The SSH Key template is included by default and can be used to store SSH keys that can later be selected for use in RPC, discovery or launcher authentication for other secrets:

**Note:** Starting with version 10.1.000000, Secret Server also supports SSH key rotation on secrets.

The **Unix Account (SSH Key Rotation)** and **Unix Privileged Account (SSH Key Rotation)** secret templates use password changers that change the public key in the account's `authorized_keys` file as well as change the password on the account. Secret Server ships with a password changer and custom command sets that allow an account to change its own public key and password, and a password changer and custom command sets that changes a user's public key and password using a privileged account. These scripts can be customized for different Unix environments.

For more information about SSH Key Rotation, see the [SSH Key Rotation](#) (KBA) and [SSH Key Rotation Quick Start](#) (KBA).



Character sets are a collection of distinct characters that are used in password requirements and password rules. Custom sets can be created, and both ASCII and Unicode are supported. For more information on setting up compliance checks and password generation standards, see [Password Requirements](#). The five standard character sets are:

- Lower Case (a-z)
- Upper Case (A-Z)
- Numeric (0-9)
- Non-Alphanumeric (!@#\$%^&\* ( ))
- Default – Includes all the above

To manage character sets, click the **Character Sets** button on the **Administration > Secret Templates** page. Only character sets which are not currently used by a password requirement can be deleted.

Secret Server supports naming patterns for secret templates. Naming patterns are a way for administrators to maintain consistency for secret names and can help ease both browsing and grouping secrets by name. Patterns are created using regular expressions. Regular expressions are a formal set of symbols commonly used to match text to patterns. For example, the regular expression `^\\w+\\w+$`, allows NTDOMAIN01\USER3454 but not USER3454 on NTDOMAIN01.

**Note:** Regular expressions are beyond the scope of this document. They are very powerful and can get quite complex—books have been written on the topic. Microsoft offers a good overview at their [Regular Expression Language Quick Reference](#) Web page.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Overview

A password requirement is a stored Secret Server object that defines the requirements on a password text-entry field to validate user-entered passwords or make auto-generated passwords conform to set specifications. You can have multiple password requirements, but only one can be set to the default.

A password requirement is made up of a minimum and maximum length, a set of characters, and optional rules such as "At least three upper-case characters" or "The first character must be lower-case". The default password requirement is 12 characters from the default character set with at least one upper-case, lower-case, numeric, and symbol character.

## Creating a Custom Password Requirement

To create a new password requirement:

1. Go to **Admin > Secret Templates**. The Manage Secret Templates page appears.
2. Click the **Password Requirements** tab.
3. Click the **Create** button. A popup appears.
4. Type the name of the new password requirement in the **Name** text box.
5. (Optional) Type a description of the new password requirement in the **Description** text box.
6. Click the **Minimum Password Length** spinner to select or type a minimum allowed password length.
7. Click the Character Set dropdown list to select a character set for the password. The out-of-the-box default is `abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890!@#$%^&*()`.
8. If you want the password requirement to become the new default, click to select the **Is Default** check box.
9. Click to select the desired password no-no check boxes. The options are:
  - **Prevent Username:** Do not allow the username to be part of the password.
  - **Prevent Spatial Pattern:** Do not allow strings of characters based their order on the keyboard, such as `qwerty` or `asdfg`.
  - **Prevent Sequential Pattern:** Do not allow strings of characters based on their order in the character set, such as `abcd` or `5678`.
  - **Prevent Dictionary Words:** Do not allow everyday English words in the password.
10. Click the **Save** button. The popup closes and the page for the new requirement appears (containing the choices you just made for the details and generation sections):
11. Scroll down to the **Password Validation** section.
12. Click the **Edit** button. The section expands.
13. Most of the validation rules are ones you have already set with these two exceptions, which you can now set:
  - **Prevent Dictionary Words:** Do not allow everyday English words in the password.
  - **Prevent Words from Dictionary ...:** Do not allow words that appear in the named dictionary. In our example, the dictionary is named "Test."
14. Go to the **Starting and Ending Character Validation** section.

15. Click the **Edit** button.
16. To require specific starting characters, click to select the **Require Specific Starting Characters** check box. Two hidden controls appear. This allows you to make rules such as "password must start with three symbols and end with two lowercase letters."

**Note:** "Start and end with" rules can decrease the password entropy (resistance to brute force attacks).
17. Type or click the spinner to set the number of required starting characters.
18. Click the **characters from** dropdown list to select the character set to draw the characters from.
19. Repeat the procedure for any desired ending characters.
20. Click the **Save** button. An edit button now appears for the Character Count Validation section.
21. To set character count validation rules:
  1. Click the **Edit** button for the **Character Count Validation** section. The section expands.
  2. Click the **Add Rule** button and select the rule type, either **Minimum Required Characters Rule** or **Maximum Consecutive Characters Rule**. A character count validation rule appears.
  3. For the first rule type, type the number of characters and select what character set they must come from, for example, "Minimum 5 characters from Upper Case (A-Z)."
  4. For the second rule, type the number of characters and select what character set they must come from, for example, "Maximum 5 characters from Lower Case (a-z)."
  5. Once you create more than one rule, the **Minimum Required Character Count Rules** dropdown list appears. This allows you to set whether you want a minimum number of rules enforced from those you created or all of them.
  6. Create as many additional character count validation rules as you desire by clicking the **Add Rule** button and repeating the procedure.
  7. Click the **Save** button.
22. Review the **Password Rule Strength** section to see how strong your choices are and any recommendations for improvement. The two tests are:
  - **Entropy Score:** The difficulty of cracking the password in a brute-force attack.
  - **Total Strength Score:** An overall weighted measure of password strength for passwords generated by the password requirements. Any rule conflicts will appear in the recommendations section.

**Note:** The explicit character rules cannot conflict with the implicit ones you created earlier or you will get an error when saving. For that reason, we suggest leaving the password requirements character set set to the default. Carefully consider any other conflicts if you get an error.

**Note:** To set a custom password requirement for a specific secret, use the "Customize Password Requirement" in the Security tab of a secret.

**Note:** You can enable or disable the validation of manually entered passwords at the secret template level via the "Validate Password Requirements on Create" and "Validate Password Requirements on Edit" settings.

**Note:** The "What Secrets Do Not Meet Password Requirements" report shows secrets containing a password that does not meet the password requirements set for its secret template.

**Note:** Password requirements cannot include rules with overlapping character sets. For example, if an attempt is made to add

both a "Minimum of 1 upper-case" rule and a "Minimum of 3 Default" rule to a new password requirement, an error displays.

## Security and Hardening

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

**Note:** Please see [Running the IIS Application Pool As a Service Account](#) for additional information.

## Introduction

Integrated Windows Authentication (IWA) requires:

- Installing a SQL Server instance
- Creating a new domain service account
- Granting access to SQL Server database
- Registering a service account to run IIS and ASP.NET
- Assigning an account as an application pool identity

**Note:** For instructions on Creating the SQL account or Installing SQL Server see [Installing and Configuring SQL Server](#) (KBA).

## Creating a Domain Service Account

The account needs access to the application server and database server. Ensure password expiration is not enabled or the account could lock you out of Secret Server.

## Granting Access to SQL Server database

1. Connect to the Database instance using SQL Management Studio.
2. Right click on the Security node (ensure this is the top most security node under the instance and not under the database name itself) and select **New > Login**.
3. Enter the Login name as Domain\Username.
4. Ensure **Windows Authentication** radio button is selected.
5. If you have already created the database, then under **User Mappings** select the database and grant dbOwner permission. Otherwise, if you plan to have the Database created for you, under **Server Roles** select dbCreator.
6. Click the **Ok** button.

## Assigning Account as Identity of Application Pool

1. Open IIS (Run command inetmgr).
2. Click the Application Pool node.
3. Select Secret Server's Application Pool (default is SecretServerAppPool).
4. On the Right panel, Click .
5. Scroll down to the **Identity** row under **Process Model**.
6. In the popup, select **Custom Account > Set**.
7. Type the user as domain\username.
8. Type the password.
9. Click the **Ok** button.

10. Recycle the application pool by clicking the **Recycle..** button under the **Application Pool** tasks.



## The Common Criteria Standard

The Common Criteria for Information Technology Security Evaluation (ISO/IEC 15408), known as "Common Criteria," is an international standard for certifying security of computer systems, networks, and application software. Certification ensures that claims about the security attributes of the evaluated product have been independently verified in the specified, evaluated configuration and environment. The certification does not validate any security claims when the product is used outside of that evaluated configuration or environment.

## Common Criteria for Secret Server

### Secret Server

Secret Server releases 10.4 and later provide security features enabling users to achieve Common Criteria certification. To ensure that each parameter setting matches those evaluated and certified as secure by Common Criteria standards, follow these guidelines in their entirety.

## Audience

This Common Criteria documentation is for users with administrative access to configure their organization's operational environment; knowledge of their organization's network infrastructure and applicable policies; and responsibility for installing, configuring, and operating enterprise infrastructure for their organization.

**Note:** This documentation is not updated with every Secret Server release—some releases do not affect the documentation's contents and thus do not warrant a document update.

## Enabling Common Criteria Security Hardening

Secret Server releases 10.4 and later provide security features enabling users to achieve Common Criteria certification. Due to the stringency of the standards and the need for customized user configuration, not all of these features are automatically set by the installer application. Instead, an administrator must configure some settings, and this documentation provides the information to perform those configurations to comply with the Common Criteria evaluated configuration.

This documentation is closely associated with the Security Hardening Report in Secret Server (Click Reports > Security Hardening). Follow the checklists in Secret Server to adjust parameters to achieve Common Criteria certification.

### Security Hardening Checklist

After installing Secret Server, navigate to the **Reports > Security Hardening** tab, and follow the checklist to ensure your environment is as secure as possible:

1563386730221

### Evaluated Configuration

The **Target of Evaluation (TOE)** is Delinea Secret Server Government Edition v10.1, a software application used in the enterprise settings to define and maintain user credentials within a large organization. The evaluated configuration consists of the software application running on Windows Server 2016 (or later) with Microsoft .NET Framework 4.6.2 (or later) and Microsoft SQL Server 2016 (or later) database, installed locally.

Delinea Secret Server – Government Edition can manage any IT asset compatible with the following types of credentials:

- Windows Accounts
- Active Directory accounts
- Unix accounts (SSH)

These credential types define a broad range of compatible ESM products. Generally, Linux 2.6.32 or later, Windows Server 2008 R2 or later, Windows 7 Enterprise or later would be compatible.

### Assumptions and Operational Environment

There are specific conditions that are assumed to exist in the TOE's Operational Environment. The following table lists assumptions about the Operational Environment as specified by the Protection Profile:

Assumption Name	Assumption Definition
A.CRYPTO	The TOE will use cryptographic primitives provided by the Operational Environment to perform cryptographic services.
A.ENROLLMENT	There will be a defined enrollment process that confirms user identity before the assignment of credentials.
A.ELECTRONIC SUPPORT MEASURES (ESM)	The TOE will be able to establish connectivity to other ESM products in order to share security data.
A.FEDERATE	Third-party entities that exchange attribute data with the TOE are assumed to be trusted.
A.MANAGE	There will be one or more competent individuals assigned to install, configure, and operate the TOE.
A.SYSTIME	The TOE will receive reliable time data from the Operational Environment.

The following table identifies the organizational security policies applicable to the TOE as specified by the Protection Profile:

P.BANNER	The TOE shall display an initial banner describing restrictions of use, legal agreements, or any other appropriate information to which users consent by accessing the TOE.
----------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Table: Organizational Security Policies

## Configuring TLS

To achieve Common Criteria certification on Secret Server, you must enable Transport Security Layer (TLS).

### Manually Disabling TLS Version 1.0

TLS 1.0 is no longer considered secure, so it is important to disable this version of the protocol on Secret Server. To do this, follow the instructions in **Manually Disabling TLS v1.0**.

### TLS Diffie-Hellman Hardening Overview

For information on configuring your servers with stronger Ephemeral Diffie-Hellman hardening, see the **TLS Diffie-Hellman Hardening Overview**.

### Restricting Server Cipher Suites for TLS

#### Allowed Suites

Common Criteria certification requires restricting the cipher suites configured on your server to only:

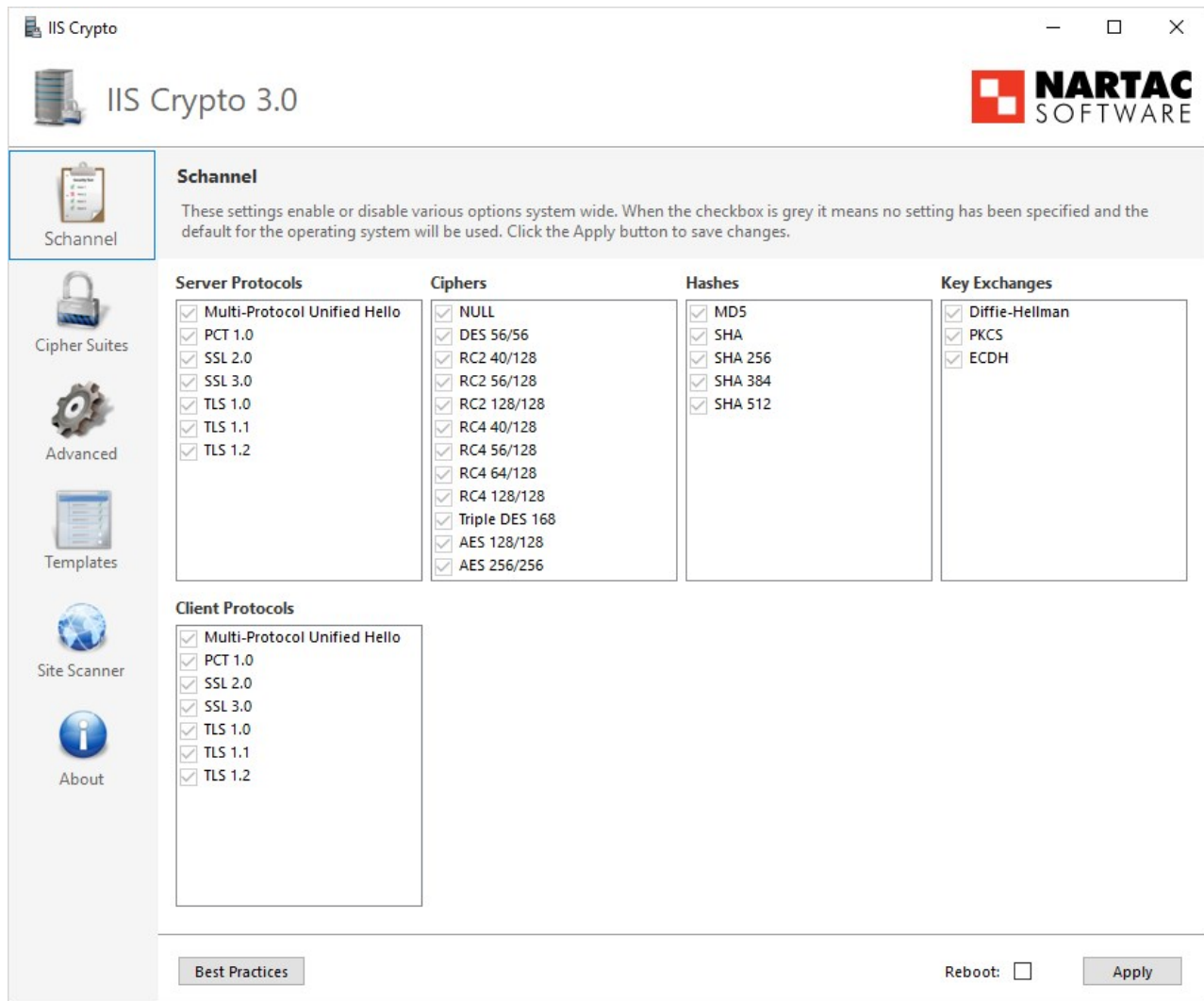
- TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA
- TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA
- TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA
- TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA256
- TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA
- TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA256

Restricting them can cause communication issues with other servers if they are not able to communicate using any of the above ciphers. In that case, you need to modify those servers to include these cipher suites to securely communicate according to Common Criteria guidelines.

### Changing Cipher Suites with the IIS Crypto Tool

One way to change the cipher suites on a computer is to use the free IIS Crypto tool:

1. Download the GUI version of the [NARTAC IISCrypto](#) tool.
2. Run the tool:



3. Click **Cipher Suites** button on the left. The Cipher Suites window appears:

### Cipher Suites

Enable, disable or reorder various cipher suites that are negotiated for the TLS handshake. When the checkbox is grey it means no setting has been specified and the default for the operating system will be used.

<input checked="" type="checkbox"/>	TLS_AES_256_GCM_SHA384	
<input checked="" type="checkbox"/>	TLS_AES_128_GCM_SHA256	
<input checked="" type="checkbox"/>	TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384	
<input checked="" type="checkbox"/>	TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256	
<input checked="" type="checkbox"/>	TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384	
<input checked="" type="checkbox"/>	TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256	
<input checked="" type="checkbox"/>	TLS_DHE_RSA_WITH_AES_256_GCM_SHA384	
<input checked="" type="checkbox"/>	TLS_DHE_RSA_WITH_AES_128_GCM_SHA256	
<input checked="" type="checkbox"/>	TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA384	
<input checked="" type="checkbox"/>	TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256	
<input checked="" type="checkbox"/>	TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384	
<input checked="" type="checkbox"/>	TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256	
<input checked="" type="checkbox"/>	TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_AES_256_GCM_SHA384	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_AES_128_GCM_SHA256	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_AES_256_CBC_SHA256	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_AES_128_CBC_SHA256	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_AES_256_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_AES_128_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_3DES_EDE_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_NULL_SHA256	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_NULL_SHA	
<input checked="" type="checkbox"/>	TLS_PSK_WITH_AES_256_GCM_SHA384	
<input checked="" type="checkbox"/>	TLS_PSK_WITH_AES_128_GCM_SHA256	

Best Practices
Reboot: ☐
Apply

- Click the **Uncheck All** button to uncheck all cipher suites
- Find and click to select the suites in the list above.
- Click the **Apply** button.

#### Configuring TLS with IIS

Common Criteria certification requires using HTTPS/SSL for all connections to the Secret Server Web page. To do this, follow the instructions in **TLS Configuration with IIS**.

#### Enabling TLS Auditing

To have Secret Server audit TLS connections and connection failures, follow the instructions in **Configuring Auditing for TLS Connections**.

#### Configuring TLS with Active Directory

To ensure that TLS is configured with Active Directory Follow the instructions in **Configuring TLS with Active Directory**.

**Note:** If you have any existing domains configured in Secret Server, you must edit them and enable LDAPS on each one.

#### Configuring TLS with Syslog

To configure TLS with Syslog, follow the steps in **Configuring Syslog/CEF External Audit Server**.

## Additional Common Criteria Configurations

### Configuring X.509v3 Certificates

For instructions on installing and configuring certificates on the Secret Server Web servers, see **Configuring X.509v3 Certificates**.

### Enabling DPAPI

The Windows Data Protection API (DPAPI) is a pair of functions that allow access to operating-system-level data protection services to protect the master encryption key file, encryption.config.

To enable DPAPI, follow the instructions in the **Verify DPAPI Setting Is Enabled** section.

### Enabling FIPS Mode

To configure your server and Secret Server to use the Federal Information Processing Standard (FIPS), follow the instructions in the **Verify FIPS Mode Is Enabled**.

**Note:** Also see: [Enabling FIPS Compliance](#)

### Ensuring Zero Information Disclosure

To comply with Common Criteria requirements, you must configure Secret Server to not display any unnecessary information. This applies to unhandled errors as well as the application version number.

### Configuring Custom Error Messages

To hide detailed error messages and display a custom message when an unhandled error occurs:

1. Open `https://<your_secret_server_url>/ConfigurationAdvanced.aspx` in your browser.
2. Scroll to the bottom of the page and click the **Edit** button.
3. Type the message you want displayed to users in the **Zero Information Disclosure Message** text box.
4. Click the **Save** button.

### Hiding the Application Version Number

To hide the application version number in the application header and footer:

1. Go to **Admin > Configuration > Security**.
2. Click the **Edit** button. The Configuration page appears:

**Configuration**

[General](#) [Login](#) [SAML](#) [Folders](#) [Local User Passwords](#) [Security](#) [Ticket System](#) [Email](#) [Session Recording](#)

**APPLICATION SETTINGS**

[Anonymized System Metrics Information](#)

Send Anonymized System Metrics to Thycotic Yes [View Metric Data](#)

[View Webservices](#)

Enable Webservices No

[Syslog/CEF Logging Advanced Settings Information](#)

3. Click the **Security** tab.
4. In the **Web Services** section of the page, click to select the **Hide Secret Server Version Numbers** check box.
5. Click the **Save** button.

**Note:** For diagnostic purposes, the application version number is still displayed on the Diagnostics page. Make sure that permissions to this page is limited to employees that may need to access this page when contacting Delinea technical support.

## Configuring the Login Banner

For Common Criteria compliance, when a user first logs in, the login banner must reveal the user policy agreement and force that user to agree to the policy before logging into Secret Server. To configure the Login Banner according to Common Criteria guidelines, follow the instructions in **Configuring the Login Banner**.

## Configuring Account Lockout

To access Secret Server, users must login with local or domain credentials. To comply with Common Criteria, Secret Server must use "account lockouts" to prevent repeated unsuccessful login attempts. Configurable by an Secret Server admin, an account becomes inaccessible after a defined number of unsuccessful authentication attempts until an admin unlocks the user's account.

To configure settings for account lockouts:

1. Navigate to **Admin > Configuration**.
2. Click the **Login** tab.
3. Click the **Edit** button.
4. Adjust the number in the **Maximum Login Failures** text box. The default is five attempts.

To Unlock a user's account:

1. Navigate to **Admin > Users > Select the User**.
2. Click the **Edit** button.
3. Click to deselect the **Locked Out** check box.
4. Click the **Save** button.

## Disabling "Remember Me" Logins

A browser's "remember me" login function stores the user's login name and password so the user does not need to enter it again on that browser, which is both convenient and insecure. To disable "Allow Remember Me" during logins, follow the instructions in **How to Disable Allow Remember Me during Logins**.

## Configuring SQL Server

To meet Common Criteria requirements, Microsoft SQL Server must be installed on the local machine—the same as the Secret Server Web server. During the install process for MS SQL, ensure that you use Windows authentication mode.

If you have an installed instance of Secret Server that does not meet this requirement, you can migrate the remote database to the server hosting Secret Server. If MS SQL Server is not installed and configured on the Secret Server, you must install it. The server must be configured with enough RAM, storage space, and processors to support running MS SQL Server and the Web site simultaneously. After copying the database, you can go to **Admin > Database** to point Secret Server to the new database location.

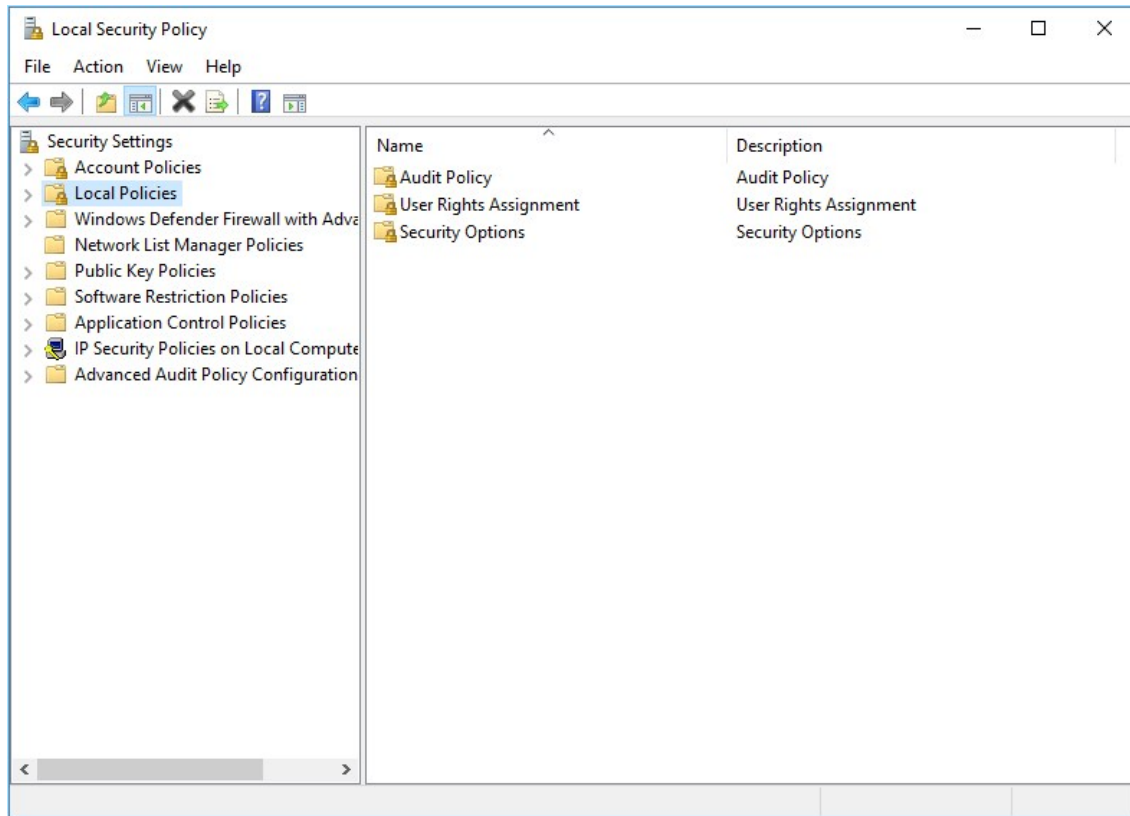
**Note:** Because the database must be installed locally with the Secret Server Web application for Common Criteria compliance, Secret Server is not fully compliant when running multiple nodes.

## Running the IIS Application Pool with a Service Account

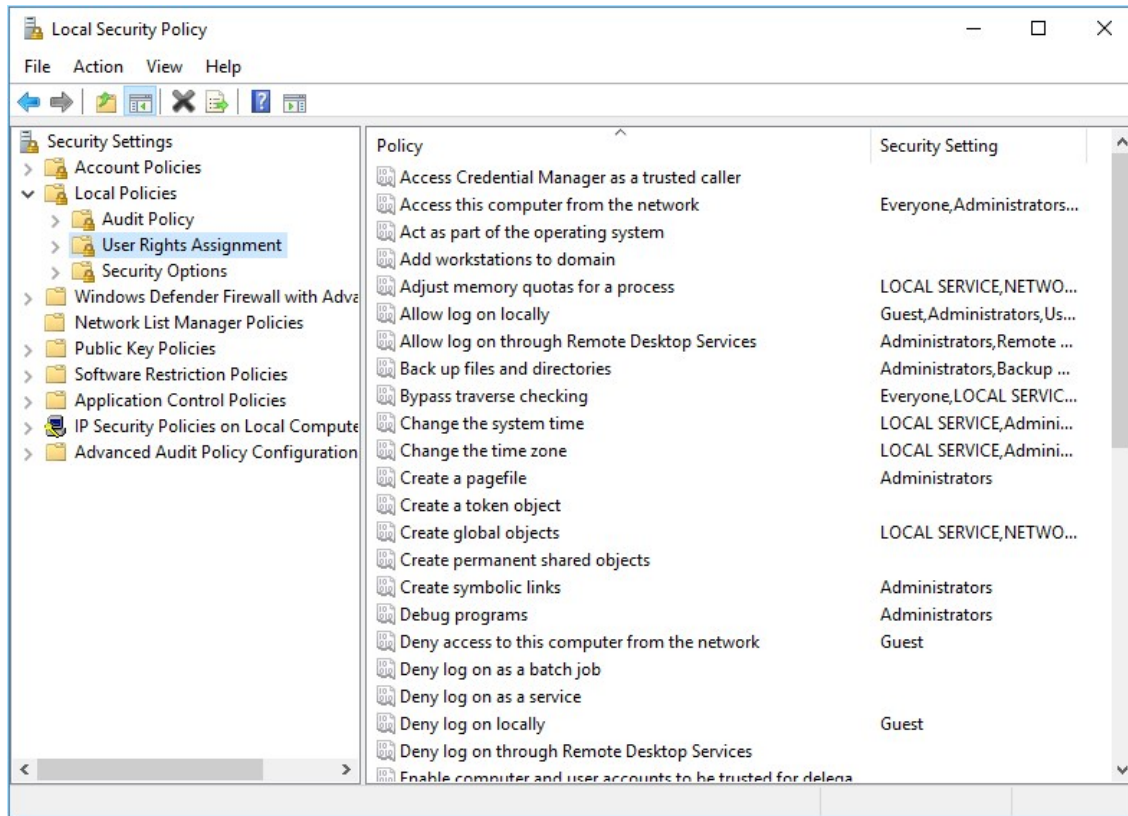
To use Windows authentication to access the SQL database, you should create a service account. To run the Secret Server IIS Application Pool with a service account:

1. Open a command prompt window, change the directory to your .NET framework installation directory (usually C:\Windows\Microsoft.NET\Framework...) using the `cd` command.
2. Type `.\aspnet_regiis -ga <user_name>` and press **<Enter>**. The username is from the MS SQL Server user account.
3. Give your service account "modify" access to C:\Windows\TEMP.
4. Open the Local Security Policy App from your start menu.
5. Grant batch logon permissions to your service account:
  1. Open the Local Security Policy Console (search for and open `secpol.msc`):

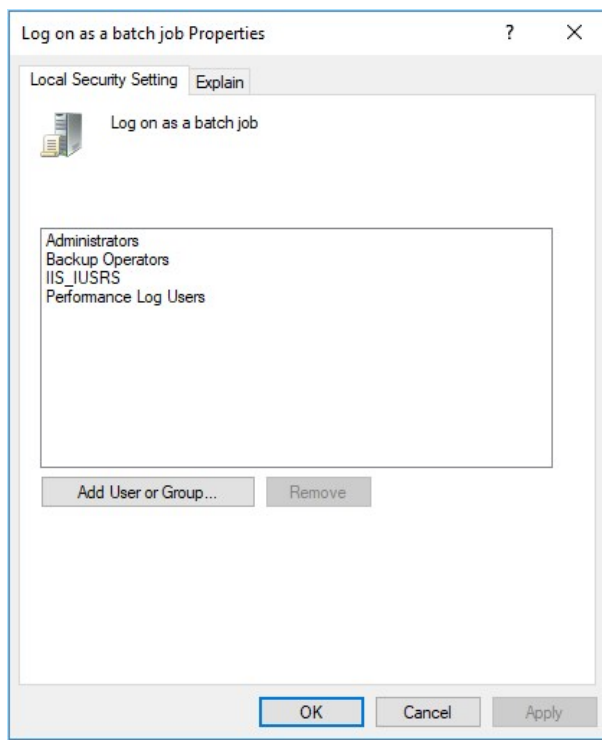




1. Expand the **Local Policies** folder (not shown).
2. Click to select the **User Rights Assignment** folder.



3. Right-click **Log on as a batch job** in the right panel and select **Properties**.



4. Click the **Add User or Group** button.
5. Add your service account.
6. Click the **OK** button.

**Note:** If you use group policy to enforce "Log on as a batch job" and have group-managed service accounts, that will overwrite any local permissions to "Log on as a batch job" on all computers that have the policy applied. Using the local security policy is a safer option if you are not sure about your usage across your domain.

1. Grant "Impersonate a client after authentication" permission to the service account under **User Rights Assignment** the same way "Log on as a batch job" was assigned above.
2. If you now get a "Service Unavailable" error after applying "Log on as a batch job" permissions:
  1. Update your group policy settings (**Start > Run > Cmd** and type `gpupdate /force`) and restart the Windows Process Activation service.

**Note:** For more information, see [Running the IIS Application Pool As a Service Account](#).

## Assigning Common Criteria Roles and Permissions

See the "Common Criterial Roles and Permissions" section of the Common Criteria Hardening Guide.

## Managing User Passwords

See "Managing User Passwords."

## Configuring Secret Templates

To enable only the secret templates that are certified Common Criteria compliant and to set Common Criteria-compliant password policies on those templates, see "Configuring Secret Templates" and "Configuring Password Policy for Secret Templates."

## Setting Authentication Strength for Non-Password Credentials

See "Authentication Strength for Non-Password Credentials."

## Configuring Remote Password Changing for SSH Key Rotation

See "Configuring Remote Password Changing for SSH Key Rotation."

## Configuring External Auditing

### Connecting to an External Audit Server

To connect to an external syslog/CEF audit server, see "Security—Connecting to an External Audit Server" and "Configuring Syslog/CEF External Audit Server."

### Configuring Local Windows Event Log Auditing

See "Configuring Local Windows Event Log Auditing."

## Installing Your System

### Prerequisites

#### Minimum Hardware

- **CPU:** Intel 2.4 GHz 4 core 64-bit
- **RAM:** 8 GB
- **Data storage:** 60 GB of free space
- **Network:** Gigabit Ethernet adapter

#### Recommended Software

- Windows Server 2016 or later
- Microsoft .NET Framework 4.6 or later
- IIS v10 or later
- Microsoft SQL Server 2016 or later

For more information on SQL licensing, see Microsoft's 2016 [editions and components list](#). Use of SQL Server Express, although included in the installation package, was not covered by the evaluation.

Windows Server 2016 ships with .NET 4.6.2 included; .NET 4.6.2 is backwards compatible with all previous .NET 4.x versions. Microsoft ensures that new .NET framework versions are backwards compatible. The .NET framework is updated through Windows Update, where Microsoft dictates specific release of the .NET framework on a fully patched system.

#### Operational Environment

- **Audit Server:** syslog-ng 3.9 or later
- **Domain Controller:** Active Directory version 2008 R2 or later

More detailed System Requirements can be found at [System Requirements for Secret Server](#).

### SQL Installation and Configuration

To maintain Common Criteria Compliance, *SQL must be installed locally* on the Secret Server web application machine before running the Secret Server installer. During the install process for SQL, ensure that you use *Windows authentication mode*.

The steps that follow walk you through setup and configuration for SQL Server 2016 Standard Edition. At the end of these steps you will have:

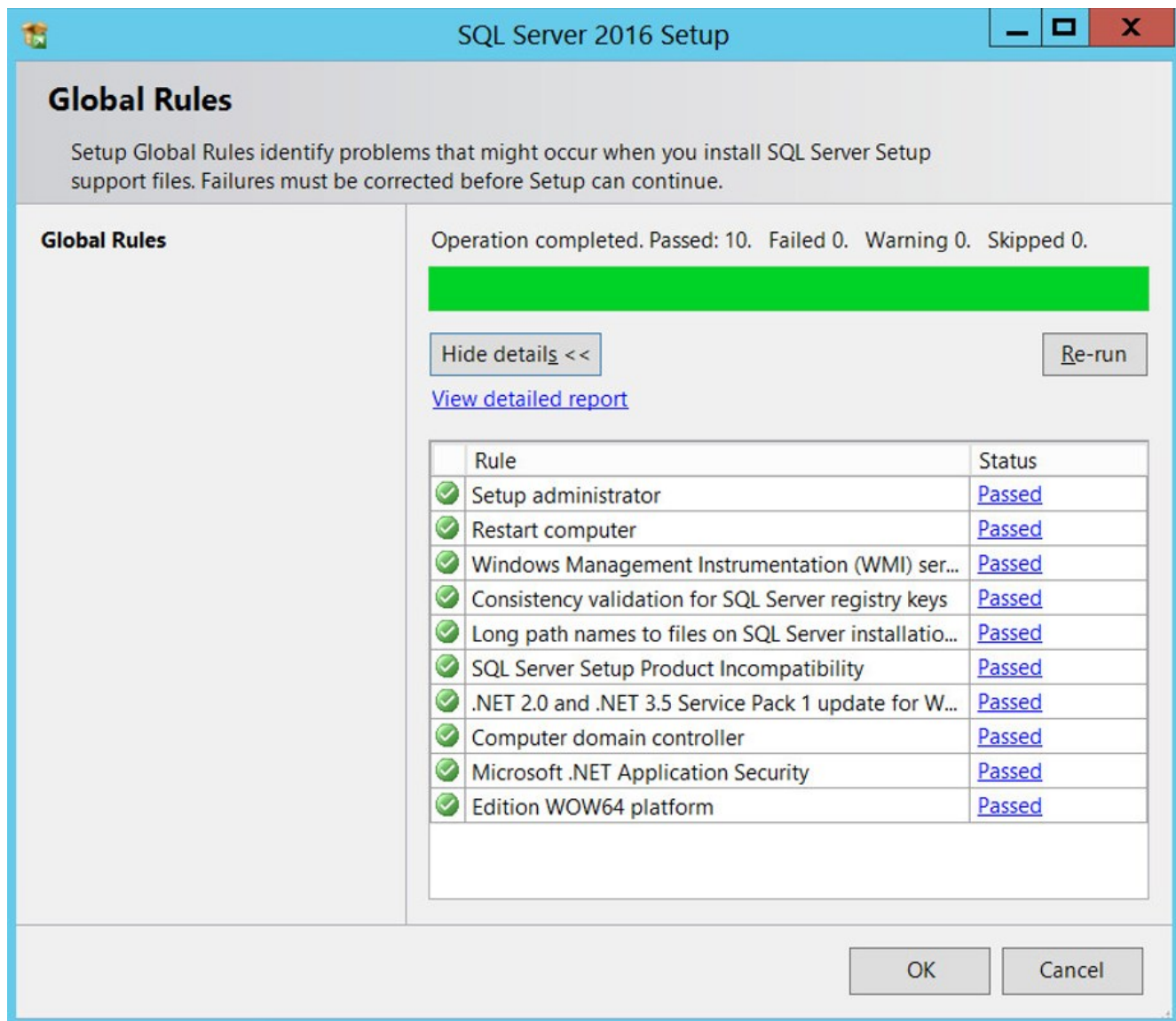
- Installed a basic stand-alone instance of SQL Server 2016 Standard with the minimum features necessary for SQL Server.
- Installed SQL Server Management Studio for managing the local database.
- Created a local windows account to be used as the database account for the Secret Server installation.

#### Installing SQL Server 2016 Standard Edition

1. Launch the SQL Server installer from CD or file download.

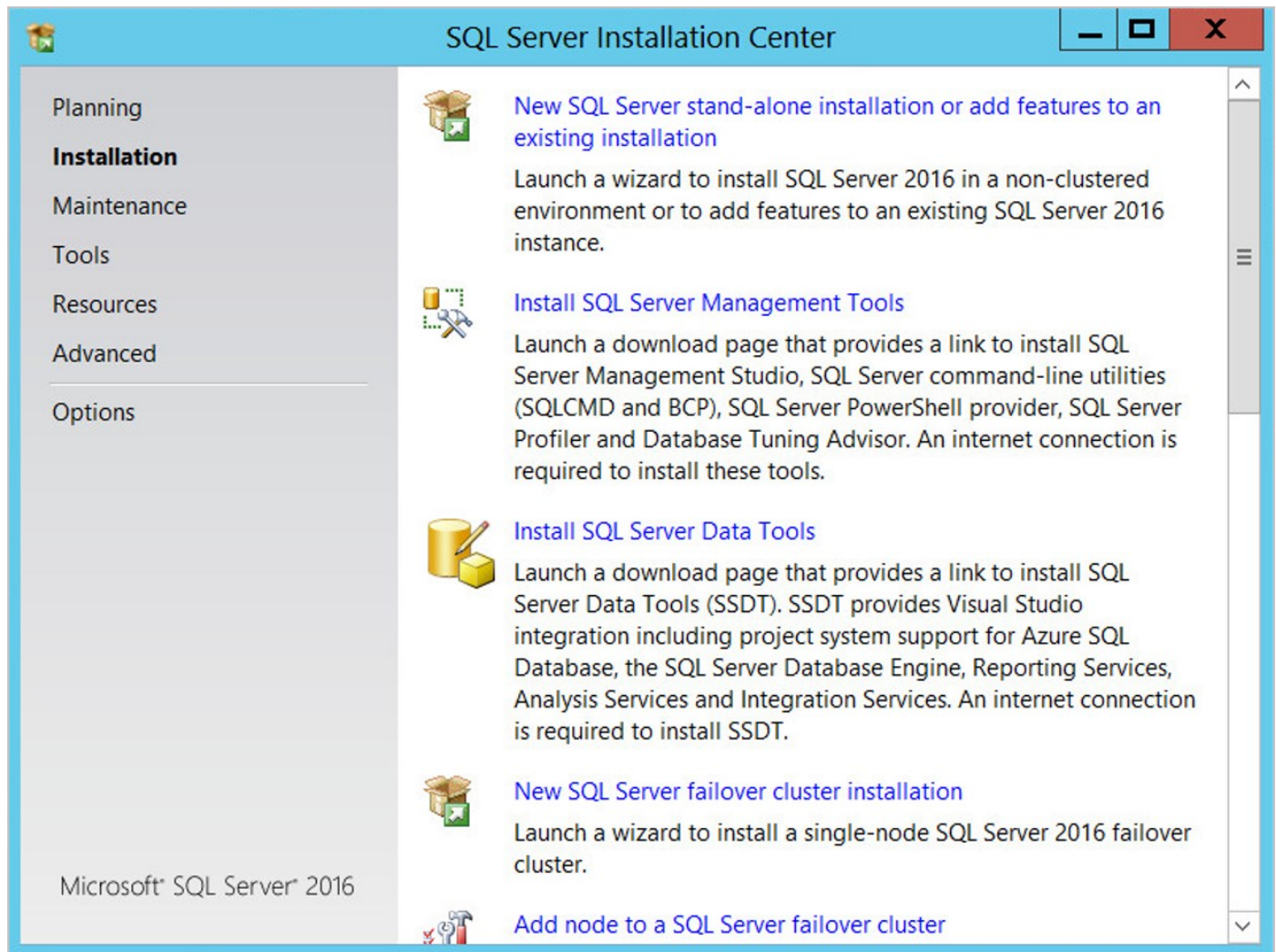


2. Click **System Configuration Checker** to run a utility that checks for conditions on your server that could prevent SQL Server from installing.
3. When the tool launches, click the **Show details** button. A successful scan should look like the one shown below. If you encounter any issues, look at the detailed report, resolve the reported issues, and rerun the scan.

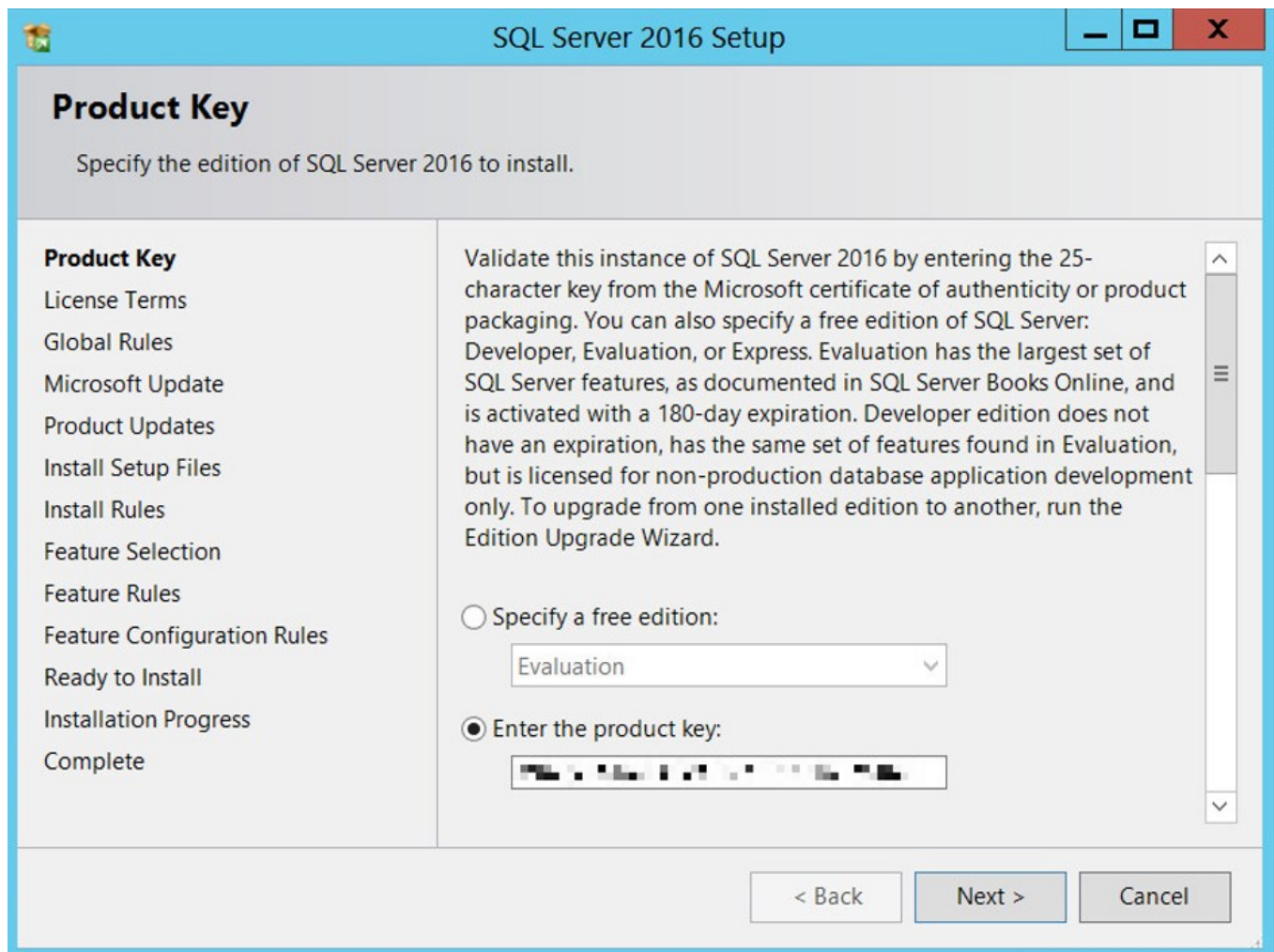


4. Click **OK** when done to return to the SQL Server Installation Center window.
5. In the SQL Server Installation Center window, click **Installation**.
6. Click **New SQL Server stand-alone installation or add features to an existing installation**.



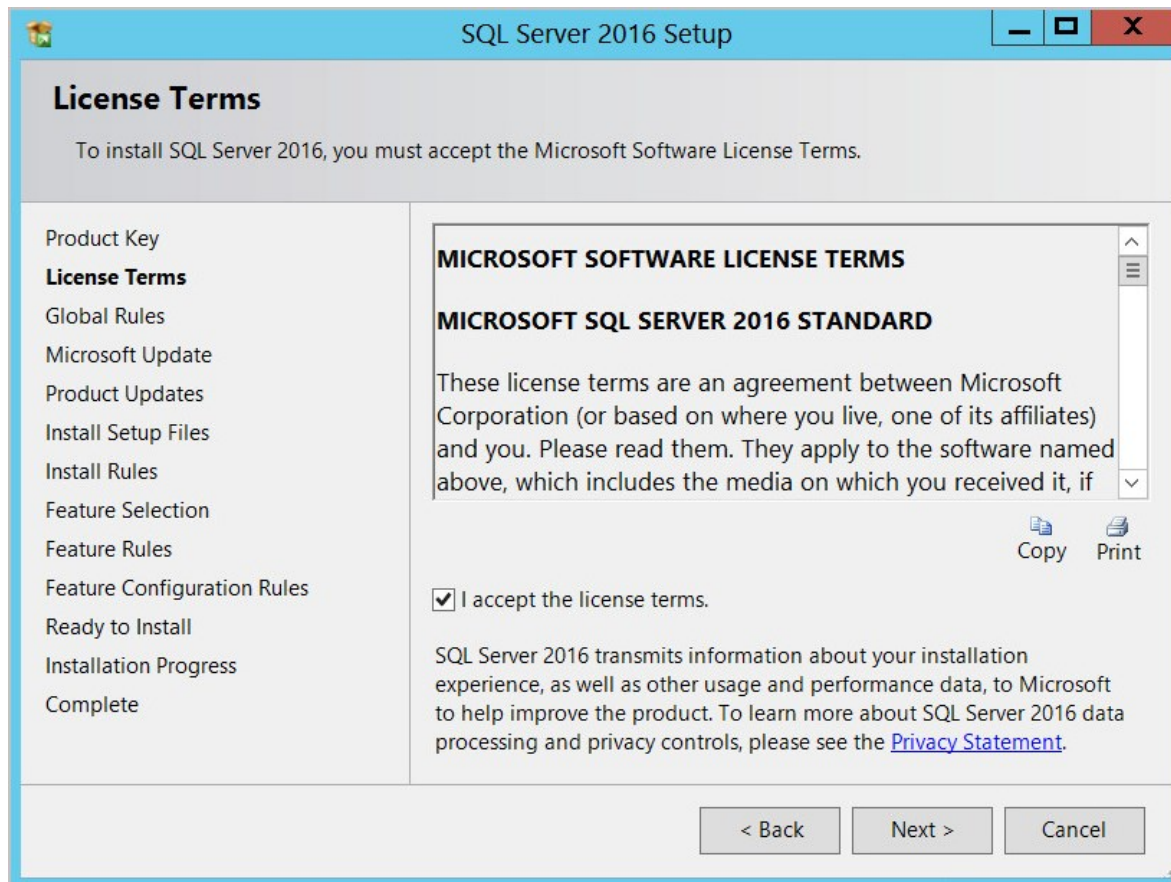


7. Enter your product key and click **Next**.

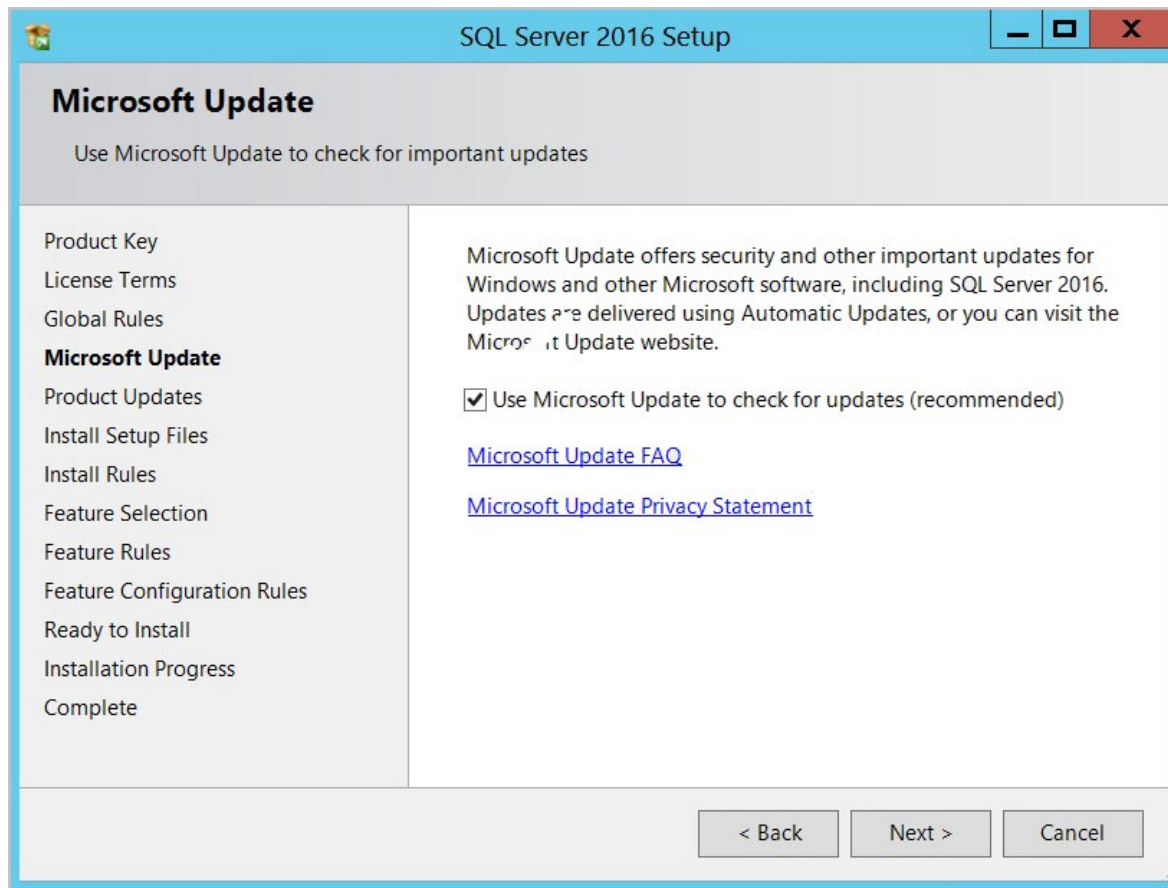


8. Check the **I accept the license terms** checkbox and click **Next**.

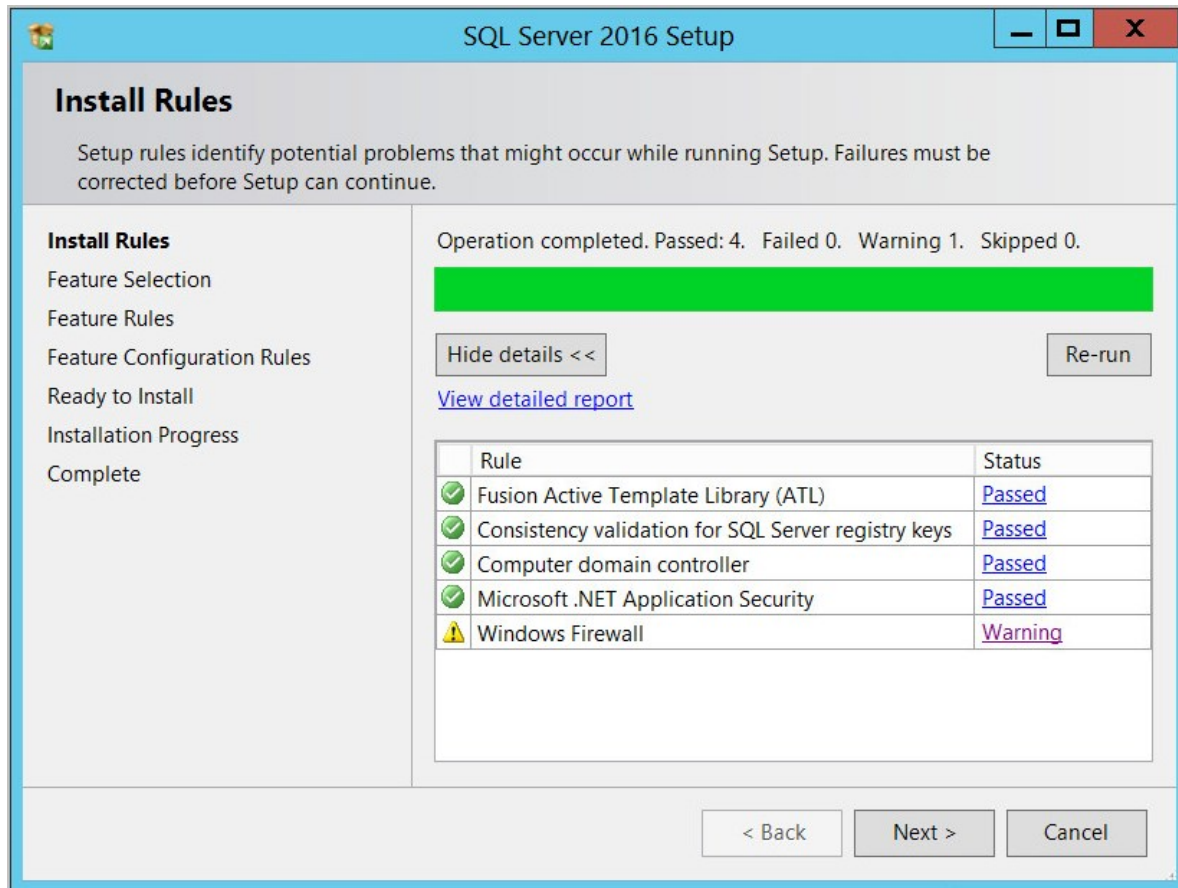




9. Wait for the Rule Check to run.
10. At the Microsoft Update step, check **Use Microsoft Update to check for updates (recommended)** If your software update process does not utilize automatic updates from Microsoft, skip this step.
11. Click **Next**.



12. At the Product Updates step leave all defaults and click **Next**.
13. Wait for the "Install Setup Files" step to complete. Check that all operations pass (with the exception of Windows Firewall, which may return a warning status since the database will not be accessed from outside the firewall). The "Install Rules" screen (below) will appear upon completion. When the installation is successful, click **Next**.



The only feature in Feature Selection necessary for Secret Server is Database Engine Services (see screenshot below).

Unless you are using Geo-Replication (this is not in scope for Common Criteria standards) you can leave everything else unchecked. Leave the directory locations unchanged and click **Next**.

**SQL Server 2016 Setup**

## Feature Selection

Select the Standard features to install.

Install Rules

**Feature Selection**

Feature Rules

Instance Configuration

Server Configuration

Database Engine Configuration

Feature Configuration Rules

Ready to Install

Installation Progress

Complete

**Features:**

Instance Features

- ☒ Database Engine Services
- ☐ SQL Server Replication
- ☐ R Services (In-Database)
- ☐ Full-Text and Semantic Extracti
- ☐ Data Quality Services
- ☐ PolyBase Query Service for Ext

Select All   Unselect All

Instance root directory: C:\Program Files\Microsoft SQL ...

Shared feature directory: ram Files\Microsoft SQL Server\ ...

Shared feature directory (x86): C:\Program Files (x86)\Microsof ...

**Feature description:**

development.

Prerequisites for selected features:

Disk Space Requirements

Drive C: 1058 MB

< Back   Next >   Cancel

14. At the Instance Configuration step leave **Default instance** selected and click **Next**.

**SQL Server 2016 Setup**

## Instance Configuration

Specify the name and instance ID for the instance of SQL Server. Instance ID becomes part of the installation path.

☒ Default instance  
☐ Named instance:

Instance ID:

SQL Server directory: C:\Program Files\Microsoft SQL Server\MSSQL13.MSSQLSERVER

Installed instances:

Instance Name	Instance ID	Features	Edition	Version

< Back   Next >   Cancel

- At the Server Configuration step (screenshot below) leave the defaults and click **Next**.



**SQL Server 2016 Setup**

## Server Configuration

Specify the service accounts and collation configuration.

Install Rules  
Feature Selection  
Feature Rules  
Instance Configuration  
**Server Configuration**  
Database Engine Configuration  
Feature Configuration Rules  
Ready to Install  
Installation Progress  
Complete

Service Accounts Collation

Microsoft recommends that you use a separate account for each SQL Server service.

Service	Account Name	Password	Startup Type
SQL Server Agent	NT Service\SQ...		Manual ▼
SQL Server Database...	NT Service\MS...		Automatic ▼
SQL Server Browser	NT AUTHORIT...		Disabled ▼

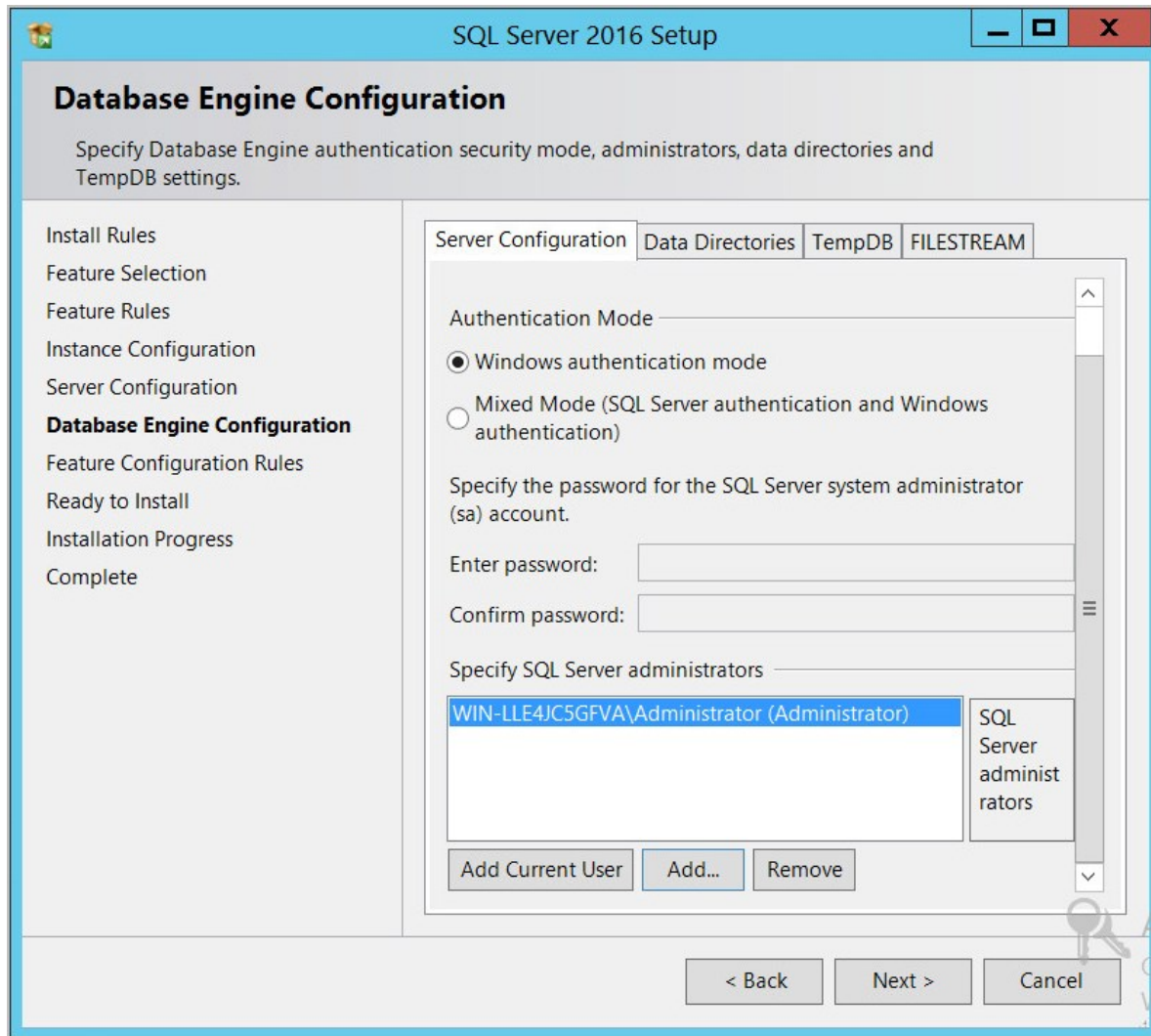
☐ Grant Perform Volume Maintenance Task privilege to SQL Server Database Engine Service

This privilege enables instant file initialization by avoiding zeroing of data pages. This may lead to information disclosure by allowing deleted content to be accessed.

[Click here for details](#)

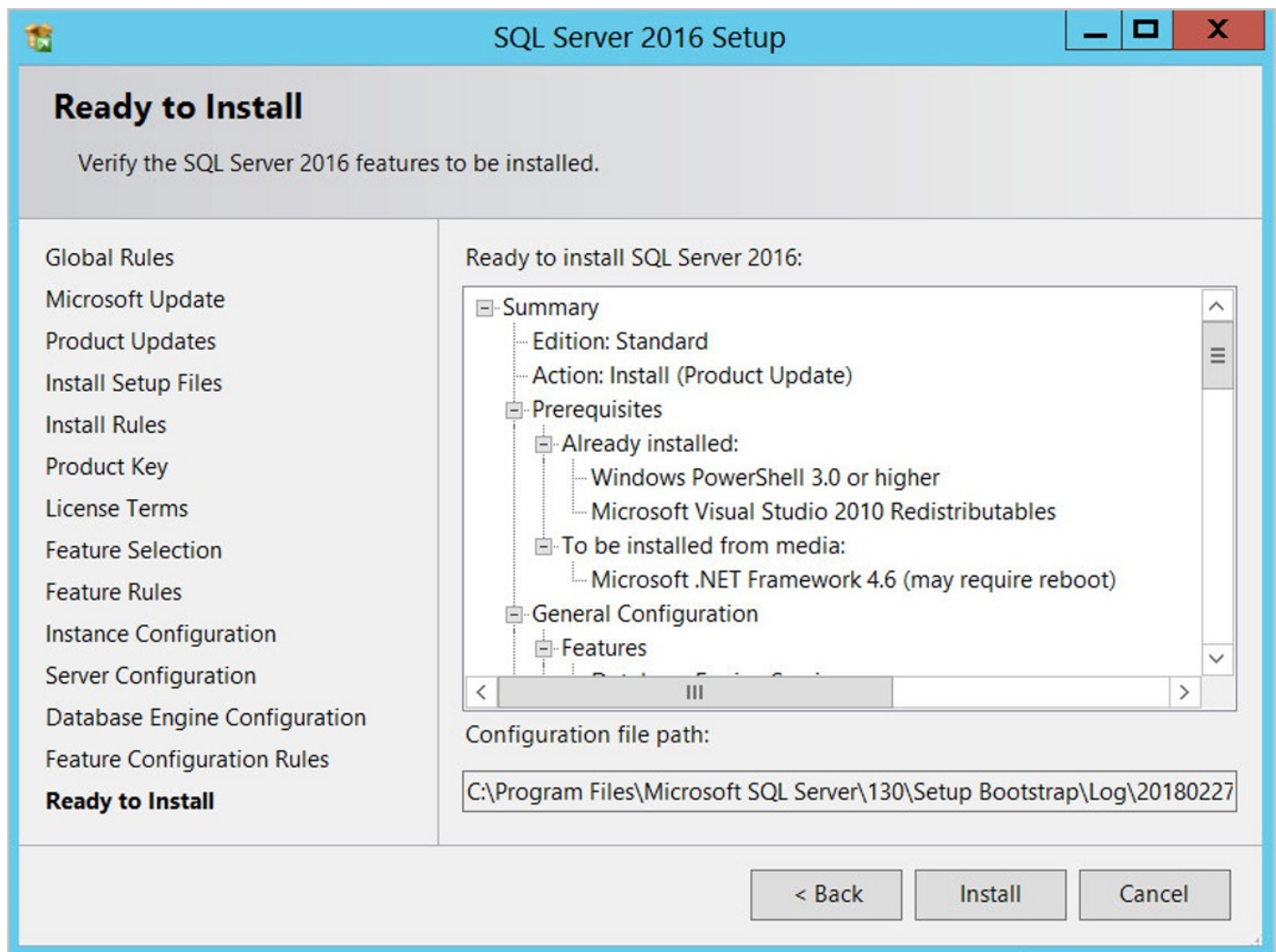
< Back Next > Cancel

16. At the Database Engine Configuration step, make sure that **Windows authentication mode** is selected on the Server Configuration tab.
17. Scroll down and add at least one Local Windows or Active Directory user or group in Specify SQL Server administrators.
18. Click the **Add Current User** button to find and then **Add** the Administrator account.



You can leave the options in the remaining tabs at their default values, or to store the database and log data in a different drive or directory, change the file locations in the **Data Directories** and **TempDB** tabs.

19. Click **Next**.
20. Wait for the setup wizard to progress to the Ready to Install step and click **Install**.



21. Wait for the installation to complete. This may take several minutes.

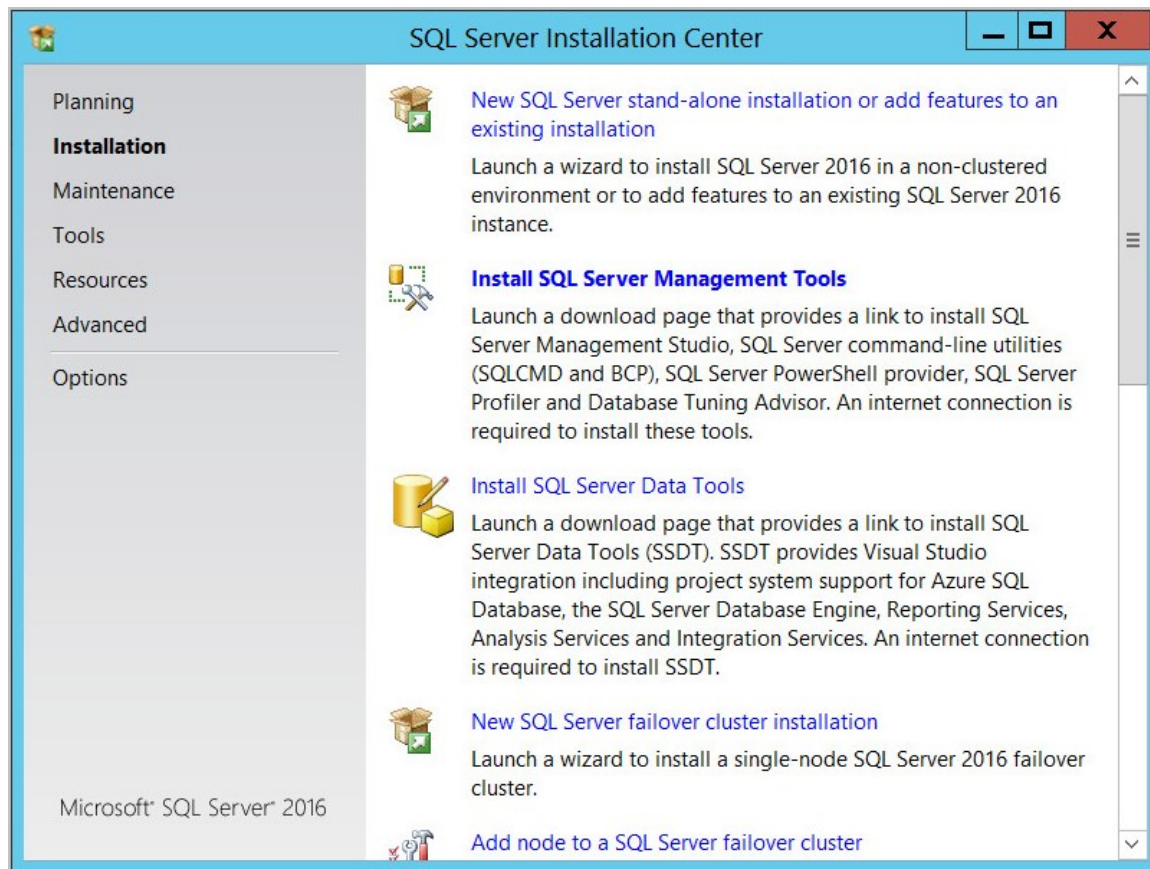
22. Click **Close**.

You may be prompted to reboot the computer before proceeding.

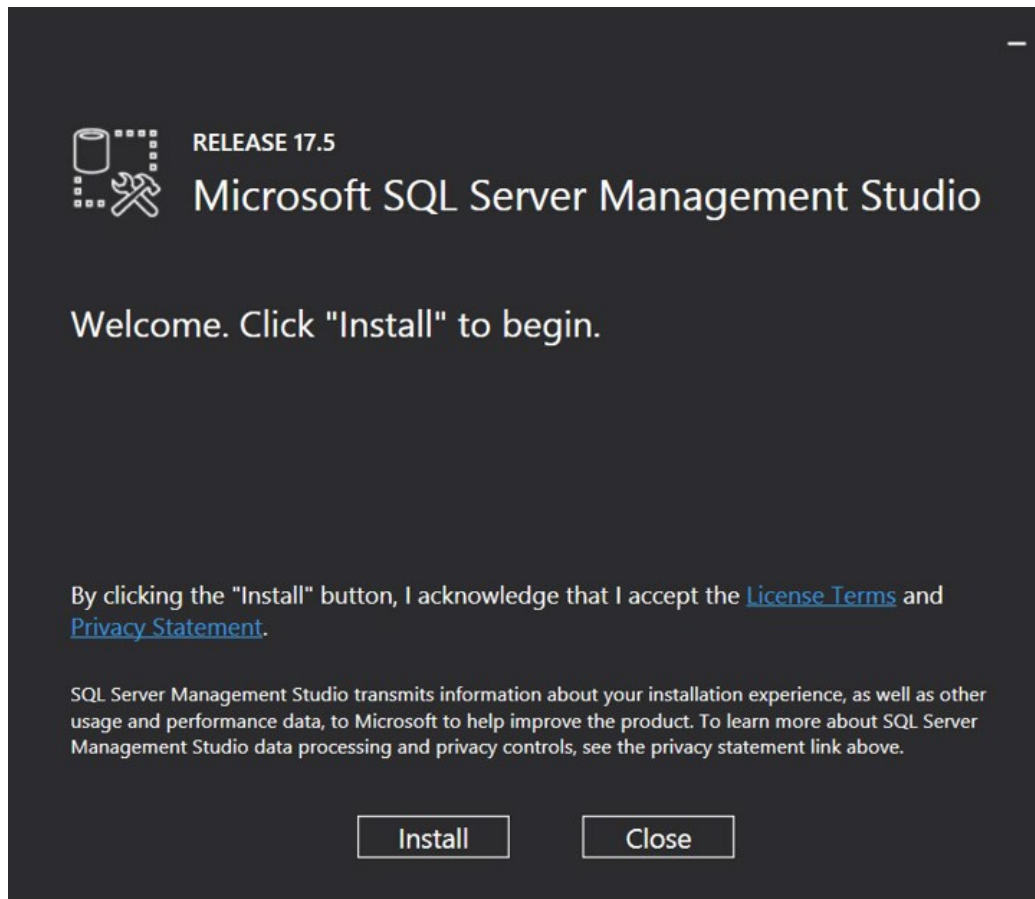
## Installing SQL Server Management Studio

1. Back in the SQL Server Installation Center window, click **Installation**.
2. Click **Install SQL Server Management Tools** and wait for the web page to load.

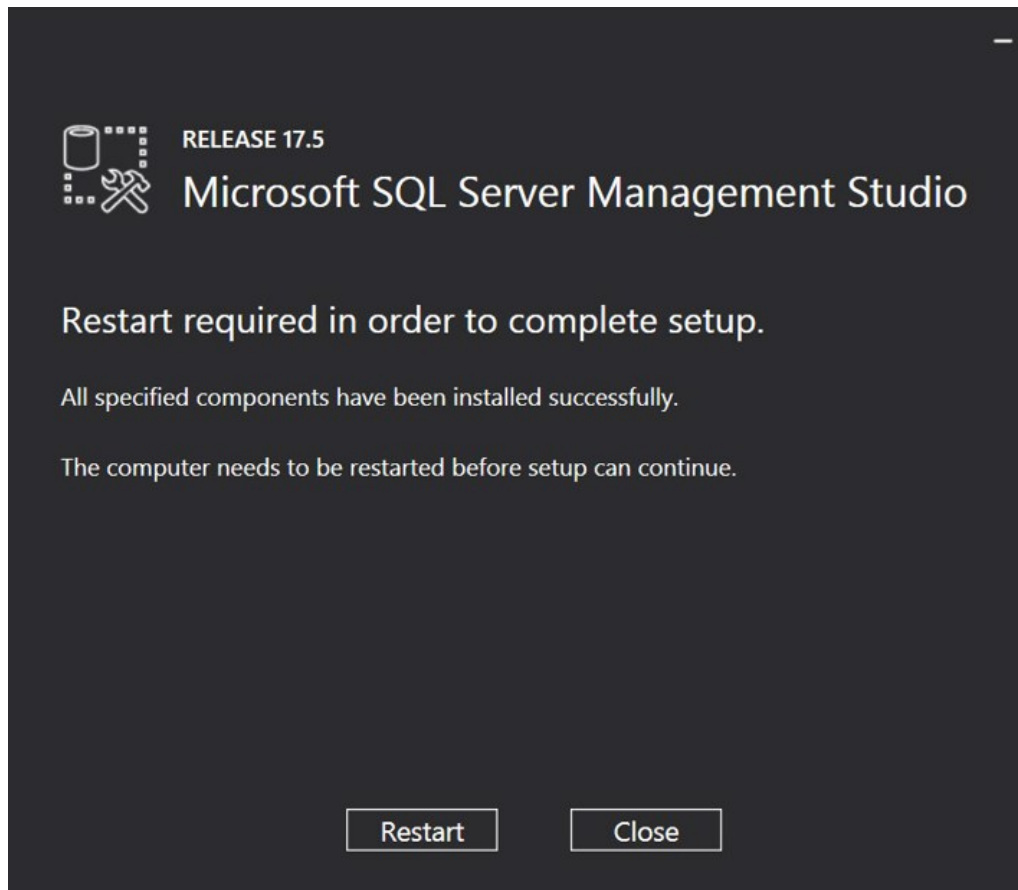




3. Click the **Download SQL Server Management Studio 17.6** link (note: actual version number may be higher).
4. After the download is complete, click or double-click the file to begin the installation process.
5. When the SQL Server Management Studio installer starts, click **Install**.
6. Wait for the installer to complete. This may take several minutes.



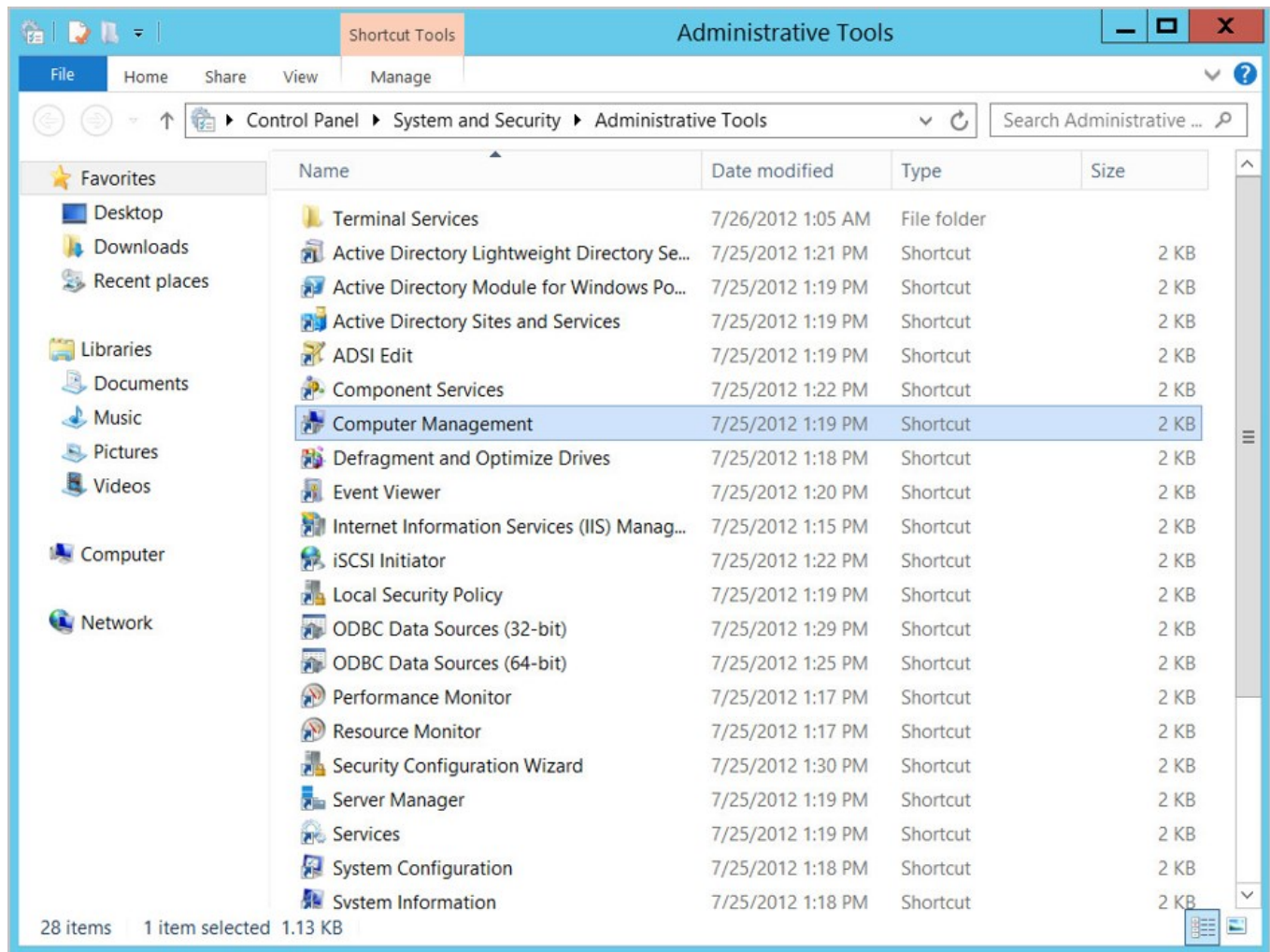
7. When the installation has completed, click **Restart** if prompted. Otherwise, click **Close**.



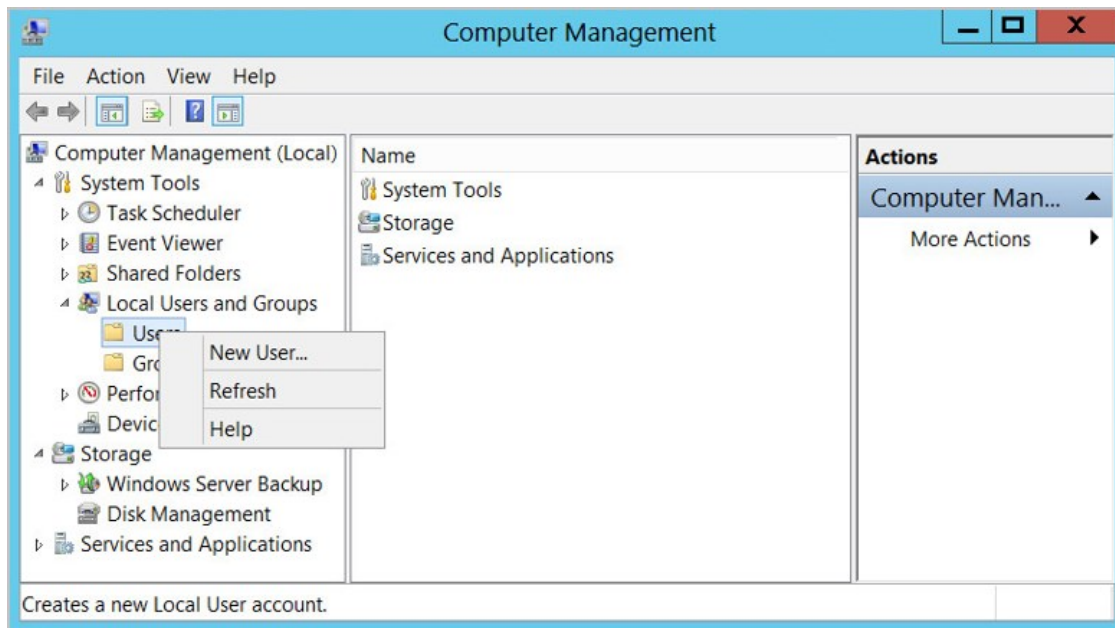
## Configuring SQL Server for Secret Server Installation

### Create the SQL Server User Account

1. Open **Control Panel | System and Security | Administrative Tools**.
2. Double-click **Computer Management**.



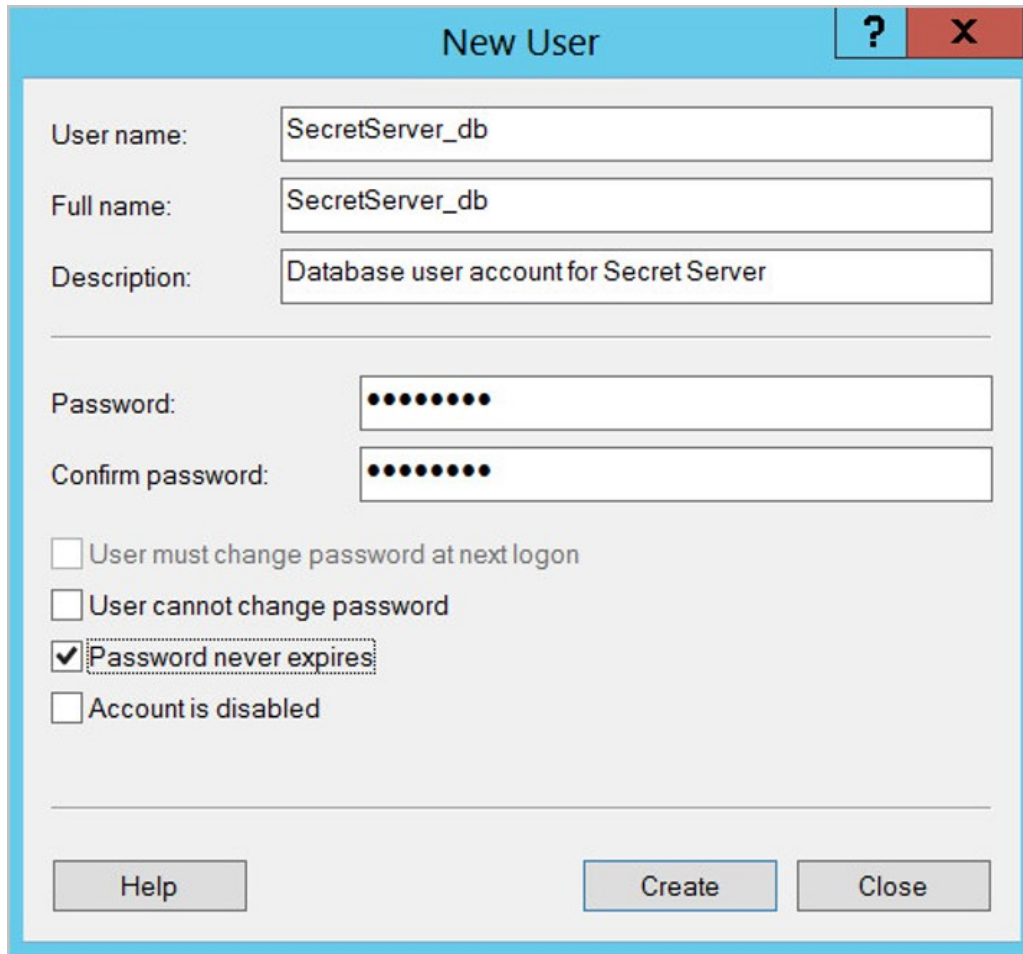
3. Expand the Local Users and Groups folder.
4. Right-click **Users**.
5. Select **New User....**



6. Give the user *any desired user name and a very strong password*.
7. Uncheck the default **User must change password at next logon**.
8. Check **Password never expires**.

This account will be added as a user in **SQL Server Management Studio** in the next step and its credentials will be saved to an encrypted file during Secret Server setup.

9. Click **Create** followed by **Close** when done.



**New User** ? X

User name: SecretServer\_db

Full name: SecretServer\_db

Description: Database user account for Secret Server

---

Password: ••••••••

Confirm password: ••••••••

☐ User must change password at next logon

☐ User cannot change password

☒ Password never expires

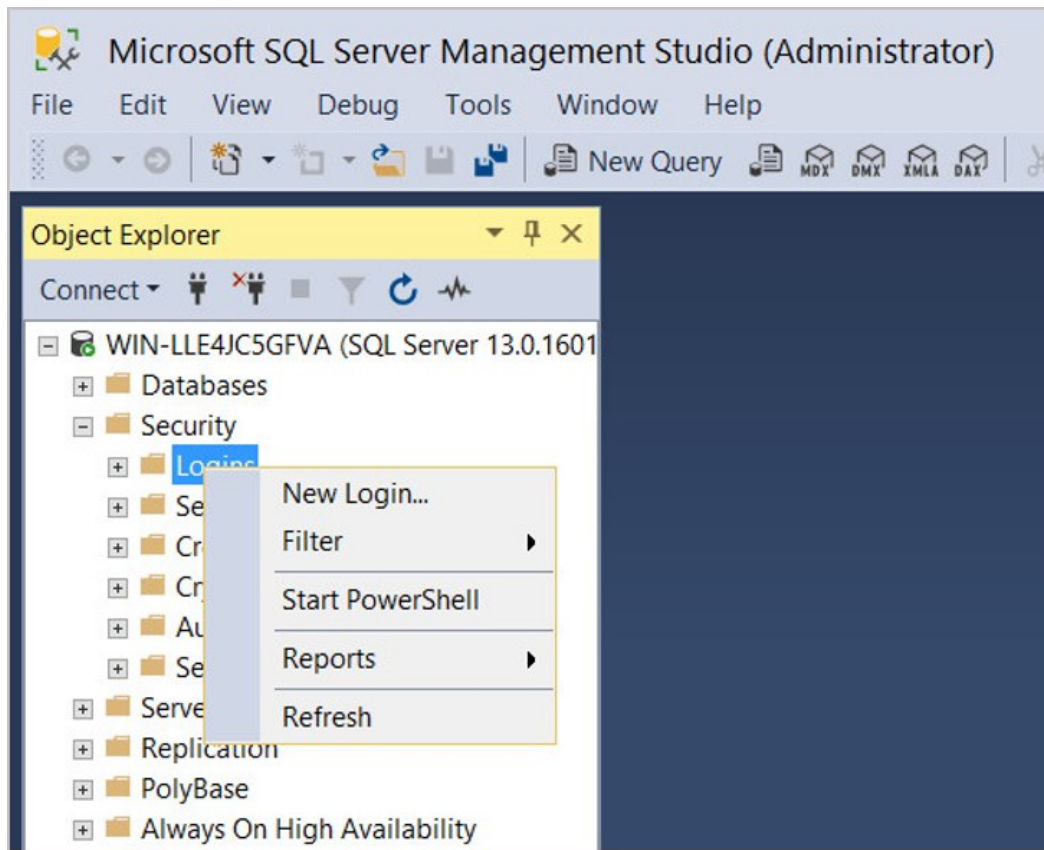
☐ Account is disabled

---

Help Create Close

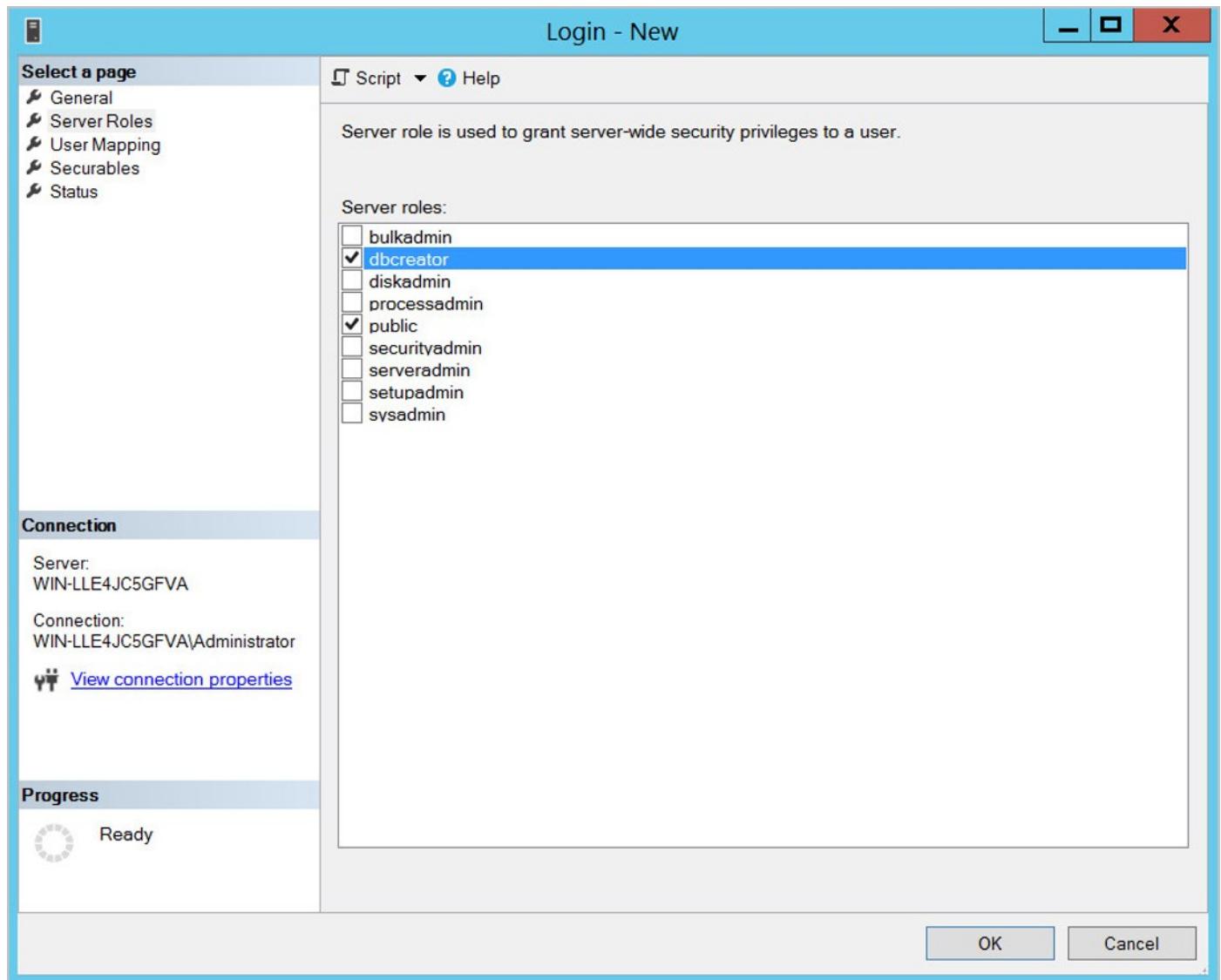
## Add the User Account to SQL Server

1. Start SQL Server Management Studio. This may take several minutes the first time the application is started.
2. Click the drop-down box beside **Server name**.
3. Click **Browse for more...**
4. Select the name of the database installed.
5. Click **Connect** to login using **Windows Authentication** (login as the user that you selected in the Database Engine Configuration step of the SQL Server installation).
6. Open the Security folder.
7. Right-click **Logins**.
8. Select **New Login...**



9. In the Login – New dialog, click the **Search** button.
10. Enter the full name of the Windows account you created in the previous step.
11. Click **Check Names**. If entered correctly, the user name should be underlined. If it is not, correct the name and repeat. When the name is entered correctly, click **OK**.
12. Back in the Login – New dialog, click **Server Roles**.
13. Check **dbcreator**.
14. Click **OK**.





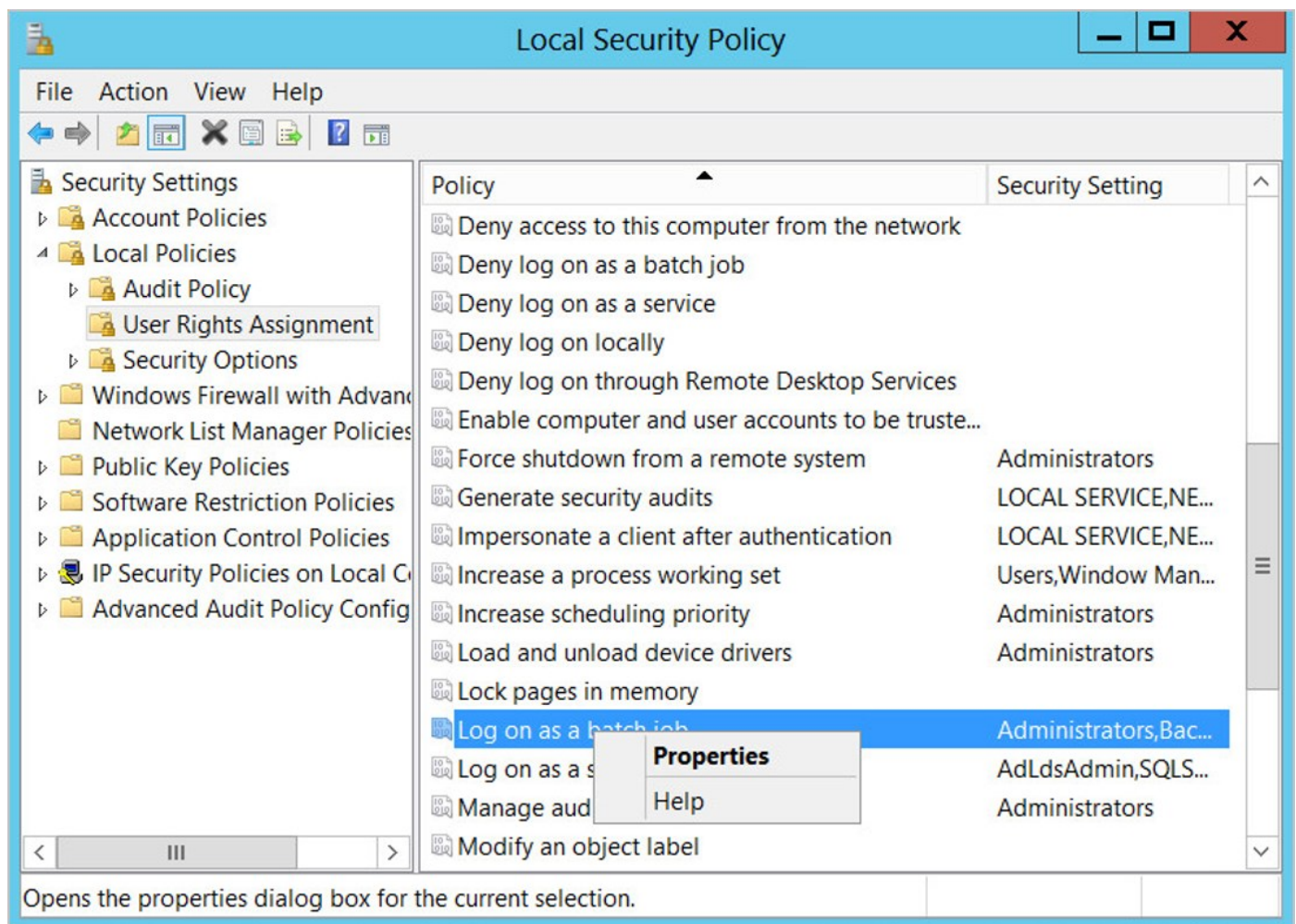
## Additional Pre-Requisites for Secret Server

For Windows Authentication to access the SQL database, it is recommended that you create a service account.

## To run the Secret Server IIS Application Pool with a Service Account

1. Open a command prompt window
2. Change the directory to your .NET framework installation directory using the "cd" command (either `C:\Windows\Microsoft.NET\Framework\v4.0.30319` or `C:\Windows\Microsoft.NET\Framework64\v4.0.30319`)
3. Type in `.\aspnet_regiis -ga < user name>` and press enter. Replace the field with the relevant value from the SQL Server user account created in section 2.2.3.1.
4. Give your service account "modify" access to C:\Windows\TEMP
5. Next open the Local Security Policy App from your start menu. Grant batch logon permissions to your service account:





1. Open the Local Security Policy Console (Search- > secpol.msc- > [Enter]).
2. Expand **Local Policies**.
3. Click **User Rights Assignment**.
4. Right-click **Log on as a batch job**.
5. Click **Properties**.
6. Click **Add User or Group** and add your service account.
7. Click **OK**.

**NOTE:** If you utilize Group Policy to enforce the "Log on as a batch job" and have group managed service accounts, take note that this will overwrite any local permissions to the "Log on as a batch job" on all computers that have the policy applied. Utilizing the local security policy is a safer option if you are not sure about your usage across your domain.

6. Grant **Impersonate a client after authentication** permission to the service account under "User Rights Assignment" the same way "Log on as a batch job" was assigned above.
7. If you now get a "Service Unavailable" after applying "Log on as a batch job" permissions, then you need to update your group policy settings (start- > run- > cmd, type in gpupdate /force) and restart the Windows Process Activation Service.

For information about configuring a Windows account for database access, please see [Accessing MS SQL Server with IWA](#).

## Secret Server Installer

## Downloading and Verifying the Installer

You can download the **Government Edition Installer** files from the Delinea Portal Downloads page after logging into the Delinea Support Portal.

To meet Common Criteria standards, you must run the ThycoticSetup.exe file as an Administrator on a 'clean' Secret Server web server, with a full, licensed version of SQL on the same database.

## Installer Verification and Authentication

Delinea generates SHA1 and SHA256 hashes for each software release, and they are available for download from a link in the [Secret Server Setup](#) chapter of the Secret Server documentation.

To verify that the installer has not been altered from our official release, run the Get-FileHash PowerShell command against your copy of the installer and check to make sure that the hash generated from that file matches the official hash value we publish. Assuming the copy of the installer you are checking is in the C:\temp\ folder, the command you would run is:

```
Get-FileHash -path c:\temp\gov\ThycoticSetup.exe -algorithm SHA256
```

This will generate the hash and output the results. The output will look something like this:

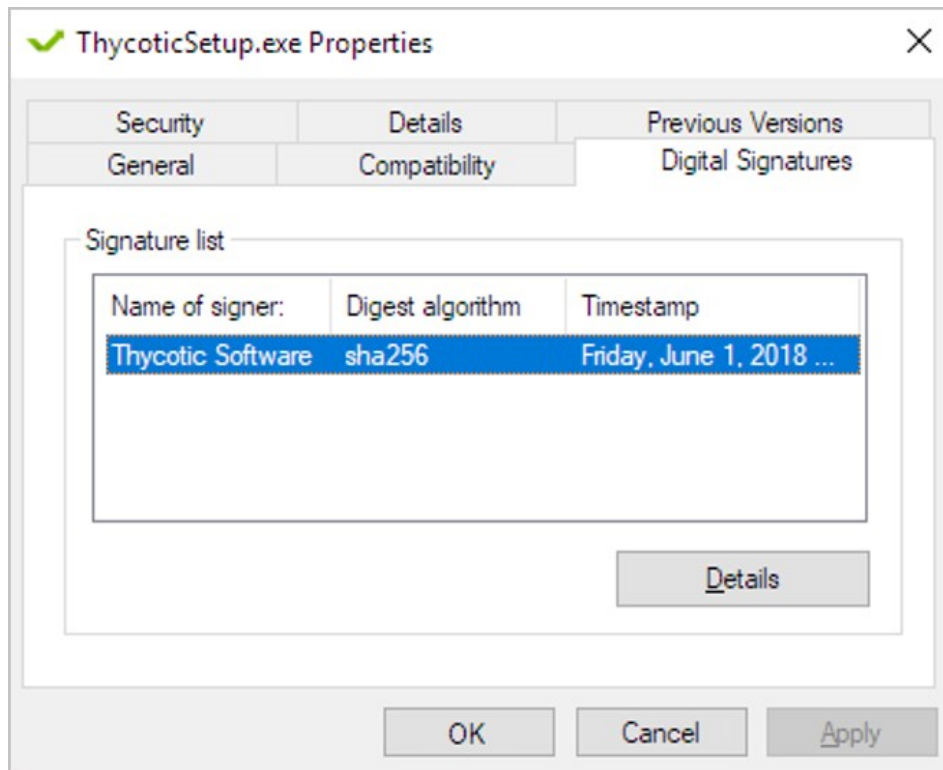
Algorithm Hash Path

---

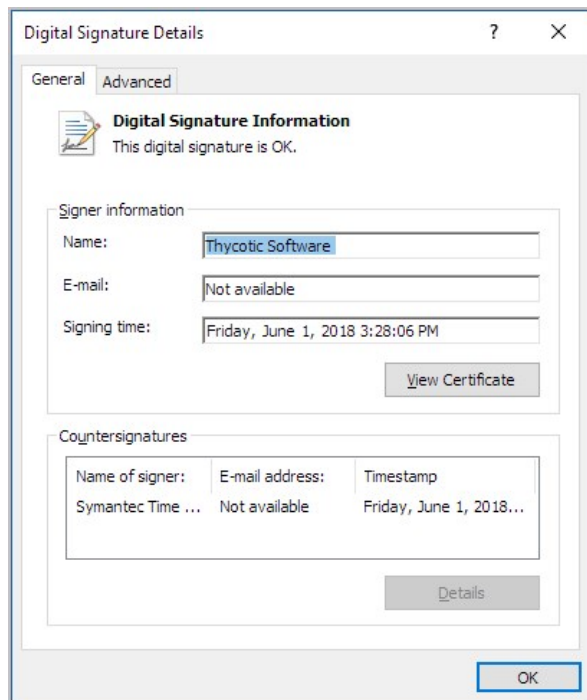
```
SHA256 588D130AE766C34E53072DFA4B900A372A99B5E413B3D1667CB17C2738ACD046 C:\temp\gov\ThycoticSetup.exe
```

The second step to take when checking the authenticity of the installer is to check the code signing certificate to confirm that it is signed by Delinea and has a valid certificate chain. To do this:

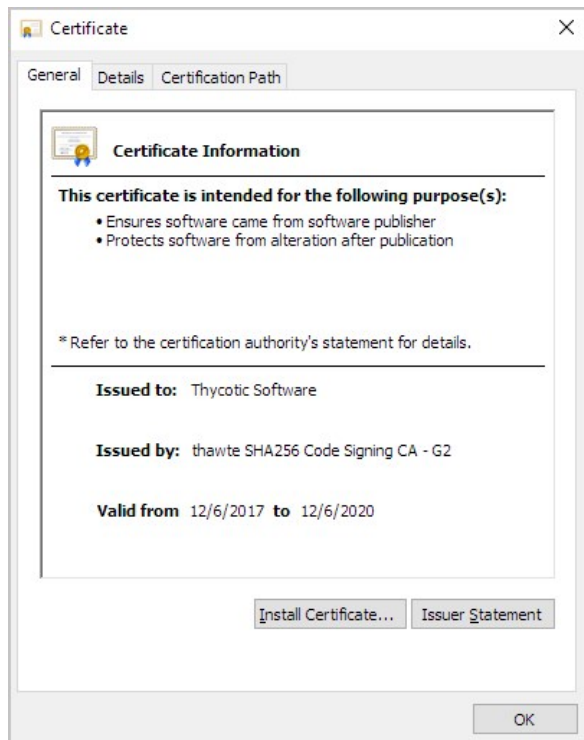
1. Right-click on ThycoticSetup.exe and select "Properties" from the context menu.
2. Switch to the "Digital Signatures" tab.



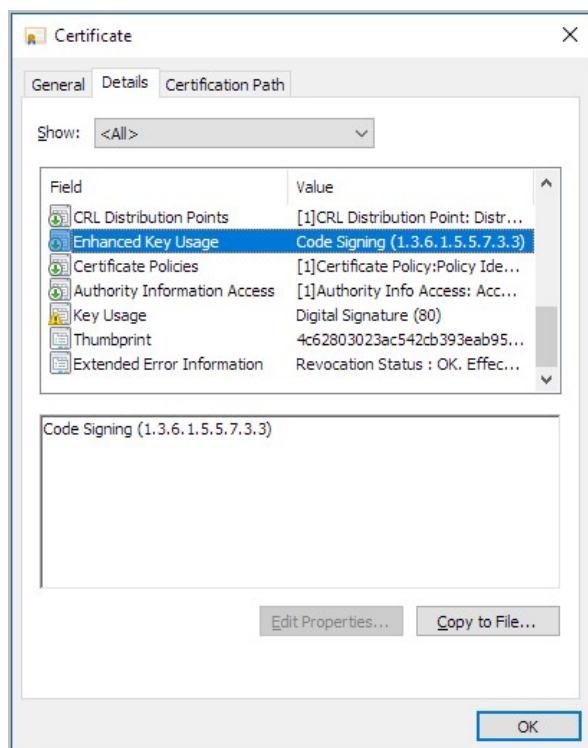
3. Verify that the name of signer is "Delinea Software" and make note of the date in the Timestamp. Select that entry in the Signature list and click "Details."



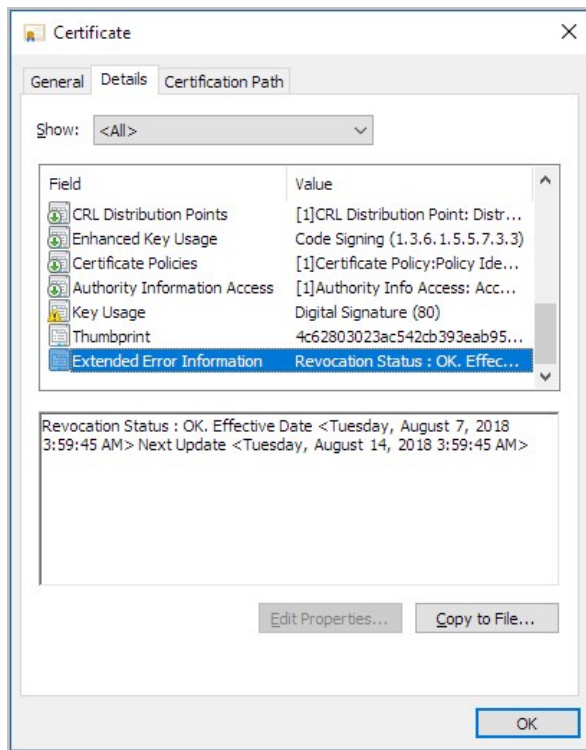
4. Click "View Certificate" to view the signing certificate.



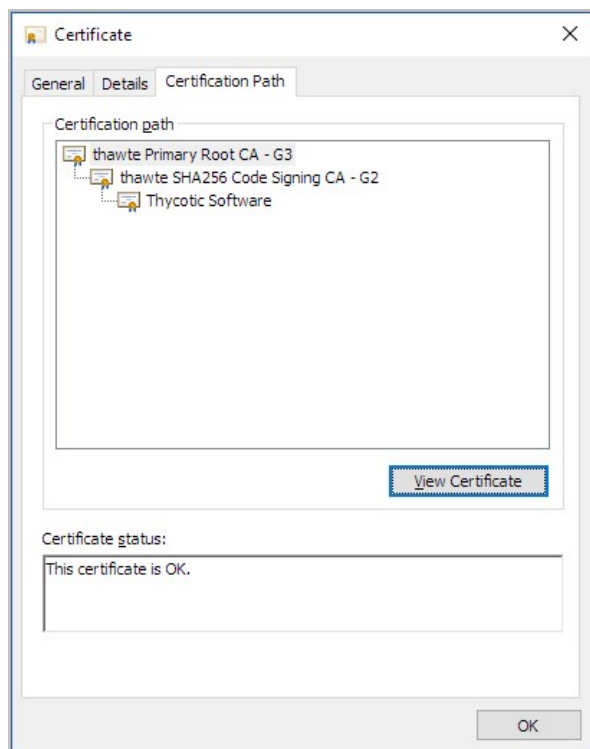
5. Verify that the certificate is issued to "Delinea Software" and that the signing timestamp from the signature list is within the "Valid from" date range.
6. Switch to the "Details" tab.



7. Verify that the "Enhanced Key Usage" field lists that the key is valid for code signing, as shown above.
8. Select the "Extended Error Information" field.



9. Verify that the certificate's revocation status is "OK"
10. Switch to the **Certification Path** tab.



11. View each certificate in the chain above "Delinea Software" and verify that the certificates are all valid.

## Running the Installer

If the following components are not already installed in your environment the Delinea Installer will automatically set them up for you:

- Microsoft .NET 4.6.2+ Framework or newer
- Application and Web Server roles enabled in IIS
- SQL License (Login with *dbcreator* rights needed)
- SSL certificate (Troubleshooting self-signed certificates is not supported by Delinea, we recommend a Certificate Authority for the certificate)

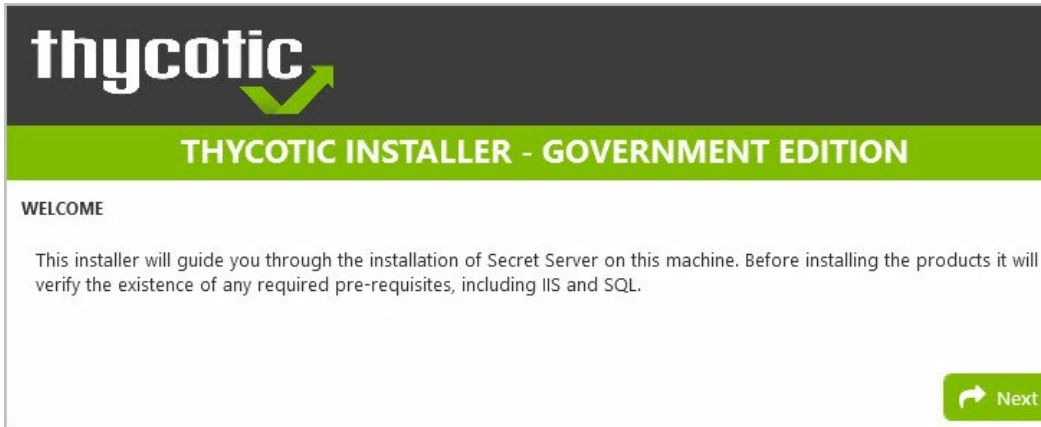
We strongly recommend that your Web Server is "clean," meaning that you should have no other running applications installed on this server to avoid complications between multiple applications

If an existing SQL server does not exist in your environment already, the installer will give you the option to install SQL Express, however, *using SQL Express is ONLY intended for trials or sandbox environments and is not acceptable for production use.*

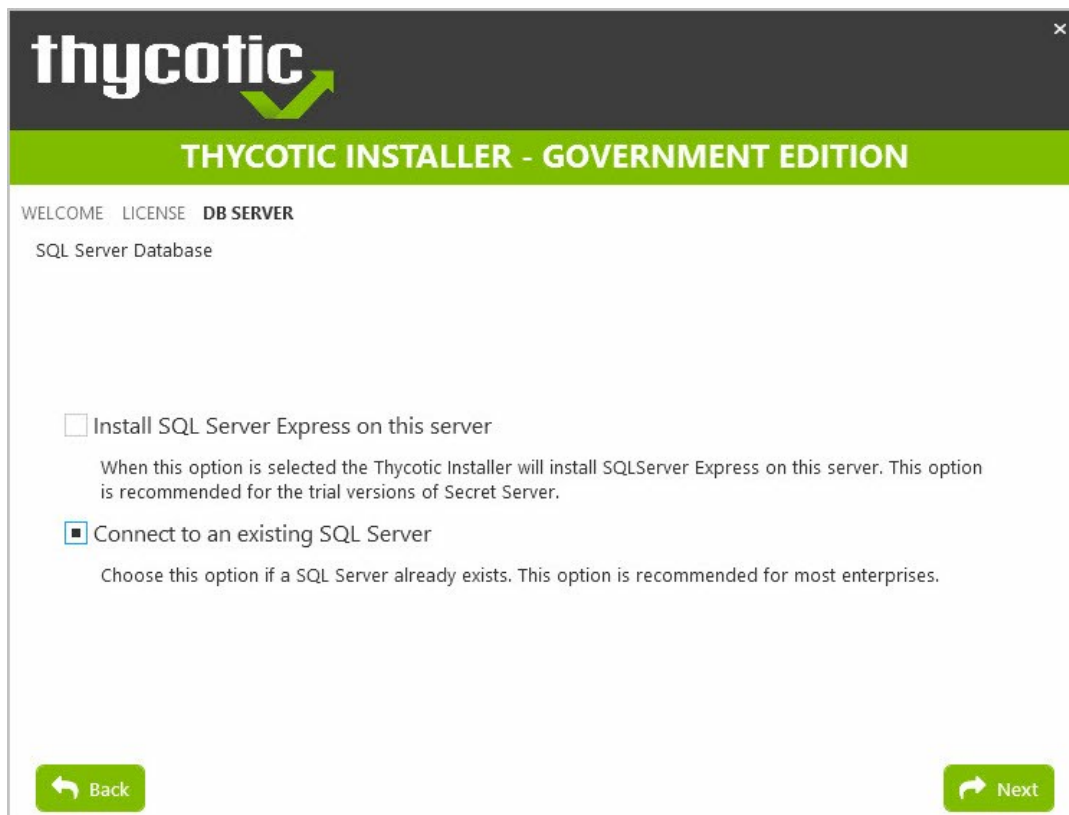
If your web server does not already have an SSL certificate, the installer will create and install a self-signed certificate, however, *self-signed certificates are NOT recommended for production environments.*

The installer will walk you through the steps required to perform your **Secret Server – Government Edition** install. The following steps comprise a shortened version for the install, highlighting Common Criteria Compliance requirements. For a comprehensive step-by-step guide see our KB on **Installing Secret Server – Government Edition** at:

<https://thycotic.force.com/support/s/article/SS-Installing-Secret-Server-Government-Edition> **INTERNAL ONLY SUGGESTS**  
<https://thycotic.force.com/support/s/article/System-Requirements-for-Secret-Server>



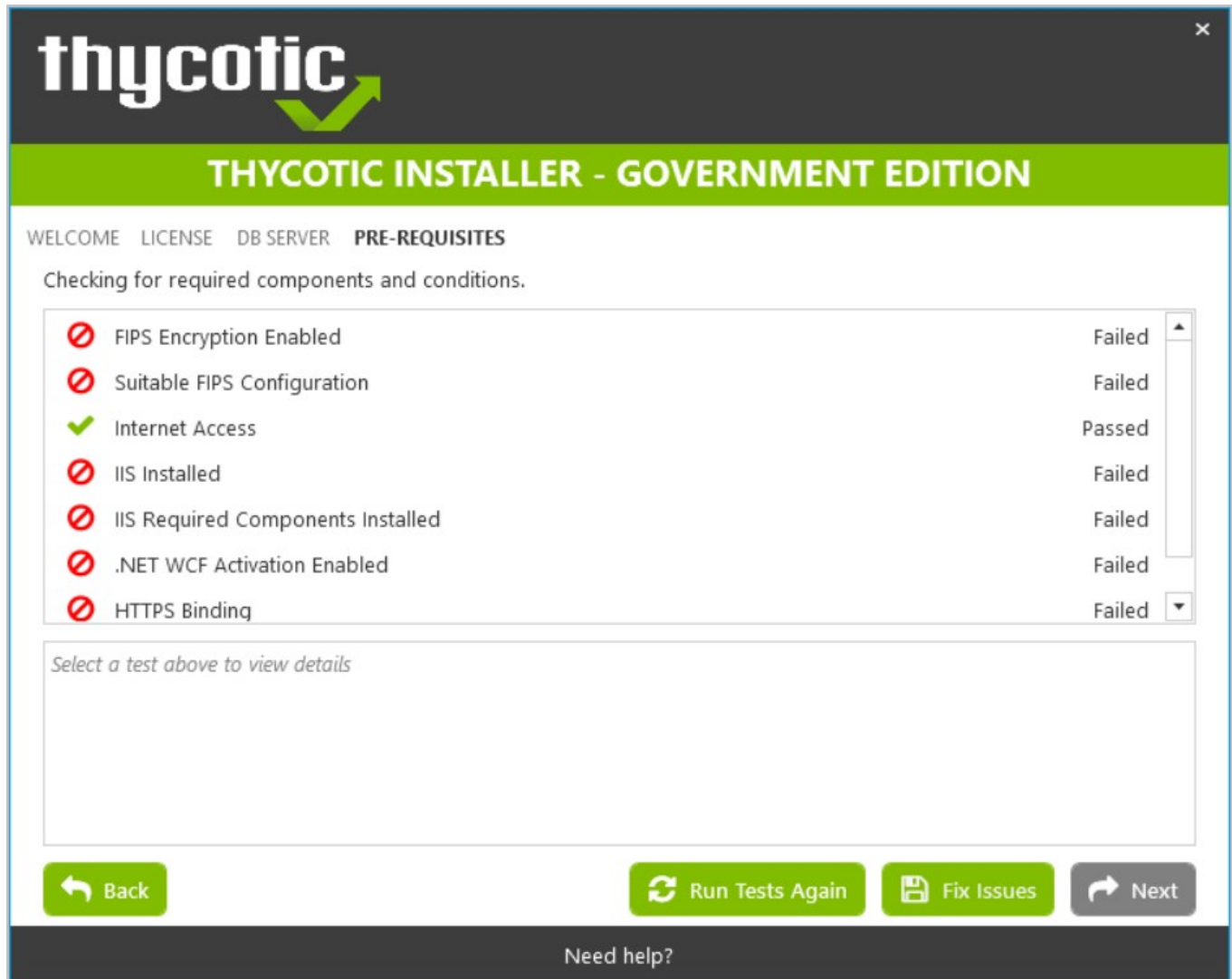
1. Click on the **Government Edition** of Secret Server to download installer (see section 2.3.1 for link) and execute the installer on your joint Web Application + Database Server. The first installer page you will be presented with is the **Welcome** splash screen. Click **Next**, then read and **Accept** the End User Licensing Agreement.



2. For Common Criteria compliance, select **Connect to an existing SQL Server**. To uphold compliance a full licensed version of SQL must be installed locally (e.g. on the same server where Secret Server is installed).

**Note:** Installing SQL Express is only intended for the trial version of Secret Server and is *NOT* suitable for production environments. If you choose "Install SQL Server Express on this server," the Delinea Installer will automatically install a fresh instance of SQL Express locally, but your instance will not be supported and will not be up to standard for production use.

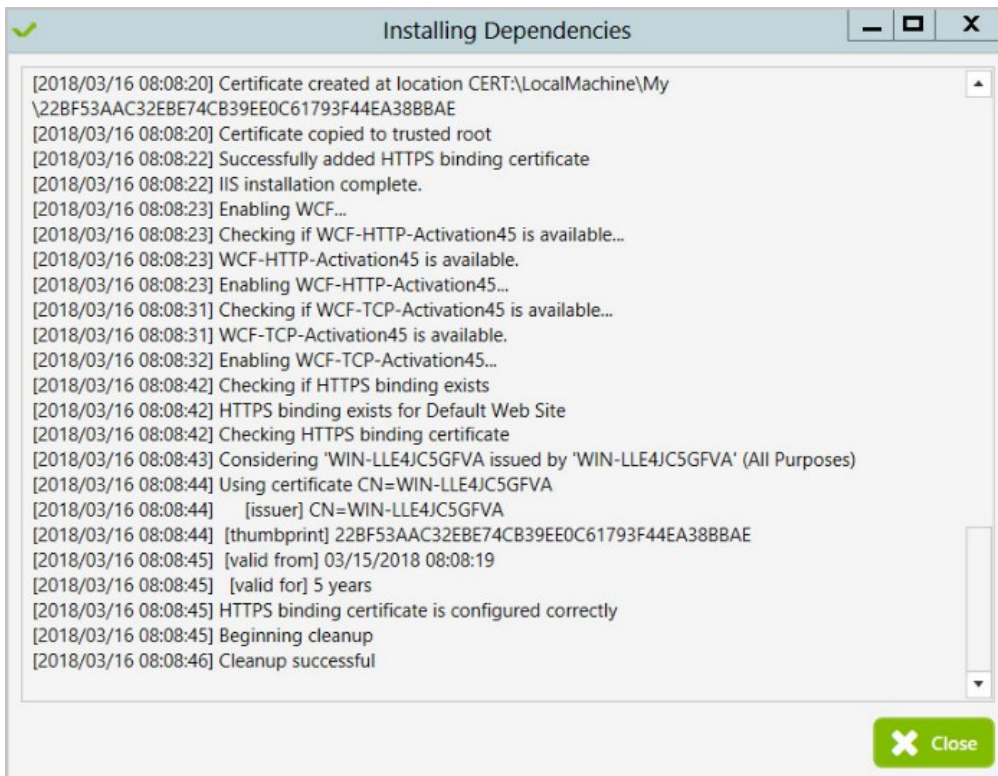




- When you arrive at the **Pre-Requisites** window the Delinea Installer will check to make sure that all required conditions are met. If there are issues or failures, choose **"Fix Issues"** to automatically install the necessary Pre-Requisites. This may take several minutes. If an "Installing Dependencies" windows pops up during this process, close to continue. When successful, click **Next**.

## Troubleshooting:

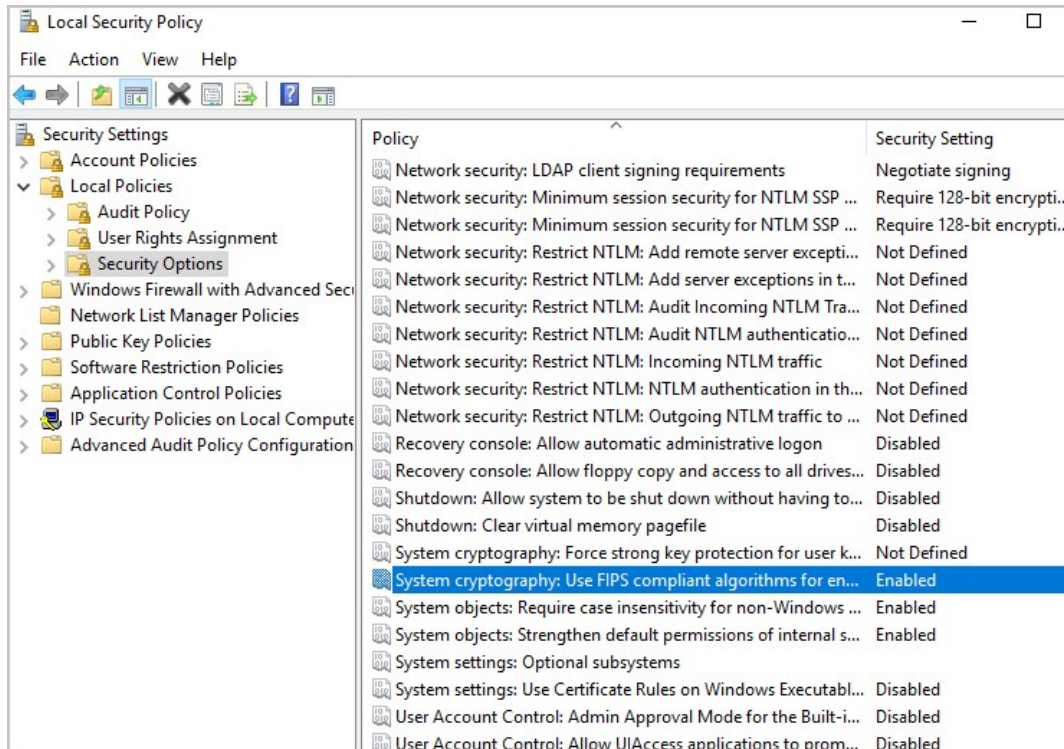




**Troubleshooting Note:** If the **FIPS Encryption Enabled**, **Suitable FIPS Configuration**, or **HTTPS Binding** settings *Fail* during this Pre-Requisites check, click the **Fix Issues** button. After the tests run again, if the settings still list as "Failed," close the installer as directed, and then re-open the Installer. **Run the installer again** and the settings should pass.

If the FIPS Encryption Enabled setting continues to fail the pre-requisite check, you can manually turn on FIPS mode, Enabling FIPS Compliance in Windows by following the steps below:

1. Go to **Windows Security Policy editor** (secpol.msc) from your search bar
2. Navigate on your left pane to **Security Settings | Local Policies | Security Options**
3. Find and go to the property of **System Cryptography: Use FIPS Compliant algorithms for encryption, hashing, and signing...**
4. Choose **Enable** and click **OK**.
5. Restart your IIS server with **iisreset**.



- **FIPS Encryption Enabled** means that FIPS-compatible encryption algorithms (i.e. AES128, AES256) are available
- **Suitable FIPS Configuration** means that Windows is in FIPS mode on the local server
- For more information about enabling FIPS compliance, refer to the following:
  - [Enabling FIPS Compliance](#)
  - [FIPS 140 Validation](#).

**NOTE:** If installing SQL Express you may need to manually install .NET 3.5 through the Server Manager Roles and Features wizard. If this is the case, the installer will flag it for you in the details section. Remember that SQL Express is not compatible for Common Criteria compliance and is only intended for trial or sandbox environments.\*

1. Provide the Server Name or IP address for your Database server. According to Common Criteria compliance, SQL should already be installed locally on this machine.

**NOTE:** Using SQL Server Authentication with Administrator SQL credentials in mixed mode is *NOT* compliant with Common Criteria. Instead, select **Windows Authentication using Service Account**. Then click **Next**.

**SQL Authentication**

☐ SQL Server Authentication (SQL Server authentication requires Mixed Mode)

**User name**

**Password**

☒ Windows Authentication using Service Account

☒ **Advanced (not required)**

2. Choosing **Windows Authentication using Service Account** will bring you to a new tab called **Account**. This tab will prompt you for the **DOMAIN\User Name** and **Password** of your pre-configured service account which we will assign to the application pool

identities in IIS when the site is created. This account must have the **db\_creator** role.

**NOTE:** To move between the Secret Server web platform and the SQL database, **your licensed SQL database must be maintain Compliance according to Common Criteria and ensure that encryption standards are upheld by communications installed locally (e.g. on the same server that the installer is running on).**

- If your database does not yet exist when you click "**Test Connection**" the Delinea Installer will create an instance of SQL Express, which is only intended for trial use and not suitable for production environments (see step 4).

3. Select **Validate Credentials**. When the connection has been tested successfully, click **Next**.

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## THYCOTIC INSTALLER - GOVERNMENT EDITION

WELCOME LICENSE DB SERVER PRE-REQUISITES DB CONNECTION **CIPHERS**

### Configure TLS Cipher Suites

By default the TLS cipher settings will use the standard Windows settings. Thycotic recommends that Secret Server is the only application used on this server if you choose to limit the allowed TLS cipher suites.

For more information, see <https://updates.thycotic.net/link.ashx?ciphers>

☐ Use Windows current TLS cipher settings

☒ Use only these TLS cipher suites:

- ☒ TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA
- ☒ TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA
- ☐ TLS\_RSA\_WITH\_AES\_256\_GCM\_SHA384
- ☐ TLS\_RSA\_WITH\_AES\_128\_GCM\_SHA256
- ☒ TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA256
- ☒ TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA256
- ☒ TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA
- ☒ TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA

[Select All](#) [Unselect All](#)

[Back](#) [Next](#)

4. Verify that "Use only these TLS cipher suites" is selected, along with the six checked cipher suites. If not, deselect the toggle for "Use Windows current TLS cipher settings" and select **Use only these TLS cipher suites**.

The following TLS cipher suites are required to make sure your Secret Server instance's encryption standards are as secure as possible:

TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA  
 TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA  
 TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA  
 TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA

TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA256  
 TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA256

**thycotic**

**THYCOTIC INSTALLER - GOVERNMENT EDITION**

WELCOME LICENSE DB SERVER PRE-REQUISITES **CREATE USER**

Please enter credentials for your initial Secret Server Administrator.

**User Name** Admin

**Display Name** Lois Lane

**Email** loislane@helpdesk.heroes

**Password** .....

**Confirm Password** .....

**IMPORTANT: KEEP THIS INFORMATION**  
 This user name and password is used to administer Secret Server. It is the initial administrator and will be used to install licenses, create users, and setup advanced features. If you lose the password for this account, you will be unable to use these credentials in the event of an emergency.

☒ I understand

Back Next

5. **Enter credentials** for your Secret Server Administrator account. Please remember these credentials as they are necessary to login to the web application after you complete installation. According to Common Criteria Compliance regulations, **this local administrator user password must be 15 characters or greater in length and include both numbers and special characters** – see section **9.1 Password Requirements for User Authentication** for more details.
6. If you have an **Email Server** that your organization uses for notifications, enter its information in the Email Server Window and then click **Next**. If this does not apply to your organization, select **Skip Email**
7. In the **Review** window (screenshot below), verify that all settings are correctly listed. If anything needs to be changed feel free to modify the section by clicking "Modify" on the righthand side. You may also hover over the left-hand question mark symbols for descriptions of each point. Once reviewed, click **Install**.

**Note:** Installation time will vary, most installs last between 10-40 minutes.



THYCOTIC INSTALLER - GOVERNMENT EDITION

WELCOME LICENSE DB SERVER PRE-REQUISITES DB CONNECTION ACCOUNT CIPHERS CREATE USER EMAIL **REVIEW**

Review the installation options and then click Install to continue.

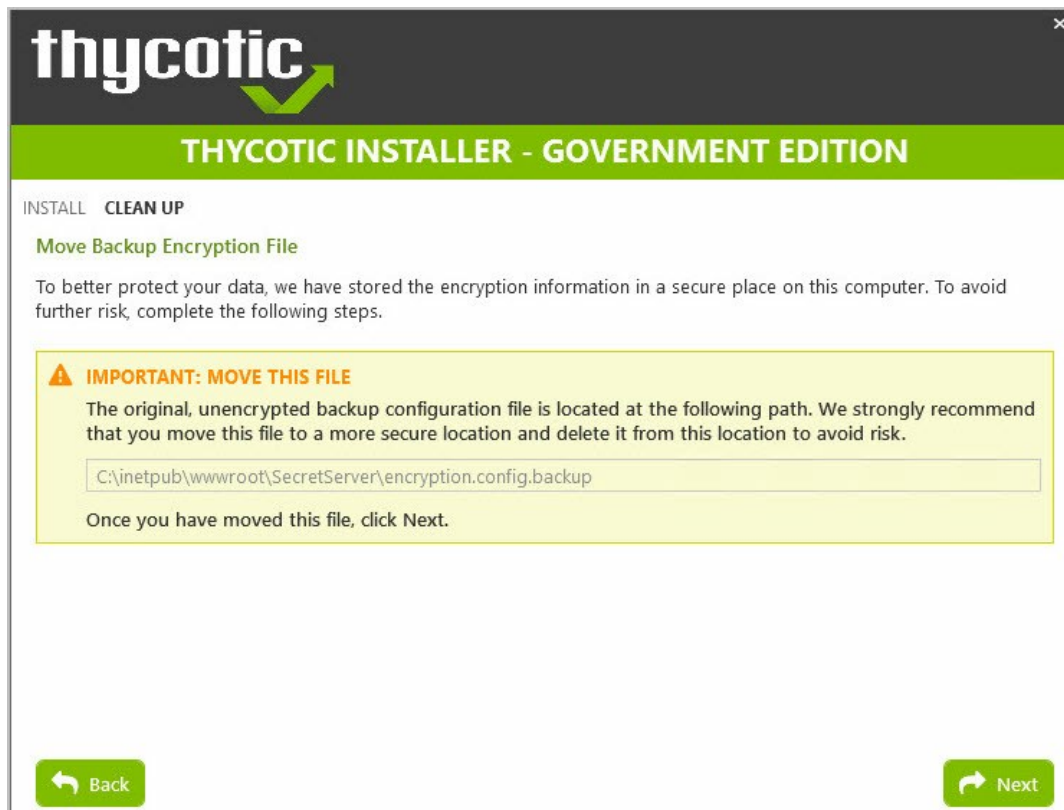
Name	Setting	
? SQL Server	Using Existing SQL Server	<a href="#">Modify</a>
? Database Connection	SecretServer_db on	<a href="#">Modify</a>
? Encryption Configuration		<a href="#">Modify</a>
? Site Name		<a href="#">Modify</a>
? Secret Server Destination		<a href="#">Modify</a>
? Secret Server App Name	SecretServer running as	<a href="#">Modify</a>
? Create User		<a href="#">Modify</a>
? Email Server		<a href="#">Modify</a>
? TLS Ciphers		<a href="#">Modify</a>

[Back](#)[Install](#)

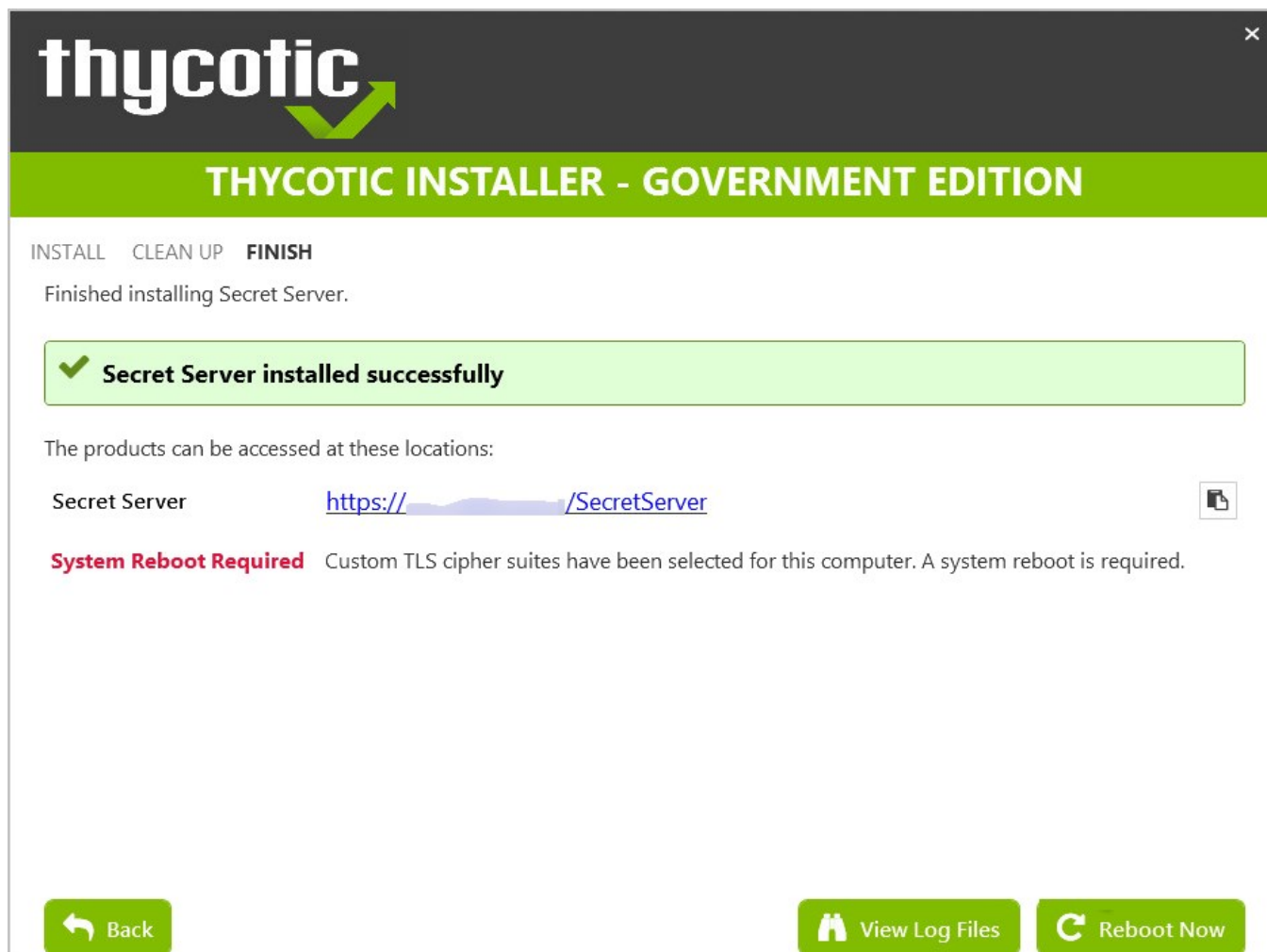
Need help?

8. When the install has successfully completed, the **Clean Up** tab will direct you to move your backup file path location. Follow these instructions and move your backup encryption file to a secure location on a different machine for disaster recovery purposes. Then click **Next**.





9. Because you specified TLS ciphers in step 6, after successfully completing the Secret Server Government Edition install you will be directed to fully reboot your Windows server so that the ciphers will take effect. Click **Reboot Now** to finish (screenshot below).



You can click on the provided URL to navigate directly to your setup landing page. Login using the Username and Password that you created on the "Create User" installer screen.

#### Additional Permissions for Secret Server Folder

1. After installing Secret Server, check permissions on the folder by navigating to the folder in which the web site was created (by default **C:\inetpub\wwwroot\SecretServer**)
2. Right-click the folder name and select **Properties | Security** tab | **Edit** button, then click **Add...** to add the **local user account created for the database** in step **2.2.3.1 Add the User Account to SQL Server**.
3. If not already checked, check the **Allow** boxes beside the **"Read and Execute," "List Folder Contents,"** and **"Read"** access permissions above, click **Apply**.

## Accessing Your System

### Browser Compatibility

Secret Server is compatible with the following browsers and versions. Some functionality, as noted below, is not available in all browsers.

Firefox	version 23+	Copy to Clipboard requires add-on. Click-once Launcher requires Microsoft add-on: <a href="https://www.microsoft.com/en-us/download/details.aspx?id=9923">https://www.microsoft.com/en-us/download/details.aspx?id=9923</a> (Protocol Handler supported)
Chrome	version 25+	Copy to Clipboard requires add-on. Click-once Launcher not supported (Protocol Handler supported)
Edge	all versions	Web filler not currently supported. Copy to Clipboard not currently supported.
Safari	version 5.0+	Copy to Clipboard requires add-on (Snow Leopard OSX or better; not supported on Windows). Click-once Launcher not supported (Protocol Handler supported)
Opera	not supported	

Table 4: Browser Compatibility

Note: Click-Once launcher is not supported on any non-Windows platform.

### Web Interface

To access Secret Server, navigate to your organization's URL and login using your administrator credentials. The first time you login your screen will look like this:

\*For information on setting up your Secret Server Local Administrator account, see section 3.2.

After enforcing the Login Policy Banner (for instructions, see section 5.4.1), the login screen will appear this way:



Login

Username \*

admin

Password \*

\*\*\*\*\*

Access to this system is restricted to authorized users. Users (authorized or unauthorized) have no explicit or implicit expectation of privacy. Any or all secrets may be modified, copied, audited, inspected, and disclosed to company management, law enforcement personnel, and other authorized individuals. I understand that I am responsible

☒ I accept these terms

Login

Once user accounts are configured, both Local accounts and Active Directory users will access Secret Server through this login screen. To configure Active Directory users, see section 7.1.

You will be directed to Secret Server's landing page for Administrator accounts.

Thycotic Secret Server 10.0

Government Edition

Search Secrets

Search

HOME

TOOLS

ADMIN

REPORTS

4

?

Advanced | Basic

+ Content

Browse

+

Find Folder

< All Folders >

Personal Folders

(Drag a folder to create a tab.)

Search in results

Advanced

Secret

Folder

Template

Page 1 of 0

15 records to view

< Select Bulk Operation >

Create Secret

Create New

< Select >

Recent Secrets

Favorite Secrets

Expired Secrets

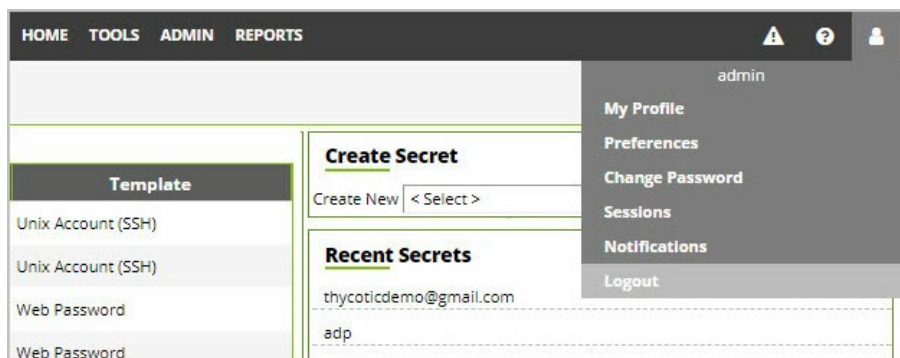
Welcome

Getting Started with Dashboard

Dashboard has a rich array of widgets with a customizable design. Create Tabs, add widgets, and arrange your own layout using drag and drop. See all the new features in Dashboard in this movie.

View Movie

Dismiss



To logout, navigate to the **profile icon** in the upper right-hand corner and select **Logout** from the dropdown list. Once user accounts are created in Secret Server from the Admin profile, users can login using user-level credentials by navigating to your organization's login URL.

More detailed information for setting up Secret Server including customizing Secret Server your dashboard and creating users can be found in Secret Server's User Guide:

[https://updates.thycotic.net/secretserver/documents/SS\\_UserGuide.pdf](https://updates.thycotic.net/secretserver/documents/SS_UserGuide.pdf) **CHANGE TO INTERNAL LINK(S)**

## Local Admin Account

To create Secret Server's Local Administrator Account you will be prompted for information through the installer (step 7 in section 2.3.2 of this guide). Save the information you provide during this step so that you can login to the administrator account when the installer finishes setting up your instance.

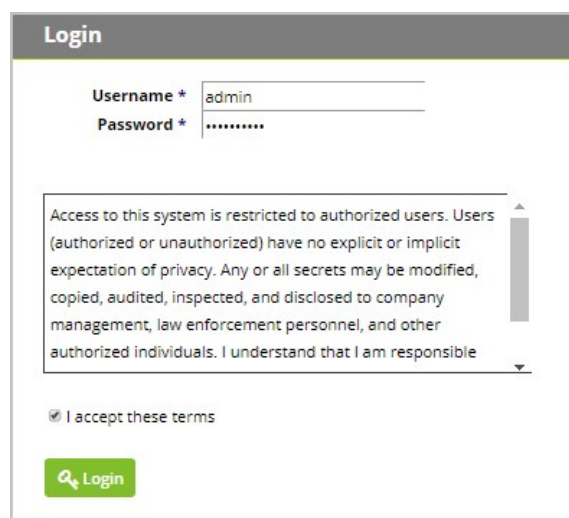
## Installing License Keys

After logging into Secret Server with Secret Server's local administrator account, the first thing you will need to do is install your organization's license keys. You will need three different license keys, one for the Secret Server Edition being used, one for Support, and one for Users. Install your keys by navigating to **Admin | Licenses**, click **Install New License**. To install multiple licenses at once, click the **Bulk Entry Mode** button. Add your licenses according to the example format and click **Add Multiple Licenses**. button, enter the required informational fields included in your trial or purchase license email and then click **Activate**.

To Activate newly installed licenses, click the **License Activation**images/a44f4a741a52b81b178cd16a325d8116.png)

\*For information on setting up your Secret Server Local Administrator account, see section 3.2.

After enforcing the Login Policy Banner (for instructions, see section 5.4.1), the login screen will appear this way:



Once user accounts are configured, both Local accounts and Active Directory users will access Secret Server through this login screen. To configure Active Directory users, see section 7.1.

You will be directed to Secret Server's landing page for Administrator accounts.

---

Thycotic Secret Server 10.0 Government Edition

Search Secrets Search HOME TOOLS ADMIN REPORTS

Advanced | Basic + Content

Browse +

Find Folder Search in results Advanced

< All Folders > Personal Folders

Secret Folder Template

Page 1 of 0 15 records to view

< Select Bulk Operation >

Create Secret

Create New < Select >

Recent Secrets

Favorite Secrets

Expired Secrets

Welcome

Getting Started with Dashboard

Dashboard has a rich array of widgets with a customizable design. Create Tabs, add widgets, and arrange your own layout using drag and drop. See all the new features in Dashboard in this movie.

View Movie Dismiss

HOME TOOLS ADMIN REPORTS

admin

My Profile

Preferences

Change Password

Sessions

Notifications

Logout

Create Secret

Create New < Select >

Recent Secrets

thycoticdemo@gmail.com

adp

Template

Unix Account (SSH)

Unix Account (SSH)

Web Password

Web Password


To logout, navigate to the **profile icon** in the upper right-hand corner and select **Logout** from the dropdown list. Once user accounts are created in Secret Server from the Admin profile, users can login using user-level credentials by navigating to your organization's login URL.

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[https://updates.thycotic.net/secretserver/documents/SS\\_UserGuide.pdf](https://updates.thycotic.net/secretserver/documents/SS_UserGuide.pdf) **CHANGE TO INTERNAL LINK(S)**

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**THYCOTIC INSTALLER - GOVERNMENT EDITION**

WELCOME   LICENSE   DB SERVER   PRE-REQUISITES   **CREATE USER**

Please enter credentials for your initial Secret Server Administrator.


User Name

Display Name

Email


Password


Confirm Password


**IMPORTANT: KEEP THIS INFORMATION**

This user name and password is used to administer Secret Server. It is the initial administrator and will be used to install licenses, create users, and setup advanced features. If you lose the password for this account, you will be unable to use these credentials in the event of an emergency.

☒ I understand

 Back

 Next

## Installing License Keys

After logging into Secret Server with Secret Server's local administrator account, the first thing you will need to do is install your organization's license keys. You will need three different license keys, one for the Secret Server Edition being used, one for Support, and one for Users. Install your keys by navigating to **Admin | Licenses**, click **Install New License**. To install multiple licenses at once, click the **Bulk Entry Mode** button. Add your licenses according to the example format and click **Add Multiple Licenses**. button, enter the required informational fields included in your trial or purchase license email and then click **Activate**.

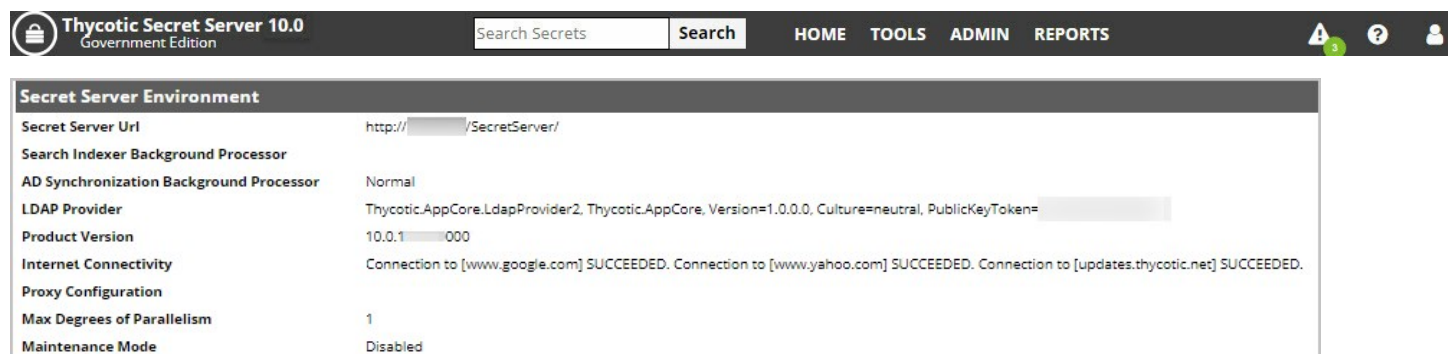
To Activate newly installed licenses, click the **License Activation**

## Updating Secret Server

### Checking Software Version

#### Verify Software Version and Components

A shorthand representation of the software version appears in the upper left-hand corner of any user screen, along with the product edition. The full software version number is listed in the **Secret Server Environment** section by navigating to **Admin | Diagnostics**:

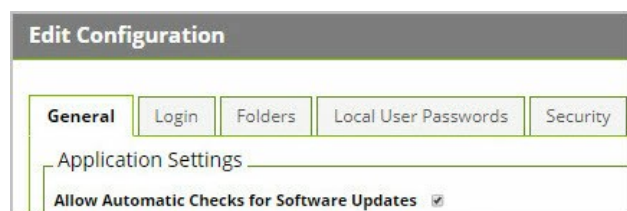


The screenshot shows the top navigation bar of the Thycotic Secret Server 10.0 Government Edition. Below the navigation bar, the 'Secret Server Environment' section is displayed, listing various system parameters and their values.

Secret Server Environment	
Secret Server Url	http://[redacted]/SecretServer/
Search Indexer Background Processor	
AD Synchronization Background Processor	Normal
LDAP Provider	Thycotic.AppCore.LdapProvider2, Thycotic.AppCore, Version=1.0.0.0, Culture=neutral, PublicKeyToken=[redacted]
Product Version	10.0.1000
Internet Connectivity	Connection to [www.google.com] SUCCEEDED. Connection to [www.yahoo.com] SUCCEEDED. Connection to [updates.thycotic.net] SUCCEEDED.
Proxy Configuration	
Max Degrees of Parallelism	1
Maintenance Mode	Disabled

#### Downloading Software Updates

By default, Secret Server is configured to notify you immediately when software updates are available. To customize this behavior, navigate to **Admin | Configuration | General** tab and **Edit**, then check the box next to **Allow Automatic Checks for Updates**. This setting will create a banner at the top of your Administrator account's user screen when a new update is available for download.



The screenshot shows the 'Edit Configuration' page with the 'General' tab selected. Under the 'Application Settings' section, the checkbox for 'Allow Automatic Checks for Software Updates' is checked.

If your Secret Server web server has no outbound access, you can elect to receive updates through Delinea's Support Portal by logging into your Portal account at **Delinea.force.com**, **CHANGE TO WHAT?** navigating to your Account Settings, and signing up for the Delinea Mailing List.

After receiving a notification for the latest software release, navigate to <https://support.delinea.com/s/download-onprem> in order to download the latest .zip file.

To perform an upgrade without outbound access, follow the steps in [Upgrading Secret Server Without Outbound Access](#).



## Configuring Authentication and Login

The way that Secret Server authenticates interactive users depends on the type Secret Server of authentication that your organization has configured. Secret Server can use both **Local Accounts** and/or Active Directory **Domain Accounts** for authentication into Secret Server.

### Local Authentication

A local user account is stored and managed by Secret Server. To successfully authenticate a local user must login with a matching username and password. When using local login, user credentials are checked against the internal authorized users' database.

To **create, edit, or remove** a local user account you must navigate to **Admin | Users** and locate any users whose Domain is listed as "Local" or **Create New** users.

### Domain Authentication

A domain user account is stored and managed by Secret Server, but subject to changes made in Active Directory. To successfully authenticate a user must login with an Active Directory account that exists in Secret Server with matching Secret Server credentials. When using domain login, the TOE (Secret Server) initiates an authentication request to the external domain controller (Active Directory) using LDAP over TLS, and only allows access after receiving a successful result message.

For more information on syncing Secret Server with Active Directory credentials see section **7.1 Configuring Active Directory Sync**

### Account Lockout Configuration

To access any information or functionality within Secret Server, users must login with correct local or domain credentials. To comply with Common Criteria regulations, Secret Server must be configured to prevent repeated unsuccessful attempts at logging in. **Account Lockouts** are used for this purpose. Configurable by the Secret Server Administrator, an account becomes inaccessible after a limited number of unsuccessful authentication attempts until an Administrator unlocks the user's account.

To configure settings for Account Lockouts, navigate to **Admin | Configuration | Login** tab, then click **Edit** and adjust the number for **Maximum Login Failures**. Default for this setting is five attempts.

To Unlock a user's account, navigate to **Admin | Users | Select the User** and click **Edit**. Change the value for "**Locked Out**" from Yes to **No**, then click **Save**.

### Lockout Window

Secret Server is programmed with a default Lockout Window of 60 minutes. This means that once a user has locked out their account, they will be able to login with the correct credentials after a period of one hour has passed. Account lockouts are designed to prevent brute force attacks.

### How to Disable "Allow Remember Me" during Logins

By default, the Secret Server installer will disable the "Allow Remember Me" caching feature during logins, however, to ensure this is feature is disabled, navigate to **Admin | Configuration | Login** tab, and verify that the first setting "**Allow Remember Me**" is set to **No**. If this is set to Yes, **Edit** the page and uncheck the toggle, then **Save**. Audits for this setting are logged under **Admin | Configuration | General** tab, by clicking the **View Audit** button. To filter log results, search for "**AllowRememberMe**" in the search bar.

### Configuring the Login Banner

To configure the Login Banner, navigate to **Admin | Configuration | Login** tab, scroll to the bottom of the page and click the **Login Policy Agreement** button, then **Edit** and check the **Enable Login Policy** and **Force Login Policy** boxes.

Enabling these boxes will 1) Reveal the **User's Policy Agreement** on the Login page, and 2) Force users to **Agree** to the policy when logging into Secret Server.

## How to Modify the Login Banner Messaging

To modify the display text from this **Login Policy Agreement**, go to Secret Server's Web Server and open **File Explorer**. Navigate to a text file called "**policy.txt**" (default file path location is **C:\inetpub\wwwroot\SecretServer\policy.txt**)

Open this file in Notepad and adjust the text according to your organization's policy requirements, then **Save**. The default text reads as follows:

*Access to this system is restricted to authorized users. Users (authorized or unauthorized) have no explicit or implicit expectation of privacy. Any or all secrets may be modified, copied, audited, inspected, and disclosed to company management, law enforcement personnel, and other authorized individuals.*

*I understand that I am responsible for protecting the confidentiality of company secrets and will comply with the company Information Security Policy. Unauthorized or improper use of this system may result in administrative disciplinary action, civil and/or criminal penalties. By continuing to Login, I am indicating my awareness of and consent to these terms and conditions of use.*

**\*\* CLOSE THIS SITE IMMEDIATELY if you do not agree to these conditions \*\***

## Configuring Session Timeouts

To configure Session Timeouts, navigate to **Admin | Configuration | General** tab, click **Edit**. Under the User Experience section, check the **Force Inactivity Timeout** check box, then adjust the number of minutes of inactivity before an active session in Secret Server will timeout and force users to login again. Click on the **Save** button to save your changes.

## Configuring IP Address Restrictions

To configure IP address restrictions, navigate to **Admin | More... | IP Addresses** and click **Create New**. Then provide the **IP Address User/Network Name** and the **IP Address Range**, click **Save**.

IP address restrictions can then be set at a user-level by navigating to **Admin | Users** and clicking on a user name, then click **Change IP Restrictions** and click on the Restriction checkbox for the restriction(s) you would like to enable for that user. **Save** changes.

To restrict group access into Secret Server by a specific IP address or IP address range, simply configure your IP address or range as listed above, then navigate to **Admin | Groups | Create New**. Select all employees or groups of employees to impose this restriction on and move left into the **Members** box. Click **Save**. Next click the button **Change IP Restrictions** and check the box for your desired IP Address/Range. **Save** changes to apply. Now users will now be restricted from accessing Secret Server outside of the designated IP Address Range.



## Managing Local Users

### Create New Local Users

To create a new local user in Secret Server, navigate to **Admin | Users** and select the **Create New** button. Provide the requested information on the **Edit User** page.

### Manage Local Users

Click on the **Username** for details about a specific local user. Secret Server will provide information including **User** and **Display Names**, **email address**, **Domain** affiliated, whether the user has **Two Factor** verification set up on their account, whether the user is **Enabled**, **Locked Out** from accessing their account, or whether the account is not a User account but an **Application Account**. The **View User** page also provides information about **Groups** and **Roles** for this user.

To edit these settings, click the **Edit** button. By editing a local user you may change their **display name**, **email address**, allow **Two Factor**, **disable/enable** the account, or **lock/unlock** the account.

You also can **create a new, one-time password** for the user's account. If you change a user's password they will be prompted for a new password after logging in with the Administrator-created password.

## Managing Domain Users

### Configuring Active Directory Sync

Secret Server can integrate with Active Directory by allowing users to use their Active Directory credentials to login to Secret Server. According to Common Criteria compliance, Active Directory relies **on LDAPv3 (RFC 2251) protocol**, which is not configurable by users.

In order to setup Active Directory in Secret Server, you will need to:

1. **Create a Sync Secret**
2. **Specify the domain to authenticate against**
3. **Configure TLS with Active Directory**
4. **Set Synchronization Groups**
5. **Turn on Active Directory Sync**

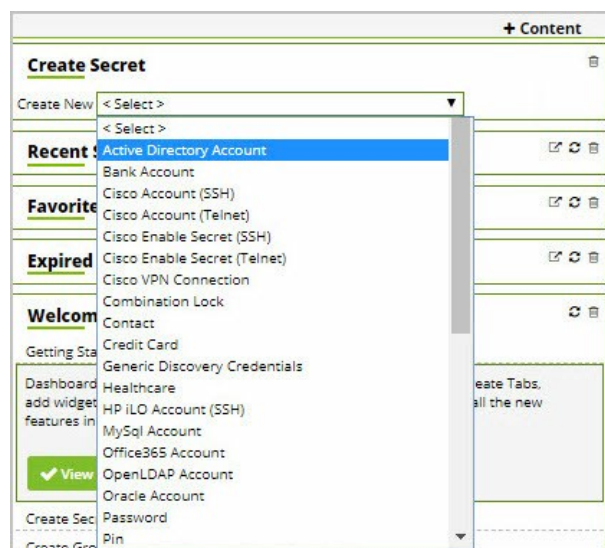
Secret Server relies on a primary “Sync” secret to connect to the LDAPv3 server in Active Directory. Once connection has been made to Active Directory through this secret, Secret Server needs to know which domain within Active Directory to authenticate against, and within that domain which specific Active Directory Group(s) to synchronize with. The Active Directory Sync in Secret Server targets Secret Server user account credentials from Active Directory. Secret Server will categorize users according to group information from Active Directory, but **Secret Server does not create, delete, or alter Active Directory Group Policies**.

#### Create a Sync Secret

Before synchronizing users, you must first create a secret to be used as the Sync Secret. This secret should contain **Domain Admin credentials** (or an account with appropriate permissions for **Read Access** to all your organization’s AD objects).

From Secret Server’s dashboard you can create this secret through the Create Secret Widget.

1. Next to “Create New,” select **Active Directory Account** from the dropdown list.



2. Add a **Secret Name** and provide the **Domain Name**, **Username**, and **Password** for the Sync Secret that will be able to access Active Directory with Admin credentials. **Save**.

**New**

This folder is for work related Secrets only. Do not store personal non-work Secrets, such as your Online Banking password, in this folder.

**General**

Secret Template: Active Directory Account

Secret Name: \* Sync Secret

Domain: \* testlab.com

Username: \* TESTLAB\Administrator

Password: \* [masked] [Generate](#) Strong ✓

Notes:

Folder: \Personal Folders\admin [Clear](#)

Inherit Secret Policy: ☒

Secret Policy: < No Policy >

[Save](#) [Save and Share](#) [+ Save and Add New](#) [X Cancel](#)

## Specify the Domain & Enable Active Directory Integration

Specify which domains Secret Server will be able to authenticate against. Secret Server can synchronize with any number of domains.

1. Once logged into Secret Server – Click on **Admin | Active Directory**

Search Secrets [Search](#) [HOME](#) [TOOLS](#) [REPORTS](#) [ADMIN](#) [HELP](#) [LOGOUT](#)

**Active Directory**

**Licenses**

**Remote Password Changing**

**Roles**

**Scripts**

**Secret Policy**

**Secret Templates**

**Session Monitoring**

**SSH Proxy**

**System Log**

**Users**

**More...**

Secret	Folder	Template	Heartbeat
10.12.10.6\localadmin...	\Infrastructure\Serve...	Unix Account (SSH)	Success
10.12.10.6\sysman (...	\Infrastructure\Serve...	Unix Account (SSH)	Success
amazon.com (Web F...	\Personal Folders\Le...	Web Password	
GORO.testlab.com\A...	\Infrastructure\Serve...	Windows Account	Heartbeat F
GORO.testlab.com\S...	\Infrastructure\Data...	SQL Server Account	Success
goro\DBAdmin (SQL ...	\Infrastructure\Data...	SQL Server Account	Success
REPTILE\Administrat...	\Infrastructure\Work...	Windows Account	Success

2. From the AD Configuration page, click **Edit**.
3. Check **Enable Active Directory Integration** in the Active Directory Integration section
4. Select **Enable Synchronization of Active Directory** in the Active Directory User Synchronization section
5. Wait a few seconds for the screen to update
6. Next to **User Account Options** select **User status mirrors Active Directory (Automatic)** from the drop-down. This allows

Secret Server to mirror any changes made to Active Directory automatically.

7. Click **Save**

**Edit Active Directory Configuration**

Active Directory Integration

Enable Active Directory Integration ☒

Enable Integrated Windows Authentication ☐ Requires advanced IIS settings (See [KB Article](#))

Active Directory User Synchronization

Enable Synchronization of Active Directory ☒ Enable to synchronize users by Active Directory Group. Once saved set the group with Edit Synchronization button.

Synchronization Interval for Active Directory

Days: 0

Hours: 1

Minutes: 0

User Account Options

Users are enabled by default (Manual)

Users are enabled by default (Manual)

Users are disabled by default (Manual)

User status mirrors Active Directory (Automatic)

Save Cancel

8. Click **Edit Domains**

Thycotic Secret Server 10.0 Government Edition

Search Secrets Search HOME TOOLS ADMIN REPORTS

**Active Directory Configuration**

⚠ Active Directory Integration is enabled but no Domains have been added. Please click Edit Domains to Add the domain

Active Directory Integration

Enable Active Directory Integration Yes

Enable Integrated Windows Authentication No

Active Directory User Synchronization

Enable Synchronization of Active Directory Yes

Synchronization Interval for Active Directory 1 hour

User Account Options User status mirrors Active Directory (Automatic)

Back Edit Edit Domains Edit Synchronization

9. Click **Create New**

10. Provide the **Fully Qualified Domain Name**

11. Provide a **Friendly Name**

12. Ensure that the box next to **Active** is checked.

13. Check the box next to **Allow Logins From Domain**.

14. Select your Sync Secret by clicking **No Selected Secret**
15. Search for the secret created earlier.
16. Click **Save and Validate**.

The Active Directory Sync Secret will be used to synchronize users and groups, **it will require permission to search and view the attributes of the users and groups**. If you plan on using **Discovery** (NOTE: Discovery is not under Common Criteria's scope), the account will also need permissions to scan computers on the network for accounts.

## Configuring TLS with Active Directory

To ensure that TLS is configured with Active Directory:

- From the **Admin | Active Directory | Edit Domains | Create New** page (continuing from previous section), after entering the requested information, click **Advanced (not required)** and check the **Use LDAPS** box to enable. Click **Save And Validate** to save this domain.

*\*If the TLS connection to Active Directory fails, the user will be notified and the failure will be logged. Secret Server does not automatically retry to connect to TLS but will retry the next time a user attempts to connect to AD.*

More information for setting up Active Domain with LDAPS can be found at

<https://blogs.msdn.microsoft.com/microsoftserverteam/2017/04/10/step-by-step-guide-to-setup-ldaps-on-windows-server/>

"We're no longer updating this content regularly."

## Setup Synchronization Groups

Once the domain has been added, click the "**Edit Synchronization**" button on the Active Directory Configuration page.

Synchronization Edit

testlab.com ▼

Synchronized Groups

SecretServer

<<

<

>

>>

Available Groups

(Search Results are limited to 100 groups. Use \* for wildcards, ex: Admin\*)

To view groups, click Search Q Search

Access Control Assistance Operators

Access-Denied Assistance Users

Account Operators

Administrators

Allowed RODC Password Replication Group

Backup Operators

Cert Publishers

Certificate Service DCOM Access

Cloneable Domain Controllers

Cryptographic Operators

Save

Cancel

The Available Groups represent all accessible groups on the specified Active Directory domain. The user membership can be previewed with the Group Preview control.

- Select the desired group from the Available Groups that contains the Active Directory accounts for users you would like to create in Secret Server and move it into the **Synchronized Groups** area, click **Save**. This allows you to tailor specific Active Directory users to have domain accounts in Secret Server.

## Managing Domain Credentials

### Updating Domain Credentials

Updating Active Directory (AD) Credentials and passwords happens directly through Active Directory and syncs with Secret Server according to a schedule. You can synchronize your Active Directory accounts at any time by navigating to **Admin | Active Directory** and clicking the **Synchronize Now** button. *You cannot add or edit Active Directory credentials through Secret Server directly.*

When a user logs into Secret Server using Active Directory credentials or uses an AD account to launch a session, the credentials are sent to the Domain Controller in real time for authentication verification. Therefore, if an AD user account has been updated or removed, changes will be reflected immediately in Secret Server.

### Failed Domain Authentication

If the connection between Secret Server and the AD domain breaks, domain users Secret Server will fail to authenticate into Secret Server until the connection is re-established. Secret Server will log all failed authentication attempts by users.

To find these audit logs, navigate to **Admin | Users | select a user | View Audit** or refer to section **12.0 Local Auditing**.



## Common Criteria Roles and Permissions

User Roles can be edited by navigating to **Admin | Roles** and choosing **Assign Roles**, then **Edit**. On the Role Assignment page you will be able to select which users should be assigned to which role.

The **User Roles** that comply with Common Criteria standards are:

- **Administrator**
- **User**
- **Read Only User**

By default, Administrators have all possible Role Permissions. To view the list of permissions and security attributes that associate to each User Role, navigate to **Admin | Roles** and select each role to view the list of permissions. Each user session will be limited by the Role Permissions assigned to that user.

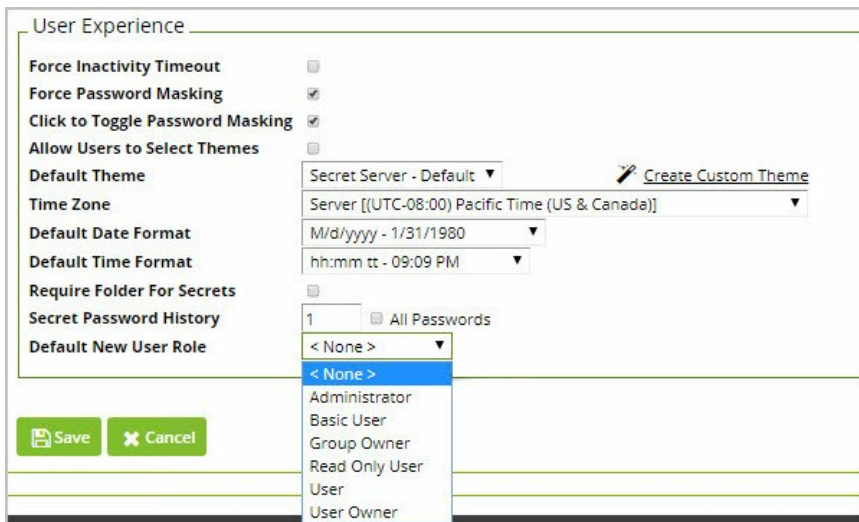
Each can be associated with individual user identities, or can be associated with either a local Group or an Active Directory Group. To assign a Role to a User or Group, navigate to **Admin | Roles | Assign Roles**.

To administer configurations required for Common Criteria standards, an Administrator requires the default permissions that are included for the Administrator Role.

## Assigning Roles to Users

The default role assignment for new users is set by navigating to **Admin | General** tab | **User Experience** section (scroll to bottom). To ensure that no new users are created or imported with any extra privileges, make sure that this setting is set to "None."

To edit this default setting, click **Edit** and select "**None**" from the dropdown list as shown by the screenshot below. Then click **Save**.



The screenshot shows the 'User Experience' configuration page. The 'Default New User Role' dropdown menu is open, displaying the following options: '< None >', 'Administrator', 'Basic User', 'Group Owner', 'Read Only User', 'User', and 'User Owner'. The '< None >' option is currently selected and highlighted in blue. At the bottom of the page, there are 'Save' and 'Cancel' buttons.

To assign users to Roles that are compliant with Common Criteria standards to specific users or groups, navigate to **Admin | Users** and select the user, OR navigate to **Admin | Roles**; then click **Assign Roles**.



View User

User Name

Diana Prince

Display Name

dprince

Email Address

dprince@helpdesk.heros

Domain

Local

Two Factor

< None >

Enabled

Yes

Locked Out

No

Application Account

No

IP Address Restrictions

None

Groups For User

There are no groups for this user.

Roles For User

Save To File < 1 to 1 of 1 >

Role Name

User

Back

Edit

View Audit

Change IP Restrictions

Assign Groups

Assign Roles

Under the **By User Or Group** tab, select a user or group from the dropdown, then click **Edit**.

The Roles supported in Common Criteria include **Administrator**, **User**, and **Read Only User**.

To apply one of these roles, select it from the righthand list and move it to the left side under the Assigned box. Ensure that every user only is assigned only one of these Roles. If both "Administrator" and "Read Only User" are assigned to the same user, the user will maintain full Administrator access to Secret Server. Click **Save Changes**:

Role Assignment

Please note that changing role assignment could remove your access to Role Administration.

By Role

By User Or Group

User/Group dprince

Assigned

Read Only User

Unassigned

Administrator

Basic User

Group Owner

User

User Owner

Save Changes

Discard Changes

Management Functions Based On Role

This section describes management activities and corresponding roles of the evaluated security functionality.

--

Read-only User	Search and list Secrets
User	Use Secret/Launch session
User	Request access to Secret
Administrator	Create, view, expire, edit, and assign Secrets
Administrator	Perform bulk operations on Secrets
Administrator	Create and manage groups
Administrator	Create and manage roles, assign roles to users
Administrator	Create and manage containers (folders)
Administrator	Create and manage Secret policy
Administrator	Configure TOE SF (see Table 5)
Administrator	Create, manage, and unlock local accounts
Administrator	Configure IIS, SQL, syslog
Administrator	Update TOE

Table 5: Management Functions and Roles

By default each User Role is attached to Permission Sets. To view the specific permissions that each role is attached to, navigate to **Admin I Roles** and click into the user roles listed to see the list of permissions.

Organizations can tailor these user roles to maintain whatever permissions settings are required for your specific user environment.

### 8.3 Common Criteria Management Activities Based On Role

The following table specifies the user role required to allow each management activity listed according to Common Criteria Standards.

ESM_EAU.2	Management of authentication data for both interactive users and authorized IT entities (if managed by the TSF)	Administrator
ESM_EID.2	Management of authentication data for both interactive users and authorized IT entities (if managed by the TSF)	Administrator
ESM_ICD.1	Definition of identity and credential data that can be associated with users (activate, suspend, revoke credential, etc.)	Administrator
	Management of credential status	Administrator
	Enrollment of users into repository	Administrator

ESM_ICT.1	Configuration of circumstances in which transmission of identity and credential data (and object attributes, if applicable) is performed	Administrator
FAU_STG_EXT.1	Configuration of external audit storage location	Administrator
FIA_AFL.1	Management of the threshold for unsuccessful authentication attempts	Administrator
	Management of actions to be taken in the event of an authentication failure	Administrator
FIA_USB.1	Definition of default subject security attributes, modification of subject security attributes	Administrator
FMT_MOF.1	Management of sets of users that can interact with security functions	Administrator
FMT_SMR.1	Management of the users that belong to a particular role	Administrator
FTA_SSL.3	Configuration of the inactivity period for session termination	Administrator
FTA_TAB.1	Maintenance of the banner	Administrator
FTP_ITC.1	Configuration of actions that require trusted channel (if applicable)	Administrator
FTP_TRP.1	Configuration of actions that require trusted path (if applicable)	Administrator

Table 6: Management Functions and Roles by Common Criteria Requirement

## Managing User Passwords

### Password Requirements for User Authentication

The Secret Server password policy for your user accounts is determined either through Active Directory or through Local User Passwords settings. To configure settings for Local User Passwords, navigate to **Admin | Configuration | Local User Password** tab and click **Edit**.

To meet Common Criteria Compliance regulations, passwords must be a **minimum of 16 characters** and include any subset of the following requirements (as demonstrated below):

- Upper case letters
- Lower case letters
- Numbers
- These Special Characters: ! @ # \$ % ^ & \* ( )

**Edit Configuration**

General Login Folders **Local User Passwords** Security Ticket System

Allow Users to Reset Forgotten Passwords ☐

Symbols Required for Passwords ☒

Lowercase Letters Required for Passwords ☒

Uppercase Letters Required for Passwords ☒

Numbers Required for Passwords ☒

Minimum Password Length ☒ Minimum Password Length

Enable Local User Password Expiration ☒

Days

Hours

Minutes

Enable Minimum Local User Password Age ☐

Enable Local User Password History ☐

Passwords in Secret Server are randomly generated according to admin-defined password complexity policies. By default the generator requires at least one upper case letter, one lower case letter, one number, and one symbol. The number of each type of character can be modified, and custom character sets can be created and used in password policies.

**Example:** h)Wa7zNPw2j57%l7

**Name** Default

**Description** The default password requirement, which uses the alpha-numeric character set and requires one lowercase, one uppercase, one number, and one symbol.

**Is Default** Yes (All new Secret Templates will use this Password Requirement for password fields.)

**Generate Password**

Prevent Username In Password ☒
Length between \* 16 and \* 16 .
Using Default ▼ [Character Set](#).

**Password Rules**

Minimum of ▼	1	from	Lower Case (a-z) ▼	
Minimum of ▼	1	from	Symbol ▼	
Minimum of ▼	1	from	Numeric (0-9) ▼	
Minimum of ▼	1	from	Upper Case (A-Z) ▼	
Minimum of ▼	1	from	Select... ▼	

Save

Cancel

View Audit

## Resetting User Authentication

To reset an Active Directory user account password, you must go *through Active Directory*.

To reset a Local User Password, follow these steps:

1. Navigate to **Admin | Users**.
2. Select the user who needs a reset.
3. Select **Edit**.
4. Type a new password twice. This is a *temporary password* that you must provide to the user. Immediately after the user logs into Secret Server they will be prompted to change their password.

If you are locked out of the Secret Server Local administrator account and you cannot request a reset through a linked administrator email account, contact the Delinea Support Team to request a password reset, and have your organization's **security pin code** at hand.

## Setting Local User Password History Requirements

Ensure that local users cannot re-use old passwords to an administrator-settable number of past passwords used by that user.

1. Navigate to **Admin | Configuration | Local User Passwords**
2. Click **Edit**.
3. Check the toggle box next to **Enable Local User Password History**.
4. Set the number of historic passwords you would like to block for Secret Server Users.
5. Click the toggle next to **All** to block users from ever re-using any previous password.
6. Click **Save** to save changes.

**Edit Configuration**

GeneralLoginFolders**Local User Passwords**SecurityTicket SystemEmailSession RecordingHSM

**Allow Users to Reset Forgotten Passwords** ☐

**Symbols Required for Passwords** ☐

**Lowercase Letters Required for Passwords** ☐

**Uppercase Letters Required for Passwords** ☐

**Numbers Required for Passwords** ☐

**Minimum Password Length** ☐

**Enable Local User Password Expiration** ☒

Days30

Hours0

Minutes0

**Enable Minimum Local User Password Age** ☐

**Enable Local User Password History** ☒

Number of Passwords:20

☐ All

Save

Cancel

## Managing Secrets

### Creating Secrets

Each object that is stored within Secret Server is referred to as a **Secret**. Usually, a Secret will be a username and password combination. Other examples of Secrets can include SSH keys, contact information, or safe combinations.

To create a Secret, use the “Create Secret” widget.

The screenshot displays the Thycotic Secret Server 10.5 Enterprise Plus Edition interface. The top navigation bar includes a search bar, a 'Search' button, and links for HOME, TOOLS, ADMIN, and REPORTS. The interface is divided into three main sections:

- Left Sidebar:** A 'Find Folder' section with a search icon and a list of folders: Personal Folders, Active Directory, AWS, Azure, Local Admins, Network, Service Accounts, and SQL. Below this is a note: "(Drag a folder to create a tab.)".
- Main Table:** A table titled 'Search in results' with a search icon and the word 'Advanced'. The table has columns for 'Secret', 'Folder', and 'Template'. It lists 13 secrets, including 'internal.thycotic.training\b...', 'Admin Account 1', 'Computer\Administrator', and 'sql\lsa'. At the bottom of the table, there is a pagination bar showing 'Page 1 of 1' and 'View 1 - 13 of 13'.
- Right Panel:** A 'Create Secret' widget with a 'Create New' dropdown menu. Below it are three sections: 'Recent Secrets' (listing 'internal.thycotic.training\administrator', 'internal.thycotic.training\buildmachine', and 'Computer\Administrator'), 'Favorite Secrets' (listing 'Computer\Administrator'), and 'Expired Secrets' (listing 'Computer\Administrator', 'internal.thycotic.training\AdminEast (RequestAccess)', 'internal.thycotic.training\administrator', 'Jumphost-10\jumphostadmin', and 'sql\lsa'). At the bottom is a 'Welcome' section with the text 'Getting Started with Dashboard' and 'Dashboard has a rich array of widgets with a customizable design. Create Tabs, add widgets, and arrange your own'.

Select the type of Secret you want to create.

Search Secrets

Search

HOME

TOOLS

ADMIN

REPORTS

2

?

Advanced | Basic

+ Content

Browse

+

Find Folder

< All Folders >

Personal Folders

Active Directory

AWS

Azure

Local Admins

Network

Service Accounts

SQL

(Drag a folder to create a tab.)

Search in results

Advanced

Secret	Folder	Template
internal.thycotic.training\b...	Development	Active Directory Account
Admin Account 1	Administrator	Active Directory Account
Computer\Administrator	Local Admins	Windows Account
internal.thycotic.training\Ad...	Active Directory	Active Directory Account
internal.thycotic.training\ad...	Active Directory	Active Directory Account
internal.thycotic.training\Ad...	Active Directory	Active Directory Account
internal.thycotic.training\Ce...	Domain Admins	Active Directory Account
internal.thycotic.training\Fu...	Domain Admins	Active Directory Account
internal.thycotic.training\Js...	Standard Policy	Active Directory Account
internal.thycotic.training\Ne...	Domain Admins	Active Directory Account
Jumphost-10\jumphostadmin	Local Admins	Windows Account
Secret	Australia	SSH Key
sql\sa	SQL	SQL Server Account

Page 1 of 1

15

View 1 - 13 of 13

< Select Bulk Operation >

Create Secret

Create New

< Select >

< Select >

Active Directory Account

AS/400 IBM iSystem

Bank Account

Cisco Account (SSH)

Cisco Account (Telnet)

Cisco Enable Secret (SSH)

Cisco Enable Secret (Telnet)

Cisco VPN Connection

Combination Lock

Contact

Credit Card

Generic Discovery Credentials

Healthcare

HP iLO Account (SSH)

Infoblox

MySQL Account

Office365 Account

Enter the data for the Secret you want to save, and make sure to choose the Folder that the Secret will be saved into. Hit Save, and your Secret has been created.



**Thycotic Secret Server 10.5**  
Enterprise Plus Edition

Search Secrets

HOME TOOLS ADMIN REPORTS

**New**

**General**

Secret Template: Active Directory Account ▼

Secret Name: ! example name

Domain: ! example domain

Username: ! example Username

Password: ! .....  Weak !

Notes: example notes

Folder: \Active Directory

Inherit Secret Policy: ☒

Secret Policy: < No Policy >

Site: Local ▼

AutoChange?: ☐

**Notes**  
Any additional notes.

## Configuring Secret Templates

Secret Server manages privileged account credentials through a highly configurable system of secrets. **Secret Templates** are used to create secrets and define object attributes for secrets. Templates can be configured according to account requirements.

The following is a list of Secret Templates that are compliant with Common Criteria standards available in the Government edition of Secret Server:

- **Active Directory Account**
- **Bank Account**
- **Combination Lock**
- **Contact**
- **Credit Card**
- **Password**
- **Pin**
- **Product License Key**
- **Security Alarm Code**
- **Social Security Number**
- **Unix Account (SSH Key Rotation)**

To follow Common Criteria standards, navigate to **Admin | Secret Templates** and click the **Active Templates** button. Ensure that only the templates listed above are selected in the Active column. Then **Save**. Users only can create Secrets using templates marked as Active.

To view object attribute data in a template from the dropdown list of Active Templates, **select a template** from the dropdown list and then click **Edit**.

Each of the listed templates below only hold object attribute data that are defined locally by Secret Server. The objects, secrets, and

templates are as follows:

## **Object**

### **Attribute**

Objects in Secret Server are defined by attribute data. All object attribute data is locally defined by Secret Server.

## **Secret**

### **Attributes Inherited from Template**

Secret templates dictate the fields each secret contains, the launchers for each secret, and the remote password changer used. They also provide a default expiration, which can be changed on a per-secret basis.

### **Command Restrictions**

Command restrictions are limited to SSH sessions and allow administrators to create multiple-choice command menus that users can follow. If SSH command menus are enabled, users cannot issue commands directly to the target system.

### **Field Data**

Each field in a secret template is either "Text," "Password," or "Notes." Password fields can be hidden from users and are updated when a password change has occurred on that secret's account. Text fields are the standard field type and may include information such as "Domain" or "Username."

## **Folder**

Folders in Secret Server store individual secrets. Permissions applied to folders dictate which users can view the secrets inside that folder and which users can see the folders.

### **Password Requirements Rule Override**

Password requirements can optionally be enforced on a per-template basis. If the password requirement is not enforced, users can manually type any password they want and will be notified if they enter a weak password that does not meet the password requirements. If the requirements are enforced, users cannot save the new password until it meets the requirements.

### **Policy Identifier**

Secret policies are a collection of security and password settings that are applied to individual secrets or folders. Each setting of a secret policy can be configured as either default or enforced. Default allows users to later change the setting. Enforced locks the settings and cannot be modified on a per-secret basis unless the secret is moved out of the folder that has the secret policy attached. Secret policy settings include items such as "Remote Password Changing Auto Change," and "Requires Approval for Access."

### **Subject Identifier**

The secret template of each secret identifies the type of store password or other data. This allows users to see the intended usage of each template.

### **Secret Name**

The secret name is the label or title that describes the content of each secret. When Secret Server creates secrets automatically, the default naming convention is "host/account," or "domain/account."

## Template

### Field Parameters

Field parameters include username, password, and type. Secrets include a combination of field parameters that vary with user input. Secret type is defined by the template for each secret, such as "Bank Account" or "Active Directory Account." The number of field parameters also are defined at the secret template level.

### Password Change Policy

Password rotation is enabled or disabled on a per-secret or per-template basis. Password rotation frequency depends entirely on the expiration period for each secret. The default expiration time is 30 days for all secret templates.

### Password Strength Policy

A password policy is a set of instructions on how each new password is created. Administrators must choose a minimum and maximum password length, which character sets are used, and how many characters from each set are required. See section 9.0 for details on setting password requirements.

### Secret Expiration Policy

When a secret reaches its expiration date, it is flagged as "Expired." If automatic password rotation is enabled for that secret, expiration triggers a remote password change. Expiration can be changed on each secret, but the default expiration period is set at the secret template level.

### Secret Name Pattern

When Secret Server names a secret via the discovery import process, it uses the naming convention "hostname/username," or "domain/username." This is not enforced, so users can name secrets whatever they want.

### Template Description

Secret template descriptions allow administrators to describe the purpose of a template when they create a new template, which is a best practice to avoid confusion.

### Template Name

The secret template name is what users see in the drop-down menu when they create a new secret. It is also on the Secret Browse page so that users can see which secret template is associated with each secret.

### Template Status

Like secrets, users can disable secret templates to make them invisible to users, unless they chose to view inactive templates. The status is either "enabled" or "disabled."

### Secret Access Policy

If users have view (or greater) rights, they can see whether a secret exists and can open the secret to view its data. If a user does not have view rights, the secret is invisible.

### Secret Modification Policy

Each secret carries individual access permissions that are typically inherited from the secret's folder. These permissions determine which users can view the secret and which users can edit the secret's data. A user can have view, edit, or owner permission. With the view permission, a user can view but not modify a secret. The edit permission allows the user to modify field data. The owner permission allows users to grant or revoke access to other users.

## Configuring Password Policy for Secret Templates

When creating and rotating passwords for secrets inside of Secret Server, it is important to uphold strong requirements and to use Secret Server to manage changing requirements effectively.

For example, Secret Server allows administrators to set the minimum password length to 6 characters, observe that a 7-character password and a 16-character password are both accepted, then change the minimum length to 8, observe that a 7-character password is then rejected but that a 16-character password is accepted.

In Secret Server password requirements can be set and applied *at the Secret Template level*. To adjust requirements:

1. Navigate to **Admin | Secret Templates**.

**Manage Secret Templates**

MySQL Account ☐ Show Inactive

[Back](#)
[Edit](#)
[+ Create New](#)
[Export](#)
[View Audit](#)
[Active Templates](#)
[Password Requirements](#)
[Character Sets](#)

[Configure Launchers](#)
[Configure Secret Template Permissions](#)

**Other Templates**

[Configure Dependency Templates](#)
[Configure Scan Templates](#)

**Import Secret Templates**

Please paste your XML from the online [Secret Templates Gallery](#) into the box below to add your new Secret Template.

2. Select the **type of template** you want to adjust from the dropdown menu.
3. Click **Password Requirements** to open the Password Requirements" page.

Password Requirements				
Name	Description	Minimum Length	Maximum Length	Default
<a href="#">Default</a>	The default password requirement, which uses the alpha-numeric character set and requires one lowercase, one uppercase, one number, and one symbol.	12	12	Yes
<a href="#">SAP</a>	SAP Password Requirement	12	12	No
<a href="#">Mainframe</a>	Mainframe Password Requirement	8	8	No

[← Back](#)
[+ Create New](#)

- To edit *all* your organization's default password requirements on secret templates, select the **Default** password requirement from the list.
  - To create a new password requirement specific to this template, select **Create New**.
4. Adjust the **Password Length** and **Character Set** requirements to the needs of your organization. You may assign your new requirement to any Secret Template or templates.

*Example: SS(vLjg5yli4!xic)*

Name

Default

Description

The default password requirement, which uses the alphanumeric character set and requires one lowercase, one uppercase, one number, and one symbol.

Is Default

Yes (All new Secret Templates will use this Password Requirement for password fields.)

Generate Password

Prevent Username In Password ☒

Length between \* 16 and \* 16

Using Default ▼ [Character Set.](#)

Password Rules

Minimum of ▼ 1 from Lower Case (a-z) 🗑️

Minimum of ▼ 1 from Symbol 🗑️

Minimum of ▼ 1 from Numeric (0-9) 🗑️

Minimum of ▼ 1 from Upper Case (A-Z) 🗑️

Minimum of ▼ 1 from Select... ⊕

Save

Cancel

[Show Usages](#)

**Note:** Password Requirements set for these templates will be enforced for both human-generated and auto-generated secrets.

## Authentication Strength for Non-Password Credentials

Secret Server uses RSA keys of 2048 bits or higher for secure authentication. These SSH keys are non-password credentials that can be managed by Secret Server. To ensure that these are maintained up to encryption standards, make sure that your **Unix Account (SSH Key Rotation)** Template is configured with an SSH Key Bit Size of 2048 or higher.

By default, the Government Edition of Secret Server will set this Template setting to 2048.

To adjust the bit size:

1. Navigate to **Admin | Secret Templates**.
2. Select **Unix Account (SSH Key Rotation)** from the dropdown list.
3. Click the **Edit** button.

- From the Secret Template Designer page, click **Edit** to adjust settings. You can increase the bit size to 4096 from the default setting of 2048 if you choose, but do *not* lower this setting to 1024.

The screenshot shows a configuration window titled 'Field Displayed on Basic Home'. It contains two dropdown menus: 'SSH Key Format' set to 'OpenSSH' and 'SSH Key Bit Size' with options 1024, 2048 (highlighted), and 4096. At the bottom left are 'Save' and 'Cancel' buttons.

To create, store, and manage SSH keys in Secret Server, users must engage this Unix Account (SSH Key Rotation) Template. That means an SSH key will be created only when a standard encryption is enforced.

## Configuring Remote Password Changing for SSH Key Rotation

### Security Overview for SSH Key Rotation and PuTTY Launcher

SSH Key Rotation allows you to manage your Unix account private keys and passphrases as well as their passwords. The public/private key pair is regenerated and the private key is encrypted with a new passphrase any time a secret's password changes, either manually or automatically. The public key is then updated on the Unix machine referenced on the secret.

To use default SSH Key Rotation commands, the machine being managed must meet the following minimum requirements:

- SSH Key logins in OpenSSH format should be enabled on the target using keys. A secret can be created with keys in PuTTY format but they will be converted to OpenSSH when the key is rotated.
- Public keys should be stored in [~userhome]/.ssh/authorized\_keys (not authorized\_keys2).
- Grep and Sed should be installed on the target.
- If doing a privileged SSH Key Rotation, where a privileged user sets the key for another user, the privileged user must have sudo permissions that do not prompt for a password, as well as permissions to edit the user's authorized keys file with sudo.

If a system does not meet these requirements it may still be possible to do key rotation by modifying the key rotation command sets.

### Creating a Unix Account (SSH Key Rotation) Secret

Under Secret Server's Common Criteria compliance standards, you can set up Secret Server to rotate SSH Keys for Unix Accounts.

To setup a Launcher, you will need a **Unix Account (SSH Key Rotation)** Secret that is connected to a remote machine

To create a Unix Account (SSH Key Rotation) Secret:

- From the **Home** Dashboard select the **Unix Account (SSH Key Rotation)** Template from the **Create Secret** widget.
- Enter a **Secret Name**, **Machine Name**, **Username**, and **Password** for the Unix/Linux Account.
- Select the SSH **Private Key** by browsing to it on your machine.
- Enter the **Private Key Passphrase** for the SSH Key. If there is a corresponding Public Key, upload that as well.
- Specify which Secret Server folder you want to store the Key in if it differs from the default folder path. Likewise, determine what secret policies you want to assign to this SSH key, if any.

**General**

Secret Template: Unix Account (SSH Key Rotation)

Secret Name: \* Test SSH Rotate

Machine: \* .180

Username: \* ec2-user

Password: \* [Masked] **Generate** Strong ✓

Private Key: Choose File ProductMana...Pair-01.pem ☒ Generate New SSH Key

Private Key Passphrase: [Masked] **Generate**

Public Key: Choose File No file chosen

Notes: Here is an SSH Key for a Unix Account--Rotate it regularly!

Folder: \Personal Folders\ssadmin [Clear](#)

Inherit Secret Policy: ☒

Secret Policy: < No Policy >

AutoChange?: ☐

**Save** **Save and Share** **+ Save and Add New** **Cancel**

To automatically rotate the private and public SSH key pairing upon clicking **Save**, click **Generate New SSH Key**. This action is a security measure to ensure that no one can access your SSH key unless they are doing so through Secret Server's vault.

## Enabling the Launcher

By default, the Launcher is enabled.

To verify this, click on **Admin | Configuration**. Check the **Enable Launcher** Setting to ensure that this is set to **Yes**.

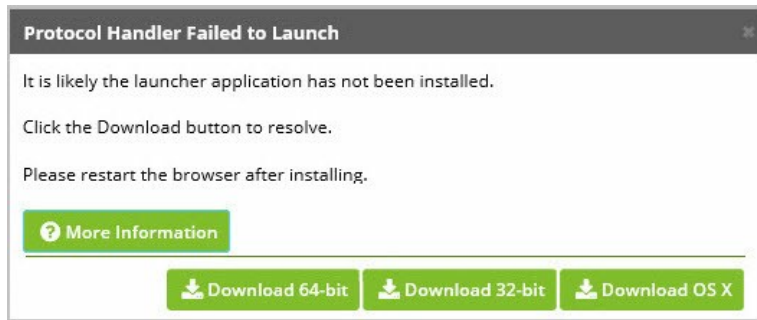
## Using the Launcher

**Note:** SSL Certificates must be properly configured or the Launcher will fail to connect. So when you try to connect to Secret Server you receive a certificate error such as host name mismatch, you must resolve the cause of the error before the putty launcher will function. To directions on setting up certificates, see section **CREATE AN INTERNAL LINK** 11.2 Configuring X.509v3 Certificates.

1. From your Home screen, click the SSH secret
2. Click **View Secret**.
3. Click the **PuTTY Launcher** icon.

**Note:** The first time you perform this task you will receive a "**Protocol Handler Failed to Launch**" message. Select the type of launcher you need and **Run** the .msi file. Secret Server will download a very small process called a Protocol Handler that facilitates the connection between your machine and the endpoint. Once the Protocol Handler is downloaded, close out the "Failed to Launch" window and *refresh your browser page*.





4. Click the launcher icon on the secret, and provide the machine name if prompted. The credentials will be passed along to the launcher and will open the appropriate launcher PuTTY session.

## Enable Remote Password Changing

**Note:** To maintain compliance with Common Criteria regulations, Remote Password Changing is applicable for SSH Key Rotation ONLY.

1. Navigate to **Admin | Remote Password Changing**.
2. Click **Edit**.
3. Check to select **Enable Remote Password Changing**.
4. Click **Save**.



## Rotate SSH Key Remotely

1. Navigate back to the SSH Key Rotation Secret's **View** screen.
2. At the bottom of the screen, click the **Change Password Remotely** button.

**Test SSH Rotate (Unix Account (SSH Key Rotation))**

General | Personalize | Expiration | Launcher | Security | Remote Password Changing | Dependencies

Secret Name: Test SSH Rotate

Machine: 111.111.111.180

Username: ec2-user

Password: \*\*\*\*\*

Private Key: id\_rsa (1.74 KB)

Private Key Passphrase: \*\*\*\*\*

Public Key: id\_rsa.pub (382.00 B)

Notes: [Redacted]

Status: Active

Folder: \Personal Folders\ssadmin

Inherit Secret Policy: Yes

Secret Policy: < No Policy >

Expiration: Expires in 29 days. (Expires every 30 day(s))

Favorite? ☒

Putty Launcher

Back Edit Copy Secret Share View Audit Expire Now Change Password Remotely

- From the Change Password Remotely screen, **Generate** a new Password and Passphrase for your new SSH Key.
- Next to Generate New SSH Key, leave the toggle checked.
- Click **Change**. You will be directed to a **Password Scheduled for Change** screen.
- Click **Back** to return to your secret's Remote Password Changing tab.

**Change Password Remotely**

By clicking the change button, the password on the remote device will be queued for an immediate change.

Secret Name: pp6b

Next Password: [K#1\$F4g8] \* Generate

Change Cancel

- Navigate to the **General** tab.
- Verify that a new password is listed. In the screenshot below you can see the previous passwords listed in the Notes section, confirming that the rotation was effective.

**Test SSH Rotate (Unix Account (SSH Key Rotation))**

General | Personalize | Expiration | Launcher | Security | Remote Password Changing | Dependencies

**Secret Name** Test SSH Rotate

**Machine** 1 80

**Username** ec2-user

**Password** LjyZ78\*A^Gpw

**Private Key** id\_rsa (1.74 KB)

**Private Key Passphrase** Q2ME1B\*vJ7rq

**Public Key** id\_rsa.pub (382.00 B)

**Notes** last pw: jUe1^iZLORp5  
last key passphrase: BW^BFz(^)69\*

**Status** Active

**Folder** \Personal Folders\ssadmin

**Inherit Secret Policy** Yes

**Secret Policy** < No Policy >

**Expiration** Expires in 29 days. (Expires every 30 day(s))

**Last Heartbeat** Success (4/25/2018 03:16 PM)

**Favorite?** ☒

 PuTTY Launcher

[Back](#) [Edit](#) [Copy Secret](#) [Share](#) [View Audit](#) [Run Heartbeat](#) [Expire Now](#) [Cancel Passw](#)

- Click the **PuTTY Launcher** icon to confirm that Secret Server can still connect to the unix/linux machine using the newly rotated SSH Key.

```
ec2-user@ip-10-3-20-180:~
Using username "ec2-user".
Authenticating with public key ""
Last login: Wed Apr 25 15:26:48  from 1 .12

 _ | _ | _ )
 _ | ( _ /   Amazon Linux AMI
 _ | \ _ | _ |

https://aws.amazon.com/amazon-linux-ami/2017.09-release-notes/
12 package(s) needed for security, out of 20 available
Run "sudo yum update" to apply all updates.
Amazon Linux version 2018.03 is available.
[ec2-user@ip-10-3-20-180 ~]$
```

## Secret Expiration

A core feature of Secret Server is Secret expiration. Any template can be set to expire within a fixed time interval. For a Secret to expire, a field must be selected as the target of the expiration. For example, a Secret template for Active Directory accounts might require a change on the password field every 90 days. If the password remains unchanged past the length of time specified, that Secret is considered expired and will appear in the **Expired Secrets** panel on either the Dashboard's Expired Secrets widget or the Home page.

Secret expiration provides additional security by reminding users when sensitive data requires review. This can assist in meeting compliance requirements that mandate certain passwords be changed on a regular basis. When expiration is combined with Remote Password Changing, Secret Server can completely automate the process of regularly changing entire sets of passwords to meet security needs.

## Setting up Secret Expiration for the Secret template

To set up expiration on a Secret, you must first enable expiration on the template from which the Secret is created.

To enable Secret expiration for a Secret template, navigate to **Administration | Secret Templates**. In the Manage Secret templates page, select the template from the dropdown list and click the **Edit** button. In the Secret template Designer page, click on the Change link. On this subsequent page, check the **Expiration Enabled?** box. You can now enter the expiration interval (every x number of days) as well as the field on the Secret you wish to expire and require to be changed. The interval setting can be overridden for each individual Secret.

Enabling expiration for a template will enable expiration for all the Secrets that were created using this template.

## Setting up Secret Expiration for the Secret

Now that expiration has been enabled for the template, Secret expiration is enabled for the Secrets that were created using that template as well as Secrets created in the future. The Expiration tab will appear on the Secret View page and requires the user to have Owner permission on the Secret. If you would prefer to set a custom expiration at the Secret level, you can adjust the interval of expiration for the Secret by clicking the **Expiration** tab in the Secret View page. In the Expiration tab, you can set the Secret to expire using the template settings (default), a custom interval, or a specific date in the future.

## Forcing Expiration

To force expiration, navigate to the **Secret View** page. From there, click **Expire Now**. This will force the Secret to expire immediately regardless of the interval setting. The expiration date will read "Expiration Forced".

## Resetting an Expired Secret

To reset an expired Secret, you will need to change the field that has expired and is required to change. For example, if the field set to expire is the Password field and the current Password is "asdf", then a change to "jklh" will reset the expiration interval and thus remove the expiration text on the Secret View page.

If you do not know which field is set to expire, you will need to go to the Secret template that the Secret was created from. Navigate to **Administration | Secret Template** and select the template. Click the **Edit** button and then on the next page, click the **"Change"** link. In the "Change Required On" textbox you will see the field that is set to expire.

## AutoChanging an Expired Secret

Remote Password Changing (RPC) is enabled under the Administration, Remote Password Changing page. Click **Edit** to enable Remote Password Changing, Secret Heartbeat, and Secret Checkout. Once enabled, all Secret templates with RPC configured will be available to use RPC.

The Remote Password Changing tab contains the settings for configuring RPC on an individual Secret. Enabling AutoChange on a Secret will allow Secret Server to Remotely Change the Password when it expires. The user must have Owner permission on the Secret to enable AutoChange. When editing on the RPC tab, the Next Password field can be set. If left blank an auto-generated password will be used.

To auto-change passwords based on secret expiration leave the AutoChange schedule set to **"None"**.

If the password change fails, Secret Server will flag the Secret as Out of Sync and continue to retry until it is successful. If the Secret cannot be corrected or brought In Sync, manually disabling AutoChange will stop the Secret from being retried.

## Setting the Password Change Retry Interval

Secret Server checks for expired secrets once every minute. However, if a previous password change attempt failed, Secret Server will not immediately try to change that password again the next time expired secrets are checked. Each secret template has a "Retry Interval" that it uses to determine how often to attempt retries of failed password changes. This exists to prevent unavailable machines or network

connection issues from overwhelming the server or network with potentially thousands of password change requests at once. The default retry interval is one hour. To change the default, navigate to **Admin | Secret Templates**, select the template you wish to change from the dropdown menu, and click **Edit**.

## Manage Secret Templates

Unix Account (SSH)

Show Inactive

Back

Edit

Create New

Export

View Audit

Active Templates

Password Requirements

Character Sets

Configure Launchers

Configure Secret Template Permissions

At the bottom of the **Secret Template Designer** page, click **Configure Password Changing**

Fields

Field Name	Field Description	Field Type	Is Required?	History	Searchable	Edit Requires	Hide On View	Expose For Display	
Machine	The Server or Location of the Unix Machine.	Text	✓	All	✓	Edit	⊖	⊖	🗑️📝🔄📋
Username	The Unix Machine Username.	Text	✓	All	✓	Edit	⊖	⊖	🗑️📝🔄📋
Password	The password of the Unix Machine.	Password	✓	All	⊖	Edit	⊖	⊖	🗑️📝🔄📋
Notes	Any additional notes.	Notes	⊖	All	✓	Edit	⊖	⊖	🗑️📝🔄📋
*		Text	<input type="checkbox"/>	<input type="checkbox"/> All	<input type="checkbox"/>	Edit	<input type="checkbox"/>	<input type="checkbox"/>	+

Show Inactive Fields

Back

Assign Password Requirement

Configure Password Changing

Configure Launcher

Configure Extended Mappings

View Audit

Copy Secret Template

On the **Secret Template Edit Password Changing** page, click **Edit**. Adjust the **Days**, **Hours**, and **Minutes** values of the **Retry Interval**. You can also adjust the **Maximum Attempts** if you want Secret Server to stop attempting to change the password after a specified number of failures. Click **Save** when done.

## Secret Template Edit Password Changing

Enable Remote Password Changing ☒

Retry Interval

Days 0

Hours 1

Minutes 0

Maximum Attempts

10 ☒ UnlimitedEnable Heartbeat ☒

Heartbeat Check Interval

Days 0

Hours 8

Minutes 0

Password Type to use

Unix Account Custom (SSH) ▼

Machine Name

Machine ▼ \*

Password

Password ▼ \*

User Name

Username ▼ \*



Save



Cancel

## Configuring Common Criteria

### Verify Settings in Government Edition

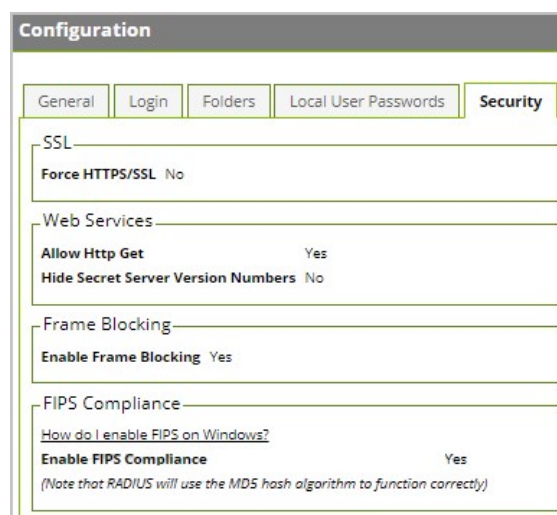
#### Verify DPAPI Setting is Enabled

The Delinea Government Edition Installer will automatically set encryption in Secret Server to use DPAPI. To verify that DPAPI is in use, navigate to **Admin | Configuration | Security** tab and ensure that DPAPI is enabled by scrolling to the bottom of the page and checking the existence of the **Decrypt Key to not Use DPAPI** button.

If DPAPI is not enabled in your Secret Server installation, this button will say “**Encrypt Key to Use DPAPI.**” To maintain compliance with Common Criteria standards do not decrypt the Secret Server key.

#### Verify FIPS Mode is Enabled

Common Criteria evaluations rely on FIPS 140 validations to provide assurance that cryptographic functionality is implemented properly. The Secret Server Government Edition Installer checks for FIPS encryption security standards on the Windows local server and enables FIPS mode by default in Secret Server. To check this setting, go to **Admin | Configuration | Security** tab and ensure that the **Enable FIPS Compliance** line is set to **Yes**.



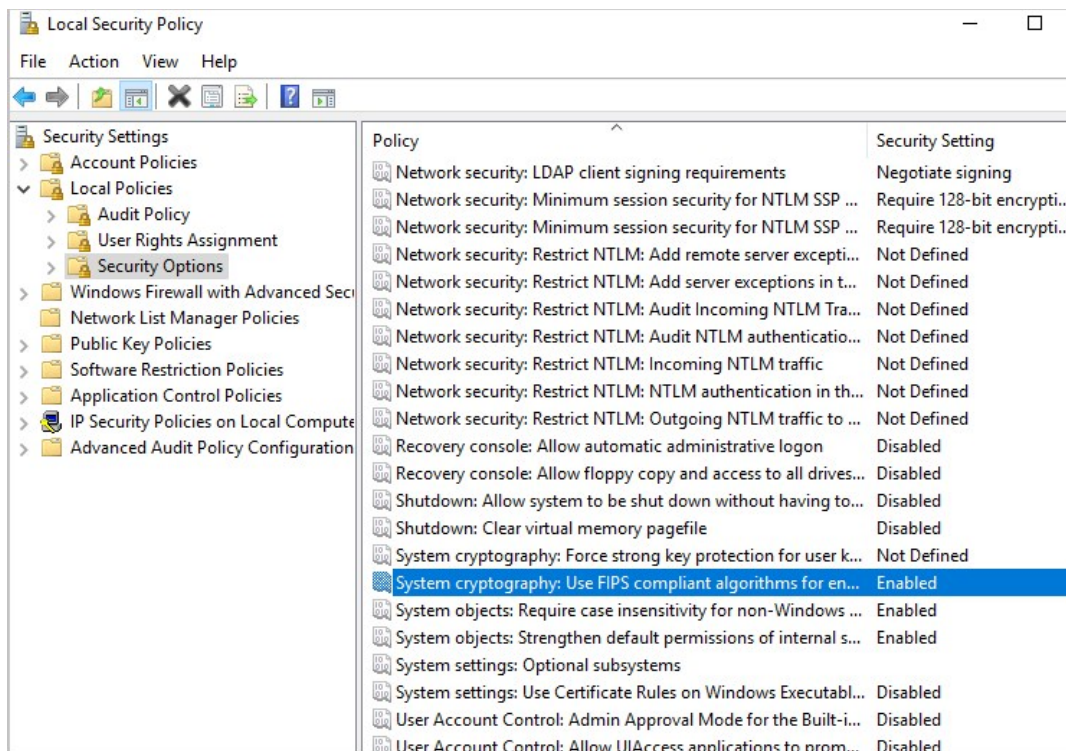
The screenshot shows the 'Configuration' window with the 'Security' tab selected. The 'FIPS Compliance' section is expanded, showing the 'Enable FIPS Compliance' checkbox checked (Yes). A note below states: '(Note that RADIUS will use the MD5 hash algorithm to function correctly)'. Other sections visible include 'SSL' (Force HTTPS/SSL: No), 'Web Services' (Allow Http Get: Yes, Hide Secret Server Version Numbers: No), and 'Frame Blocking' (Enable Frame Blocking: Yes).

#### Manually Enabling FIPS on Windows Local Server

The **Secret Server Government Edition Installer** ensures that FIPS Compliance is automatically enabled in Windows on your local server. To verify or do this manually:

1. Go to **Windows Local Security Policy editor** (secpol.msc)
2. Navigate on your left pane to **Security Settings | Local Policies | Security Options**
3. Find and go to the property of **System Cryptography: Use FIPS Compliant algorithms for encryption, hashing, and signing...**
4. Choose **Enable** and click **OK**.





1. Restart your Server with **lisreset**

The Microsoft .NET implementations of AES and SHA are not FIPS certified so Secret Server uses the Windows API versions for encryption functionality which \*are\* FIPS certified. **More information on the FIPS certificate numbers for the Windows operating systems, including the algorithm implementations that we use can be found at:** <http://technet.microsoft.com/en-us/library/cc750357.aspx>

## Manually Disabling TLS v1.0

To disable the TLS 1.0 protocol so that IIS does not try to negotiate using the TLS 1.0 protocol, follow these steps:

1. Click **Start**, click **Run**, type regedt32 or type regedit, and then click **OK**.
2. In Registry Editor, locate the following registry key:

**HKey\_Local\_Machine\System\CurrentControlSet\Control\SecurityProviders\SCHANNEL\Protocols\TLS 1.0\Server**

- \*If the subkeys "Server" or "Client" do not exist, create them under the
- TLS 1.0 key.

1. On the **Edit** menu for each subkey, click **Add Value**.
2. In the **Data Type** list for each subkey, click **DWORD**.
3. In the **Value Name** box for each subkey, type **"Enabled,"** and then click **OK**.

\*Note If this value is present, double-click the value to edit its current value.

4. Type **00000000** in Binary Editor to set the value of the new key equal to "0".



5. Click **OK**. Restart the Windows Server.

More information can be found at <https://support.microsoft.com/en-us/help/187498/how-to-disable-pct-1-0-ssl-2-0-ssl-3-0-or-tls-1-0-in-internet-informat>

## Microsoft Cryptographic Engine

Secret Server relies on Windows Server 2016 Standard Edition to provide protocol and cryptographic functionality. Windows Server 2016 Standard Edition implements a FIPS certified (CMVP #2937) Cryptographic Primitives Library.

More information on the FIPS 140 certificate numbers for the Windows operating systems, including the algorithm implementations that we use can be found at: <http://technet.microsoft.com/en-us/library/cc750357.aspx>

**Warning: The use of other cryptographic engines was not evaluated nor supported in the Common Criteria configuration.**

## Configuring X.509v3 Certificates

In order to maintain compliance with Common Criteria standards, the following installed certificates must follow the standard X.509v3 digital certificate structure.

*\*Do not use self-signed certificates in production environments.*

## Installing Certificate in Trust Store

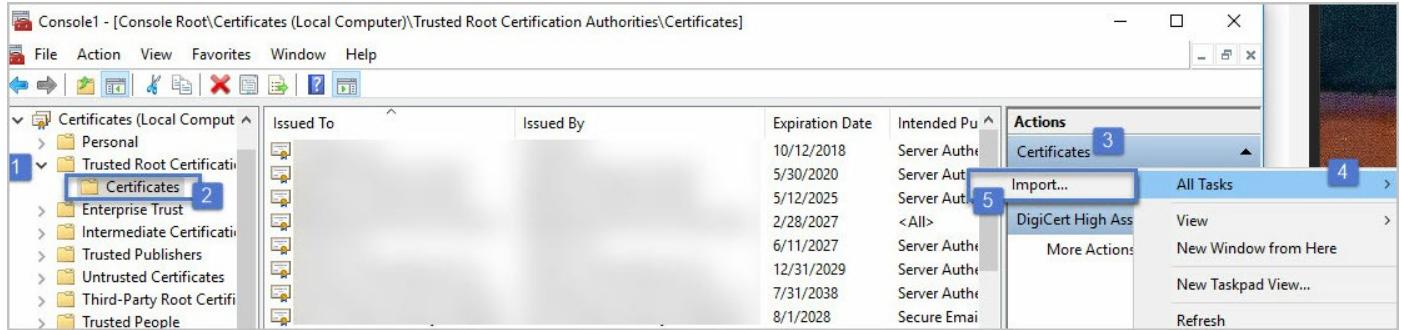
To best protect the users of your Secret Server website, use an SSL certificate from a trusted root authority and install it on your **web server(s)**.

- It is possible to use a self-signed certificate in demo or sandbox environments as long as **all other machines** used to access Secret Server are also configured to trust the certificate. Otherwise, users will receive warnings about it being invalid and unsafe to navigate to your Secret Server URL.
- Local machines either need to:
  - Import your **public certificate** into the **Trusted People** certificate store if you used IIS to create it
- OR
- If you used OpenSSL and set up a **custom Root CA** to sign your web server certificate, the Root CA must be imported into the **Trusted Root Certification Authorities** store.
- If a **custom Intermediary CA** is created, this must also be imported into the **Intermediate Certification Authorities** store.

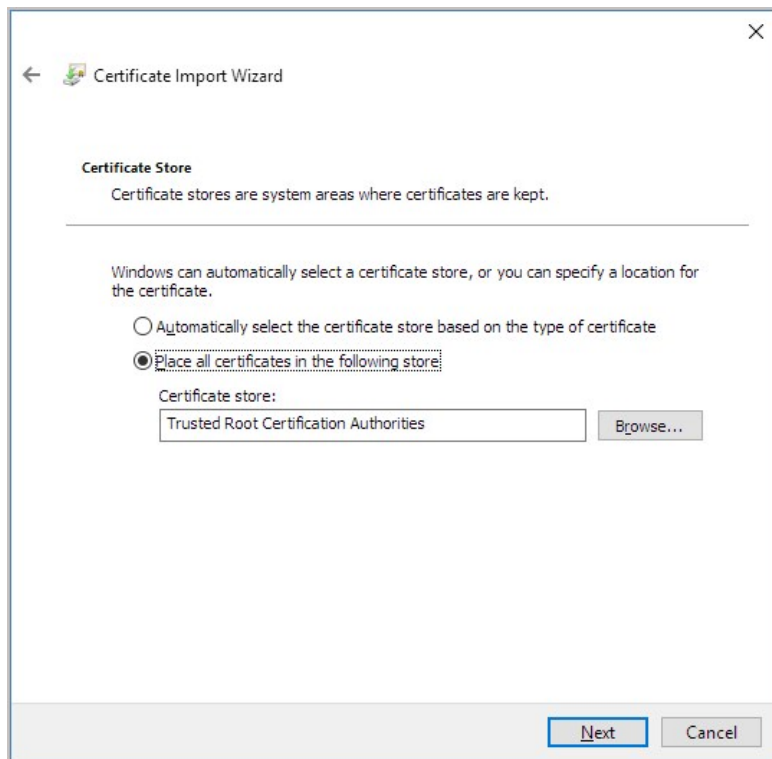
If Secret Server will be communicating with any remote server using TLS, any Root CAs and Intermediate CAs in the trust chains of the certificates presented by those remote servers must be added to the **Trusted Root Certification Authorities** and **Intermediate Certification Authorities** stores respectively. This includes syslog and LDAPS servers.

Follow the steps below to install a certificate in the Trusted Root CA store:

1. On your local machine open **mmc.exe**, select **File**, then **Add/Remove Snap-In...**
2. Next choose **Certificates** and then **Add**. Select **Computer Account**, then **Local Computer**. Click **Finish**.
3. Open **Certificates (Local Computer)**, then expand the **Trusted Root Certification Authorities** store/folder from the left pane and select **Certificates**, then in the right-side **Actions** pane select **More Actions**, **All Tasks**, and **Import...**



- Click **Next** then select the certificate to import. This is usually a file with a file extension of .cer, .crt, .pem, or .pfx and click **Next**.
- If prompted, enter the certificate's password and click **Next**.
- Leave the selected options at the **Certificate Store** step and click **Next**.



- Click **Finish** to import the certificate

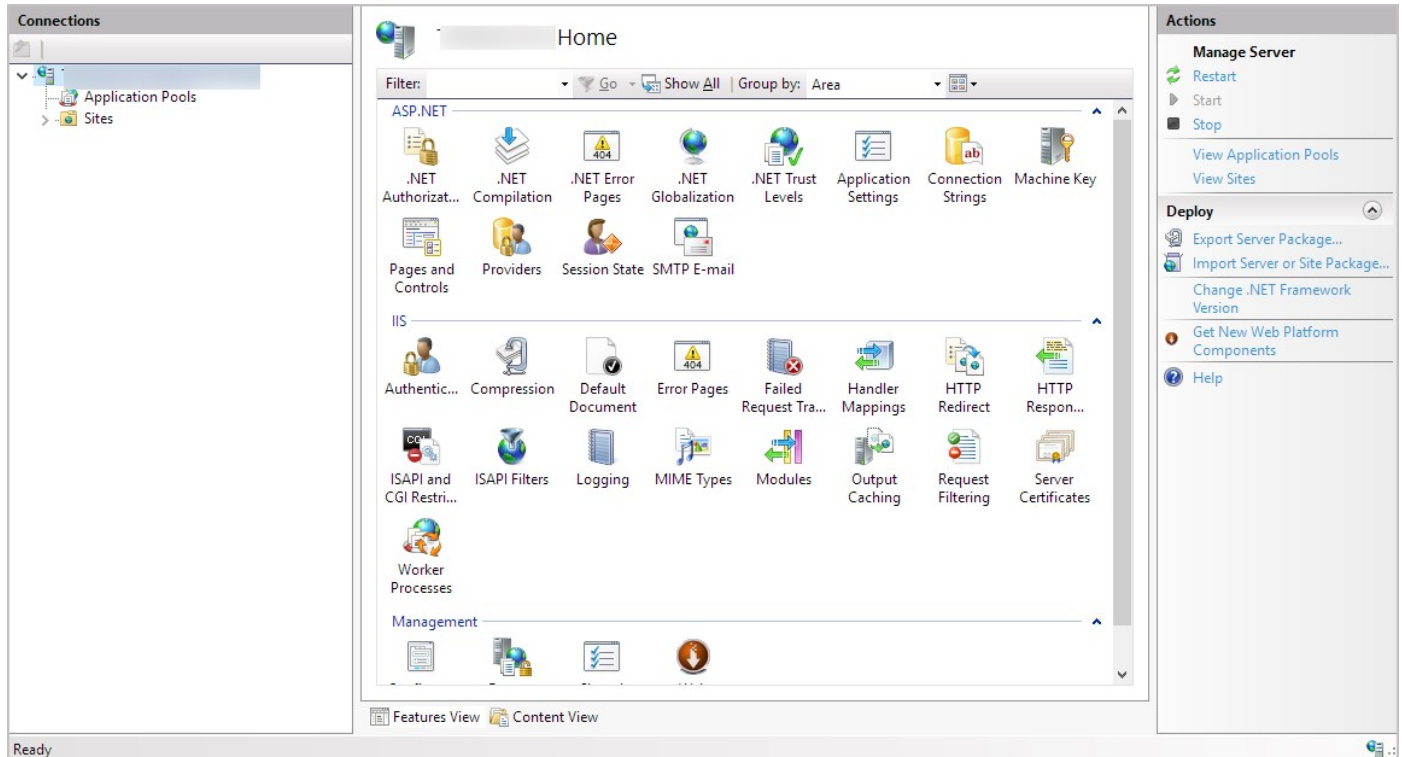
To import and Intermediate Certificate Authority follow the same steps for a Root Certificate Authority but select **Intermediate Certification Authorities** in step 3 instead of **Trusted Root Certification Authorities**. In step 6, the selected certificate store should also say **Intermediate Certification Authorities**.

## Configuring Web Certificate

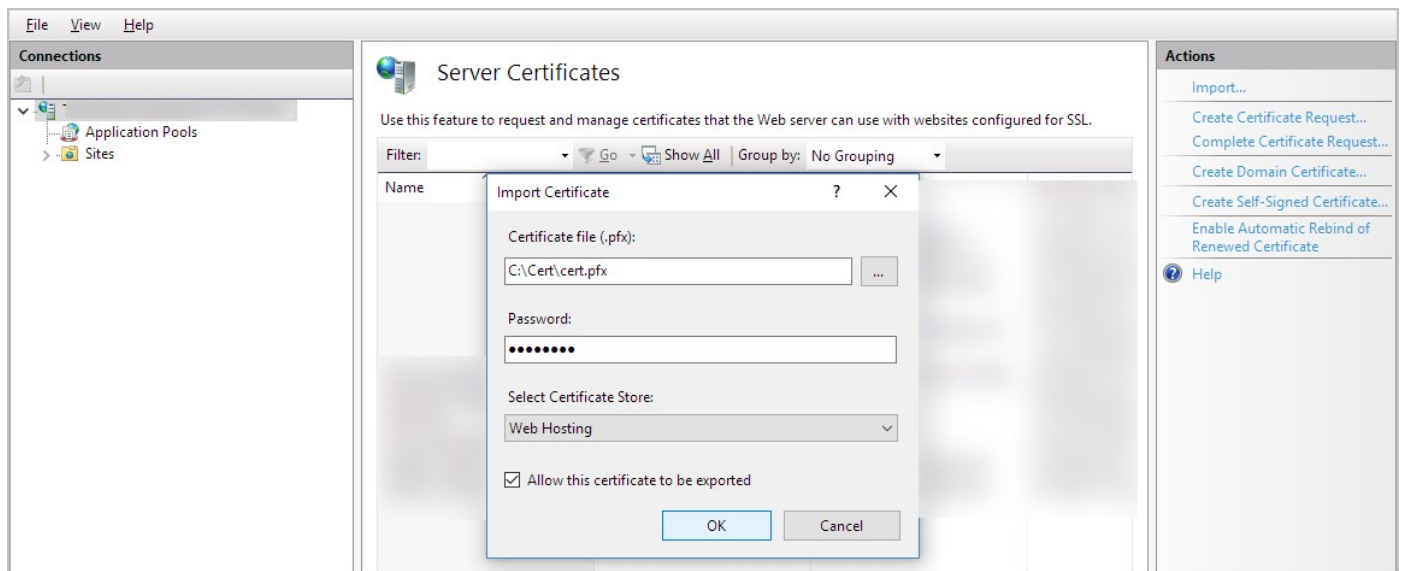
To install a web certificate for use by IIS:

- Open IIS Manager by clicking **Start**, clicking **Run**, typing in "inetmgr", and clicking **OK**.

- Click on the server node (one of the root nodes) in the left panel, and double click on **Server Certificates**.



- Click **Import...** in the right-hand **Actions** panel



- Select the certificate to use, enter the password, select "Web Hosting" in **Select Certificate Store**, and click **OK**.

Alternatively, to create a self-signed certificate, click **Create Self-Signed Certificate** on the right panel and type in a Friendly Name.

*\*Note, using Self-Signed certificates is not compliant with Common Criteria standards. If using a self-signed certificate you must also export and install it on every user machine that connects to the Secret Server website.*

Now that your certificate is installed, IIS must be configured to use it.

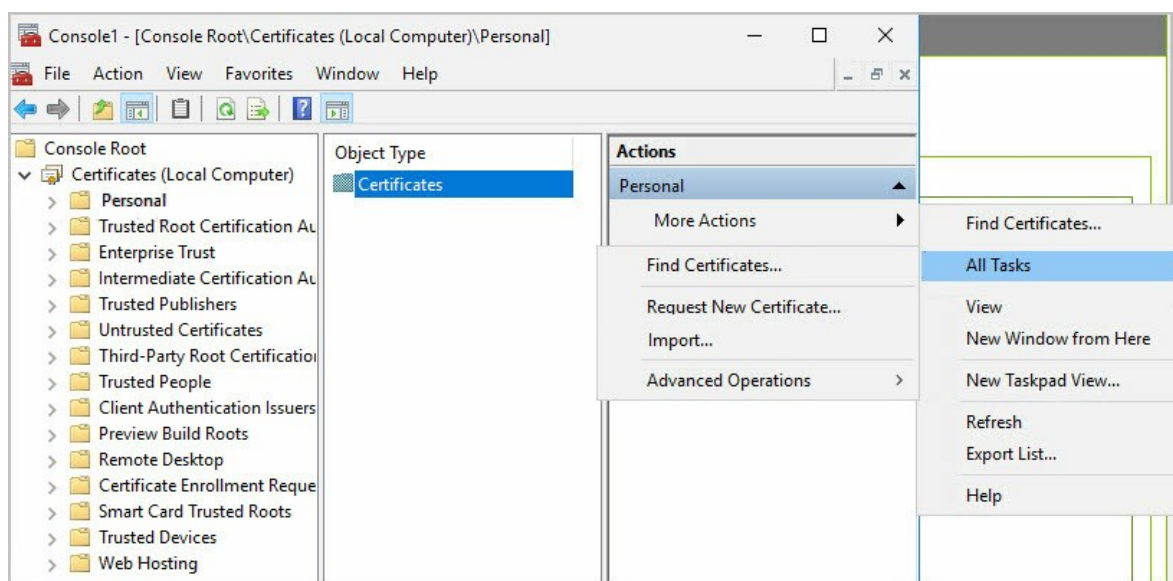
- In IIS Manager, click on your website in the left panel, then click **Bindings** on the right panel.
- If https is not already listed, click **Add**, select **https**, select the correct certificate, and click **OK**.
- If https was already listed, select it, click **Edit**, and select the correct certificate.

## Configuring Client Certificates

Client Certificates can be used for **LDAPS** connections and for **Secure TCP** Syslog connections if your LDAPS or Secure TCP Syslog server requires one to be used.

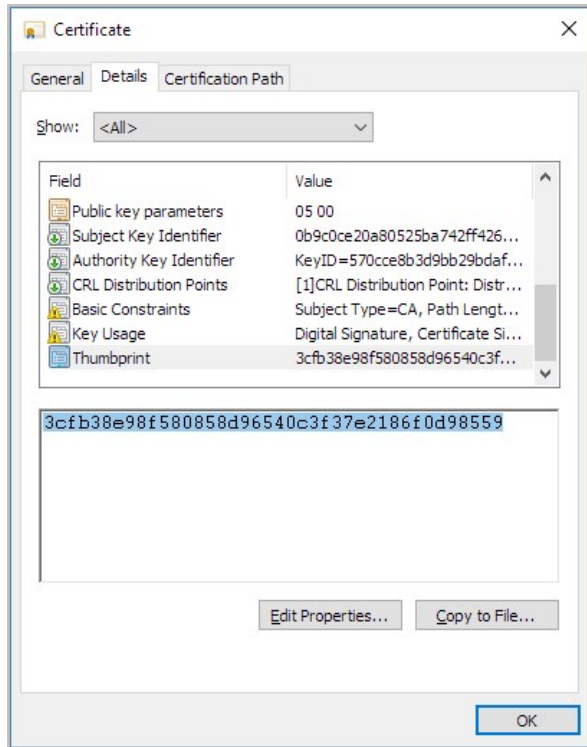
You will need to install a Client Certificate on your **web server(s)** in the Local Computer's **Web Hosting** (used by newer versions of IIS) or **Personal** Stores:

1. On your local machine open **mmc.exe**, select **File**, then **Add/Remove Snap-In...**
2. Next choose **Certificates** and then **Add**. Select **Computer Account**, then **Local Computer**. Click **Finish**.
3. Open **Certificates (Local Computer)**, then import your certificate by selecting the **Personal** or **Web Hosting** store/folder from the left pane, then **All Tasks**, and **Import...**



4. Follow the Import Wizard to complete the installation of the client certificate.  
*\*Note: If you are using an older version of IIS, or IIS is not installed on your machine, the Web Hosting store will not exist. In that case, import into the Personal store.*
  - To enable Secret Server to send the client certificate to remote servers,
  - you must first get the certificate thumbprint. This thumbprint will be added
  - to Secret Server and used to identify which certificate to send when a
  - client certificate is requested.
  - To get the certificate thumbprint:

1. Right-click on the certificate file in Windows Explorer or the certificate listed in MMC and select **Open**.
2. Select the **Details** tab.
3. Scroll down in the list of fields until you find **Thumbprint**. Select it. The value will be displayed in the box below the field list.



4. Select the text in this box and copy it by pressing **Ctrl+V**.
    - Now that you have the thumbprint copied to the clipboard, you can add it to
    - Secret Server:
  1. In Secret Server, select **ADMIN > Configuration**.
  2. Select the **Security** tab and click **Edit**.
  3. Find the **TLS Auditing** section.
-

TLS Auditing

Apply TLS Certificate Chain Policy and Error Auditing
☒

Additional Certificate Chain Policy Options
What are X509 Certificate Chain Policy Options?

Enable TLS Debugging and Connection Tracking
☐

Advanced (not required)

Secret Server's IIS AppPool must be granted permission to use the Client Certificate, using the Windows HTTP Services Certificate Configuration Tool (WinHttpCertCfg.exe). Example usage:  
winhttpcertcfg.exe -g -c LOCAL\_MACHINE\MY -s "Certificate Subject" -a "HOSTNAME\IIS APPPOOL\SecretServer"  
[Download WinHttpCertCfg](#) - [Official WinHttpCertCfg documentation](#)

Client Certificate Thumbprint(s)

3cfb38e98f580858d96540c3f37e2186f0d98559
706e96862acb755bdf7f1a840d7aca7cdb503684

4. Check **Apply TLS Certificate Chain Policy and Error Auditing**.
5. Click **Advanced (not required)** to expand that section.
6. Paste the thumbprint in the **Client Certificate Thumbprint(s)** field. If you need to use more than one client certificate (for example, if you have multiple Secret Server nodes with different client certificates), you can paste multiple thumbprints in this field.
7. Click **Save** when done.

## Certificate Identifiers Overview

Certificates used for server authentication are verified by Secret Server using the verification provided by Microsoft Windows' Schannel. A certificate must contain a reference identifier that the client can use to verify that the server is presenting a matching certificate. This identifier can be contained in either the certificate **Subject** or **Subject Alternative Name (SAN)**. In order for the Subject to be verified as valid for a given server, it must contain a CN entry that contains the **Fully-Qualified Domain Name (FQDN)** of the server. If a certificate needs to be valid for more than one reference identifier, the certificate can contain a SAN that contains multiple entries. These entries can include both DNS names and IP addresses. If a certificate contains a SAN, the CN in the subject is ignored and only the entries in the SAN are used to validate the certificate against the server.

## Configuring Transport Layer Security (TLS)

Common Criteria users must configure TLS in Secret Server. To enable TLS, follow the steps in the below sections:

### TLS Configuration with AD

To configure TLS with Active Directory, follow the steps in section **7.1.3 Configuring TLS with Active Directory**.

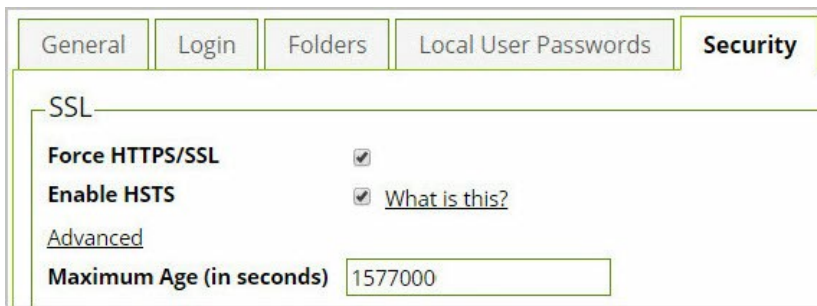
### TLS Configuration with Syslog



To configure TLS with Syslog, follow the steps in section **13.3 Configuring Auditing for TLS Connections**.

## TLS Configuration with IIS

According to Common Criteria security standards, you must force Secret Server through HTTPS/SSL for all website connections, ensure you are using an https URL in your Secret Server browser, then navigate to **Admin | Configuration | Security** tab, click **Edit** and then check the **Force HTTPS/SSL** checkbox, followed by the **Enable HSTS**. We recommend adjusting the Maximum Age (in seconds) to a high number, the example below allows for approximately six months, but we recommend up to one year. **Save** changes.



The screenshot shows the 'Security' tab in the IIS configuration interface. Under the 'SSL' section, the 'Force HTTPS/SSL' checkbox is checked. The 'Enable HSTS' checkbox is also checked, with a link 'What is this?' next to it. Below these, there is an 'Advanced' link and a 'Maximum Age (in seconds)' field containing the value '1577000'.

General	Login	Folders	Local User Passwords	Security
<b>SSL</b>				
<b>Force HTTPS/SSL</b> <input checked="" type="checkbox"/>				
<b>Enable HSTS</b> <input checked="" type="checkbox"/> <a href="#">What is this?</a>				
<a href="#">Advanced</a>				
<b>Maximum Age (in seconds)</b> <input type="text" value="1577000"/>				

For more information on HSTS, see [Securing Traffic with HTTP Strict Transport Security](#)

## Local Auditing

### Understanding Local Audit Records and Reports

By design, Secret Server locally audits all actions taken within Secret Server. Secret Server's auditing capacity is not configurable. See **Auditable Events** for details on Secret Server items that are audited and corresponding user permissions required for accessing audit records.

Various User Permissions are tailored for specific kinds of audits, listed below. To adjust user permissions, go to **Admin | Roles** and create a new role or click an existing role to edit the permissions on it. You can assign roles to individual users by going to **Admin | Users** and assigning roles.

- **Add Secret Custom Audit**  
Allows a user to make a custom audit entry when accessing a Secret using the web services API.
- **User Audit Expire Secrets**  
Allows a user to view the User Audit report, which shows all secrets that have been accessed by a particular user in a specified date range. Also allows the user to force expiration on all these secrets, which would make Secret Server automatically change the password.
- **View Configuration Unlimited Admin**  
Formerly "View Unlimited Admin Configuration," allows a user to view the Unlimited Admin Mode configuration. Also allows a user to view the Unlimited Admin Mode audit log.
- **View Secret Audit**  
Allows a user to view Secret Audit.
- **View User Audit Report**  
Allows a user to view, but not edit, the User Audit Report.

### Accessing Local Reports

To view a list of out of the box reports, navigate to the **Reports** tab from an Administrator account.

---



Reports

General

Security Hardening

User Audit

Secrets

[What Secrets can all users see?](#)  
[What Secrets can a user see?](#)  
[What Secrets have been accessed?](#)  
[What Secrets have been accessed by a user?](#)  
[What Secret permissions exist?](#)  
[What Secret permissions exist for a user?](#)  
[What Secrets changed passwords in the last 90 days?](#)  
[What Secrets have not changed passwords for over 90 days?](#)  
[What Secret permissions exist for a group?](#)  
[What Secrets don't require approval?](#)  
[What Secrets have failed Heartbeat?](#)  
[What Secrets require approval?](#)  
[Secret Count per Site](#)  
[What Secrets Do Not Have Distributed Engines?](#)  
[What Secrets require Comments?](#)  
[What Secrets have been accessed by an impersonated user?](#)  
[What Secrets are expiring this week?](#)  
[What Secrets Have Distributed Engines?](#)  
[What Secrets have Expiration?](#)  
[Secret Permissions Mismatch](#)  
[What SSH Command Menus do Secrets have?](#)

Folders

[What folders can all users see?](#)  
[What folder permissions exist?](#)  
[What folder permissions exist for groups?](#)

User

[Failed login attempts](#)  
[Who hasn't logged in within the last 90 days?](#)  
[What SSH Command Menus do users have access to?](#)  
[Secret Template Permissions by User](#)  
[What users have had an admin reset their password?](#)

Groups

[Group Membership](#)  
[Group Membership By Group](#)

Roles and Permissions

[What role permissions does a user have?](#)  
[What role assignments exist?](#)  
[What role permission assignments exist?](#)

Password Compliance

[Secret Password Compliance Statuses](#)  
[What Secrets Do Not Meet Password Requirements?](#)

Secret Policy

[What Folders have Policies assigned?](#)  
[What Secrets have different Policies than their folders?](#)  
[What Secrets have policies assigned?](#)

Activity

[Secret Activity](#)  
[Secret Activity Today](#)  
[Secret Activity Yesterday](#)  
[Folder Activity](#)  
[Users Activity](#)  
[Custom Report Activity](#)  
[Dual Control Audit](#)  
[Internal Communication Changes](#)  
[IP Address Range Audit](#)  
[Unlimited Administrator behavior](#)  
[Distributed Engine Activity](#)  
[Event Subscription Activity](#)  
[Secret Template Activity](#)

Legacy Reports

[Secret Server Usage](#)  
[Secret Expiration Health](#)  
[Secret Template Distribution](#)  
[Top Ten Viewers](#)

Discovery Scan

[Discovery Scan Status](#)  
[What computers in Active Directory no longer exist?](#)  
[What computers have been successfully scanned?](#)  
[What computers that exist have not been successfully scanned?](#)

For customized reports and creation, see the options available to you at the bottom right corner of the Reports page. The **View Audit** button on the bottom left corner will show you a local audit for any reports that have been viewed.

Folders

[What folders can all users see?](#)  
[What folder permissions exist?](#)  
[What folder permissions exist for groups?](#)  
[What folders can a user see?](#)

Secret Policy

[What Folders have Policies assigned?](#)  
[What Secrets have different Policies than their folders?](#)  
[What Secrets have policies assigned?](#)

Discovery Scan

[Discovery Scan Status](#)  
[What computers in Active Directory no longer exist?](#)  
[What computers have been successfully scanned?](#)  
[What computers that exist have not been successfully scanned?](#)  
[What Secrets failed to import by Discovery?](#)  
[What Secrets are pending import by Discovery?](#)

Report Schedules

[Report Schedules](#)

Edit

View Audit

Can't find the report you need? [Create it](#), [request a custom report](#) or [search the Reports Gallery](#).

Administrator actions have audit trails inside Secret Server, these are generally found as a **View Audit** button on any landing page under the **Admin** tab. For example, at the bottom of **Admin | Configuration** you can view the audit for every edit that has occurred on the **Configuration** page:

Back

Edit

View Audit

Change Administration Mode

For User Audits, navigate to **Reports | User Audit** tab, then select a user and time period to view the audit of all actions taken by that user in Secret Server.

## Configuring Local Windows Event Log Auditing

Outside of Secret Server, you can also send audit logs as EVT records to your Windows Server's Windows Event Log locally<sup>\*\*</sup>.<sup>\*\*</sup>

**Note that the Windows Event Log is tied to the syslog implementation, because of this, disabling syslog will disable Windows Event Logs as well.** If Syslog/CEF Logging is not yet enabled within Secret Server, go to **Admin I Configuration** and **Edit** the General tab to check **Enable Syslog/CEF Logging** followed by **Write Syslogs As Windows Events**. *Syslog/CEF Logging configuration also detailed in section 13.3 Configuring Auditing for TLS Connections*

The following steps walk you through how to grant required permissions to the Application Pool outside of Secret Server to successfully write audits to the Windows Event Log:

### Granting Application Pool Access to Windows Event Log

When the database becomes inaccessible, Secret Server will try to log errors to the Windows Event Log. By default, however, Network Service and standard service accounts will not have permissions to the Event Log. *Permissions must be manually added to the Application Pool for specific Event Log registry keys.*

- **IMPORTANT NOTE:** *Changes made to the Windows registry happen immediately, no backup is created automatically. Do not edit the Windows registry unless you are confident about doing so. Using Registry Editor incorrectly can cause serious, system-wide problems that may require you to re-install Windows to correct them. Microsoft cannot guarantee that any problems resulting from the use of Registry Editor can be solved. Use this tool at your own risk.*

### Required Registry Permissions

The following permissions are required for the Identity configured on the Secret Server Application Pool in IIS (Network Service, IIS APPPOOL\SecretServer, etc.).

HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\EventLog

Applies to "This key and subkeys".

- Read
  - Query Value
  - Enumerate Subkeys
  - Notify
  - Read Control

- Set Value
- Create Subkey

HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\EventLog\Security

Applies to "This key and subkeys".

- Read
  - Query Value
  - Enumerate Subkeys
  - Notify
  - Read Control

## How to Apply Windows Event Log Permissions

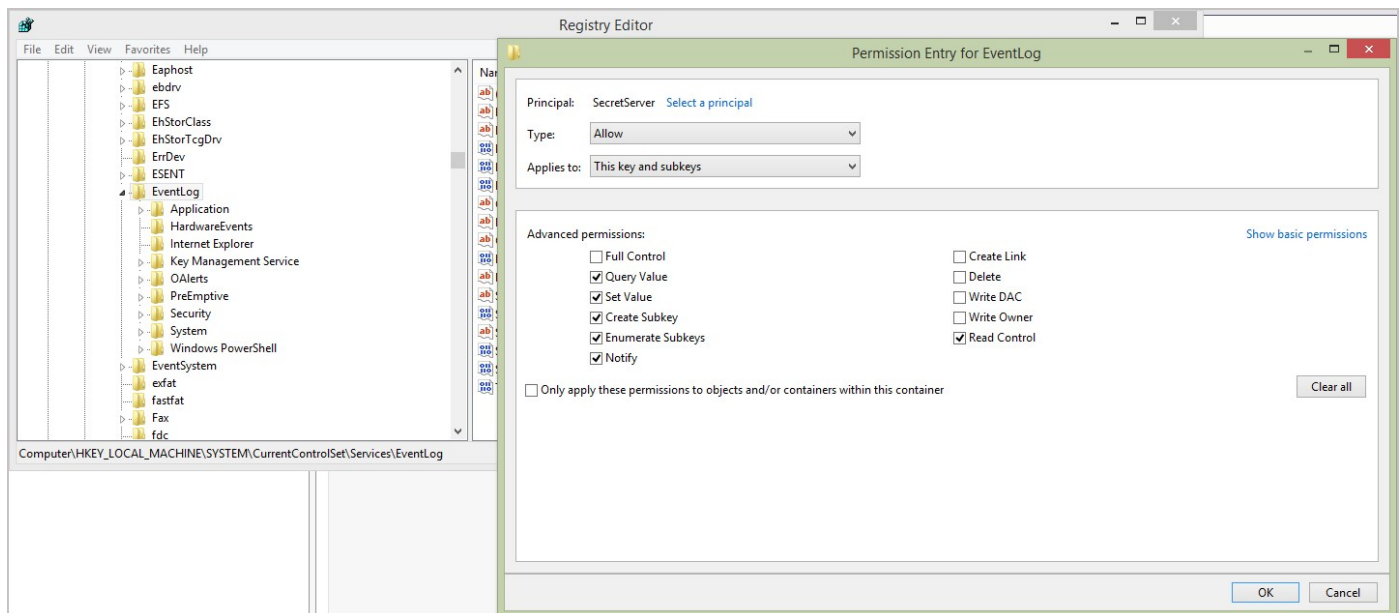
1. Determine the account that is running Secret Server. This can be done by Secret Server. logging in to Secret Server, **Admin I Diagnostics**. Click the button to **Show Background Processes**. Look for any of the "Thread Identity" labels. These will contain the identity of Secret Server (often NT AUTHORITY\NETWORK SERVICE or IIS APPPOOL\SecretServer).

Background Processes	
Environment Name	/SecretServer-1-131617968072680649
Thread Name	CheckOutMonitor
Thread Identity	IIS APPPOOL\SecretServer
Last Activity	1/30/2018 12:55 PM (0 minutes ago)
Environment Name	/SecretServer-1-131617968072680649
Thread Name	NodeClusteringMonitor
Thread Identity	IIS APPPOOL\SecretServer
Last Activity	1/30/2018 12:55 PM (0 minutes ago)

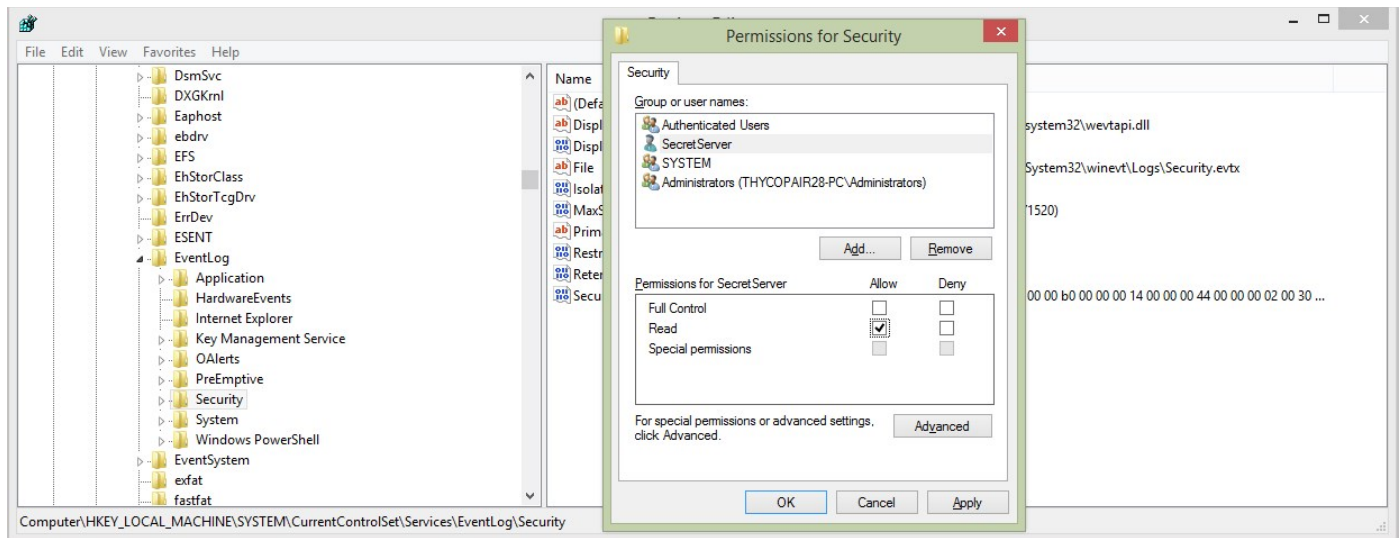
Background Processes	
Environment Name	/SecretServer-1-131617968072680649
Thread Name	CheckOutMonitor
Thread Identity	IIS APPPOOL\SecretServer
Last Activity	1/30/2018 12:55 PM (0 minutes ago)
Environment Name	/SecretServer-1-131617968072680649
Thread Name	NodeClusteringMonitor
Thread Identity	IIS APPPOOL\SecretServer
Last Activity	1/30/2018 12:55 PM (0 minutes ago)

Background Processes	
Environment Name	/SecretServer-1-131617968072680649
Thread Name	CheckOutMonitor
Thread Identity	IIS APPPOOL\SecretServer
Last Activity	1/30/2018 12:55 PM (0 minutes ago)
Environment Name	/SecretServer-1-131617968072680649
Thread Name	NodeClusteringMonitor
Thread Identity	IIS APPPOOL\SecretServer
Last Activity	1/30/2018 12:55 PM (0 minutes ago)

2. Open the **Registry Editor** on the machine running Secret Server (**Start | run-regedit**, depending on OS)
3. On the left, navigate to **HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\EventLog**
4. Right click on the **EventLog** folder in your registry editor and select **Permissions**, then click the **Advanced** button
5. On the Permissions tab, Click **Add**
6. Click **Select a principal**.
7. Enter the name of your app pool's account (see step 1, for example: "IIS APPPOOL\SecretServer") in the box listed under **Enter the object name to select (examples)**. Click **Check Names**. Once "SecretServer" (or the name of your Secret Server app pool) is listed in the box and underlined, click **OK**
8. Under **Basic permissions:**, check **Read**.
9. Click **Show advanced permissions**, then check **Set Value** and **Create Subkey** under **Advanced permissions:**.



10. Click **OK** on the remaining dialogs and **Apply** the permissions. You should be back on the main Registry Editor window.
11. Navigate to **HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\EventLog\Security**, right-click and select **Permissions...**
12. Click **Add...**, find the account running Secret Server (like in step 7), then click **OK**.
13. Check **Read** in the **Allow** column, then click **OK** to apply the permission.

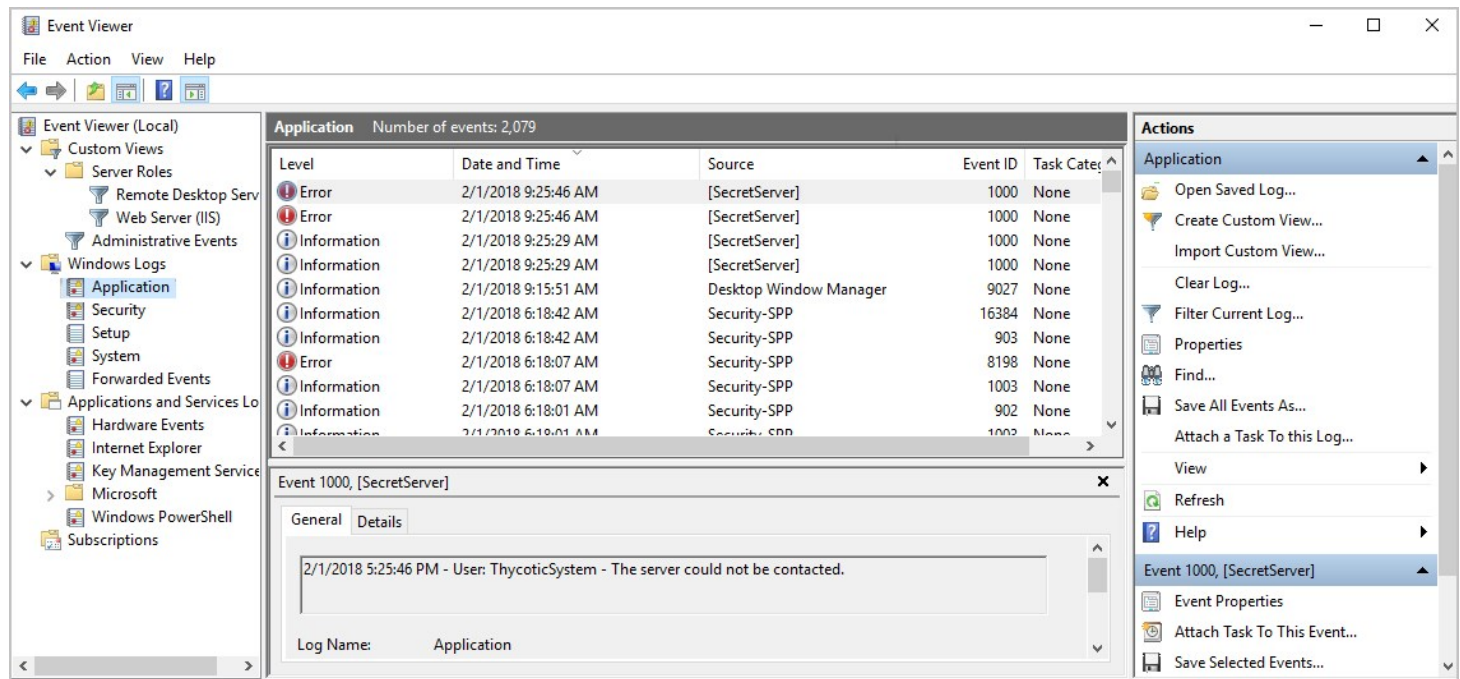


- In Secret Server, navigate to **Admin | Configuration | General** tab to verify that the Application Setting **Write Syslogs as Windows Events** is set to **Yes**.

## Accessing Windows Event Logs

After setting up Windows Event Logs to consume Secret Server logs you can access logs for local auditing and troubleshooting purposes through the **Windows Event Log Event Viewer** on Secret Server's local server.

To find the Windows Event Log, open the Windows **Event Viewer** from the local server and navigate to **Windows Logs | Application**. Event Logs for Secret Server will be listed as **[SecretServer]** under the **Source** column:





## External Auditing

### Security—Connecting to an External Audit Server

Using the **Secure TCP** Syslog/CEF Protocol will make Secret Server try to establish a secure connection to your external audit server. Secret Server will only use TLS v1.2 or v1.1 for security reasons.

If your audit server requires Client Certificates, see **Configuring Client Certificates**. If configured, Secret Server will pass the Secret Server certificate to the external audit server when it connects, so the audit server can validate the Secret Server machine.

If the connection between Secret Server and the external audit server is disconnected or cannot be established, Secret Server will log an internal error and automatically try to re-send any missed audit messages later. For more information, see **Determining Status of a Remote Audit Server**.

For a connection to be successfully established using Secure TCP protocol, Secret Server must trust the SSL certificates being used by the audit server. If the audit server is using a self-signed certificate, the Certificate Authorities that created it must be installed on the Secret Server machine. If Secret Server has issues trusting the certificate, details will be logged internally.

More information on creating your own Certificate Authorities can be found at the [OpenSSL Certificate Authority](#).

### Configuring Syslog/CEF External Audit Server

#### Compatible Audit Servers

- syslog-ng
- Any Audit server that accepts TLS encrypted messages using the BSD Syslog Protocol

#### Configuring Your External Audit Server

1. Navigate to **Admin | Configuration**, then click **Edit**.
2. You will see a configuration area in the **General** tab under **Application Settings** to **Enable Syslog/CEF Logging**. Check this box to enable:

<b>Enable Syslog/CEF Logging</b>	Yes
<b>Syslog/CEF Server</b>	Syslog.Example.com
<b>Syslog/CEF Port</b>	6514
<b>Syslog/CEF Protocol</b>	SECURE TCP
<b>Syslog/CEF Time Zone</b>	Server Time

**Note:** Syslog/CEF may require an additional license key. To install licenses, navigate to **Admin | Licenses** and select **Install New License**. Once installed, you will need to activate your license. Contact your Delinea Sales Representative if you have questions about your licensing.

- **Syslog/CEF Server.** Configure the Syslog/CEF IP address for the IIS Server hosting the Syslog/CEF web application.
- **Syslog/CEF Port.** Next, configure the port number where the logging information will be passed for the **Syslog/CEF Port**. 6514 is the default port for Secure TCP Syslog. Secret Server requires outbound access to this server and port so communication can pass freely.
- **Syslog/CEF Protocol.** Set the Syslog/CEF Protocol to **Secure TCP**. This setting will accept either TLS v1.2 or v1.1 for added security, because other versions of SSL (i.e. SSL v3 and TLS v 1.0) have known weaknesses.

- **Syslog/CEF Time Zone.** Lastly set Syslog/CEF Time Zone to **UTC Time** or **Server Time** depending on your preference.

**Note:** The standard for Syslog is ISO timestamps; however, some still use the legacy format. Syslog is the default for upgrades to allow current configurations to retain their behavior, and ISO format is the default in new instances. Syslog format: Jun 23 2022 11:22:33. ISO 8601 format: 2022-06-23T11:22:33.000. You must enable the configuration preview to modify this setting.

## Caching Syslog Audits

Once secure logging is enabled in Secret Server, if the connection breaks between the external Syslog server and Secret Server, failed syslog messages will be cached in the Secret Server database and re-sent at regular intervals until the connection between the syslog server and Secret Server is reestablished.

## Compatibility Notes Related to Using Client Certificates

If you are using a Client Certificate, Secret Server's IIS AppPool must be granted access to use the certificate using the Windows HTTP Services Certificate Configuration Tool (WinHttpCertCfg.exe). Otherwise if Secret Server is configured to use a Client Certificate, and IIS doesn't have permission, you will see errors like this in the logs:

*TLS Error Detected (Authentication Error connecting to IP:PORT) - The credentials supplied to the package were not recognized.*

Example usage:

```
cd C:\Program Files (x86)\Windows Resource Kits\Tools\winhttpcertcfg.exe -g -c LOCAL_MACHINE\MY -s "CertificateSubject" -a "HOSTNAME\IIS APPPOOL\SecretServer"
```

Download the [Windows HTTP Services Certificate Configuration Tool](#) (WinHttpCertCfg.exe).

If you are using a Client Certificate and a Syslog-NG logging server, you may occasionally see this message in the main Syslog-NG log file:

*SSL error while reading stream; tls\_error='SSL routines:ssl\_get\_prev\_session:session id context uninitialized'*

On the Secret Server side, it shows up like this:

*TLS Error Detected (Authentication Error connecting to IP:PORT) - Authentication failed because the remote party has closed the transport stream.*

This error is caused because Windows tries to cache secure connections when client certificates are in use, but because Syslog-NG has not configured their OpenSSL "session id context", OpenSSL gives this error when it tries to resume a previous session.

Secret Server will automatically reconnect and resend any missed messages, so these errors really should cause no impact. However if you would like, you can disable Windows' secure connection caching, by adding the [ClientCacheTime](#) setting set to 0 (zero) in the Registry, and then doing a reboot. This did not cause any significant performance impact in our internal testing, but your mileage may vary.

If Syslog-NG configures their OpenSSL session ID context, this error message correction will no longer be needed.

## Configuring Auditing for TLS Connections

To track problems with TLS connections including whenever the connection might fail, enable the TLS Certificate Chain Policy and Error Auditing in Secret Server by navigating to **Admin | Configuration | Security** tab, then scrolling down to the TLS Auditing section.

- Ensure that the **Apply TLS Certificate Chain Policy and Error Auditing** is set to **Yes**. If not set to yes, Client Certificates cannot be used.
- Ensure that the **Enable TLS Debugging and Connection Tracking** is set to **Yes**. When set to yes, Secret Server will send information logs to your audit server about when TLS connections are opened or closed. If debug logging is enabled in "web-log4net.config" detailed information about X509 certificate chain validation will also be logged. Note that this setting may create a lot of extra messages in your log files.

TLS Auditing

Apply TLS Certificate Chain Policy and Error Auditing

Yes

Additional Certificate Chain Policy Options

[What are X509 Certificate Chain Policy Options?](#)

Enable TLS Debugging and Connection Tracking

Yes

To Edit click the **Edit** button and **check** the setting you want to turn on or uncheck the setting you want to turn off.

If the TLS connection breaks, an error message will be logged in the local audit trail and Secret Server will keep trying every 60 seconds to reestablish the TLS connection to the syslog server.

If Secure TCP is used for the Syslog/CEF Protocol, and there are one or more Client Certificate Thumbprints entered, Secret Server will check the Local Computer's Web Hosting and Personal certificate store and use the first one it finds. For more information see **Configuring Client Certificates**.

To add Client Certificate Thumbprints, you can copy and paste a list in bulk after clicking Edit, then Advanced (not required). Separate each SSL Certificate SHA1 Thumbprint (40 characters each) with a semicolon (up to ten total are allowed).

## Determining Status of a Remote Audit Server

To view the logs for any TLS-Connection related errors:

- Open **Microsoft SQL Server Management Studio**, navigate to your SecretServer database (**DBMachineName > Databases > SecretServer**) and run a **New Query**.
- Type **select \* from tbSecurityAuditLog** to view the events from your TLS Audit:

```
select * from tbSecurityAuditLog
```

SecurityAuditLogId	UserId	DateRecorded	EventActionId	LogSourceId	IpAddress	Notes	MachineName	DatabaseName
1	1	2017-12-06 16:19:07.470	10118	4		TLS Error Detected (Authentication Error connecting to 192.168.1.17:7514 - The credentials supplied to the package were not recognized	Secret Server	Secret Server
2	1	2017-12-06 16:24:19.090	10118	4		TLS Error Detected (Authentication Error connecting to 192.168.1.17:7514 - The credentials supplied to the package were not recognized	Secret Server	Secret Server
3	1	2017-12-06 16:32:31.010	10118	4		TLS Error Detected (Authentication Error connecting to 192.168.1.17:6514 - The remote certificate is invalid according to the validation procedure.	Secret Server	Secret Server

For more detailed troubleshooting reporting, refer to the logs in File Explorer on Secret Server's web server

C:\inetpub\wwwroot\SecretServer\log) including ss.log, ss-BSSR.log (Background Scheduler), ss-BSWR.log (Background Worker) for any errors that might crop up.



## Management Functions

This section describes management activities and corresponding roles of the evaluated security functionality

### Roles and Management Functions

Read-only User	Search and list Secrets
User	Use Secret/Launch session
User	Request access to Secret
Administrator	Create, view, expire, edit, and assign Secrets
Administrator	Perform bulk operations on Secrets
Administrator	Create and manage groups
Administrator	Create and manage roles, assign roles to users
Administrator	Create and manage containers (folders)
Administrator	Create and manage Secret policy
Administrator	Configure TOE SF (see Table 16)
Administrator	Create, manage, and unlock local accounts
Administrator	Configure IIS, SQL, syslog
Administrator	Update TOE

By default each User Role is attached to various Permission Sets. To view the specific permissions that each role is attached to, navigate to **Admin | Roles** and click into the user roles listed to see the list of permissions.

Organizations can tailor these user roles to maintain whatever permissions settings are required for your specific user environment.

The following table specifies the specific user roles required to allow each management activity listed.

ESM_EAU.2	Management of authentication data for both interactive users and authorized IT entities (if managed by the TSF)	Administrator
ESM_EID.2	Management of authentication data for both interactive users and authorized IT entities (if managed by the TSF)	Administrator
ESM_ICD.1	Definition of identity and credential data that can be associated with users (activate, suspend, revoke credential, etc.)	Administrator

	Management of credential status	Administrator
	Enrollment of users into repository	Administrator
ESM_ICT.1	Configuration of circumstances in which transmission of identity and credential data (and object attributes, if applicable) is performed	Administrator
FAU_STG_EXT.1	Configuration of external audit storage location	Administrator
FIA_AFL.1	Management of the threshold for unsuccessful authentication attempts	Administrator
	Management of actions to be taken in the event of an authentication failure	Administrator
FIA_USB.1	Definition of default subject security attributes, modification of subject security attributes	Administrator
FMT_MOF.1	Management of sets of users that can interact with security functions	Administrator
FMT_SMR.1	Management of the users that belong to a particular role	Administrator
FTA_SSL.3	Configuration of the inactivity period for session termination	Administrator
FTA_TAB.1	Maintenance of the banner	Administrator
FTP_ITC.1	Configuration of actions that require trusted channel (if applicable)	Administrator
FTP_TRP.1	Configuration of actions that require trusted path (if applicable)	Administrator

Secret Server can be hosted externally, like any other IIS website. We recommend using all security measures for Secret Server that you would use for any server directly accessible to the internet. We also recommend the measures described below.

## Limiting the Attack Surface

- The Secret Server application should reside on a dedicated server in a DMZ.
- Secret Server and its database should reside on separate servers. If a hole for SQL connections can be opened in the DMZ firewall, the database can reside on the other side of the DMZ firewall.

## Using Secure Connections

- Use HTTPS to access to the website.
- Use SSL to connect to the Secret Server database.
- Use LDAPS to connect the web server to Active Directory.

## Setting Up Remote Password Changing

By default, Secret Server changes passwords on devices and accounts directly from the web server where it is installed, but when Secret Server is installed in a DMZ zone, it does not have direct network connections to these devices and accounts.

However, you can enable Secret Server to change passwords throughout your network over a specified port using distributed engines. See [Distributed Engines](#) for more information on setting up and using Secret Server Distributed Engines.

## Introduction

This topic discusses best practices for hardening Secret Server distributed engine servers.

If attackers compromise one of the DE servers, they would have access to all critical DBs, applications, and network devices at the network level. DEs do not store any passwords, PII, or user data in any configuration files.

**Note:** Due to their intrinsic nature, some PowerShell script run by DEs may expose API usernames or passwords in the PowerShell log.

## General Hardening Steps

### Restrict RDP Connections

- Limit RDP connections to all PAM Server, except for PAM admins and some users from the hosting team.
- If there is no firewall segmentation in LAN network, you can accomplish this with the Windows OS firewall.

### Restrict Incoming Port Access to All DE Servers

- Allow only RDP port access from some internal IPs.
- Allow a SSH proxy port coming from the user's LAN.
- Block all other incoming ports.

### Remove Unnecessary User Groups

For administrator and Remote Desktop user groups:

- Remove default domain admins, administrator and some common groups.
- Create one group that is going to have access these servers.
- Disable the built-in local administrator user.

### Rename Default Accounts

- Change the names of both the administrator and guest accounts to names that do not indicate their permissions.
- Create a new locked and unprivileged "administrator" user name as bait.

### Disable Services

Disable these services:

- Routing and remote access
- Smart card
- Smart card removal policy
- SNMP trap
- Special administration console helper
- Windows error reporting service
- WinHTTP Web proxy auto-discovery service

### Restrict Network Protocols

Keep these:

- Client for Microsoft network
- File and printer sharing for Microsoft network
- Internet protocol version 4 (TCP/IPv4)

Remove these:

- QoS packet scheduler
- Link-layer topology discovery mapper IO driver
- Link-layer topology discovery responder

## **Validate Server Roles**

Ensure only the minimum roles and features that are required are defined on the DE Servers. Remove all unnecessary roles and features.

**Note:** The following roles are removal candidates, not ones to keep.

### **Roles**

#### **Application Server**

- TCP port sharing
- Windows process activation service support
- Named pipe activation
- TCP activation

#### **Remote Access**

- Direct access and VPN (RAS)
- Routing
- Web application proxy (with dependent features)

#### **Web Server (IIS)**

- Web server
- Health and diagnostic
- Logging tools
- Tracing

#### **Security**

- Centralized SSL certificate support
- Client certificate mapping authentication
- Digest authentication
- IIS client certificate mapping authentication
- IP and domain restrictions
- URL authentication

#### **Application Development**

- Server side includes
- Web socket protocols
- Windows deployment services (with dependent features), including all child roles

### **Features**

- Group policy management
- IIS hostable Web core
- Ink and handwriting services
- Media foundation
- RAS connection manager administration kit (CMAK)
- Remote server administration tools, including all child features.
- Windows internal database
- SMB 1.0/CIFS file sharing support

## SSL/TLS Settings

Keep your server SSL/TLS settings up to date. Among other settings, the different protocols and cipher suites can be vulnerable to different attacks on SSL/TLS.

- Disable SSL 2.0
- Disable SSL 3.0
- Disable TLS 1.0
- Disable TLS 1.1
- Enable TLS 1.2

## GPO Hardening

The following are recommended settings for Microsoft Group Policy Objects (GPO).

### User Configuration > Policies > Administrative Templates > Control Panel/Personalization

Vulnerability:

There is no protection against a user with physical and remote desktop access to the server.

Severity of the damage:

Medium

Operational aspects:

None

Enable screen saver	Enabled
Force specific screen saver	Enabled
Password protect the screen saver	Enabled
Screen saver timeout	Enabled Seconds: 600

[Unexpected Link Text](#)

### Computer Configuration > Policies > Windows Settings > Security Settings > Local Policies /Security Options

This setting enables advanced auditing in the operating system.

Audit: Force audit policy subcategory settings to override audit policy category settings	Enabled

[Unexpected Link Text](#)

**Computer Configuration > Policies > Windows Settings > Security Settings > Advance Audit Policy Configuration > Logon Account**

Vulnerability:

Lack of information on unauthorized user login attempt. Lack of this type of information prevents identification of intruders to the system, as well as inability to check access to the server or its resources.

Severity of the damage:

Medium

Operational aspects:

None

Credential Validation	Success, Fail
Other Account Logon Event	Success, Fail

[Unexpected Link Text](#)

**Computer Configuration > Policies > Windows Settings > Security Settings > Advance Audit Policy Configuration > Account Management**

Vulnerability:

Lack of information on user management in the system (addition and removal of users). Lack of this type of information will prevent identification of intruders to the system, as well as inability to check access to the server or its resources.

Severity of the damage:

Medium

Operational aspects:

None

Application Group Management	Success, Fail
Computer Account Management	Success, Fail
Distribution Group Management	Success, Fail

Other Account Management Events	Success, Fail
Security Group Management	Success, Fail
User Account Management	Success, Fail

[Unexpected Link Text](#)

## Computer Configuration > Policies > Windows Settings > Security Settings > Advance Audit Policy Configuration > Logon\Logoff

Vulnerability:

Lack of information on unauthorized user login attempt. Lack of this type of information will prevent identification of intruders to the system, as well as inability to check access to the server or its resources.

Severity of the damage:

Medium

Operational aspects:

None

Account Lockout	Success, Fail
Logoff	Success, Fail
Logon	Success, Fail
Network Policy Server	Success, Fail
Other Logon\Logoff Event	Success, Fail
Special Logon	Success, Fail

[Unexpected Link Text](#)

## Computer Configuration > Policies > Windows Settings > Security Settings > Advance Audit Policy Configuration > Object Access

Vulnerability:

Lack of information on access to sensitive files and folders in the system. Lack of this type of information will prevent identification of intruders to the system, as well as inability to check access to the server or its resources.

Severity of the damage:

Medium

Operational aspects:



Applying Auditing for Success can overload the system. In case an overload is created, it is recommended to apply the auditing for Failure only.

Application Generated	Success, Fail
Certification Services	Success, Fail
Detailed File Share	Fail
File Share	Success, Fail
File System	Success, Fail
Kernel Object	Success, Fail
Registry	Success, Fail
Removable Storage	Success
SAM	Success, Fail

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## Computer Configuration > Policies > Windows Settings > Security Settings > Advance Audit Policy Configuration > Policy Change

Vulnerability:

Lack of information on changes in the policy. Lack of this type of information will prevent identification of intruders to the system, as well as inability to check access to the server or its resources.

Severity of the damage:

Medium

Operational aspects:

None

Audit Policy Change	Success, Fail
Authentication Policy Change	Success, Fail
Authorization Policy Change	Success, Fail
Filtering Platform Policy Change	Success, Fail
MPSSVC Rule-Level Policy Change	Success, Fail

[Unexpected Link Text](#)

## Computer Configuration > Policies > Windows Settings > Security Settings > Advance Audit Policy Configuration > Privilege Use

Vulnerability:

Lack of information on the use of system authorizations. Lack of this type of information will prevent identification of intruders to the system, as well as inability to check access to the server or its resources.

Severity of the damage:

Medium

Operational aspects:

None

Non Sensitive Privilege Use	Success, Fail
Sensitive Privilege Use	Fail

[Unexpected Link Text](#)

## Computer Configuration > Policies > Windows Settings > Security Settings > Advance Audit Policy Configuration > System

Vulnerability:

Lack of information on system start-up, shutdown and system changes. Lack of this type of information will prevent identification of intruders to the system, as well as inability to check access to the server or its resources.

Severity of the damage:

Medium

Operational aspects:

None

Other System Events	Success, Fail
Security State Change	Success, Fail
Security System Extension	Success, Fail
System Integrity	Success, Fail

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## Computer Configuration > Policies > Windows Settings > Security Settings > Event Log

Vulnerability:

There is a risk that many log records will not be saved due to the file's size.

Severity of the damage:

Medium

Operational aspects:

None

Maximum application log size	100032 KB
Maximum security log size	100032 KB
Maximum system log size	100032 KB
Prevent local guests group from accessing application log	Enabled
Prevent local guests group from accessing security log	Enabled
Prevent local guests group from accessing system log	Enabled
Retention method for application log	As needed
Retention method for security log	As needed
Retention method for system log	As needed

[Unexpected Link Text](#)

## Computer Configuration > Policies > Windows Settings > Security Settings > Registry

Auditing should be applied according to the following parameters:

Audit - Success only: Set Value

Audit - All:

Create Subkey, Create Link, Delete, Read Permissions, Change Permissions

Audit the following registry keys:

- HKLM\SYSTEM
- HKLM\SOFTWARE

## Computer Configuration > Policies > Windows Settings > Security Settings > File System

Vulnerability:

Lack of information on delete, change of authorizations, gain ownership of sensitive files, or any attempt to do so, will prevent the ability to identify unauthorized access and therefore will make it difficult to prevent such attempts.

Severity of the damage:

Medium

Operational aspects:

None

Set permissions and audit to the following folders:

- %SystemRoot%\System32\Config
- %SystemRoot%\System32\Config \RegBack

Permissions and auditing should be applied according to the following parameters:

Audit-Failure only:

Traverse Folder\ Execute File, List Folder\ Read Data, Read Attributes, Read Extended Attribute.

Audit - All:

Create Files\ Write Data, Create Folders\ Append Data, Write Attributes, Write Extended Attributes, Delete Subfolders And Files, Delete, Change Permissions, Take Ownership.

Permissions:

Administrator, System - Full

## Computer Configuration > Policies > Windows Settings > Security Settings > Local Policies/Security Options

I Policy | Recommended Value | Comment or Vulnerability | I ----- | ----- | ----- | I Accounts: Administrator account status | Enabled | I I Accounts: Guest account status | Disabled | I I Accounts: Limit local account use of blank passwords to console logon only | Enabled | I I Accounts: Rename administrator account | It is recommended to change both the Administrator and the guest names to a name that will not testify about their permissions, and also to create a new locked and unprivileged user name Administrator as bate | Comment: Apply this parameter according to the organization security policy. Vulnerability: The administrators default name is known as a high privilege user. This user is a target for hacking attempts. Severity of the damage: Medium Operational aspects: None | I Audit: Audit the use of Backup and Restore privilege. | Enabled | Vulnerability: The system does not monitor backup and restore activities of files, therefore it does not allow exposing unusual activities in this area. Severity of the damage: Low Operational aspects: None | I Devices: Allowed to format and eject removable media | Administrator | Vulnerability: Users may be able to move data on removable disks to a different computer where they have administrative privileges. The user could then take ownership of any file, grant themselves full control, and view or modify any file. The fact that most removable storage devices will eject media by pressing a mechanical button diminishes the advantage of this policy setting. Severity of the damage: Low Operational aspects: None | I Devices: Prevent users from installing printer drivers | Enabled | Vulnerability: A malicious user could install inappropriate printer drivers in a deliberate attempt to damage the computer, or a user might accidentally install malicious software that masquerades as a printer driver. Severity of the damage: Low Operational aspects: None | I Domain member: Disable machine account password changes | Disabled | Vulnerability: Computers that cannot automatically change their account password are at risk from an attacker who could determine the password for the computer's domain account. Severity of the damage: Low Operational aspects: None | I Domain member: Maximum machine account password age | 30 days | Vulnerability: Setting this parameter to 0 will allow an attacker to execute Brute Force attacks to find the computer account password. Severity of the damage: Low Operational aspects: None | I Domain member: Require strong (Windows 2000 or later) session key | Enabled | Vulnerability: Session keys that are used to establish secure channel communications between domain controllers and member computers are much stronger in Windows 2000 than they were in previous Windows operating systems. Severity of the damage: Low Operational aspects: None | I Interactive logon: Do not display last user name | Enabled | Vulnerability: An attacker with access to the console (for example, someone with physical access or someone who is able to connect to the server through Remote Desktop Services, also known as Terminal Services) could view the name of the last user who logged on to the server. The attacker could then try to guess the password, use a dictionary, or use a brute force attack to try to log on. Severity of the damage: Low Operational aspects: None | I Interactive logon: Do not require CTRL+ALT+DEL | Disabled | Vulnerability: If users are not

required to press CTRL+ALT+DEL, they are susceptible to attacks that attempt to intercept their passwords. If this setting is enabled, an attacker could install a Trojan horse program that looks like the standard logon dialog box in the Windows operating system, and capture the user's password. Severity of the damage: Low Operational aspects: None | Interactive logon: Number of previous logons to cache (in case domain controller is not available). | 0 | Vulnerability: Users who access the server console will have their logon credentials cached on that server. An attacker who is able to access the file system of the server could locate this cached information and use a brute force attack to attempt to determine user passwords. Severity of the damage: Medium Operational aspects: The local Administrator password should be known in case of DC unavailability. | [Unexpected Link Text](#)

| Policy | Recommended Value | Comment or Vulnerability | | ---- | ---- | ---- | | Interactive logon: Require Domain Controller authentication to unlock workstation | Enabled | Vulnerability: By default, the computer caches in memory the credentials of any users who are authenticated locally. The computer uses these cached credentials to authenticate anyone who attempts to unlock the console. When cached credentials are used, any changes that have recently been made to the account-such as user rights assignments, account lockout, or the account being disabled-are not considered or applied after the account is authenticated. User privileges are not updated, and (more important) disabled accounts are still able to unlock the console of the computer. Severity of the damage: Medium Operational aspects: The local Administrator password should be known in case of DC unavailability | | Microsoft network client: Send unencrypted password to third-party SMB servers. | Disabled | Vulnerability: The server can transmit passwords in plaintext across the network to other computers that offer SMB services. These other computers might not use any of the SMB security mechanisms that are included with Windows Server 2003 and above. Severity of the damage: Medium Operational aspects: None | | Microsoft network server: Amount of idle time required before suspending session | 15 minutes | Vulnerability: Each SMB session consumes server resources, and numerous null sessions will slow the server or possibly cause it to fail. An attacker could repeatedly establish SMB sessions until the server's SMB services become slow or unresponsive. Severity of the damage: Medium Operational aspects: None | | Microsoft network server: Attempt S4U2Self to obtain claim information | Disabled | Vulnerability: Enabling this policy setting allows you take advantage of features in Windows Server 2012 and Windows 8 for specific scenarios to use claims-enabled tokens to access files or folders that have claim-based access control policy applied on Windows operating systems prior to Windows Server 2012 and Windows 8. Severity of the damage: Medium Operational aspects: None | | Microsoft network server: Server SPN target name validation level | Off | Vulnerability: This policy setting controls the level of validation that a server with shared folders or printers performs on the service principal name (SPN) that is provided by the client computer when the client computer establishes a session by using the SMB protocol. The level of validation can help prevent a class of attacks against SMB servers (referred to as SMB relay attacks). This setting will affect both SMB1 and SMB2. Severity of the damage: Low Operational aspects: None | | Network access: Do not allow anonymous enumeration of SAM accounts | Enabled | Vulnerability: An unauthorized user could anonymously list account names and shared resources and use the information to attempt to guess passwords or perform social engineering attacks. Severity of the damage: Medium Operational aspects: None | | Network access: Do not allow anonymous enumeration of SAM accounts and shares | Enabled | Vulnerability: An unauthorized user could anonymously list account names and shared resources and use the information to attempt to guess passwords or perform social-engineering attacks. Severity of the damage: Medium Operational aspects: None | | Network access: Do not allow storage of passwords and credentials for network authentication. | Enabled | Vulnerability: Passwords that are cached can be accessed by the user when logged on to the computer. Although this information may sound obvious, a problem can arise if the user unknowingly runs malicious software that reads the passwords and forwards them to another, unauthorized user. Severity of the damage: Medium Operational aspects: This parameter could affect windows schedule task services | | Network access: Let Everyone permissions apply to anonymous users | Disabled | Vulnerability: The system will allow all users, including users who have not identified themselves in the Domain, perform operations of reading information related to user accounts and the names of the shares. Severity of the damage: Medium Operational aspects: None | | Network access: Named Pipes that can be accessed anonymously | List has been deleted | Vulnerability: Ability to remotely access data on the system by an unauthorized user. Severity of the damage: Low Operational aspects: None | | Network access: Remotely accessible registry paths | List has been deleted | Vulnerability: An attacker could use information in the registry to facilitate unauthorized activities. To reduce the risk of such an attack, suitable ACLs are assigned throughout the registry to help protect it from access by unauthorized users. Severity of the damage: Low Operational aspects: None | | Network access: Remotely accessible registry paths and subpaths | List has been deleted | Vulnerability: An attacker could use information in the registry to facilitate unauthorized activities. To reduce the risk of such an attack, suitable ACLs are assigned throughout the registry to help protect it from access by unauthorized users. Severity of the damage: Low Operational aspects: None | | Network access: Restrict anonymous access to Named Pipes and Shares. | Enabled | Vulnerability: Null sessions are a weakness that can be exploited through shared folders on computers environment. Severity of the damage: Low Operational aspects: None | | Network access: Shares that can be accessed anonymously | List has been deleted | Vulnerability: Any shared folders that are listed can be accessed by any network user, which could lead to the exposure or corruption of sensitive data. Severity of the damage: Medium Operational aspects: None | | Network access: Sharing and security model for local accounts | Classic - Local users authenticate as themselves | Vulnerability: With the Guest only model, any user who can authenticate

to the server over the network does so with guest privileges, which means that they will not have write access to shared resources on that server. Although this restriction does increase security, it makes it more difficult for authorized users to access shared resources on the server because ACLs on those resources must include access control entries (ACEs) for the Guest account. With the Classic model, local accounts should be password protected. Otherwise, if Guest access is enabled, anyone can use those user accounts to access shared system resources. Severity of the damage: Low Operational aspects: None || Network security: Do not store LAN Manager hash value on next password change | Enabled | Vulnerability: The SAM file can be targeted by attackers who seek access to user name and password hashes. Such attacks use special tools to discover passwords, which can then be used to impersonate users and gain access to resources on your network. Severity of the damage: Medium Operational aspects: None || Network security: Force logoff when logon hours expire | Enabled | Vulnerability: Users can remain connected to the computer outside of their allotted logon hours. Severity of the damage: Low Operational aspects: None || Network security: LAN Manager authentication level | Send NTLMv2 Responses Only/Refuse LM & NTLM | Vulnerability: The system allows identification of users in the old LM and NTLM protocols. The old identification protocols are vulnerable to attacks. Severity of the damage: Medium Operational aspects: These parameters could effect on legacy system if the system don't support NTLMv2 || Network security: Minimum session security for NTLM SSP based (including secure RPC) clients | Require NTLMv2 session security Require 128-bit encryption | Vulnerability: Network traffic that uses the NTLM Security Support Provider (NTLM SSP) might be exposed such that an attacker who has gained access to the network can create man-in-the-middle attacks. Severity of the damage: Medium Operational aspects: None || Network security: Minimum session security for NTLM SSP based (including secure RPC) servers | Require NTLMv2 session security Require 128-bit encryption | Vulnerability: Network traffic that uses the NTLM Security Support Provider (NTLM SSP) might be exposed such that an attacker who has gained access to the network can create man-in-the-middle attacks. Severity of the damage: Medium Operational aspects: None | [Unexpected Link Text](#)

| Policy | Recommended Value | Comment or Vulnerability | | ---- | ---- | ---- | | Recovery console: Allow automatic administrative logon | Disabled | Vulnerability: The Recovery Console can be very useful when you need to troubleshoot and repair computers that do not start. However, it is dangerous to allow automatic logon to the console. Anyone could walk up to the server, disconnect the power to shut it down, restart it, select Recover Console from the Restart menu, and then assume full control of the server. Severity of the damage: Medium Operational aspects: None || Recovery console: Allow floppy copy and access to all drives and all folders | Disabled | Vulnerability: An attacker who can cause the system to restart into the Recovery Console could steal sensitive data and leave no audit or access trail. Severity of the damage: Low Operational aspects: None || Shutdown: Allow system to be shut down without having to log on | Disabled | Vulnerability: Users who can access the console locally could shut down the computer. Severity of the damage: Low Operational aspects: None || Shutdown: Clear virtual memory pagefile | Enabled | Vulnerability: Important information that is kept in real memory may be written periodically to the paging file to help the operating system handle multitasking functions. An attacker who has physical access to a server that has been shut down could view the contents of the paging file. The attacker could move the system volume into a different computer and then analyze the contents of the paging file. Although this process is time consuming, it could expose data that is cached from random access memory (RAM) to the paging file. Severity of the damage: Low Operational aspects: It takes longer to shut down and restart the computer, especially on computers with large paging files. || System Settings: Optional subsystems | No one | Vulnerability: The POSIX subsystem introduces a security risk that relates to processes that can potentially persist across logons. If a user starts a process and then logs out, there is a potential that the next user who logs on to the computer could access the previous user's process. This would allow the second user to take actions on the process by using the privileges of the first user. Severity of the damage: Low Operational aspects: None || System settings: Use Certificate Rules on Windows Executables for Software Restriction Policies | Enable | Vulnerability: Without the use of software restriction policies, users and computers might be exposed to the running of unauthorized software, such as viruses and Trojans horses. Severity of the damage: Medium Operational aspects: None || User Account Control: Use Admin Approval Mode for the built-in Administrator account | Enable | Vulnerability: Malicious software running under elevated credentials without the user or administrator being aware of its activity. Severity of the damage: Medium Operational aspects: None || User Account Control: Allow UIAccess applications to prompt for elevation without using the secure desktop | Disable | Vulnerability: Without the use of software restriction policies, users and computers might be exposed to the running of unauthorized software, such as viruses and Trojans horses. Severity of the damage: Medium Operational aspects: None || User Account Control: Behavior of the elevation prompt for administrators in Admin Approval Mode | Prompt for consent for non-Windows binaries | Vulnerability: Malicious programs running under elevated credentials without the user or administrator being aware of their activity. This setting raises awareness to the user that a program requires the use of elevated privilege operations and requires that the user be able to supply administrative credentials in order for the program to run. Severity of the damage: Medium Operational aspects: None || User Account Control: Behavior of the elevation prompt for standard users | Prompt for credentials on the secure desktop | Vulnerability: Malicious programs running under elevated credentials without the user or administrator being aware of their activity. This setting raises awareness to the user that a program requires the use of elevated privilege operations and requires that the user be able to supply administrative credentials in order for the program to run. Severity of the damage: Low Operational aspects: None || User

Account Control: Run all administrator in admin approval mode | Enable | Vulnerability: This is the setting that turns on or off UAC. If this setting is disabled, UAC will not be used and any security benefits and risk mitigations that are dependent on UAC will not be present on the system. Severity of the damage: Medium Operational aspects: None | | User Account Control: Switch to the secure desktop when prompting for elevation | Enable | Vulnerability: Elevation prompt dialog boxes can be spoofed, causing users to disclose their passwords to malicious software. Severity of the damage: Medium Operational aspects: None | | User Account Control: Virtualize file and registry write failures to per-user locations | Enable | Severity of the damage: Low Operational aspects: None | [Unexpected Link Text](#)

## Computer Configuration > Policies > Windows Settings > Security Settings > System Services

Vulnerability:

An unlimited number of open connections can cause denial of Service attack on the Remote Desktop services, also known as Terminal Services.

If a disconnected session kept alive that can lead a session hijacking by an attacker.

Clipboard mapping enables the client to transfer a virus or a malicious application to the server as well as copy configuration or sensitive data from the server back to the client machine. There is a risk of infecting to the whole network or damaging the system.

Severity of the damage:

Medium

Operational aspects:

None

Automatic reconnection	Disabled
Configure keep-alive connection interval	Enabled Keep-Alive interval:1
Deny logoff of an administrator logged in to the console session	Enabled
Do not allow Clipboard redirection	Disabled
Do not allow supported Plug and Play device redirection	Enabled
Do not allow COM port redirection	Enabled
Do not allow LPT port redirection	Enabled
Do not allow drive redirection	Enabled
Do not allow local administrators to customize permissions	Enabled
Do not delete temp folders upon exit	Disabled
Do not use temporary folders per session	Disabled
End session when time limits are reached	Enabled
Remove "Disconnect" option from Shut Down dialog	Enabled

Remove Windows Security item from Start menu	Enabled
Require secure RPC communication	Enabled
Set client connection encryption level	Enabled Encryption Level: High Level
Set rules for remote control of Remote Desktop Services user sessions	Enabled View Session without user's permission
Set time limit for active but idle Remote Desktop Services sessions	Enabled
Set time limit for disconnected sessions	Enabled 15 minutes

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## Computer Configuration > Policies > Windows Settings > Security Settings > User Rights Assignment

Access Credential Manager as a trusted caller		Vulnerability: If an account is given this right, the user of the account can create an application that calls into Credential Manager and is then provided the credentials for another user. Severity of the damage: Medium Operational aspects: None
Access this computer from the network	BUILTIN\Administrators	Vulnerability: This right allows the users to use the SMB communications protocol in front of the server. This protocol allows access to the operating resources, such as: sharing and remote system administration using the operating system's built-in tools. Severity of the damage: Medium Operational aspects: None
Act as part of the operating system		Vulnerability: Users with the Act as part of the operating system user right can take complete control of the computer and erase evidence of their activities. Severity of the damage: Medium Operational aspects: None
Adjust memory quotas for a process	NT AUTHORITY\NETWORK SERVICE, NT AUTHORITY\LOCAL SERVICE, BUILTIN\Administrators	Vulnerability: A user with the Adjust memory quotas for a process user right can reduce the amount of memory that is available to any process, which could cause business-critical network applications to become slow or to fail. This privilege could be used to start a denial-of-service (DoS) attack. Severity of the damage: Medium Operational aspects: None
Allow log on locally	BUILTIN\Administrators	Vulnerability: Any account with the Allow log on locally user right can log on at the console of the computer. If you do not restrict this user right to legitimate users who must log on to the console of the computer, unauthorized users could download and run malicious software to elevate their privileges. Severity of the damage: Medium Operational aspects: None
Allow log on through		Vulnerability: Any account with the Allow log on through Remote Desktop Services user right can log on to the remote console of the computer. If you do not restrict this user right to legitimate



Remote Desktop Services	BUILTIN\Administrators	users who must log on to the console of the computer, unauthorized users could download and run malicious software to elevate their privileges. Severity of the damage: Medium Operational aspects: None
Back up files and directories	BUILTIN\Administrators	Vulnerability: Users who can back up data from a computer could take the backup media to a non-domain computer on which they have administrative privileges and restore the data. They could take ownership of the files and view any unencrypted data that is contained within the backup set. Severity of the damage: Medium Operational aspects: None
Bypass traverse checking	NT AUTHORITY\NETWORK SERVICE, NT AUTHORITY\LOCAL SERVICE, NT AUTHORITY\Authenticated Users, BUILTIN\Administrators	Vulnerability: This right allows the user to access files and partitions although he is not authorized to view files and change them. Severity of the damage: Medium Operational aspects: None
Change the system time	BUILTIN\Administrators, NT AUTHORITY\LOCAL SERVICE	Vulnerability: Users who can change the time on a computer could cause several problems. For example, time stamps on event log entries could be made inaccurate, an attacker who changes a computer's time may cause that computer to be unable to obtain or grant Kerberos protocol tickets. Severity of the damage: Medium Operational aspects: None
Change the time zone	BUILTIN\Administrator	Vulnerability: Changing the time zone represents little vulnerability because the system time is not affected. This setting merely enables users to display their preferred time zone while being synchronized with domain controllers in different time zones. Severity of the damage: Low Operational aspects: None
Create a token object		Vulnerability: A user account that is given this user right has complete control over the system, and it can lead to the system being compromised. Severity of the damage: High operational aspects: None
Create global objects	NT AUTHORITY\SERVICE, NT AUTHORITY\NETWORK SERVICE, NT AUTHORITY\LOCAL SERVICE, BUILTIN\Administrators	Vulnerability: Users who can create global objects could affect processes that run under other users' sessions. This capability could lead to a variety of problems, such as application failure or data corruption. Severity of the damage: Medium Operational aspects: None
Create permanent shared objects		Vulnerability: Users who have the Create permanent shared objects user right could create new shared objects and expose sensitive data to the network. Severity of the damage: Medium Operational aspects: None
Create symbolic links	Administrators	Vulnerability: Users who have the Create symbolic links user right could inadvertently or maliciously expose your system to symbolic link attacks. Symbolic link attacks can be used to change the permissions on a file, to corrupt data, to destroy data, or as a DoS attack. Severity of the damage: Low Operational aspects: None
Vulnerability: The Debug programs user right can be exploited to capture sensitive computer		

Debug programs	BUILTIN\Administrators	information from system memory or to access and modify kernel or application structures. Some attack tools exploit this user right to extract hashed passwords and other private security information or to insert rootkit code. Severity of the damage: Low Operational aspects: None
Deny access to this computer from the network	BUILTIN\Guests	Vulnerability: Users who can log on to the computer over the network can enumerate lists of account names, group names, and shared resources. Users with permission to access shared folders and files can connect over the network and possibly view or modify data. Severity of the damage: Medium Operational aspects: None
Deny log on as a batch job	BUILTIN\Guests	Vulnerability: Accounts that have the Deny log on as a batch job user right could be used to schedule jobs that could consume excessive computer resources and cause a DoS condition. Severity of the damage: Medium Operational aspects: None
Deny log on as a service	BUILTIN\Guests	Vulnerability: Accounts that can log on as a service could be used to configure and start new unauthorized services, such as a keylogger or other malicious software. Severity of the damage: Medium Operational aspects: None
Deny log on locally	BUILTIN\Guests	Vulnerability: Any account with the ability to log on locally could be used to log on at the console of the computer. If this user right is not restricted to legitimate users who must log on to the console of the computer, unauthorized users might download and run malicious software that elevates their privileges. Severity of the damage: Medium Operational aspects: None
Deny log on through Remote Desktop Services	BUILTIN\Guests	Vulnerability: Any account with the right to log on through Remote Desktop Services could be used to log on to the remote console of the computer. If this user right is not restricted to legitimate users who need to log on to the console of the computer, malicious users might download and run software that elevates their privileges. Severity of the damage: Medium Operational aspects: None
Enable computer and user accounts to be trusted for delegation	BUILTIN\Administrators	Vulnerability: Misuse of the Enable computer and user accounts to be trusted for delegation user right could allow unauthorized users to impersonate other users on the network. An attacker could exploit this privilege to gain access to network resources and make it difficult to determine what has happened after a security incident. Severity of the damage: Medium Operational aspects: None
Force shutdown from a remote system	BUILTIN\Administrators	Vulnerability: Any user who can shut down a computer could cause a DoS condition to occur. Therefore, this user right should be tightly restricted. Severity of the damage: Low Operational aspects: None
Generate security audits	NT AUTHORITY\NETWORK SERVICE, NT AUTHORITY\LOCAL SERVICE	Vulnerability: Accounts that can write to the Security log could be used by an attacker to fill that log with meaningless events. If the computer is configured to overwrite events as needed, attackers could use this method to remove evidence of their unauthorized activities. If the computer is configured to shut down when it is unable to write to the Security log and it is not configured to automatically back up the log files, this method could be used to create a DoS condition. Severity of the damage: Low Operational aspects: None

Increase scheduling priority	BUILTIN\Administrators	Vulnerability: Increasing the working set size for a process decreases the amount of physical memory that is available to the rest of the system. Severity of the damage: Low Operational aspects: None
Load and unload device drivers	BUILTIN\Administrators	Vulnerability: Device drivers run as highly privileged code. A user who has the Load and unload device drivers user right could unintentionally install malicious software that masquerades as a device driver. Severity of the damage: Low Operational aspects: None

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Lock pages in memory	BUILTIN\Administrators	Vulnerability: Users with the Lock pages in memory user right could assign physical memory to several processes, which could leave little or no RAM for other processes and result in a DoS condition. Severity of the damage: Low Operational aspects: None
Manage auditing and security log	BUILTIN\Administrators	Vulnerability: Anyone with the Manage auditing and security log user right can clear the Security log to erase important evidence of unauthorized activity. Severity of the damage: Medium Operational aspects: None
Modify an object label		Vulnerability: Anyone with the Modify an object label user right can change the integrity level of a file or process so that it becomes elevated or decreased to a point where it can be deleted by lower-level processes. Either of these states effectively circumvents the protection offered by Windows Integrity Controls and makes your system vulnerable to attacks by malicious software. Severity of the damage: Low Operational aspects: None
Modify firmware environment values	BUILTIN\Administrators	Vulnerability: Anyone who is assigned the Modify firmware environment values user right could configure the settings of a hardware component to cause it to fail, which could lead to data corruption or a DoS condition. Severity of the damage: Medium Operational aspects: None
Perform volume maintenance tasks	BUILTIN\Administrators	Vulnerability: A user who is assigned the Perform volume maintenance tasks user right could delete a volume, which could result in the loss of data or a DoS condition. Also, disk maintenance tasks can be used to modify data on the disk such as user rights assignments that might lead to escalation of privileges. Severity of the damage: Low Operational aspects: None
Profile single process	BUILTIN\Administrators	Vulnerability: The Profile single process user right presents a moderate vulnerability. Attackers with this user right could monitor a computer's performance to help identify critical processes that they might want to attack directly. Attackers may be able to determine what processes run on the computer so that they could identify countermeasures that they may need to avoid, such as antivirus software or an intrusion-detection system. They could also identify other users who are logged on to a computer. Severity of the damage: Low Operational aspects: None
Restore files and	BUILTIN\Administrators	Vulnerability: An attacker with the Restore files and directories user right could restore sensitive data to a computer and overwrite data that is more recent, which could lead to loss of important data, data corruption, or a denial-of-service condition. Attackers could overwrite executable files that are used by legitimate administrators or system services with versions that include malicious

directories		software to grant themselves elevated privileges, compromise data, or install programs that provide continued access to the computer. Severity of the damage: Medium Operational aspects: None
Shut down the system	BUILTIN\Administrators	Vulnerability: The ability to shut down the server should be limited to a very small number of trusted administrators. Severity of the damage: Low Operational aspects: None
Take ownership of files or other objects	BUILTIN\Administrators	Vulnerability: Any users with the Take ownership of files or other objects user right can take control of any object, regardless of the permissions on that object, and then make any changes that they want to make that object. Such changes could result in exposure of data, corruption of data, or a DoS condition. Severity of the damage: High Operational aspects: None

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**Note:** This document is not updated with every Secret Server release—some minor releases do not affect the guide's contents and thus do not warrant a document update.

## Introduction

**Important:** This document is closely associated with the Security Hardening Report in Secret Server (Click **Reports > Security Hardening**) and with the [Security Hardening Guide](#), which provides information on security hardening beyond Common Criteria. We recommend having those available while reading this document.

## Overview

Secret Server made several security enhancements to achieve Common Criteria (CC) certification. These features are available in all versions of Secret Server 10.4 and later. Due to their stringency and need for additional user configuration, not all these features are enabled by default by our standard installer.

This guide provides the information an administrator needs to configure Secret Server 10.4 and above in compliance with the Common Criteria evaluated configuration. Follow this guide in its entirety to ensure each parameter setting matches those evaluated and certified as secure by Common Criteria standards.

## Audience

This document is for administrators who are responsible for installing, configuring, and operating enterprise infrastructure for their organization. To use this guide, you must have knowledge of your organization's network infrastructure and applicable policies. In addition, you must have administrative access to configure your operational environment.

## What Is Common Criteria?

The Common Criteria for Information Technology Security Evaluation (ISO/IEC 15408), known as "Common Criteria," is an international standard for security certification of computer systems, networks, and application software. The certification ensures that claims about the security attributes of the evaluated product were independently verified in the evaluated configuration in the same specific environment. The certification assumes a specific evaluated configuration and does not validate any security claims when the product is used outside of that configuration.

## Procedures

### Security Hardening Checklist

After installing Secret Server, navigate to the **Reports > Security Hardening** tab, and follow the checklist to ensure your environment is as secure as possible:

**Note:** See the [Security Hardening Guide](#) for details.

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### Configuring TLS

To achieve Common Criteria certification on Secret Server, you must enable Transport Security Layer (TLS).

## **Manually Disabling TLS Version 1.0**

TLS 1.0 is no longer considered secure, so it is important to disable this version of the protocol on Secret Server. To do this, follow the instructions in the "Manually Disabling TLS v1.0" section of the [Common Criteria Hardening Guide](#).

## **TLS Diffie-Hellman Hardening Overview**

For information on configuring your servers with stronger Ephemeral Diffie-Hellman hardening, see the "TLS Diffie-Hellman Hardening Overview" in the [Common Criteria Hardening Guide](#).

## **Restricting Server Cipher Suites for TLS**

### **Allowed Suites**

Common Criteria certification requires restricting the cipher suites configured on your server to only:

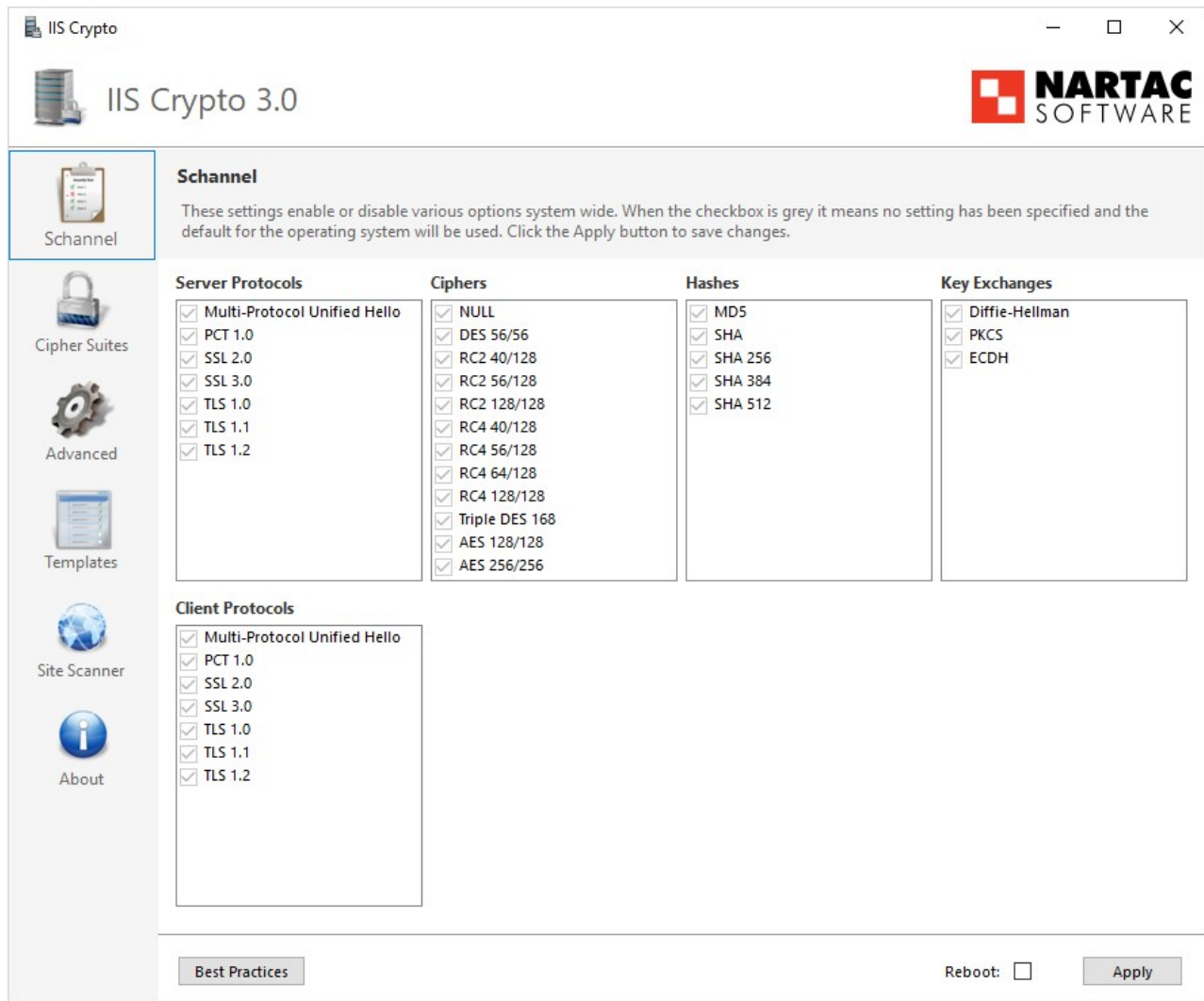
- TLS\_DHE\_RSA\_WITH\_AES\_128\_CBC\_SHA
- TLS\_DHE\_RSA\_WITH\_AES\_256\_CBC\_SHA
- TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA
- TLS\_RSA\_WITH\_AES\_128\_CBC\_SHA256
- TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA
- TLS\_RSA\_WITH\_AES\_256\_CBC\_SHA256

Restricting them can cause communication issues with other servers if they are not able to communicate using any of the above ciphers. In that case, you need to modify those servers to include these cipher suites to securely communicate according to Common Criteria guidelines.

## **Changing Cipher Suites with the IIS Crypto Tool**

One way to change the cipher suites on a computer is to use the free IIS Crypto tool:

1. Download the GUI version of the tool at: <https://www.nartac.com/Products/IISCrypto/Download>
2. Run the tool:



3. Click **Cipher Suites** button on the left. The Cipher Suites window appears:

### Cipher Suites

Enable, disable or reorder various cipher suites that are negotiated for the TLS handshake. When the checkbox is grey it means no setting has been specified and the default for the operating system will be used.

<input checked="" type="checkbox"/>	TLS_AES_256_GCM_SHA384	
<input checked="" type="checkbox"/>	TLS_AES_128_GCM_SHA256	
<input checked="" type="checkbox"/>	TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384	
<input checked="" type="checkbox"/>	TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256	
<input checked="" type="checkbox"/>	TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384	
<input checked="" type="checkbox"/>	TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256	
<input checked="" type="checkbox"/>	TLS_DHE_RSA_WITH_AES_256_GCM_SHA384	
<input checked="" type="checkbox"/>	TLS_DHE_RSA_WITH_AES_128_GCM_SHA256	
<input checked="" type="checkbox"/>	TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA384	
<input checked="" type="checkbox"/>	TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256	
<input checked="" type="checkbox"/>	TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384	
<input checked="" type="checkbox"/>	TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256	
<input checked="" type="checkbox"/>	TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_AES_256_GCM_SHA384	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_AES_128_GCM_SHA256	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_AES_256_CBC_SHA256	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_AES_128_CBC_SHA256	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_AES_256_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_AES_128_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_3DES_EDE_CBC_SHA	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_NULL_SHA256	
<input checked="" type="checkbox"/>	TLS_RSA_WITH_NULL_SHA	
<input checked="" type="checkbox"/>	TLS_PSK_WITH_AES_256_GCM_SHA384	
<input checked="" type="checkbox"/>	TLS_PSK_WITH_AES_128_GCM_SHA256	

Best Practices
Reboot: ☐
Apply

- Click the **Uncheck All** button to uncheck all cipher suites.
- Find and click to select the suites in the list above.
- Click the **Apply** button.

#### Configuring TLS with IIS

Common Criteria certification requires using HTTPS/SSL for all connections to the Secret Server Web page. To do this, follow the instructions in the "TLS Configuration with IIS" section of the [Common Criteria Hardening Guide](#).

#### Enabling TLS Auditing

To have Secret Server audit TLS connections and connection failures, follow the instructions in the "Configuring Auditing for TLS Connections" section of the [Common Criteria Hardening Guide](#).

#### Configuring TLS with Active Directory

To ensure that TLS is configured with Active Directory Follow the instructions in the "Configuring TLS with Active Directory" section of the [Common Criteria Hardening Guide](#).

**Note:** If you have any existing domains configured in Secret Server, you must edit them and enable LDAPS on each one.

#### Configuring TLS with Syslog



To configure TLS with Syslog, follow the steps in the "Configuring Syslog/CEF External Audit Server" section of the [Common Criteria Hardening Guide](#).

## Additional Common Criteria Configurations

### Configuring X.509v3 Certificates

See the "Configuring X.509v3 Certificates" section of the [Common Criteria Hardening Guide](#) for instructions on installing and configuring certificates on the Secret Server Web servers.

### Enabling DPAPI

The Windows Data Protection API (DPAPI) is a pair of functions that allow access to operating-system-level data protection services to protect the master encryption key file, encryption.config.

To enable DPAPI, follow the instructions in the "Verify DPAPI Setting Is Enabled" section of the [Common Criteria Hardening Guide](#).

### Enabling FIPS Mode

To configure your server and Secret Server to use the Federal Information Processing Standard (FIPS), follow the instructions in the "Verify FIPS Mode Is Enabled" section of the [Common Criteria Hardening Guide](#).

**Note:** Also see: [Enabling FIPS Compliance](#)

## Ensuring Zero Information Disclosure

To comply with Common Criteria requirements, you must configure Secret Server to not display any unnecessary information. This applies to unhandled errors as well as the application version number.

### Configuring Custom Error Messages

To hide detailed error messages and display a custom message when an unhandled error occurs:

1. Open [https://<your\\_secret\\_server\\_url>/ConfigurationAdvanced.aspx](https://<your_secret_server_url>/ConfigurationAdvanced.aspx) in your browser.
2. Scroll to the bottom of the page and click the **Edit** button.
3. Type the message you want displayed to users in the **Zero Information Disclosure Message** text box.
4. Click the **Save** button.

### Hiding the Application Version Number

To hide the application version number in the application header and footer:

1. Go to **Admin > Configuration > Security**.
2. Click the **Edit** button. The Configuration page appears:

**Configuration**

[General](#) [Login](#) [SAML](#) [Folders](#) [Local User Passwords](#) [Security](#) [Ticket System](#) [Email](#) [Session Recording](#)

**APPLICATION SETTINGS**

[Anonymized System Metrics Information](#)

Send Anonymized System Metrics to Thycotic Yes [View Metric Data](#)

[View Webservices](#)

Enable Webservices No

[Syslog/CEF Logging Advanced Settings Information](#)

3. Click the **Security** tab.
4. In the **Web Services** section of the page, click to select the **Hide Secret Server Version Numbers** check box.
5. Click the **Save** button.

**Note:** For diagnostic purposes, the application version number is still displayed on the Diagnostics page. Make sure that permissions to this page is limited to employees that may need to access this page when contacting Delinea technical support.

## Configuring the Login Banner

For Common Criteria compliance, when a user first logs in, the login banner must reveal the user policy agreement and force that user to agree to the policy before logging into Secret Server. To configure the Login Banner according to Common Criteria guidelines, follow the instructions in the "Configuring the Login Banner" section of the [Common Criteria Hardening Guide](#).

## Configuring Account Lockout

To access Secret Server, users must login with local or domain credentials. To comply with Common Criteria, Secret Server must use "account lockouts" to prevent repeated unsuccessful login attempts. Configurable by an Secret Server admin, an account becomes inaccessible after a defined number of unsuccessful authentication attempts until an admin unlocks the user's account.

To configure settings for account lockouts:

1. Navigate to **Admin > Configuration**.
2. Click the **Login** tab.
3. Click the **Edit** button.
4. Adjust the number in the **Maximum Login Failures** text box. The default is five attempts.

To Unlock a user's account:

1. Navigate to **Admin > Users > Select the User**.
2. Click the **Edit** button.
3. Click to deselect the **Locked Out** check box.
4. Click the **Save** button.

## Disabling "Remember Me" Logins

A browser's "remember me" login function stores the user's login name and password so the user does not need to enter it again on that browser, which is both convenient and insecure. To disable "Allow Remember Me" during logins, follow the instructions in the "How to Disable Allow Remember Me during Logins" section of the [Common Criteria Hardening Guide](#).

## Configuring SQL Server

To meet Common Criteria requirements, Microsoft SQL Server must be installed on the local machine—the same as the Secret Server Web server. During the install process for MS SQL, ensure that you use Windows authentication mode.

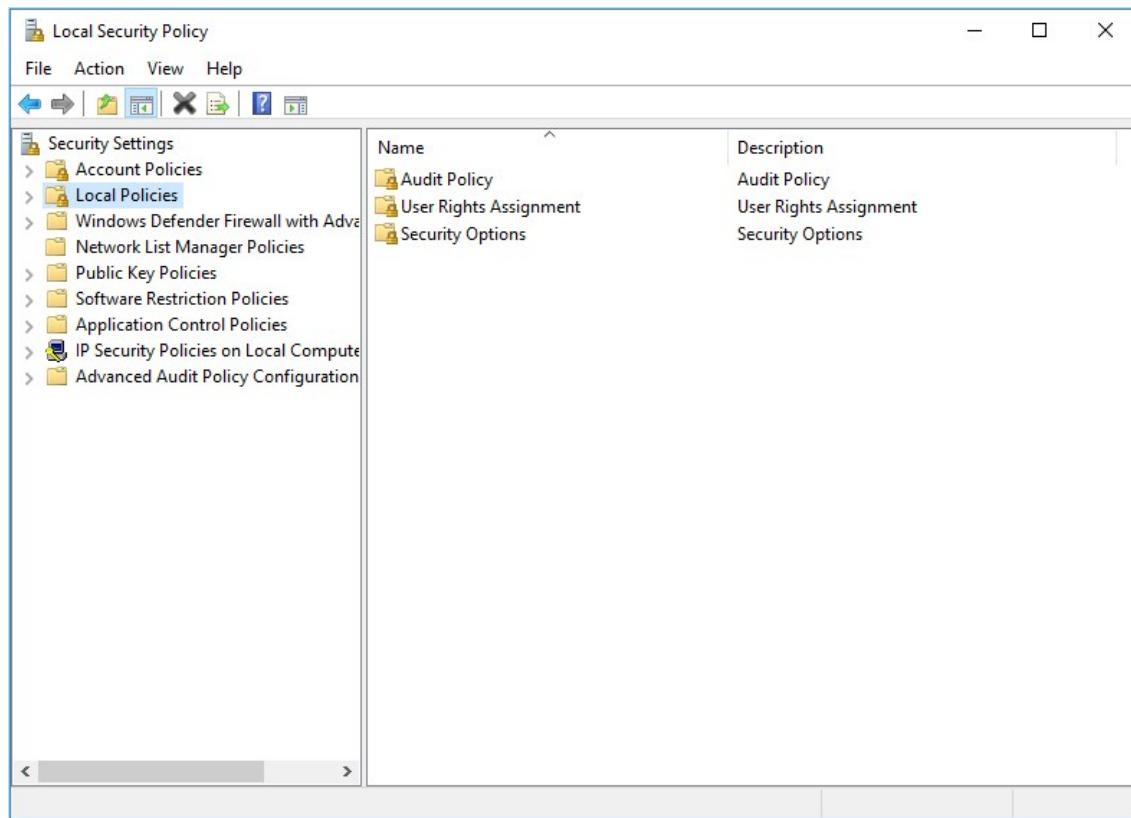
If you have an installed instance of Secret Server that does not meet this requirement, you can migrate the remote database to the server hosting Secret Server. If MS SQL Server is not installed and configured on the Secret Server, you must install it. The server must be configured with enough RAM, storage space, and processors to support running MS SQL Server and the Web site simultaneously. After copying the database, you can go to **Admin > Database** to point Secret Server to the new database location.

**Note:** Because the database must be installed locally with the Secret Server Web application for Common Criteria compliance, Secret Server is not fully compliant when running multiple nodes.

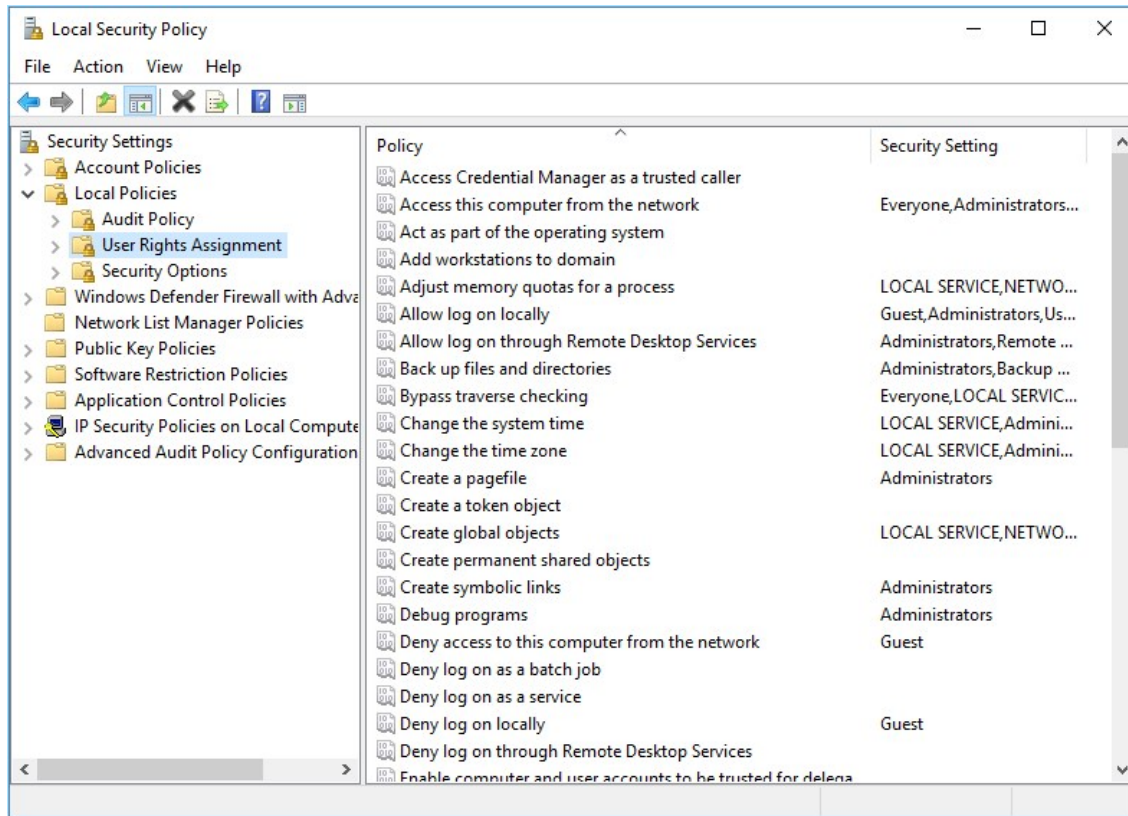
## Running the IIS Application Pool with a Service Account

To use Windows authentication to access the SQL database, you should create a service account. To run the Secret Server IIS Application Pool with a service account:

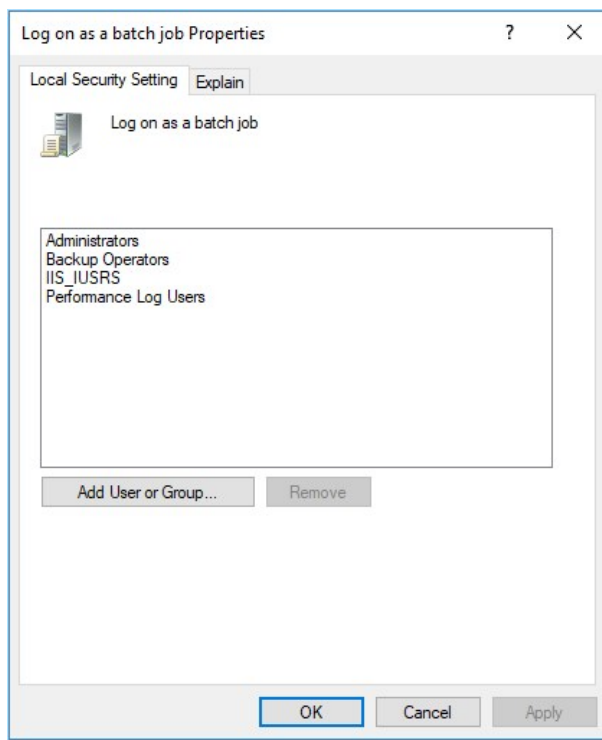
1. Open a command prompt window, change the directory to your .NET framework installation directory (usually C:\Windows\Microsoft.NET\Framework...) using the `cd` command.
2. Type `.\aspnet_regiis -ga <user_name>` and press **<Enter>**. The username is from the MS SQL Server user account.
3. Give your service account "modify" access to C:\Windows\TEMP.
4. Open the Local Security Policy App from your start menu.
5. Grant batch logon permissions to your service account:
  1. Open the Local Security Policy Console (search for and open `secpol.msc`):



1. Expand the **Local Policies** folder (not shown).
2. Click to select the **User Rights Assignment** folder.



- Right-click **Log on as a batch job** in the right panel and select **Properties**.



4. Click the **Add User or Group** button.
5. Add your service account.
6. Click the **OK** button.

**Note:** If you use group policy to enforce "Log on as a batch job" and have group-managed service accounts, that will overwrite any local permissions to "Log on as a batch job" on all computers that have the policy applied. Using the local security policy is a safer option if you are not sure about your usage across your domain.

5. Grant "Impersonate a client after authentication" permission to the service account under **User Rights Assignment** the same way "Log on as a batch job" was assigned above.
6. If you now get a "Service Unavailable" error after applying "Log on as a batch job" permissions:
  1. Update your group policy settings (**Start > Run > Cmd** and type `gpupdate /force`) and restart the Windows Process Activation service.

**Note:** For more information, see [Running the IIS Application Pool As a Service Account] (setup/installation/running-Secret-Server-iis-app-pool-service-account/index.md).

## Assigning Common Criteria Roles and Permissions

See the "Common Criterial Roles and Permissions" section of the Common Criteria Hardening Guide.

## Managing User Passwords

See the "Managing User Passwords" section of the [Common Criteria Hardening Guide](#).

## Configuring Secret Templates

To enable only the secret templates that are certified Common Criteria compliant and to set Common Criteria-compliant password policies on those templates, see the "Configuring Secret Templates" and "Configuring Password Policy for Secret Templates" sections of the [Common Criteria Hardening Guide](#).

## Setting Authentication Strength for Non-Password Credentials

See the "Authentication Strength for Non-Password Credentials" section of the [Common Criteria Hardening Guide](#).

## Configuring Remote Password Changing for SSH Key Rotation

See the "Configuring Remote Password Changing for SSH Key Rotation" section of the [Common Criteria Hardening Guide](#).

## Configuring External Auditing

### Connecting to an External Audit Server

To connect to an external syslog/CEF audit server, see the "Security—Connecting to an External Audit Server" and "Configuring Syslog/CEF External Audit Server" sections of the [Common Criteria Hardening Guide](#).

### Configuring Local Windows Event Log Auditing

See the "Configuring Local Windows Event Log Auditing" section of the [Common Criteria Hardening Guide](#).

## Introduction

Secret Server integrates with hardware security modules (HSMs). When Secret Server is configured to use an HSM, the Secret Server encryption key is protected by that HSM.

HSMs offer several security features that traditional servers cannot. Depending on the model and design of the HSM, most HSMs are designed to be physically tamper-proof. HSMs may also be independent hardware on a network, which allows physically placing the HSM in a more secure location that might otherwise be too inconvenient for a server.

To provide broad support for HSMs, Secret Server supports any HSM that can be configured with Microsoft's Cryptography Next Generation (CNG) provider. CNG is a layer provided by Windows Server 2008 and later that HSM manufacturers can interface with. If your HSM properly supports CNG and supports the right algorithms, Secret Server can use it.

**Note:** Turning off HSM (deselecting the check box) in Secret Server may cause a "Server connection unavailable" error. If this happens, a manual reset of the IIS server should take care of it.

**Note:** CNG provider installation and configuration varies from HSM to HSM; however, documentation is available from each HSM vendor on how to correctly install CNG providers.

## HSM Requirements

Each HSM must provide support for these algorithms through CNG:

- **RSA 4096:** Support for RSA with 4096-bit keys is required. The HSM must also support RSA for encryption and decryption, in addition to signing.
- **Padding Type:** The HSM must support one of the following for RSA encryption:
  - PKCS#1 v1.5 padding
  - OAEP padding

Additionally, closely follow the requirements and recommendations of the HSM vendor for things such as minimum latency, redundancy, and operating environment.

**Note:** Due to limitations of the account, the NETWORK SERVICE account is not supported as an account for the IIS Application Pool. We recommend configuring Secret Server's application pool as a service account. In the advanced settings for the application pool, set "Load User Profile" to true.

**Note:** Some HSM CNG provider's products interfere with each other. We recommend no more than one HSM CNG provider is configured on a Windows installation at a time.

## Silent HSM Operation

Because Secret Server is a Web application with no one physically present at the server at most times, Secret Server interacts with the HSM in "silent" mode. This prevents the HSM from attempting to interact with any users logged onto the server.

Some HSM features require interaction. If the HSM is configured in a way that requires interaction, Secret Server cannot communicate with the HSM and fails during the configuration steps.

For example, Operator Card Sets (OCS) in Thales network HSMs are such a configuration. If the Thales CNG provider is configured to use an OCS for key protection instead of module protection, someone must be physically present at the HSM and the server to insert their operator card when the key is needed. If the OCS quorum is more than a single card, Secret Server cannot interact with the HSM because it requires inserting and removing the OCS cards.

In that case, we recommend that Thales' CNG provider is configured to use module protection instead of an OCS. It is possible to use an OCS

with Secret Server if the quorum is exactly one card and the card is left in the HSM at all times.

Consult your HSM vendor and their documentation to ensure that the HSM and their CNG provider are able to operate in silent mode and are configured to do so.

## Configuring HSM Integration

To configure the HSM integration, go to the **Admin > Configuration** menu and click **Configuration**, then select the **HSM** tab. This starts the HSM wizard, which guides the process of selecting the HSM's CNG provider.

You can find the list of available CNG Providers by querying for the list of registered CNG providers. Each provider must correctly report that it is a "Hardware" provider, and that it is not a Smart Card reader. If an error occurs while querying the CNG provider for its properties, it will not appear in the list; however the error is reported to Secret Server's system log. If the desired CNG provider does not appear in the list of CNG providers, ensure that the provider is correctly registered and that IIS has been restarted after the CNG registration. Also check that an error is not occurring while querying the HSM by examining the system log.

Once the CNG providers are selected, Secret Server simulates encryption and decryption operations and verifies the results to check that it is functioning properly. Finally, Secret Server verifies the selected providers, and then enables HSM integration. Detailed steps are provided throughout the HSM configuration wizard.

## Rotating the HSM Key

If HSM is enabled, Secret Server can now rotate the HSM key to ensure the secret keys are always protected by an HSM key. Rotating the HSM key only decrypts the secret keys and then re-encrypts them with the new HSM key. We recommend performing a secret key rotation after the HSM key has been rotated.

To rotate the HSM key:

1. Navigate to **Admin > Configuration > HSM**.
2. Click the **Rotate HSM Key** button.
3. Make sure to back up the `encryption.config` file before proceeding.
4. Click the **Next** button.
5. Select the **HSM Persistent Provider**, **Key Size**, and **Padding Type**.
6. Click the **Next** button. This performs a test to ensure the HSM can be used.
7. Click the **Next** button.
8. Verify the new HSM configuration.
9. Click the **Save** button.
10. Click the **Finish** button.
11. Do an `IISReset` or application pool recycle. This starts the rotation.

## Securing HSM Integration

The wizard to enable, rotate, and disable HSM integration is protected by the "Administer HSM" role permission in Secret Server. The permission should be carefully assigned—if at all. Additionally, you can create an event subscription that sends alerts when the role permission is assigned or unassigned from a role.

Configuring the HSM also has its own event subscriptions for when the HSM integration is enabled, rotated, or disabled.



Additionally, you can add an application setting to Secret Server to prevent changes to HSM configuration. Enabling, rotating, and disabling this requires direct access to the file system where Secret Server is installed.

To enable this, edit the `web-appSettings.config` file within Secret Server to contain a key called **LockHsmConfiguration** with a value of **True** as follows:

```
<?xml version="1.0" encoding="utf-8" ?>
<appSettings>
  <add key="LockHsmConfiguration" value="True" />
</appSettings>
```

This prevents access to the HSM configuration pages, regardless of role permissions. The only way to gain access is to remove this setting, thus proving you, at a minimum, have access to the server where Secret Server is installed.

## HSM Redundancy

HSM redundancy varies from HSM to HSM. Please refer to the vendor's documentation on how to back up the HSM. Backups are typically either made to common file location, another HSM, or onto a smart card with the HSM's built-in smart card reader.

As long as the CNG provider is installed on the server and a key exists on the HSM with the same identifier, Secret Server attempts to use that key.

## Testing HSM CNG Configuration

Secret Server does its own testing and verification of the HSM and its CNG provider before the HSM integration can be enabled. To further diagnose any issues with the HSM, the **certutil** command line utility, which is part of Windows, can test the HSM with the **-csptest** option specified. An example output may contain something like this:

```
Provider Name: SafeNet Key Storage Provider

  Name: SafeNet Key Storage Provider
.....

Asymmetric Encryption Algorithms:

RSA

BCRYPT_ASYMMETRIC_ENCRYPTION_INTERFACE -- 3
NCRYPT_ASYMMETRIC_ENCRYPTION_OPERATION -- 4
NCRYPT_SIGNATURE_OPERATION -- 10 (16)

NcryptCreatePersistedKey(SafeNet Key Storage Provider, RSA)

  Name: cngtest-6166f8fe-8caf-4e30-8e5c-a-24575
.....

Pass
```

Examine the output of the test by looking for your CNG provider's name for your HSM and verifying the result. We recommend running this test using the same account as the application pool Secret Server is using. If the testing tool reports errors, consult your HSM's vendor or documentation for resolution.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

**Important Support Note: Rotating the master encryption key is a sensitive operation. While we have detailed the steps in this topic, we urge you to contact Support to work with a support representative before attempting any MEK rotation to ensure all pre-requisites have been met. Please provide at least a five-day notice in advance of when you want to conduct the rotation.**

## Overview

When Secret Server is first installed, a unique random AES256 Master Encryption Key (MEK) is generated and saved in a file, `encryption.config`. The MEK protects anything sensitive in Secret Server that is not associated with a specific secret, as well as each secret's unique AES256 key when an HSM is not used.

For added security, you can rotate the MEK, re-encrypting protected data with the new key.

**Note:** Geo-Replication, DPAPI, or an active secret key rotation must not be in effect when rotating the MEK.

MEK rotation fully supports using a Hardware Security Module (HSM) for Secret Server On-Premises or key management for Secret Server Cloud. This feature requires Enterprise Plus edition or the advanced encryption license. If you are using an HSM, disable it for your first MEK rotation. You can then re-enabled it, and you can run future MEK rotations without disabling it.

**Note:** If the rotation button is disabled then DPAPI also needs to be disabled, otherwise it will cause the process to fail. The DPAPI needs to be disabled on all nodes.

## Rotation Procedure

To perform a MEK rotation:

1. **Important:** For Secret Server on Premises, back up the current MEK file `encryption.config` in the application directory **on each node**.

**Warning:** Do not continue until you back up your encryption key. Failure to do so could cause extensive **permanent data loss**.

**Important:** For Secret Server on Premises, if this is the first MEK rotation, also backup any encrypted session recording videos saved to disk. They are only updated during the very first MEK rotation. Failure to do so could cause extensive **permanent data loss**.

2. **Important:** For Secret Server on Premises, back up your database. See the first task on the [Moving the Microsoft SQL Server Database to Another Machine](#) topic for details.

**Warning:** Do not continue until you back up your database. Failure to do so could cause extensive **permanent data loss**.

3. Go to **Admin > Configuration > Security**. The Configuration page appears:

## Configuration

[General](#)
[Login](#)
[SAML](#)
[Folders](#)
[Local User Passwords](#)
[Security](#)
[Ticket System](#)

### APPLICATION SETTINGS

Allow Automatic Checks for Software Updates	Yes
Early Adopter	No
<a href="#">Anonymized System Metrics Information</a>	
Send Anonymized System Metrics to Thycotic	No <a href="#">View Metric Data</a>

- Click the **Security** tab.
- Go to the **Master Encryption Key Rotation** section (*not* the Key Rotation section):

### MASTER ENCRYPTION KEY ROTATION

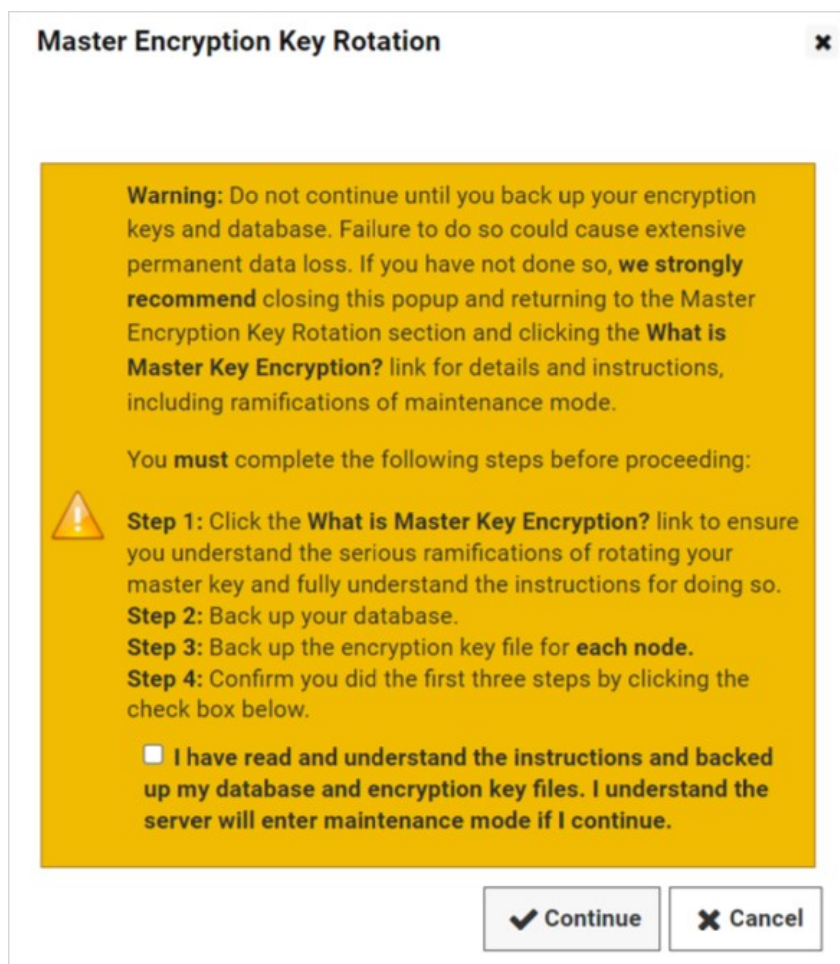
[What is Master Encryption key rotation?](#)

Last Master Encryption Key Rotation	Never
Last Master Encryption Key Rotation Status	Never Run

 Rotate Encryption Keys

 Logs

- Click the **Rotate Encryption Keys** button. The Master Encryption Key Rotation popup appears:



7. Carefully read the text, especially for the check box itself.
8. When you are finished, click to select the check box to acknowledge having read it.
9. Click the **Continue** button. The server goes into maintenance mode to perform MEK rotation. Secrets and configuration settings cannot be updated while in maintenance mode. Secrets cannot be updated while in this mode. Processing time will vary, depending on the hardware, number of secrets, and HSM key size.
10. The rotation begins.
11. Secret Server updates the `encryption.config` file on the current server. The file now contains the new MEK, as well as the previous MEK, which is needed to re-encrypt all of the data. The `encryption.config` file is only updated on the node you are connected to when you click the **Rotate Encryption Keys** button, so, depending on whether you have clustered servers, pick one of the following procedures:

If you are *not* running a cluster of On-Premises servers:

1. When prompted to restart the IIS application, run `iisreset` to stop and restart the IIS server.
2. Open Secret Server to restart it.

If you are running a cluster of On-Premises servers:

1. When prompted to restart the IIS server, run command `iisreset /stop` on all nodes in an elevated command prompt. This stops but does not restart IIS on the nodes.

2. Copy the `encryption.config` file from the updated node to all other nodes.

**Note:** If you are not sure which node performed the rotation, check the "modified time" of the `encryption.config` files.

3. Run `iisreset /start` on all nodes. This restarts IIS on the nodes.
4. Open Secret Server to restart it. The first Secret Server node you run continues the rotation process.
12. The new MEK takes effect, and any *new* records encrypted use the new key. Any data still using the old key continues to work until the rotation fully finishes.
13. Secret Server's background worker (Secret Server-BWSR.log) enables maintenance mode, preventing changes to secrets and other configuration settings, and continues the rotation process.
14. Secret Server marks the data needing an update in the database and begins rotating everything. A progress bar appears on the **Security** tab.
15. After all data is rotated except for session recording videos, maintenance mode is disabled.
16. Secret Server's session recording role (Secret Server-SRWSR.log) starts rotating any existing session recording videos encrypted by the MEK. The **Last Master Encryption Key Rotation Status** text changes to **Pending - Encrypting Session Data**. Depending on the number of videos, this may take some time. This only applies to the first MEK rotation—further rotations do not update the recordings again.
17. Once the process finishes, the **Last Master Encryption Key Rotation Status** text changes to **Completed - Master Encryption Keys Rotated**.

**Important:** Because we only track the current and previous MEK, the MEK rotation must be fully successful before you can run another one. A Retry button appears if the process times out or needs restarting. Monitor the rotation status and contact support if it fails to complete. Failure to do so could cause extensive **permanent data loss**.

## Overview

There are 3 reasons for Delinea products to call home—when:

- Checking for available updates
- Activating licenses
- Reporting anonymized usage metrics

Each of these communications is explained below and can be disabled or avoided.

## Checking for and Downloading Updates

Frequency: Once per day

The software checks for available updates and sends the following information to Delinea's update server:

- .NET Framework version
- IP address of the installed instance
- Microsoft SQL Server version
- Microsoft Windows version
- Product version

Checking for updates and sending this information will only occur if both of the following are true:

- The server has outbound network access, which you can block at a firewall.
- The "Allow Automatic Checks for Software Updates" check box is enabled at Admin > Configuration (see below).

No sensitive data is sent during the check. Its only purpose is to alert administrators if a software update is available. The queried website is also used to download new software versions during the upgrade process. If you wish to allowlist the specific servers involved, they are:

- d36zgw9sidnotm.cloudfront.net:443
- updates.thycotic.net:443
- updates.thycotic.net:80
- tmsnuget.thycotic.com/nuget/

## License Activation

Frequency: when a new license is activated.

The software also sends contact and license-key information, provided by the administrator, to Delinea during online license activation. The same information is sent via another computer for offline activation.

## Reporting Anonymized Usage Metrics

**Note:** This section only applies to Secret Server and Secret Server Cloud versions 10.6 and above.

Delinea collects anonymized usage data to help guide future research and development plans so that product improvements can provide the greatest benefit to customers.

Frequency: Once per day

Secret Server returns anonymized metrics across several categories:

- A unique identifier number that allows Delinea to correlate metrics from the same server over time but does not contain any information that identifies the customer.
- License information, including edition information and the number of licensed users but not license keys or other identifying data.
- Product configuration and usage, such as number of secrets stored and product feature status, not including any identifying data.
- Product environment, including host operating system and SQL server version, not including any identifying data.

Reporting of anonymized metrics only occurs if:

- The server has outbound network access (you can block your server at a firewall if desired)
- The "Send Anonymized System Metrics to Delinea" setting under Admin > Configuration is enabled (see below).

You can allow for the metrics reporting on your firewall by allowlisting: <https://telemetry.thycotic.net:443>.

## Setting and Viewing Secret Server Telemetry

To set or view telemetry:

1. Click **Admin > Configuration**. The Configuration page on the General tab appears:

The screenshot shows the 'Configuration' page with the 'General' tab selected. The 'Application Settings' section is expanded, displaying various configuration options and their values.

Application Settings	
Allow Automatic Checks for Software Updates	Yes
<a href="#">Anonymized System Metrics Information</a>	
Send Anonymized System Metrics to Thycotic	No <a href="#">View Metric Data</a>
<a href="#">View Webservices</a>	
Enable Webservices	Yes
Maximum Time for Offline Access on Mobile Devices	30 days
Session Timeout for Webservices	20 minutes
Prevent Application from Sleeping When Idle	Yes
<a href="#">Syslog/CEF Logging Advanced Settings Information</a>	
Enable Syslog/CEF Logging	Yes
Syslog/CEF Server	
Syslog/CEF Port	
Syslog/CEF Protocol	UDP
Syslog/CEF Time Zone	UTC Time
Syslog/CEF Site	Local
Write Syslogs As Windows Events	Yes
<a href="#">Test PowerShell with WinRM</a>	
WinRM Endpoint URL	http://localhost:5985/wsman
<a href="#">How do I configure CredSSP for WinRM?</a>	
Enable CredSSP Authentication for WinRM	Yes

2. (Optional) To view the JSON file for the possible sent metrics, click the **View Metric Data** link. The file appears:

```
{
  "identifier": "cef588896e3e9718d59ccdd0f9e77568",
  "licenses": [],
  "features": [
    {
      "name": "Remote Password Changing",
      "enabled": true,
      "count": 0,
      "countDescription": "Secrets with AutoChange enabled"
    },
    {
      "name": "Heartbeat",
      "enabled": true,
      "count": 614,
      "countDescription": "Secrets with Heartbeat enabled"
    },
    {
      "name": "Checkout",
      "enabled": true,
      "count": 5,
      "countDescription": "Secrets with Checkout enabled"
    },
    {
      "name": "Checkout Change Password",
      "enabled": false,
      "count": 0,
      "countDescription": "Secrets with Checkout change password enabled"
    },
    {
      "name": "DoubleLock",
      "enabled": true,
      "count": 0,
      "countDescription": "Secrets with DoubleLock enabled"
    },
    {
      "name": "Request Access",
      "enabled": true,
      "count": 104,
      "countDescription": "Secrets with Request Access enabled"
    },
    {
      "name": "Request Access Editors need approval",
      "enabled": true,

```

3. Scroll down and click the **Edit** button. The tab changes to edit mode:

The screenshot shows the 'General' tab of the 'Application Settings' dialog. The 'Send Anonymized System Metrics to Thycotic' checkbox is currently unchecked. Below it, there are fields for 'Maximum Time for Offline Access on Mobile Devices' set to 30 days and 0 hours. Other settings like 'Allow Automatic Checks for Software Updates' and 'Enable Webservice' are checked.

4. Click to select or deselect the **Send Anonymized System Metrics to Delinea** check box.

5. Click the **Save** button.



To secure your ASP session and forms authentication cookies, perform the following steps:

1. Ensure that there is an SSL certificate installed for the instance.
2. Log in to Secret Server using HTTPS.
3. Navigate to the **Admin > Configuration** page
4. Click on the **Security** tab.
5. Click the **Edit** button
6. Check the **Force HTTPS/SSL** check box
7. Click the **Save** button.
8. Open the `web-cookie.config` file in the application installation folder.
9. Set `requireSSL` to `true`.  
Save and Close the file.
10. Open the `web-auth.config` file in the application installation folder.
11. Set `requireSSL` to `true` . If the attribute does not exist, add it to the `forms` tag.  
Save and Close the file.
12. Recycle the Secret Server's application pool.

**Important:** If you later migrate Secret Server to a new server, SSL must be configured on the new server before you can log in due to these settings. If you want to log in prior to configuring SSL, reverse steps 8 through 13 and recycle the application pool.

This is a list of items that IIS admin can implement to secure the IIS Web server for additional Secret Server hardening.

## Accounts

- Remove unused accounts from the server.
- Disable the Windows Guest account.
- Rename the Administrator account.
- Ensure the Administrator account has a strong password.
- Ensure the IUSR\_MACHINE account is disabled if it is not used by the application.
- If your applications require anonymous access, create a custom least-privileged anonymous account. Ensure the anonymous account does not have write access to Web content directories and cannot execute command-line tools.
- Ensure the ASP.NET process account is configured for least privilege. This only applies if you are not using the default ASPNET account, which is a least-privileged account.
- Ensure strong account and password policies are enforced for the server.
- Restrict remote logons—the "Access this computer from the network" user-right is removed from the Everyone group.
- Disable null sessions (anonymous logons).
- Ensure no more than two accounts are in the Administrators group.

## Auditing and Logging

- Audit failed logon attempts.
- Relocate and secure IIS log files.
- Configure log files with an appropriate size, depending on the application security requirement.
- Regularly archive and analyze log files.
- Audit access to the Metabase.bin file.
- Configure IIS to use the W3C extended log file format for auditing.

## Code Access Security

- Enable code access security on the server.
- Remove all permissions from the local intranet zone.
- Remove all permissions from the Internet zone.

## Files and Directories

- Ensure files and directories are contained on NTFS volumes.
- Ensure Web site content is located on a non-system NTFS volume.
- Ensure log files are located on a non-system NTFS volume and not on the same volume where the Web site content resides.
- Ensure the Everyone group is restricted (no access to \Windows\system32 or Web directories).
- Ensure the website root directory has deny write ACE for anonymous Internet accounts.
- Ensure content directories have deny write ACE for anonymous Internet accounts.
- Remove the Remote IIS administration application.
- Remove the Resource Kit tools, utilities, and SDKs.

## IIS Metabase

- Use NTFS permissions to restrict access to the metabase (%systemroot%\system32\inet\_srv\metabase.bin).
- Ensure IIS banner information is restricted (IP address in content location is disabled).

## ISAPI Filters

Ensure unnecessary or unused ISAPI filters are removed from the server.

## Machine.config

- Ensure protected resources are mapped to HttpForbiddenHandler.
- Remove unused HttpModules.
- Ensure tracing is disabled: `<trace enable="false"/>`.
- Ensure debug compiles are turned off: `<compilation debug="false" explicit="true" defaultLanguage="vb">`

## Patches and Updates

- Run Microsoft Baseline Security Analyzer on a regular interval to check for latest operating system and components updates, including Windows, IIS server, and the .NET Framework.
- Test updates on development servers prior to deployment on production servers.
- Check the Microsoft Security Notification Service at [docs.microsoft.com](https://docs.microsoft.com) on a regular interval for up-to-date Microsoft technical security notifications.

## Ports

- Ensure Internet-facing interfaces are restricted to port 80 (and 443 if SSL is used).
- Ensure Intranet traffic is encrypted (for example, with SSL) or restricted.

## Protocols

- Disable WebDAV if not used by the application or secure it if it is required.
- Harden the TCP/IP stack.
- Ensure NetBIOS and SMB are disabled if not used (closes ports 137, 138, 139, and 445).

## Registry

- Restrict remote registry access.
- Secure SAM (HKLM\System\CurrentControlSet\Control\LSA\NoLMHash).

## Script Mappings

- Ensure extensions not used by the application are mapped to 404.dll, including .idq, .htw, .ida, .shtml, .shtm, .stm, .idc, .htr, and .printer.
- Ensure unnecessary ASP.NET file type extensions are mapped to HttpForbiddenHandler in Machine.config.

## Server Certificates

- Ensure certificate date ranges are valid.
- Ensure certificates are used for their intended purpose (for example, the server certificate is not used for e-mail).
- Ensure the certificate's public key is valid, all the way to a trusted root authority.
- Ensure the certificate is SHA 256 or better.

## Services

- Disable unnecessary Windows services.
- Ensure services are running with least-privileged accounts.
- You can disable FTP, SMTP, and NNTP services if they are not required.
- Ensure the Telnet service is disabled.
- Ensure the ASP.NET state service is disabled and is not used by your applications.

## Shares

- Ensure all unnecessary shares are removed (including default administration shares).
- Restrict access to required shares (the Everyone group does not have access).
- Remove administrative shares (C\$ and Admin\$) if they are not required.

## Sites and Virtual Directories

- Ensure Web sites are located on a non-system partition.
- Ensure the "Parent paths" setting is disabled.
- Remove potentially dangerous virtual directories, including IISSamples, IISAdmin, IISHelp, and Scripts.
- Remove or secure MSADC virtual directory (RDS).
- Ensure include directories do not have the "Read Web" permission.
- Restrict Write and Execute Web permissions for the anonymous account on virtual directories that allow anonymous access.
- Ensure there is script source access only on folders that support content authoring.
- Ensure there is write access only on folders that support content authoring and these folder are configured for authentication (and SSL encryption, if required).
- Remove FrontPage Server Extensions (FPSE) if not used. If they are used, ensure they are updated and access to FPSE is restricted.

## Other Considerations

- Ensure server remote administration is secured and configured for encryption, low session time-outs, and account lockouts. Ensure HTTP requests are filtered.
- Use a dedicated machine as a Web server.
- Physically protect the Web server machine in a secure machine room.
- Configure a separate anonymous user account for each application, if you host multiple Web applications.
- Do not install the IIS server on a domain controller.
- Do not connect an IIS Server to the Internet until it is fully hardened.
- Do not allow anyone except the administrator to locally log on to the machine.

## Hiding HTTP Header Information

Web applications, such as Secret Server, can leak information useful to attackers via headers, error messages, version numbers, and more. To hide HTTP header information in Secret Server, follow the procedures below.

### Hide the IIS Version

To hide the version of IIS used on the server, remove the HTTP header *X-Powered-By* by following the steps below:

1. Open the IIS Manager.
2. In the Connections tree, select the website that Secret Server is running under.
3. Click the **HTTP Response Headers** button on the right. The HTTP Response Headers panel appears.
4. Click to select the **X-Powered-By HTTP** header.
5. Click the **Remove** button in the **Actions** panel.

### Hide the ASP.NET Version

To hide the version of ASP.NET used by the Secret Server application pool, remove the HTTP header *X-ASPNET-VERSION* by following the steps below:

1. Open the `web.config` file for Secret Server, which is located in the root directory for the website.
2. Inside the `<system.web>` tag, add the tag `<httpRuntime enableVersionHeader="false"/>`.
3. Save the file.

### Hide the Server Type

To hide the server type, remove the line, `Server: Microsoft-HTTPAPI/2.0` (added by the .NET framework) from the HTTP header using the procedure below:

**Note:** Although there are other methods for hiding the server type, we strongly recommend updating the Windows registry using the procedure below. Do not simply remove the server header variable. Doing so will cause parts of Secret Server to malfunction.

1. Navigate to **Computer > HKEY\_LOCAL\_MACHINE > SYSTEM > CurrentControlSet > Services > HTTP > Parameters**.
2. Change the **DisableServerHeader** (REG\_DWORD type) registry key from 0 to 1.

## Introduction

This document outlines security hardening for securing your Secret Server instance, whether it be installed on a single server or in a multi-clustered environment.

**Note:** Throughout this guide, many references are made to "configuration" settings. Unless otherwise specified, this refers to the settings found by selecting **Configuration** from the **Admin** menu in Secret Server.

## Overview

It is critical to secure your Secret Server implementation. That needs to include a layered approach to security (defense in depth), including the operating system, software updates, physical access, protocols, system settings, backups, and personnel procedures. This section of the guide links to other sections and knowledge base articles (KBAs) containing more details.

## Best Practices

### General

- **Keep Windows up-to-date:** Microsoft regularly releases security patches that resolve vulnerabilities in Windows operating systems.
- **Backup at least daily:** Consider your disaster recovery plan. Review the [Business Continuity and Disaster Recovery Planning](#) KBA for more information.
- **Review system log for errors:** Periodically check the system log (Admin > System Log) for recurring errors. Also do so after any upgrades.
- **Whole-disk encryption:** Use whole disk encryption, such as [BitLocker](#), with a trusted platform module (TPM) to prevent those with physical access from removing disks to gain access to your Secret Server application by circumventing OS and application authentication.
- **Security Hardening Standards:** Consider security hardening standards that apply to either the operating system or applications, such as IIS or Microsoft SQL. Secret Server is compatible with CIS Level 1 and CIS Level 2 hardening and has STIG compatibility.

**Note:** Attaining full security-hardening standards compatibility is a Delinea priority.

### Active Directory

On Active Directory domain controllers, there is a set of unsafe default configurations for LDAP channel binding that allow LDAP clients to communicate with them without ensuring LDAP channel binding and LDAP signing. This can open the controllers to privilege vulnerabilities. See [2020 LDAP channel binding and LDAP signing requirements for Windows](#) for details.

### Database

- **Limit access to your Secret Server database:** When you create your Secret Server database, limit access to as few users as possible. We recommend you disable the "sa" account in the SQL instance that contains Secret Server.
- **Limit access to other databases:** When you create a database account for SS, you should ensure it only has access to the Secret Server database.
- **Use Windows Authentication for database access:** Windows authentication is much more secure than SQL authentication. See [Choose an Authentication Mode](#) (TechNet article) for details. To use Windows authentication in SS, you need to create a service account. See the [Using Windows Authentication to access SQL Server](#) for details.
- **Limit access to your database backups:** Database backups are critical for disaster recovery, but they also carry a risk if

someone gains access. The Secret Server database is encrypted, but you should still limit access to ensure maximum security. Limit access to database backups to as few users as possible.

- **Don't share a SQL instance with less secure databases:** Putting the database on a server with less-secure database instances can expose vulnerabilities. For example, an attacker could use SQL injection on another application to access your private Secret Server database. If you intend to put Secret Server on a shared SQL instance, ensure that the other databases are classified internally as sensitive as Secret Server and have similar security controls in place.
- **Review Microsoft's recommendations for SQL security:** See the [Securing SQL Server](#) article in Microsoft's documentation.

**Note:** Secret Server also supports SQL Server Transparent Data Encryption (TDE) for further protection of the database files. This can have a slight performance impact on the environment and can increase the complexity of the database configuration. Please review this page for more information: [Transparent Data Encryption \(TDE\)](#).

## Application Server

- **Use SSL (HTTPS):** We require using Secure Sockets Layer (SSL) encryption to ensure that all communication between the Web browser and Secret Server is secure. We recommend you install a third-party certificate, domain certificate, or self-signed certificate on your website. For information on creating and installing a self-signed certificate, please see the [Installing a Self-Signed SSL/HTTPS Certificate](#) KBA.
- **Force SSL (HTTPS):** Even after you install an SSL certificate, users may still be able to access Secret Server through regular HTTP. To that, enable the "Force HTTPS/SSL" option in Secret Server at Admin > Configuration on the **Security** tab.
- **Limit access to your Secret Server directory.** This contains the Secret Server encryption key, as well as the database connection information (these values are encrypted but remember "defense in depth." Try to grant access to as few users as possible).
- **Limit logon rights to the application server.** Administrators accessing the Application Server directly could attempt to monitor memory in use on the server. Secret Server does several things to protect application memory but the best safeguard is to limit access to the Application Server to as few users as possible.
- **Protect your encryption key.** The encryption key for Secret Server is contained in the encryption.config file, which resides in your Secret Server directory. This file is obfuscated and encrypted, but "defense in depth" would require limiting access to the file. [Using DPAPI to encrypt your encryption.config file](#) is one option. This will use machine-specific encryption to encrypt the file. Make sure you back up the original file before enabling this option. To further protect the file, you can enable EFS encryption. EFS (Encrypting File System) is a Microsoft technology that allows a user or service account to encrypt files with login passwords. For more details, read [Protecting Your Encryption Key Using EFS](#) in this same article. The most secure option is to use a Hardware Security Module (HSM) to protect the Secret Server encryption key. For more information see the [HSM Integration Guide](#).

## Application Settings

- **Use doublelock for your most sensitive secrets:** DoubleLock is a feature in Secret Server that allows secrets to be protected with additional AES256 encryption keys. Each user gets their own public and private key set when using doublelock. Their private key is protected by an additional password (user-specific, not a shared password) that each user must enter when using doublelock. DoubleLock protects from situations where you accidentally assign someone to the wrong AD group or an attacker gains full access to both your database and Web server - they still will not be able to access doublelocked secrets. For more information, refer to [Using DoubleLock](#).
- **Secure the local admin account:** When you create the first user in SS, it is a privileged admin account that you can use when your domain is down. We recommend that you choose a non-obvious name for this account and protect it with a very strong password. This password should be stored in a physical safe with limited access (there is no need to use this account except in emergencies where other accounts are not working if AD is down or some other reason).
- **Review activity reports:** It is a good practice to regularly review the activity and permissions reports. This can help find anomalies in secret permissions and login failures.
- **Use event subscriptions or SIEM to notify of any security anomalies:** Use event subscriptions to send email alerts on various events in the system, and syslog can send events to a SIEM tool for correlation. For example, this could be used to notify administrators if there are failed login attempts or if certain secrets are viewed.

## Security Hardening Report

Secret Server contains a built-in security hardening report to provide a basic checklist of recommendations that can improve the security of Secret Server and the data it houses. The items in this report range from common tasks, such as ensuring SSL is configured, to more advanced options like DPAPI encryption of the encryption key. To find this report, click the **Reports** on the dashboard, and then select the **Security Hardening** tab.

**Figure:** Security Hardening Report:

**Reports > Security Hardening**

General **Security Hardening** User Audit View Audit

**Configuration**

Secret Server's built-in security hardening report provides a basic checklist of recommendations that can improve the security of Secret Server and the data it houses. General security configuration settings make the most of available configuration settings inside Secret Server.

See "configuration" in the [Secret Server Security Hardening Guide](#)

	<b>Allow Approval For Access from Email</b> <a href="#">Explain</a>		<b>Browser AutoComplete</b> <a href="#">Explain</a>
	<b>File Attachment Restrictions</b> <a href="#">Explain</a>		<b>Force Password Masking</b> <a href="#">Explain</a>
	<b>Frame Blocking</b> <a href="#">Explain</a>		<b>Login Password Requirements</b> <a href="#">Explain</a>
	<b>Maximum Login Failures</b> <a href="#">Explain</a>		<b>Remember Me</b> <a href="#">Explain</a>
	<b>Secure Session and Forms Auth Cookies</b> <a href="#">Explain</a>		<b>Web Service Http Gets Allowed</b> <a href="#">Explain</a>
	<b>Zero Information Disclosure Error Message</b> <a href="#">Explain</a>		

**Database**

	<b>SQL Account Using Least</b>		<b>SQL Server Authentication</b>
--	--------------------------------	--	----------------------------------

An X denotes a failure, and a checkmark denotes a pass. An exclamation point is a warning. Typically, Secret Server could not detect a setting or all aspects of a check were not completed. For example, TLS 1.0 was disabled but TLS 1.1 was not.

You will find the following items in the report:

**Note:** The individual items below are in alphabetical order, not the order they are in the Hardening Report. The sections are in the same order as the report. This was because the report name does not always match the name of the corresponding label on the configuration UI control. In addition, the controls are not in the same order in the UI as their equivalents in the report.

## Configuration Section

### Allow Approval for Access from Email

Recommendation: Off

Allow Approval For Access from Email is a convenience option that allows users to approve or deny a secret access request by clicking a link



in the request email sent by Secret Server. Allow Approval From Email does not require a user to authenticate with Secret Server when approving access to a secret. This can be a security concern if the approver's email account becomes compromised, which could allow an attacker to mitigate MFA in some cases to complete an approval. Turn Allow Approval From Email off to get a pass result.

To disable this setting, find the **Permission Options** section of the **Configuration Settings** page and disable **Allow Approval for Access from Email**.

## File Attachment Restrictions

Recommendation: On

**Note:** Labeled **Enable File Restrictions** in the UI.

File attachment restrictions allows administrators to configure what kind of file attachments can be uploaded to secrets. This helps protect users from being tricked into downloading a malicious secret attachment. The file extension and maximum file size can be specified, such as:

\*.7z, \*.bmp, \*.ca-bundle, \*.cer, \*.config, \*.crt, \*.csr, \*.csv, \*.dat, \*.doc, \*.docx, \*.gif, \*.gz, \*.id-rsa, \*.jpeg, \*.jpg, \*.json, \*.key, \*.lic, \*.p7b, \*.pcf, \*.pdf, \*.pem, \*.pfx, \*.pkey, \*.png, \*.ppk, \*.pub, \*.tar, \*.tif, \*.tiff, \*.tpm, \*.txt, \*.vdx, \*.vsd, \*.vsdx, \*.xls, \*.xlsx, \*.xml, \*.zip

This security check will fail if the file attachment restrictions is not enabled. This check will return warnings if a potentially dangerous file extension is allowed, maximum file size is not specified, or maximum file size is greater than 30 MB.

Go to **Admin > Configuration > Security tab > File Restrictions section** to change these settings.

## Frame Blocking

Recommendation: On

**Note:** Labeled **Enable Frame Blocking** in the UI.

Do not allow Secret Server to be opened in a <iframe> HTML tag on another, potentially malicious, site. This adds the HTTP header X-Frame-Options: DENY. This deters clickjacking and spreading potential XSS vulnerabilities.

Go to **Admin > Configuration > Frame Blocking** to change this setting.

## Force Password Masking

Recommendation: On

Setting: Same

Password masking prevents over the shoulder viewing of your passwords by a casual observer (passwords show as \*\*\*\*\*). Note the number of asterisks does not relate to the length of the password for added security.

As an administrator, you can force all the secret password fields in the system to be masked when viewed. To do this, enable **Force Password Masking** on the **Configuration Settings** page. Only secret fields marked as a password type field on the secret template will be masked. There is also a user preference setting which will force password masking on all secret password fields viewed by the user.

This **Mask passwords when viewing Secrets** setting is found in the **Tools > Preferences** section for each user.

**Note:** If the "Force Password Masking" configuration setting discussed above is enabled, this user preference setting will be overridden and cannot be disabled.

## Login Password Requirements

Passwords used by local users to log onto Secret Server can be strengthened by requiring a minimum length and using a variety of character

sets. We recommend a minimum password length of eight characters. In addition, all character sets (lowercase, uppercase, numbers, and symbols) are required to get a pass result.

Turn on these login password settings on the **Local User Passwords** tab of the **Configuration Settings** page.

## Maximum Login Failures

Recommendation: Reference the lockout policy for your organization. Most often, this setting will mirror the AD GPO lockout policy.

The maximum number of login failures is the number of attempts that can be made to log into Secret Server as a user before that user's account is locked. A user with the administer users role permission will then be required to unlock the user's account. The maximum failures allowed should be set to five or less to get a pass result.

Change the **Maximum Login Failures** setting on the **Login** tab of the **Configuration** settings.

## Remember Me

Recommendation: Off

**Note:** Labeled **Allow Remember Me** in the UI.

"Remember Me" is a convenience option that allows users to remain logged onto Secret Server for up to a specific period. This setting can be a security concern because it does not require re-entry of credentials to gain access to Secret Server.

Disable **Allow Remember Me** on the **Login** tab of the **Configuration** page to get a pass result. It must be set to be valid for 1 day or less to not get a fail result.

**Note:** Closing a browser completely (all tabs) will log the user out of Secret Server, regardless of this setting.

## Secure Session and Forms Auth Cookies

**Note:** Secure Session and Forms *Authentication* Cookies.

Recommendation: See KBA

Cookies contain potentially sensitive information that can allow users to log onto application. By default, cookies are not marked with the secure attribute. That is, **they are transmitted unencrypted when a user accesses Secret Server through HTTP instead of HTTPS**.

For more information about how to secure your cookies, see [Secure ASP Session and Forms Authentication Cookies](#).

## Markdig.Syntax.Inlines.EmphasisInline

**Note:** Labeled **Allow HTTP Get** in the UI.

Recommendation: Off

Web service HTTP get requests are allowed. Allowing HTTP GET requests allows REST-style calls to many Secret Server Web service methods. This can be a security concern because simply clicking a link to the Web service, created by a malicious user, would cause it to be executed.

Disable **Allow HTTP Get** under the **Security** tab of the **Configuration** settings to pass.

## Zero Information Disclosure Error Message

Recommendation: On

Replace all error messages with a custom "contact your admin" message. Error messages can be very helpful when diagnosing installation and configuration issues. However, having errors displayed to a potential attacker can provide him or her with the critical information they need to perform a successful attack.

To hide error messages from the end user, add the `ZeroInformationDisclosureMessage` application setting to the `web-appSettings.config` file. This file is located in directory containing the Secret Server application files. Add the key below to this file in between the `<appSettings>` tags. The contents of that tag is displayed as a message that appears to the user whenever an error occurs in the system. For example:

```
<add key="ZeroInformationDisclosureMessage" value="An error occurred in the application. Please contact your administrator." />
```

**Note:** This setting is enabled by default in Secret Server 10.7.26+.

## Database Section

### SQL Account Using Least Permissions

Use the fewest Secret Server permissions as possible in the SQL Account used to access the database. We recommend using a least permission approach where the account only has `dbOwner`. See [Installing and Configuring SQL Server](#).

### SQL Server Authentication Password Strength and Username

**Note:** This section addresses two separate but closely related settings: "SQL Server Authentication Password Strength" and "SQL Server Authentication Username."

Recommendation: Change settings as needed

SQL Server authentication requires a username and a strong password. Strong passwords are eight characters or longer and contain lowercase and uppercase letters, numbers, and symbols. In addition, the SQL Server authentication username should not be obvious.

You can change the credentials of a local SQL account through SQL Server Management Studio, where the Secret Server database is located. The SQL Server authentication credentials used by the application can then be changed by going to the installer `installer.aspx` page and changing them on step three. Using Windows authentication to authenticate to SQL Server is allowed.

For details about creating or modifying a SQL account for Secret Server, see the [Installation Guide](#).

### Windows Authentication to Database

Recommendation: Configure

**Note:** If the SQL instance is *solely* using Windows authentication, this check will pass. If using mixed mode, it will fail—even you are using both Windows authentication plus SQL authentication.

Windows authentication takes advantage of Windows security to provide secure authentication to SQL Server. The SQL Server authentication options can be changed by going to the installer (`installer.aspx`) and changing them.

**Note:** See the [Installation Guide](#) for instructions on configuring Windows authentication to SQL Server.

## Environment Section

### Application Pool Identity

Recommendation: Check configuration

The Application Pool identity appears to be a member of the administrators group on the system. This puts the system at risk by giving more access than necessary.

Check the identity of the application pool used by Secret Server in IIS. The Application Pool should be configured to use a service account and not be given unrestricted access to the server or domain.

## DPAPI or HSM Encryption of Encryption Key

Recommendation: On

Encrypt your Secret Server encryption key, and limit decryption to that same server. Data Protection API (DPAPI) is an encryption library that is built into Windows operating systems. It allows encryption of data and configuration files based on the machine key. Enabling DPAPI Encryption in Secret Server protects the Secret Server encryption key by using DPAPI, so even getting access to the Secret Server encryption key is not enough to be useful—the machine key is required. If you enable this option, back up your encryption key first, as a DPAPI encrypted file can only be used by the machine it was encrypted on.

To enable DPAPI encryption, go to **Admin > Configuration > Security tab** and click the **Encrypt Key Using DPAPI** button.

**Note:** This check also passes if Hardware Security Module (HSM) integration is enabled.

## SSL Section

### Require SMTP SSL

Recommendation: On

**Note:** Labeled **Use SSL** (on the Email tab) in the UI.

**Note:** We strongly recommend enabling this setting.

SMTP SSL is required to ensure that all communication between Secret Server and the email server is encrypted. Enable the "Use SSL" option in Secret Server to get a pass result.

Go to **Admin > Configuration > Email tab > Use SSL** to enable the setting.

### Require SSL

**Note:** Labeled **Force HTTPS/SSL** in the UI.

Recommendation: On

**Note:** We **strongly** recommend using SSL for Secret Server.

Only use SSL (HTTPS) for Secret Server access. Secure Sockets Layer (SSL) is required to ensure that all communication between the Web browser and Secret Server is encrypted. To do so, you need an SSL certificate. You may use an existing wildcard certificate, create your own domain certificate, or purchase a third-party SSL certificate for the Secret Server website. For testing, you can use a self-signed certificate. See [Installing a Self-Signed SSL/HTTPS Certificate](#) (KB) for more information.

Once the SSL certificate is installed, enable **Force HTTPS/SSL** on the **Security** tab of the **Configuration** page to force users to only access Secret Server over HTTPS and to receive a pass in the report.

## SSL/TLS Hash

Recommendation: Confirm or remediate

Check the digest algorithm of the certificate. If the algorithm is SHA1, this check returns a warning because SHA1 is being phased out. If the digest algorithm is MD2, MD4, or MD5, the check will fail because they are not secure. SHA256, SHA384, and SHA512 will pass. This check fails if Secret Server cannot be loaded over HTTPS.

Example warning:

"The digest algorithm is sha1RSA, which is considered weak. The algorithm is being phased out and should be replaced with a better algorithm when it comes time to renew the SSL certificate."

Go to the browser's certificate information when logged onto Secret Server. This is usually a button next to the URL text box.

#### SSL/TLS Key

Recommendation: Confirm or remediate

Check the key size of the HTTPS certificate used. If it is RSA or DSA, the key must be at least 2048-bit to pass. If the signature algorithm of the certificate is ECDSA, the key size must be at least 256-bit to pass. If the algorithm of the certificate is unknown, the result shows "unknown. This check fails if Secret Server cannot be loaded over HTTPS.

Go to the browser's certificate information when logged onto Secret Server. This is usually a button next to the URL text box.

#### SSL/TLS Protocols

Recommendation: Confirm or remediate

Check for legacy SSL or TLS protocols, which should not be used in a secure environment. If the server accepts SSLv2 or SSLv3 connections, this check will fail. SSLv2 is not considered secure for data transport, and SSLv3 is vulnerable to the POODLE attack. If this server does not support TLSv1.1 or TLSv1.2, this check will give a warning because they are recommended. The SSL certificate used may affect what protocols can be used, even if they are enabled. This check will fail if Secret Server cannot be loaded over HTTPS.

**Note:** You can check and modify these settings in the Window registry. See [Transport Layer Security \(TLS\) Registry Settings](#) in Microsoft's documentation.

Example warning:

"The server supports the accepts SSLv2 or SSLv3 connections protocol, which are weak. Consider disabling these protocols."

#### Using HTTP Strict Transport Security

**Note:** Labeled **Enable HSTS** in the UI.

HTTP Strict Transport Security (HSTS) is an additional security layer for SSL. HSTS allows Secret Server, Password Reset Server, or Group Management Server to inform browsers that it should only be accessible over HTTPS. With this setting enabled, visitors are automatically redirected by their browser to the HTTPS-enabled site.

When the **Force HTTPS/SSL** option is enabled on the **Security** tab of the **Configuration** page, the **Enable HSTS** check box will be displayed. After the option is turned on, you can click **Advanced** to specify the maximum age in seconds for how long the policy should be in effect before re-evaluating. The default value is 31,540,000 seconds (a year)—the amount required to enable the checkmark, which assumes the site should never be accessed without TLS or SSL.

For details about this, see [Securing with HTTP Strict Transport Security \(HSTS\)](#) (KB).

## Security Settings Not in the Hardening Report

#### Apply TLS Certificate Chain Policy and Error Auditing

Recommendation: Confirm or remediate

Add audits for TLS certificate validation. Auditing will apply to all Active Directory domains using LDAPS and Syslog using TLS. Certificate

policy options, including ignoring certificate revocation failures, apply to syslog using TLS only. The default is the most strict so the certificate chain policy may need to be updated. TLS errors will be logged to Security Audit Log found on the Administration page.

Disable the **Admin > Configuration > Security tab > Apply TLS Certificate Chain Policy and Error Auditing** setting.

TLS errors are logged to the **Security Audit** log at **Admin > See All > Security Audit Log**.

## Enable FIPS Compliance

Recommendation: Off

Only allow FIPS-compliant encryption schemes. FIPS (Federal Information Processing Standards) is a set of standards for government entities. It covers many things, including encryption. For businesses, FIPS can be counter productive because it restricts them from using newer or improved existing encryption methods. In addition to enabling this setting, several other tasks are required to meet this standard, including enabling it for Windows itself. For more information, see [Enabling FIPS Compliance](#) for details.

Go to **Admin > Configuration > Security tab > FIPS Compliance** to change this setting.

## Key Rotation

Recommendation: Review KBA

**Note:** Key rotation is not a setting but an activity. It is included here for completeness (the entire Configuration Security tab)

Secret key rotation changes out the encryption key for secret data and re-encrypts that data with a new key. This helps you to meet compliance requirements mandating that encryption keys are changed on a regular basis. See [Secret Key Rotation](#).

## Two-Factor Authentication

Users must authenticate to Secret Server at least once using either local Secret Server credentials or their Active Directory credentials. In addition, you can protect Secret Server by enabling two-factor authentication (2FA). 2FA is an additional security layer, such as a text message PIN code sent to your smart phone. The following options are supported by Secret Server for 2FA:

### SAML

Secret Server supports the Security Assertions Markup Language (SAML), which provides a more centralized method of adding 2FA to the Secret Server log on. Please see the [Configuring SAML Single Sign-On](#).

### Email

Using email for 2FA means that after authenticating with their password, the user receives an email containing a one-time PIN code to enter. For this to work, an SMTP server must be configured in Secret Server and each user must have a valid email address associated with their account. For Active Directory users, the email address will be synced automatically from their domain account.

Check user email addresses at **Admin > Users**.

### Soft Tokens

Soft tokens using the Time-based One-time Password (TOTP) algorithm, such as Google Authenticator and Microsoft Authenticator, are supported by Secret Server 2FA. Users are prompted to enter a token displayed on their mobile device each time they log onto Secret Server. The time-based token changes on a regular interval (such as 30 seconds).

### RADIUS

One option is to use a Remote Authentication Dial-In User Service (RADIUS)-compliant device, such as an RSA or CryptoCard token, as the

second form of authentication. The user is prompted to enter his or her RADIUS password after initial authentication is done with their Secret Server or AD password.

To set this up, you first need to configure Secret Server to integrate with your RADIUS server, and then you can enable it for individual users or for by domain.

See [Enabling RADIUS Two-Factor Authentication](#) for details.

## Duo Security

Using this method requires that you have an active account for Duo Security. Duo Security provides several options for 2FA. The API hostname, integration key, and secret key values are required for Secret Server to authenticate Duo users.

See [Configuring DUO for Two Factor](#) for details.

## Enabling Two-Factor Authentication

### Enabling for Users

To enable two-factor authentication for a user or several users at once, select **Users** from the **Admin** menu and then select the users in the grid. Use the bulk operation drop-down menu to choose the type of authentication to enable.

**Note:** If prerequisite settings are not configured, the 2FA option may be disabled or will not appear as an option. See the descriptions above for information about prerequisites for each type of two-factor authentication.

### Enabling per Domain

Two-factor authentication can also be enabled per domain if you are syncing users from Active Directory. To do so, select **Active Directory** from the **Admin** menu and then click **Edit Domains**. Click the domain name and then click **Advanced (not required)** to reveal the **Auto-Enable Two Factor for New Users** setting. Select this checkbox and click **Save and Validate**.

## Roles

Secret Server uses role-based access control, which allows administrative and user capabilities to be partitioned by role. This can allow for granular control over which areas of the application a user has access to, for example, allowing someone the rights to manage licenses and view reports in Secret Server but nothing else.

## Controlling Access to Features Using Roles

### Limiting Role Access to the Export Permission

Exporting secrets from your Secret Server as text is very helpful for meeting regulations in certain industries (secrets can then be printed to paper and locked in a physical safe). It can also be used as another disaster recovery option, but access to exporting data from the Secret Server should be tightly controlled. You could create a separate role with just the export permission for anyone needing to export secrets.

### Unlimited Administration Mode

Unlimited administration mode allows any role with the "unlimited administrator permission" to see all secrets in the Secret Server. This mode is very helpful for recovering passwords in emergencies or when staff are terminated. You can tightly control access to this feature by splitting out the role permissions for "administer configuration unlimited admin" and "unlimited administrator" into two different roles. This allows you to create the "two-key effect" for access to the mode. See [Using Two Roles for Access to Unlimited Administration Mode](#)(#Using\_Two\_Roles\_for\_Access\_to\_Unlimited\_Administration\_Mode), below, for details.

### Limiting Role Access to Secret Templates

Anyone with access to modify your secret templates can change the definitions of the data being stored, and this access should be tightly controlled. Your secret templates are unlikely to need changing once you have defined them, so limiting access to a select number of individuals is typically sufficient.

## **Monitoring Roles with Event Subscriptions**

Another option when protecting roles is to configure event subscriptions to notify appropriate staff in the event that Roles are changed or assigned. Event subscriptions are email alerts that can be sent to users, groups or specific email addresses, based on different events in Secret Server. There are also events available around the "unlimited administrator" role to further protect it from misuse.

## **Using Two Roles for Access to Unlimited Administration Mode**

We recommend determining which role permissions should or should not be combined for users before assigning roles and allowing users access to the application. Part of that is planning access to the "unlimited administration" mode. Users with the "administer configuration unlimited admin" role permission can enable that mode. Once the system is in the mode, users with the "unlimited administrator" role permission can view all secrets in Secret Server and access all configuration settings. So a user with both permissions can enable the "unlimited administration" mode and then view all the secrets or make any configuration change.

To prevent a single person from having that much access, the two role permissions should be given to two different roles and only those roles, and nobody should have access to both of the roles. That enforces accountability and requires the cooperation of two people to enter "unlimited administration" mode.

A solution is to create the two roles, each containing one of the permissions, and then take those two permissions out of the day-to-day administrator role and any other roles besides the two. You can then assign either one of those roles to trusted people with no single person having both roles.

Thus, the access procedure is:

1. User A with the role with the "administer configuration unlimited admin" permission puts the system into "unlimited administration" mode. Not having the correct role, user A cannot make any changes requiring the "unlimited administrator" permission.
2. User B with the role with the "unlimited administrator" permission performs any configuration or accesses secrets only available to that role.
3. When User B is finished, user A takes the system out of "unlimited administration" mode.
4. User B can no longer make any changes requiring the "unlimited administrator" permission because roles with that permission can only be accessed in "unlimited administration" mode. User A cannot make any changes either because User A does not have the role with the "unlimited administrator" permission.

Additional safeguards included:

- Enabling or disabling "unlimited administration" mode is audited, and a comment should be provided each time it is enabled.
- When "unlimited administration" mode is enabled, a banner appears at the top of every Secret Server page notifying users that their secrets can currently be viewed by an unlimited administrator.
- Event subscription notifications should be set up to send an email to a specified user, group of users, or other email address whenever "unlimited administration" mode is enabled or disabled.
- All actions that are normally audited, such as secret views, edits, or permissions changes, are still audited while "unlimited administration" mode is enabled.

## **Encryption**

### **DPAPI Encryption**



## Overview

The Data Protection API (DPAPI) is an option that provides an additional layer of security for the Secret Server encryption key. The Secret Server encryption key is contained within a file that is decrypted and used by the application to encrypt or decrypt the sensitive data that is stored in the Secret Server database. Using the DPAPI option in Secret Server ensures that the encryption key file is also encrypted with a key that only Windows knows and is only be usable on same server it was encrypted on. Anybody trying to configure Secret Server on another server using that DPAPI-encrypted key is blocked from doing so.

**Important:** The encryption key file, `encryption.config`, should be backed up and stored in a secure location before turning on DPAPI encryption. This allows you to restore a backup of the application on another server in a DR scenario. The file is in the Secret Server application directory.

## Enabling and Disabling DPAPI

To turn on DPAPI encryption of the file, select **Configuration** from the **Admin** menu. Select the **Security** tab, click **Encrypt Key Using DPAPI**, and then type your password and acknowledge the warning before clicking **Confirm**. To decrypt the key, navigate to the same tab and click **Decrypt Key to not Use DPAPI**.

## Using Clustering with DPAPI

You can use DPAPI while clustering is enabled for Secret Server, however there are a few things to take into consideration:

- Backup the encryption key before using this option, otherwise disaster recovery could prove impossible, should the server fail.
- You must initially transfer the un-encrypted key that DPAPI will encrypt to each Secret Server node. Secret Server
- You must enable DPAPI for Secret Server by accessing each server locally (browse to Secret Server while on the server it is installed on, and then enable DPAPI encryption).
- During upgrades, to avoid turning off DPAPI, you can copy all files over to secondary nodes *except* for `database.config` and `encryption.config`.

For more information about clustering Secret Server, see [Setting up Clustering](#) (KBA).

## Protecting Your Encryption Key Using EFS

Encrypting File System (EFS) is a Microsoft technology that allows a user to encrypt files with their password. This means that only the user who encrypted the file will be able to access it, even if it is assigned to other users. If an administrator resets the password on this account and the account does not change its own password, then the file is not recoverable.

You can use EFS to protect your Secret Server encryption key. This allows only a single service account to access the file, and no other user can read the key unless they know the service account password. Below are the steps for encrypting your `encryption.config` and `database.config` files with EFS:

1. Backup your `encryption.config` and `database.config` files to a secure location. This is very important for DR recovery purposes.

**Important:** This step is critical—If you lose access to your service account or the server fails, you will be unable to recover your secrets without these backup files.

2. Create a new service account or select an existing one. The service account should initially have privileges to log on a computer.
3. If you have already installed Secret Server and are using Windows authentication for database access, make sure the service account has access to the database.
4. Run the Secret Server application pool as this service account. See [Running the IIS Application Pool As a Service Account](#) .
5. Give the service account full access to your Secret Server directory through Windows Explorer if it does not have it already.
6. Log on your server as the service account.

7. For both the `encryption.config` and `database.config` files (this instruction uses the former):
  1. Locate the `encryption.config` file in your Secret Server directory (usually `C:\inetpub\wwwroot\SecretServer`).
  2. Right-click the file and select **Properties**.
  3. Click the **General** tab.
  4. Click the **Advanced** button.
  5. Click to select the **Encrypt contents to secure data** check box.
  6. Click the **OK** button.
  7. Click the **Apply** button.
  8. If prompted, select the **Encrypt the file only** option.
  9. Click the **OK** button.
8. Log out of Windows and log back in as an administrator.
9. Confirm that the application still works by performing an IIS Reset (IISReset command at the command prompt) or recycling the application pool.
10. Ensure you can still log in and view your secrets.

## SSL (TLS) and HSTS

We strongly recommend employing SSL (TLS) for Secret Server. Taking SSL a step further, Secret Server also supports HTTP Strict Transport Security (HSTS). HSTS is supported by modern browsers and tells the browser that a site is only accessible by SSL with a valid certificate, period. Even if there is a man-in-the-middle attack with a trusted, but different, SSL certificate, the browser will reject the SSL certificate. Consequently, this setting is very useful for protecting against forged SSL certificates or man-in-the-middle attacks.

For more information about configuring SSL certificates, see the [Installation Guide](#). You can view additional information about HSTS in [Securing with HTTP Strict Transport Security \(HSTS\)](#) (KBA).

## SSH Key Validation

Host SSH Key verification is supported for use with heartbeat, proxied launchers, password changers, and discovery. Host SSH key verification can help ensure that the machine you are connecting to is a trusted host. Host SSH key verification will not pass credentials to the target machine unless the public key digest matches the SHA1 digest that Secret Server has on file. This helps prevent man-in-the-middle attacks.

## Mapping an SHA1 Digest to Secrets

To configure host SSH key verification:

1. Navigate to **Secret Templates** from the **Admin** menu.
2. And add a field for the host's SSH key digest.
3. Click **Configure Extended Mappings**.
4. Add a **Server SSH Key** mapping to your newly created SSH key digest field.
5. On your secrets, add the SSH key digest of the hosts to your digest field. Verification takes effect the next time you connect to the host.

## Validating SHA1 Digests for Unix Account Discovery

To validate SHA1 server digests for Unix account discovery, create a file named `KeyDigests.txt` in the root of the Secret Server website. Each line should contain an IP address or other computer identifier, a comma, and the SHA1 digest, for example:

```
192.168.1.5,7E:24:0D:E7:4F:B1:ED:08:FA:08:D3:80:63:F6:A6:A9:14:62:A8:15 apollo,7A:25:AB:38:3C:DD:32:D1:EA:86:6E:1C:A8:C8:37:8C:A6:48:F9:7B
```

When the file exists and has data, all scanned machines must match one of the SHA1 hashes in the file before scanning. Any computers that do not match will still show up on the "Discovery Network View" page, but authenticated scanning will not take place. That is, no credentials will be passed to the machine, and accounts will not be retrieved from the machine.

## Disabling IIS HTTP Headers

### Introduction

This section describes plugging some potential, minor but significant, information leaks by the Secret Server Web server. Web applications, such as Secret Server, may unintentionally disclose information about their underlying technologies through headers, error messages, version numbers, or other identifying information. An attacker can use that information to research vulnerabilities in those technologies to attack the application to breach the system.

### Procedure

First, **hide the IIS version**. The HTTP header "X-Powered-By" reveals the version of IIS used on the server. To stop this, remove the header:

1. Open the IIS Manager.
2. In the **Connections** tree, select the website that Secret Server is running under.
3. Click the **HTTP Response Headers** button on the right. The HTTP Response Headers panel appears.
4. Click to select the **X-Powered-By** HTTP header.
5. Click the **Remove** button in the **Actions** panel. The header disappears.

Second, **hide the ASP.NET version**. The HTTP header "X-ASPNET-VERSION" reveals the version of ASP.NET being used by the Secret Server application pool. To stop this, remove the header:

1. Open the `web.config` file for Secret Server, which is located in the root directory for the website.
2. Inside the `<system.web>` tag, add the tag `<httpRuntime enableVersionHeader="false"/>`.
3. Save the file.

Third, **hide the server type**. The header line `Server: Microsoft-HTTPAPI/2.0` is added to the header by the .NET framework. To remove that information, you must update the Windows Registry:

**Important:** Do not simply remove the Server header variable—it will cause parts of Secret Server to malfunction.

1. Open the Windows Registry Editor.
2. Navigate to `Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\HTTP\Parameters`.
3. Change the `DisableServerHeader` (REG\_DWORD type) registry key from 0 to 1.

**Note:** There are other ways to hide the server type. We strongly recommend this one.

## Adjusting CORS Policy Headers

By default, Secret Server only allows Cross-Origin Resource Sharing (CORS) to unauthenticated resources. CORS allows a restricted resource on a Web page to be requested from a different domain from that resource. To adjust this behavior, either hardening (such as blocking all CORS calls) or relaxing it, follow these instructions:

1. In the Secret Server installation folder, open the `web-appsettings.config` file in a text editor.
2. In the **appSettings** section add: `<add key="UseWebConfigCORS" value="true"></add>`
3. Save the file.
4. In the same folder, also open the `web.config` file in the text editor.
5. In the **system.webServer/httpProtocol/customHeaders** section, add: `<add name="Access-Control-Allow-Origin" value="[customer URL here]" /> <add name="Access-Control-Allow-Headers" value="Content-Type" /> <add name="Access-Control-Allow-Methods" value="GET, POST, PUT, DELETE, OPTIONS" />`
6. Save the file.

## Additional Resources

- [Secret Server – Security Hardening webinar](#)
- [Secret Server Best Practices](#)
- [Delinea.com](https://delinea.com)

## Session Recording

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

**Note:** macOS Catalina requires additional configuration to use basic session recording. See [macOS Catalina Security](#).

Basic session recording is a licensed feature in Secret Server. It relies on the protocol handler configured on client machines through Secret Server's launcher. Using the launcher, Secret Server captures second-by-second screenshots on the client machine during a user's recorded session. These images of the user's screen are compiled into a video that can be downloaded and played back for auditing and security purposes. Activity recorded in the session is based on screen changes only.

Session monitoring allows administrators with the Session Monitoring permission to view all active launched sessions within Secret Server. If session recording is enabled on the secret, an administrator can watch the user's session in real time.

Admins can search through active and ended sessions. To review and search through sessions go to **Admin > Session Monitoring**.

Searching across sessions can search the following data. To select what data is searched across check the options on the search filters on the left-hand side.

Session Playback Search

Search Filters

Search Across

Secret Name

☒

Secret Items

☒

Username

☒

Proxy Session Client Data

☒

RDP Keystroke Data

☒

Date

Last 30 Days

Status

All

Launcher Type

All

Users

Groups

Secrets





















Folder

< All Folders >

Back

Search for Sessions

Search

<b>10.0.0.243\winuser2</b> - Accessed By ssadmin Remote Desktop    · 4/11/2017 05:46 PM · 0:10:03 win-h0ko2iq58no · ssadmin <a href="#">View Secret</a>	
<b>10.0.0.243\winuser1</b> - Accessed By user282 Remote Desktop    · 4/11/2017 05:41 PM · 0:00:59 win-h0ko2iq58no · user282 <a href="#">View Secret</a>	
<b>10.0.0.243\winuser1</b> - Accessed By user282 Remote Desktop    · 4/11/2017 05:35 PM · 0:01:44 win-h0ko2iq58no · user282 <a href="#">View Secret</a>	
<b>10.0.0.243\winuser1</b> - Accessed By user282 Remote Desktop  · 4/11/2017 05:35 PM · 0:00:11 win-h0ko2iq58no <a href="#">View Secret</a>	
<b>10.0.0.243\winuser1</b> - Accessed By user282 Remote Desktop  · 4/11/2017 05:33 PM · 0:00:00 win-h0ko2iq58no <a href="#">View Secret</a>	
<b>10.0.0.243\winuser1</b> - Accessed By user282 Remote Desktop    · 4/11/2017 05:19 PM · 0:00:32 win-h0ko2iq58no · user282	

Some search filters require additional components to be installed or configured:

- **Proxy Session Client Data:** Search within keystroke data of proxied SSH sessions. Requires that the SSH proxy is enabled and SSH sessions are using it.
- **RDP Keystroke Data:** Requires the RDP Session Monitoring Agent be installed on the target.
- **RDP Application Name:** Requires the additional RDP Session Monitoring Agent be installed on the target.

To view a recording, click the camera icon on the session. The Watch Session Recording page appears:

## Watch Session Recording

### Session Summary

**Session Secret:** [10.0.0.243\winuser2](#)  
**Machine:** win-h0ko2iq58no

**Session User:** Andrew Smithson  
**Launcher Used:** Remote Desktop

**Session Start:** 3/30/2017 11:10 PM  
**Session End:** 3/30/2017 11:10 PM

### Search Session Activity

Activity Type: All Keyword:

Elapsed	Type	Activity	Jump To
00:00:00	explorer		
00:00:00	rdpinput		
00:00:00	TSTheme		
00:00:00	rdpclip		
00:00:00	Thycotic.SessionRecorder		
00:00:00	taskhostx		
00:00:00	explorer		
00:00:04	TSTheme		
00:00:04	powershell		
00:00:04	conhost		
00:00:04	powershell		
00:00:06	hello		
00:00:08	echo		

If there is logged session activity, such as keystroke or application data from the RDP agent or SSH proxy then you can search through session activity and jump to points within the video playback. The playback also displays an activity map to show points of high activity, such as screen changes, keystrokes, and processes started and stopped.

Selecting an activity in the grid also shows additional details below such as the full folder path where the application started and the user that performed the operation.

**Note:** SSH Keystroke data is shown in one-minute segments. In a short session of less than minute, the "jump to" only goes to the beginning of the video.

For active sessions, there are two actions that can be taken:

- **Watch Live:** When session recording is turned on for the secret and admin can view and replay the user's activity.
- **Terminate:** Sends a message to the end user or terminates their session. The end user sees an alert dialog pop up on their machine with the message. Session recording does not need to be enabled for this to work. For ended sessions admins can watch the recorded video and view the SSH log if session recording was turned on for the secret.

Advanced Session Recording (ASR) is a licensed feature of Secret Server that adds capabilities to those offered by basic session recording. You install the Advanced Session Recording Agent (ASRA), which uses the Remote Desktop Protocol, on any client machine where you want more information from the sessions recorded.

**Note:** ASR is not available to those using our Mac launcher.

**Note:** Older ASRAs (earlier than 7.7) only work if a distributed engine configuration is enabled with RabbitMQ or MemoryMQ installed.

ASR enhances the launcher sessions, which typically only include screenshots, keystrokes, and process activity. ASR features include:

- **Screen Capture:** The Secret Server launcher records second-by-second screen images compiled into a playback video of the user's session. This is essentially the same as basic session recording.
- **Logged Processes:** The ASRA logs all processes started and stopped during a user's session.
- **Recorded Key Strokes:** The ASRA records all user keystrokes during the session, which can be disabled.

In addition to those, ASR includes these enhanced video playback features:

- **Searchable Video:** You can search video activity to find locations where specific activities, such as specific keystrokes or ran processes.
- **Enhanced Playback:** Sessions recorded using ASR display additional data on playback, such as the current active window, the used processes, and keystrokes in the session.
- **On-demand video processing**
- **Recording all sessions**
- **Inactivity timeout**
- **Maximum session-length protection**

**Note:** The Windows protocol handler encodes your session in WEBM format in real time and sends the recording to Secret Server. There is now an "Enable On-Demand Video Processing" option in Secret Server which leaves the recordings in WEBM format, which Chrome and Firefox can playback without any further processing, saving server processing time. If an on-demand recording is viewed with Internet Explorer or Edge (which do not support WEBM playback), you can click a "Request Video Processing" button and the video will be converted to H.264/MP4, which they can then play. If "Enable On-Demand Video Processing" is not checked, then all sessions recorded by the Windows protocol handler will be automatically converted to H.264/MP4.

**Note:** The Mac protocol handler does not yet support this feature, so any recordings created with it are converted to the chosen legacy video codec format. We recommend H.264/MP4. You can set the advanced session recording agent to "Record All Sessions." If someone logs into a server directly without launching from Secret Server, or even logs in at the console, the full session is recorded, including metadata.

**Note:** See [Installing the Advanced Session-Recording Agent](#).

The Session Recording tab contains the following configuration options:

- **Enable Deleting:** After the "Days Until Deleting" value, Secret Server deletes the videos from disk. Secret Server
- **Enable Moving to Disk:** After the "Days Until Moved to Disk" value, Secret Server can move videos from the database to an archive path on disk.
- **Enable Session Recording:** Enable session recording for launched sessions.
- **Save Videos To:** By default, videos are stored in the database, Secret Server can also store them directly to a network share. This network share must be accessible from all Web servers that Secret Server is installed on. Secret Server
- **Video Code:** Specify the codec to use to create the videos from the launcher screenshots. This codec must be installed on the Web server (or servers if clustering is enabled) that Secret Server is installed on.

**Note:** The Microsoft Video 1 codec is for testing only and does not support in browser playback. Sessions encoded with Microsoft Video 1 can still be downloaded for review.

For details on the settings in the Login and "Local User Passwords" tab, see [Configuring Users](#).



## General

System requirements apply to both physical and virtual machines.

- Delinea does not support these Web servers:
- Any Client OS
- Domain Controllers
- SharePoint Servers
- Small Business Server (SBS)
- Windows Server Essentials
- For best performance, we recommend using dedicated (clean) servers for hosting Delinea products.
- If .NET and IIS features are not already installed on the Web server, the Delinea Installer adds and configure them automatically.

## Database

- Database disk storage depends directly on how many recorded videos are stored to disk. For active users, we recommend you **use a 1 TB shared or local drive for archival or storage space**. For light users, we recommend beginning with 300 GB. Monitor your disk space usage closely, and tailor it for best results.
- **Carefully consider how quickly your allotted storage might be exhausted.** Once again, it is highly variable, but you might expect around 15 hours of recording per GB of storage. Using the example of encoding capacity used in the Session Recording section, if you wanted to record one year of usage by your 60 8-hour users, you would need around 11 TBs of storage (given vacations and holidays). Our recommended 1 TB would last nearly a month in that scenario. A session retention policy using the automatic deletion feature is likely your best option.
- If MS SQL Server is not already installed on your database server, the Delinea Installer can setup SQL Express on the Web server; however, **SQL Express is only for trials and sandbox environments**. Though Delinea supports SQL Express, your users will likely experience performance issues due to memory and product limitations. If experiencing performance issues while using SQL Express, we highly recommended upgrading to MS SQL Server prior to contacting Delinea Support.

**Note:** Please see Microsoft documentation on SQL Express at: <https://docs.microsoft.com/en-us/sql/sql-server/editions-and-components-of-sql-server-2017>

## Network Bandwidth and Video

- For Secret Server 10.6 ASR requires around 300 Kbps. Older versions of Session Recording require 1-3 Mbps.

**Note:** Our Mac launcher uses the older bit rate.

- Session recording bandwidth requirements vary widely based on monitor resolution and image complexity--higher resolutions and more complex images (simpler screen images compress better) use more bandwidth. For example, with a 1024×768 screen resolution, the required network bandwidth is typically between 0.1 Mbps and 1 Mbps.
- If your connection cannot support the needed bandwidth, the session data is still transmitted, but it takes longer to process each session.
- If a user tries to cancel the transmission, this activity appears in the audit record for the Session Recording Secret.
- All sessions are recorded at 1080p.

**Note:** Before Secret Server 10.6, session recordings 1080p or higher were not supported due to a limitation in Microsoft IIS. The session video would be recorded but may have been corrupted.

- Sessions are recorded using the H.264 MPEG-4 codec.

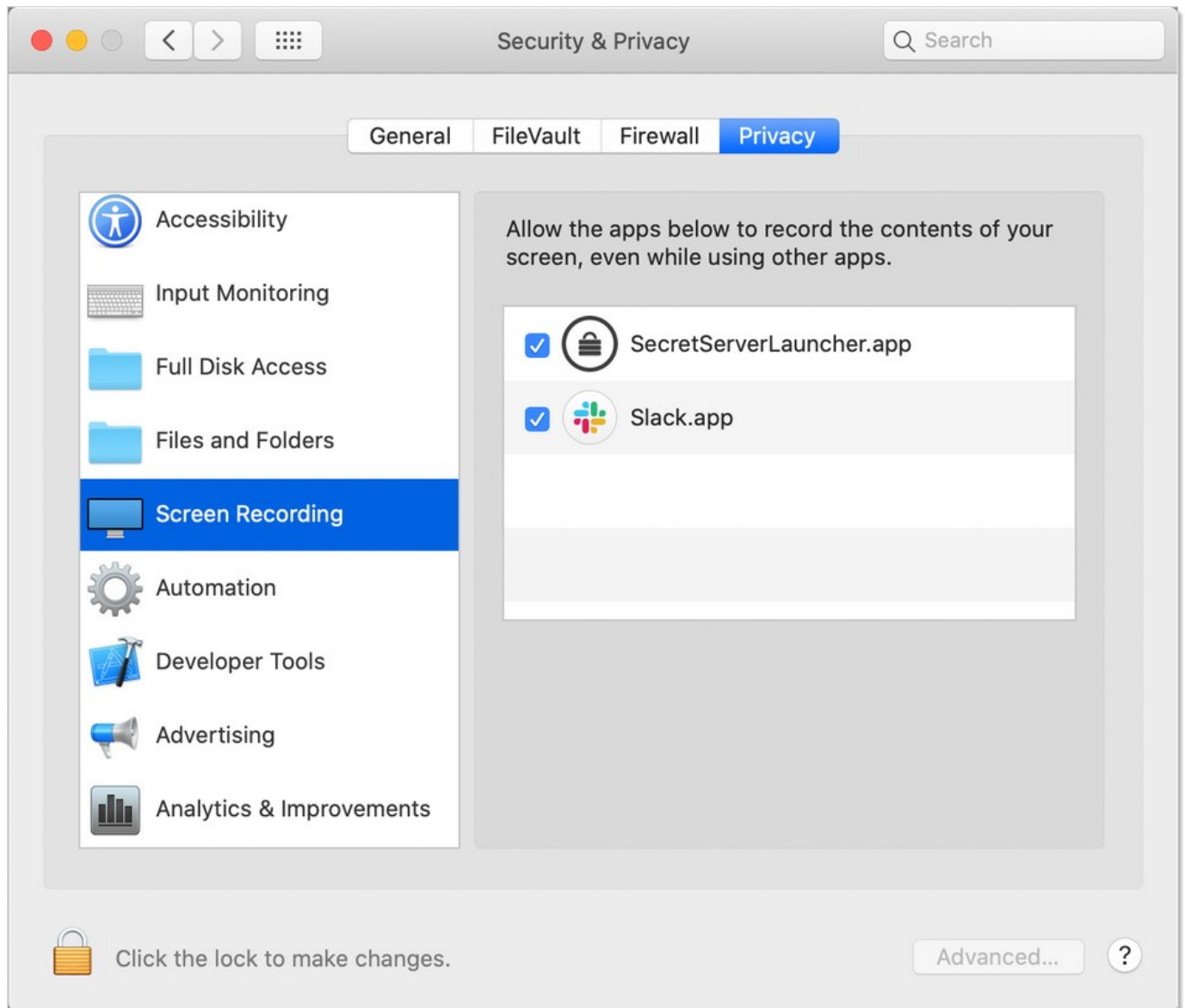
## Session Recording

- Server hosting session recording requires fixed RAM and disk space. We strongly recommend that you **do not apply dynamic settings**.
- **Do not record more sessions than you can encode.** If more concurrent sessions are recorded than the system can process, the sessions wait in a queue and are processed when enough server resources become available, which could be in a very long time or perhaps never if your storage is overwhelmed.
- The frame rate we can encode varies dramatically based on many factors, so **testing what encoding rate your session recording configuration can sustain is a must**. From there, you can get an idea of what is possible. For example, let us say you found that we can process 20 FPS on average on your Xeon processors. Given that rate, we could encode around 1 minute of a session recording in 3 seconds, or 1 hour in 3 minutes, or 1 day in 72 minutes--giving you perhaps 480 session hours per day. You could then parse that figure based on your typical usage to arrive at a maximum potential usage, for example, 60 people doing 8-hours of session recording.
- Typically, you can record **up to one hundred sessions at a time per web node**, load balanced, which should handle large use cases.
- CPU usage during video processing varies depending on concurrent users and recording length. We recommend that you **closely monitor CPU percentages on your web server** during video processing, as well on your client machines during recording, to increase CPU count for machines, if needed.
- We recommend that you **set up RabbitMQ as the backbone service bus** in session recording environments. To setup RabbitMQ, see [Installing RabbitMQ](#).

## macOS Catalina Security

macOS Catalina enforces security policy around screen recording. To use the session recording feature of the Delinea launcher on MacOS Catalina, you must first:

1. Go to **System Preferences > Security & Privacy > Screen Recording** on your Mac.
2. Allow recording for the SecretServerLauncher.app:



## Overview

Session recording allows you to record an RDP or PuTTY session, with optional metadata, and play it back in Secret Server.

The Windows protocol handler encodes your session in WebM format in real time and sends the recording to Secret Server. There is an "Enable On-Demand Video Processing" option in Secret Server which leaves the recordings in WebM format, which Chrome and Firefox can playback without any further processing, saving server processing time. If an on-demand recording is viewed with Internet Explorer or Edge (which do not support WebM playback), you can click the "Request Video Processing" button and the video is converted to H.264/MP4, which they can then play. If "Enable On-Demand Video Processing" is not checked, then all sessions recorded by the Windows protocol handler are automatically converted to H.264/MP4.

**Note:** The Mac protocol handler does not yet support this feature, so any recordings created with it are converted to the chosen legacy video codec format. We recommend H.264/MP4.

You can set the advanced session recording agent to "Record All Sessions." If someone logs into a server directly without launching from Secret Server, or even logs in at the console, the full session is recorded, including metadata.

## Configuration

1. Go to **Admin > Configuration > Session Recording**.
2. On the **Session Recording** tab, click the **Edit** button.
3. Ensure the **Enable Session Recording** check box is selected.

**Note:** For testing and proof of concept deployments, Secret Server's [Internal Site Connector](#) is sufficient for session recording. For production deployments we strongly recommend [RabbitMQ](#) for a more-robust message queue.

## Using Legacy Video Codecs

You can select a legacy video, but it will only apply to sessions recorded by the Mac protocol handler. Delinea recommends the H.264 codec, which was available starting in Secret Server 10.5.000003 because it produces the highest quality videos and requires no additional installation. If you want a different legacy codec, ensure that the codec you select is correctly installed on the same machine as Secret Server. It does not need installation on any client machines, where the session recording is occurring.

Available legacy codecs:

**Note:** On Windows Server 2008 and above, you can install Window Media Player by adding "Desktop Experience" from the features of Server Manager.

- Microsoft Video 1 (testing only): Microsoft Video 1 is deprecated in favor of Microsoft Video 9 and should not be used for production. Microsoft Video 1 does not support browser-based playback of sessions.
- Microsoft Video 9: High compression level and quality. Requires Windows Media Player. This option produces comparable video sizes to Xvid for moderate activity in an RDP session.
- VP8: High compression level and quality. VP8 is bundled with Secret Server. This option produces comparable sized video to Xvid for moderate activity in an RDP session.
- Xvid: Provides similar quality and compression to DivX and is freely available. This option produces approximately 20 MBs of video for 1 hour of moderate activity in an RDP session. See <https://www.xvid.com/>

## Enabling Session Recording on Secrets

You must enable session recording on the Security tab for each secret. Once session recording is enabled, Secret Server records that session when the launcher is used.

To view the recorded session after it is completed, click the **View Audit** button on the secret screen and then the **View Session Recording** link in the **Details** column.

You can also search recordings from the Session Monitoring page under **Admin > Session Monitoring**.

The Session Monitoring page lets users search and filter sessions based on session data, secrets, users, groups, launcher type, date, and folders. This page is also where any recordings appear when using the Record All Sessions option (see below), because such recordings are not tied to a specific secret.

**Note:** Browser playback is only supported in Secret Server 10.2 and higher. Older versions of Secret Server prompt the user to download the recording.

To view a session, click the camera icon to the right of it. This takes you to the Web playback interface. The video playback shows an activity map to quickly skip to sections of higher usage.

As noted above, if using the "On-Demand Video Processing" option, Chrome and Firefox can play the video. If you try to view an on-demand video using Internet Explorer or Edge, a warning message appears.

If you click the **Request Video Processing** button, the recording is converted from WebM to H.264 as soon as possible, allowing IE/Edge to play it back.

## Extending Session Recording with Custom Launchers

You can configure Secret Server with custom launchers to run arbitrary programs, which can then be recorded by session recording. To do so:

1. Define a custom launcher:
  1. Go to **Admin > Secret Templates > Launchers**. The Manage Launcher Types page appears.
  2. Click the **Create** button.
  3. Leave the **Launcher Type** dropdown list set to **Process**.
  4. Type a name for the custom launcher in the **Launcher Name** text box.
  5. Type a process name in the Process Name text box.
  6. (optional) Type process arguments in the Process Arguments text box.
  7. Customize other Options as needed.
  8. Click the **Save** button.
2. Associate the launcher with a secret template:
  1. Go to **Admin > Secret Templates**. The Manage Secret Templates page appears.
  2. Click the template dropdown list and select the desired template.
  3. Click the **Edit** button.
  4. Click the **Configure Launcher** button. The Secret Template Edit Launcher Configuration page appears.
  5. Click the **Add New Launcher** button.
  6. In the **Launcher Type to use** dropdown list, select your custom launcher.
  7. Customize any other options as needed.

Secret Server 10.8 added two new options to custom launchers:

## Record Multiple Windows Option

If this option is not checked, only the main window of the main launcher process will be recorded (this was always the behavior prior to Secret Server 10.8). If it is checked, multiple windows as well as child processes are recorded.

Without this enabled, the main window of the main process sometimes does not show anything useful, depending on the application, resulting in a blank recording. With this enabled, recordings are generally more accurate. This also applies to applications that can open or undock separate windows or those that launch additional processes, such as an application launching PowerShell and then launching other applications from the command prompt.

#### **Record Additional Processes Option**

Here you can type an optional comma-separated list of processes to record if found, running under your same user account, that are not started or terminated by the custom launcher. "Track Multiple Windows" must be enabled for this option to be available.

In the example above of launching PowerShell and then opening Notepad, if "Track Multiple Windows" is enabled, both PowerShell and Notepad would be recorded automatically, because the OS can tell that Notepad is a child process of PowerShell. This even works multiple levels deep—for example, launching PowerShell, then the command prompt, and then launching in PowerShell again, finally followed by Notepad.

In some cases, though, you may wish to record an additional process that was already running before the custom launcher was launched or may want to start running one later. To this end, any process names specified in this option are checked for periodically, and recording is attempted on them as well.

#### **Example**

If you wanted to run an X11 server such as Xming and then PuTTY with X11 forwarding, you could configure a custom launcher with these values:

Process Name: C:\Program Files\PuTTY\putty.exe Process Arguments: -X -ssh \$MACHINE -l \$USERNAME -pw \$PASSWORD Record Additional Processes: Xming.exe

In this case, Xming should already be running before the launcher was used and would remain running after the session has ended. It would have no parent/child relationship with PuTTY at all. However, while the launcher session was active, any windows it spawns would still be recorded, allowing the X11-forwarded applications to be recorded, not only the PuTTY window.

### **Advanced Session Recording**

#### **Metadata Recording**

By default, session recording creates videos of the launched session. Secret Server supports logging additional metadata, such as keystrokes for RDP and SSH sessions. When these options are enabled, users can search for keystrokes or applications across sessions, and the session playback interface shows additional activity information.

Remote Desktop session metadata requires Secret Server 10.6 and the advanced session recording feature, which in turn requires an installation of an advanced session recording agent (ASRA) on the target servers. See [Installing the Advanced Session Recording Agent](#).

SSH keystroke data relies on the Secret Server SSH Proxy. This can be enabled under **Admin > SSH Proxy**. See [SSH Proxy Configuration](#) for more information. Once proxying is enabled recorded SSH sessions will log SSH traffic which can be searched and is displayed in the session playback interface.

#### **Record All Sessions**

As of Secret Server 10.6.26, you can configure the ASRA to record all sessions. This causes it to record video and metadata for anyone logging into the server, even when not using Secret Server, including logging into the console. Since these recordings are not tied to any specific secret, you must go to the **Admin > Session Monitoring** page to view them.

## Session Recording Settings

Under **Admin > Configuration > Session Recording** there are several settings for configuring how Secret Server handles session recordings:

### Hide Recording Indicator

When viewing a secret, the launcher icon normally indicates if the session will be recorded or not via the recording icon. When launched into, a notification window also informs the user that their session is being recorded. If "Hide Recording Indicator" is checked, users cannot tell which secrets have recording enabled based on the icons, and if they launch a recorded session, they will not be warned that their session is being recorded.

### Enable On-Demand Video Processing

The Windows protocol handler encodes the recording on the fly in WebM format and streams the video to Secret Server. Once the session has ended, Secret Server reconstructs the video and leaves it in WebM format, which Chrome and Firefox can natively play back.

**Note:** WebM is an audiovisual media file format that is a royalty-free alternative to HTML5 audio and video.

Internet Explorer and Edge currently have issues playing back WebM videos, so if you are using those browsers and try to view an on-demand recording, you are presented with a "Request Video Processing" button, which converts the video to H.264/MP4, as soon as possible, which IE or Edge can then play back.

If this option is not checked, all sessions recorded by the Windows protocol handler are converted to H.264/MP4 automatically. If you have many IE or Edge users, Delinea recommends leaving this option unchecked, but this will increase the processing time of videos and increase the load on your Secret Server servers that have the Session Recording role enabled.

This setting has no effect on sessions recorded with the Mac protocol handler, which is always encoded using your legacy video codec choice.

### Enable Inactivity Timeout (Minutes)

If enabled, if a session appears idle, users are given a five-minute warning that they will be disconnected. A prompt appears that lets them choose to disconnect immediately or to continue the session. If no response is received, the session is disconnected five minutes later.

**Note:** This feature was added in Secret Server 10.6.26 and is currently only supported in the Windows protocol handler (not Mac).

### Max Session Length (Hours)

This sets a hard limit to how long a recorded session may last. This includes both launched from Secret Server, as well as recorded sessions if using ASRA and the "Record All Sessions" option. This option helps prevent accidental recordings over the weekend, or even longer, if someone forgets to disconnect their session.

**Note:** This feature was added in Secret Server 10.6.26 and is supported by both the Windows and Mac protocol handlers.

### Use Hardware Acceleration

If enabled, when processing H.264/MP4 files, this setting makes Secret Server attempt to use hardware acceleration for video processing if possible (GPU or CPU). Delinea recommends this setting is always enabled because Secret Server will fall back to not using hardware acceleration if necessary.

**Note:** This feature was added in Secret Server 10.6.0.

## Save Videos to

This configuration includes:

- **Database:** Stores the information from a recorded session as encrypted data to your database.
- **Disk:** Stores the recorded session as a video file directly to the specified folder path.

## Archive Location Dependent on Site

If you save recordings to disk, enabling this option lets you pick a separate path for each of your sites. This is useful in large environments that need many recordings spread out across multiple devices and locations.

**Note:** See below for a note about using network shares for storage.

## Folder Path

If you save recordings to disk, this is where they are saved. If you use the "Archive Location Dependent on Site" option, this is the default storage location for newly added sites, until you customize their folder path to something else.

**Note:** See below for a note about using network shares for storage.

## Encrypt Archive on Disk

This setting encrypts the session videos when stored on disk. Videos stored on disk are played back through the Secret Server UI but cannot be viewed directly from the file system.

## Enable Archiving to Disk

After the specified number of days have passed, all recorded session information in your database is transferred to the specified folder path as video files and cleared from the database.

## Enable Deleting

After the specified number of days have passed, all recorded videos in your database will be cleared and video files in your archive path will be deleted.

## Setting Notes

- To use "Save Videos to Disk" or "Archive to Disk," the Application Pool service account must have write permission to the specified file path.
- To delete videos from the archive path, the Application Pool service account must have "modify" permissions.
- After saving a change to **Configuration > Session Recording**, the configurations for "Save Videos To Disk" and "Enable Deleting" will immediately be applied to all existing session recordings.

## Using Network Share Path

In a clustered environment Secret Server needs to use a network path when saving the files to disk. All nodes need access to the path to read the videos back to the user.

To archive or save to a file path that is a network share, instead of a local folder:

- The SServer IIS application pool must be running as a service account. See [Running the IIS Application Pool as a Service Account](#).
- You must grant access to the network share (using Windows ACLs) to the account running the Secret Server IIS application pool.





## Configuring the Maximum Concurrent Recording Sessions per Web Node

To set the maximum number of concurrent recording sessions allowed per web node, follow the procedure below on your Secret Server web server node dedicated to session recording:

1. Navigate to the web-appSettings\_config file (default location C:\inetpub\wwwroot\SecretServer\web-appSettings.config).
2. Right-click the file to open it with Notepad.
3. Before the final appSettings line, insert the following string:

```
<add key="PrefetchCount.ConvertVideoMessage" value="7"/>
```

4. At the end of the string, set the value for the maximum number of concurrent sessions you want for this node. In the example above, the maximum number of sessions is set to 7.
5. Save the notepad file.
6. Restart IIS on the server.

## Overview

By default, Secret Server session recording creates videos of launched sessions. Secret Server supports logging additional metadata, keystrokes for RDP and SSH sessions, and process activity for Remote Desktop Protocol (RDP) sessions. When these options are enabled, users can search for keystrokes or applications across sessions and the session playback interface displays the additional information. SSH metadata relies on the Secret Server SSH proxy.

As of Secret Server 10.6, recording Remote Desktop session metadata requires the installation of an Advanced Session Recording Agent (ASRA) on the target server. In this scenario Secret Server's protocol handler is still used to launch the session and record the session video, and the ASRA records the metadata only.

As of 10.6.24, ASRA can optionally record any session on the target server. If enabled and the session was not launched from Secret Server, the ASRA will record both video and metadata for the session and upload both to Secret Server once the session is disconnected. This works even if someone logs into the console directly or Remote Desktops into the server without using Secret Server at all. Live viewing of this type of session is not supported.

If you are licensed for session recording, you can install unlimited numbers of ASRAs.

## How Advanced Session Recording Agents Work

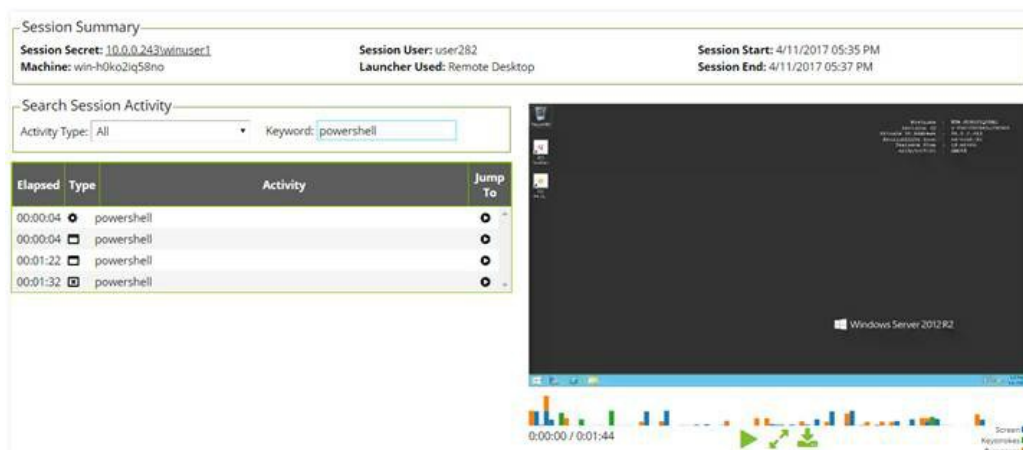
1. Once the ASRA is installed, it contacts the ASRA callback URL to determine if it should record metadata or video any time someone logs on to the computer.
2. A user logs on.
3. The ASRA sends Secret Server the computer's hostname, the username of the user who logged on, any domain name if available, and a list of the computer's IP addresses.

**Note:** This data is not logged by Secret Server unless you enable DEBUG logging, only for troubleshooting purposes.

4. Secret Server checks for any recently-launched protocol handler sessions with matching details, and tells the ASRA if it should record the session.
  - If there is a match, the ASRA starts recording metadata and sends it back to Secret Server over the chosen response bus for the duration of the session.
  - If there is no match and "Record All Sessions" is enabled for the ASRA, the ASRA records both the video and metadata for the session.
  - If there is no match and "Record All Sessions" is not enabled, the ASRA records no video or metadata and waits for the next person to log in.
5. Once a recording session has been closed:
  - If the session was launched from Secret Server using the protocol handler, the video from the protocol handler is matched up to the metadata provided by the ASRA and combined.
  - If the session was not launched from Secret Server and "Record All Sessions" is enabled, the ASRA uploads both the video recording and the metadata to Secret Server.
6. On the Session Monitoring page, additional icons are presented based on what extra metadata is present for that session, such as keystroke data for both RDP and SSH, and process data for RDP.
7. Once the session recording has been processed, on the Session Playback page the additional metadata is visible:

10.0.0.243\winuser1 - Accessed By user282  
Remote Desktop 4/11/2017 05:41 PM 0:00:59  
win-h0ko2iq58no · user282  
[View Secret](#)

And on the Session Monitoring page:



In this example, we searched for activity where the user typed in the word "powershell."

## Record All Sessions

As of Secret Server 10.6.24, recording video and metadata for all sessions on a server including console access requires Distributed Engine and ASR to be enabled as described above. ASRA must be installed on the target server, and it must be set to "Record All Sessions." If the server is set to "Only Record Secret Sessions," the ASRA will only provide metadata when people launch into the server from Secret Server. Secret Server When recording all sessions, they appear on the Session Monitoring page. They are not tied to any specific secret because the sessions are not started by Secret Server.

## Secret Server Configuration

First, session recording must be enabled (**Admin > Configuration > Session Recording**). As that page warns, Delinea highly recommends using RabbitMQ when using session recording in any production environments. See [Configuring Session Recording](#) for more information.

## SSH Metadata

To record SSH keystroke data, enable the SSH proxy (**Admin > SSH Proxy**). Individual secrets then require configuration of the Enable Proxy setting and the Enable Session Recording setting. Then when the SSH session is launched and recorded, keystroke data is recorded, which can be searched and is displayed in the session playback interface. See [SSH Proxy configuration](#) for more information.

## Remote Desktop Metadata

To record RDP session metadata, first distributed engine needs to be enabled (**Admin > Distributed Engine**) with an appropriate response bus site connector, which should be a RabbitMQ site connector in production environments. The ASRAs will communicate with the chosen site connector to return any recorded metadata. Next, the Advanced Session Recording feature must be enabled (**Admin > Configuration > Session Recording > Configure Advanced Session Recording**), and an ASRA callback URL entered. HTTPS should always be used in production environments. Individual secrets then just need the Enable Session Recording setting enabled, and the computer you launch into must have the ASRA installed. The secrets do not have to use SSH proxy since the ASRA is what records the metadata.

## Session Recording Worker Role

As of Secret Server 10.6, there is a dedicated Session Recording Worker role. If you have a clustered Secret Server environment, you can pick which nodes process recordings on the **Admin > Server Nodes** page. In a large environment with many recordings, you can configure nodes to be dedicated just to session recording, letting other nodes run the Background Worker and other roles. Session recording processes multiple videos at once, which can be controlled with the PrefetchCount.ConvertVideoMessage AppSetting (default: 2). We recommend setting this AppSetting to half the number of CPU cores on the server as a starting point. This setting applies only when using a RabbitMQ site connector, which is another reason Delinea highly recommends using Rabbit if you are using session recording.

## Advanced Session Recording Agent

First, create one or more collections to group the ASRAs together, for example, for different domains or environments. Each collection has a unique installer that you can download from their page – the installer is customized to know which collection it is associated with. On the collection, you can specify if you want new agents to **Record All Sessions**, or to **Only Record Secret Sessions**. New agents adhere to this setting, and you can toggle it for individual agents, once they have registered.

## Agent Manual Installation

The downloaded installer can be manually installed on a computer by running the setup.exe inside the zip file. It can also be deployed using group policy software installation or other MSI management software. The ASRA installs itself in C:\Program Files\Thycotic Software Ltd\Session Recording Agent and adds a Windows service, Delinea Session Recording Agent.

**Note:** Only 64-bit Windows operating systems are currently supported. .NET Framework 4.5.1 or greater is also required.

## Agent Updates

The ASRA does not automatically update, so new versions must be manually installed or re-deployed using the Group Policy MMC.

## Agent Uninstallation

You can deactivate specific ASRAs or an entire collection in Secret Server, and the next time the ASRA reaches out to the ASRA callback URL, it will uninstall itself. Since it only reaches out when someone logs on to the computer, it will remain uninstalled until someone logs on again. The ASRA can also be manually uninstalled directly on the computer like any normal Windows application, but then Secret Server will still show it in the list of active ASRAs under its collection. It should also be deactivated in Secret Server to keep the agent list accurate. If "Record All Sessions" is enabled for this server, you will get a prompt to stop the Delinea Session Recorder application when you attempt the uninstall because it is running and recording your session, as expected. To avoid these issues, we recommend using the Deactivate feature in Secret Server and then logging into the machine, and it will uninstall itself on its own.

## Agent Group Policy Installation

### Task 1: Review the Prerequisites

The ASRA requires a 64-bit operating system with .NET Framework 4.5.1 or greater installed on the client machine. This is the version that ships with Windows 8.1 and Windows 2012 R2.

### Task 2: Download the Advanced Session Recording Agent Installer

1. Log on to Secret Server.
2. Go to **Admin > Configuration > Session Recording > Configure Advanced Session Recording**.
3. Click on an existing collection, or create a new one, as appropriate.

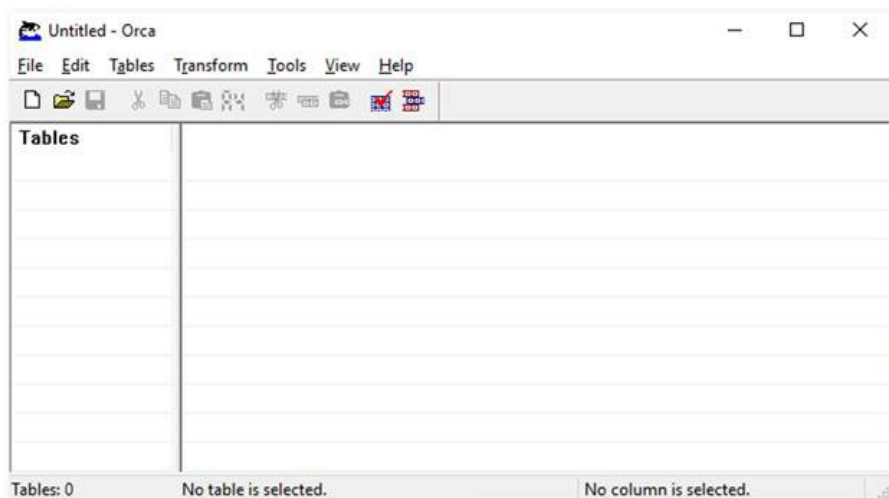
- Click the **Download Session Recording Installer** (64-bit) button. The installer is downloaded to your computer.

**Note:** The zip file is customized for each collection. Be sure to download the installer from the collection you want your new ASRAs associated with.

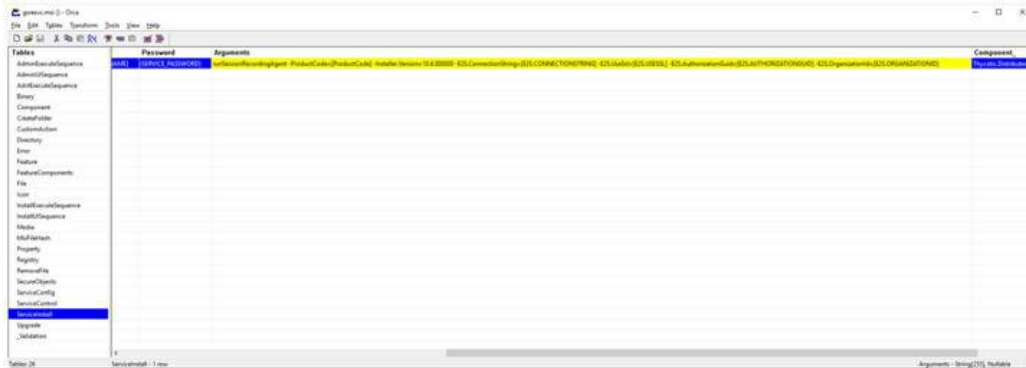
### Task 3: Customize the Installer

For a normal manual installation, you extract the zip file, and run setup.exe. There are settings saved in setup.exe.config that customize the installation of the MSI file contained in the zip (gsresvc.msi). When you deploy the ASRA using Group Policy software installation instead of a manual one, the only other files in the zip you need is the MSI, which is deployed from a network share, and an MST (Master Software Tools?) "Transform" file which configures the custom settings.

- Install Microsoft's free MSI editing tool, Orca, if you do not already have it installed.
- Extract the ASRA zip file into its own folder.
- Right click on the MSI file (gsresvc.msi) in the folder where you extracted the zip and select **Properties** to verify that there is a **Digital Signatures** tab indicating that the MSI was signed by Delinea Software.
- Launch Orca.



- Open the extracted MSI file (gsresvc.msi). The Tables list appears.
- Click the **Transform** menu at the top.
- Select **New Transform**.
- In the **Tables** list, click **ServiceInstall**. Only one row should be listed on the right.



**Note:** This screen shot shows the Arguments column dragged wider to see its contents. When you initially see it, it will be very narrow, barely showing the contents.

9. Scroll to the **Arguments** column and copy and paste its contents into a text editor. It should look like this example. Be sure to select the entire column. You might need to adjust the column width.

**Note:** The entire string of text is essentially a CLI command with parameters that begin with a hyphen. For illustration purposes we put each parameter on its own line below.

```
runSessionRecordingAgent
-ProductCode=[ProductCode]
-Installer.Version=10.6.000000
-E2S.ConnectionString=[E2S.CONNECTIONSTRING]
-E2S.AuthorizationGuid=[E2S.AUTHORIZATIONGUID]
```

Everything highlighted is what we will customize. The fields in brackets are what setup.exe would normally customize.

10. In your text editor, open the setup.exe.config XML file from the zip. You will get the Globally Unique Identifier (GUID) from it.
11. In your text editor, replace each of these with the correct values as listed below. The GUID will require looking in setup.exe.config in the XML block. The values are as follows:
  - **ProductCode** should always be: "" (not in setup.exe.config).
  - **Installer.Version** should match your Secret Server version (visible in Secret Server in the bottom right corner).
  - **E2S.ConnectionString** is the callback URL for Secret Server Cloud is the Cloud URI.

**Note:** Secret Server Cloud does not list a Callback URL on the **Advanced Session Recording** page.

- **E2S.AuthorizationGuid** is a unique GUID specific to the ASRA collection that you downloaded the installer file from. You can find it in the setup.exe.config file (in setup.exe.config). This is unique for each ASRA Collection.
12. Back in Orca, delete everything in the ServiceInstall Arguments column.
  13. Copy and paste the customized version you just created from your text editor into the Arguments column.
  14. Click the **Transform** menu.
  15. Click **Generate Transform**.
  16. Save the file as gsresvc.mst in the directory you extracted the installer into. This transform file now contains your customizations for the ServiceInstall Arguments.

17. Close Orca.
18. Check the MSI file's digital signature again to ensure that it was not edited: If you right-click the MSI file and select **Properties** again, the Digital Signatures tab should still show that the MSI is signed by Delinea Software. You created your own custom MST transform file, but the MSI itself should be unchanged. Orca can edit the MSI file itself, but that will invalidate Delinea's digital signature and it is unnecessary.

#### Task 4: Set up a Network Share

1. Place the `gsresvc.msi` and `gsresvc.mst` files on a network share on your domain controller.
2. Give "Authenticated Users" read access to this share.

**Note:** Computers in the domain will access this network share to get the installer files before any users log into the machine. It will be the machine account authenticating to the network share, before any users have logged in.

#### Task 5: Create a Group Policy with Software Installation to install the MSI

1. Open the Group Policy Management Console (**Start\ > Administrative Tools > Group Policy Management**).
2. Expand the **Forest** and **Domain** nodes until you locate the domain on which you are installing the ASRA.
3. Right click on **Group Policy Objects** and click **New**.
4. Enter a descriptive name for your GPO, such as "Delinea Session Recording Agent Installation, and click **OK**.
5. Right click on the newly created **GPO** node and click **Edit**.
6. Select **Computer Configuration > Policies > Software Settings > Software Installation**.
7. Right click on the **Software Installation** node and select **New > Package**.
8. Browse to the MSI on your network share using the share's UNC path, not its folder path. For example: `\\ServerMachineName\Shared` and not `C:\Shared`.
9. Click **Open**.
10. Click to select the **Advanced** option button.
11. Click **OK**. The name is automatically be set to "Delinea Session Recording Agent", since that is the product name in the MSI file.

**Note:** You can customize the name here, but if you use something else, that is what you will want to check for in the Verify Configuration section, instead of "Delinea Session Recording Agent."
12. On the **Modifications** tab, click **Add** and select your MST transform file. Be sure to again use a UNC path like `\\ServerMachineName\Shared`, not `C:\Shared`.

**Note:** If you wish to have the ASRA uninstalled when it falls out of management, click on the Deployment tab and click to select the box next to "Uninstall this application when it falls out of the scope of management".
13. Click **OK**.
14. In the group policy object editor, expand **Computer Configuration > Administrative Templates > System**.
15. Click the **Logon** node.
16. Right-click **Always wait for the network at computer start-up and logon** and select **Properties**.



17. Click **Enabled**.
18. Click **OK**. This helps reduce the number of reboots required for this policy to take effect as noted in the description of this option.

## Task 6: Link your Group Policy Object to an OU

1. Open the Group Policy Management Console (**Start > Administrative Tools > Group Policy Management**)
2. Expand the **Forest** and **Domain** nodes until you locate the domain on which you are installing the Secret Server protocol handler.
3. Right-click the Organizational Unit (OU) for which you want Secret Server protocol handler to be installed and select **Link an Existing GPO**.
4. Select the GPO you created earlier.
5. Click **OK**. The GPO is now linked the entire OU.

**Note:** To immediately force the group policy change and install the software on a client machine, open a command console on the client machine (start > run > cmd), type `gpupdate /force`, and restart the client machine. You can also wait for the group policy to go into effect, which usually takes one to two hours, but a reboot will still be required due to the mechanics of group policy software installations.

## Task 7: Verify Configuration at the Domain Level

1. Go to **Start > Administrative Tools > Active Directory Users and Computers**.
2. Right-click the OU for which Secret Server Protocol Handler is now configured and select **All Tasks > Resultant Set of Policy**.
3. Check to select the box next to **Skip to the final page of this wizard without collecting additional information**.
4. Click **Next** twice.
5. Click **Finish**.
6. In the new **Resultant Set of Policy** window, expand **Software Settings** under **Computer Configuration**.
7. Click to select **Software installation**.
8. **Delinea Session Recording Agent** should be visible in the **Installed Applications** column.

## Task 8: Verify the Configuration of a Domain Member

1. From a command prompt, run `gpresult /h report.html` to output a report for just that one computer to the specified HTML file, which you can then view in a browser.
2. The Delinea session recording agent should be visible in the Installed Applications section. Delinea
3. Once the computer has rebooted and completed the installation, the software shows up in Apps and Features (Add Remove Programs). As usual, the Delinea Session Recording Agent Windows Service is installed in `C:\Program Files\Thycotic Software Ltd\Session Recording Agent`.

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Advanced Session Recording

**Note:** This applies to ASRA and Secret Server. See below for additional details.

**Table: Advanced Session Recording Requirements**

8 CPU Cores	8 CPU Cores	2 CPU Cores
32 GB RAM	32 GB RAM	16 GB RAM (4 GB for the agent itself)
50 GB Disk Space	100+ GB Disk Space	25 GB Disk Space
Windows Server 2012 or newer	Windows Server 2012 or newer	Windows 7 or newer
IIS 7 or newer	SQL Server 2012 or newer	
.NET 4.6.1 or newer		

## Basic Session Recording

**Note:** See below for additional details.

**Table:** Basic Session Recording Requirements

8 CPU Cores	8 CPU Cores
16 GB RAM	16 GB RAM
25 GB Disk Space	100+ GB Disk Space
Windows Server 2012 or newer	Windows Server 2012 or newer
IIS 7 or newer	SQL Server 2012 or newer
	.NET 4.6.1 or newer

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

The latest ASRAs use more-reliable durable message exchanges, which are not compatible with earlier (already deployed) ASRAs. Version 7.7+ of the ASRA only requires HTTP connectivity to Secret Server—the distributed engine response-bus site connector is no longer required.

To prevent this from breaking older ASRS, exchanges remain permanently transient. Newer ASRAs use HTTP uploads, which do not use the message queue. Thus, older versions of ASRAs continue to function as they have, and newer ASRA versions do not use the message queue and will have “durable” behavior over HTTP. We recommend updating your ASRA to version 7.7 or later as soon as feasible.

## Enabling Inactivity Timeout

If enabled, if a session appears idle, users are given a five-minute warning that they will be disconnected. A prompt appears that lets them choose to disconnect immediately or to continue the session. If no response is received, the session is disconnected five minutes later.

**Note:** This feature was added in Secret Server SP2 and is currently only supported in the Windows protocol handler (not Mac).

## Enabling On-Demand Video Processing

As described above, this feature was added in Secret Server 10.6.24 to greatly improve session recording performance.

The Windows protocol handler now encodes the recording on the fly in WEBM format and streams the video to Secret Server. Once the session has ended, Secret Server reconstructs the video and leaves it in WEBM format, which Chrome and Firefox can natively play back.

Internet Explorer and Edge currently have issues playing back WEBM videos, so if you are using those browsers and try to view an on-demand recording, you are presented with a "Request Video Processing" button, which converts the video to H.264/MP4, as soon as possible, which IE or Edge can then play back.

If this option is not checked, all sessions recorded by the Windows protocol handler are converted to H.264/MP4 automatically. If you have many IE or Edge users, Delinea recommends leaving this option unchecked, but this will increase the processing time of videos and increase the load on your Secret Server servers that have the Session Recording role enabled.

This setting has no effect on sessions recorded with the Mac protocol handler, which is always encoded using your legacy video codec choice.

## Record All Sessions

As of Secret Server SP2, you can configure the ASRA to record all sessions. This causes it to record video and metadata for anyone logging into the server, even when not using Secret Server, including logging into the console. Since these recordings are not tied to any specific secret, you must go to the **Admin > Session Monitoring** page to view them.



## Recording Metadata

By default, session recording creates videos of the launched session. Secret Server supports logging additional metadata, such as keystrokes for RDP and SSH sessions. When these options are enabled, users can search for keystrokes or applications across sessions, and the session playback interface shows additional activity information. Remote Desktop session metadata requires Secret Server 10.6 and the advanced session recording feature, which in turn requires an installation of an advanced session recording agent (ASRA) on the target servers. See [Installing the Advanced Session-Recording Agent](#). SSH keystroke data relies on the Secret Server SSH Proxy. This can be enabled under Admin > SSH Proxy. See the SSH Proxy configuration KB article for more information. Once proxying is enabled recorded SSH sessions will log SSH traffic which can be searched and is displayed in the session playback interface.

**Note:** This applies to both ASR and basic session recording. See below for details.

**Table: Session Recording Capacities**

Dedicated for session recording	4	2 hours	10 minutes
Shared for front-end processing and session recording	2	2 hours	20 minutes

**Note:** See [Configuring the Maximum Concurrent Recording Sessions per Web Node](#).

## Secret Server Setup

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

This section contains information about installation and upgrading Secret Server and its components.

- Components Installation
- Protocol Handler
- ASRA
- Launcher plugins
- Distributed Engines
- RabbitMQ
- SDK Client

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Please [review our prerequisites](#) and then select either our [basic \(automatic\)](#) or [advanced \(manual\)](#) installation.

## Advanced (Manual) Installation

### Procedure

#### Step 1: Downloading the Secret Server Application Files

**Important:** Ensure you have the IIS, .NET Framework, and SQL Server prerequisites installed before following the steps below.

Go to the [download page](#) to get a .zip file that contains both Secret Server and Privilege Manager files in the manual installation section. Use this .zip file for the instructions below.

#### Step 2: Creating Folders and Extracting Contents

1. Extract the contents of the .zip file downloaded above (Right-click, **Extract All...**). The original file is named with the latest version number for Secret Server.
2. Extracting this file reveals a `nugetCache` folder, as well as another zipped folder named `ss_update`. For a Secret Server-only install, you will not need the contents of the `nugetCache` folder.
3. Create a folder called `SecretServer` in the location `C:\inetpub\wwwroot\`.
4. Extract the contents of the `ss_update.zip` file (Right-click, **Extract All...**) to `C:\inetpub\wwwroot\SecretServer`.

#### Step 3: Configuring IIS

Open Internet Information Services (IIS) Manager\* and create a new application pool:

**Note:** Our IIS installation sets the .NET trust level to "Full (internal)", which may affect other applications on the server.

1. Right-click **Application Pools** and select **Add Application Pool...**
2. Type a name (for example, `SecretServerAppPool`).
3. Ensure that the highest .NET CLR version is selected.
4. Ensure the Managed pipeline mode is set to **Integrated**.
5. Click the **OK** button.

**Note:** The Secret Server installer sets the application pool to default to the system Network Service account. If you selected Windows Authentication Mode during the SQL Installation process, see [Running the IIS Application Pool As a Service Account](#). To use Windows Authentication you must use an Active Directory service account to run the application pool in IIS. We recommend this as a security best practice.

6. See [Changing IIS to Not Stop Worker Process in IIS 7.0 and Later](#) to set the Idle Timeout and Regular Timeout settings to 0 for the application pool in IIS.
7. Install Secret Server as either a virtual directory (4a) or as a website (4b):

#### Step 4a: Installing Secret Server as a Virtual Directory

1. Right-click **Default Web Site** and select **Add Virtual Directory...**
2. Select an alias for your Secret Server. The alias is appended to the website, and it is best to name it the name of your earlier unzipped folder. For example, `SecretServer` becomes `https://myserver/SecretServer`.

3. Select the physical directory for where you unzipped Secret Server, for example, C:\inetpub\wwwroot\SecretServer.
4. Click the **OK** button.
5. In the tree, right-click the new virtual directory and select **Convert to Application**.
6. Set the **Application Pool** to the same one you created in the Manual Installation section, for instance, SecretServerAppPool. Secret Server is now ready for installation. Skip to Step 5.

#### Step 4b: Installing Secret Server as a Website

1. In IIS, right-click **Sites** and select **Add Website...**
2. Type a site name.
3. Click **Select...** and choose the application pool you created in the Manual Installation section.
4. Click the **OK** button.
5. Click the ... button beside the **Physical path** field and select the directory containing the unzipped Secret Server files, for example C:\inetpub\wwwroot\SecretServer.
6. Click the **OK** button.
7. Click the **OK** button at the bottom of the **Add Website** window to save your settings. Secret Server is now ready for installation.

#### Step 5: Completing Secret Server Installation from the Website

Your Secret Server advanced installation is now ready to complete:

1. [Install your SQL Server](#).
2. Open a browser and navigate to where your Secret Server is located, such as http://localhost/secretserver. You should arrive at a page that says "Secret Server (Not Installed or Unable to Access the Database)."
3. Click the **Install Secret Server** button.
4. On the **SQL Server Location** page, specify the server name of your SQL Database Server, <DatabaseMachineName>\InstanceName and then the database name that you created in SQL for Secret Server.
5. If you are using Windows authentication mode to access SQL (recommended), ensure the correct service account is listed.
6. If you selected mixed mode during the SQL install, select **SQL Server Authentication** and enter the SQL username and password you created for the SQL account. For information about adding a SQL Server user, see the [Adding a SQL Server User](#).
7. Click the **Install Secret Server** button. Secret Server verifies it is able to successfully create the Secret Server database. If an error occurs no database changes will be made.

**Note:** Secret Server attempts to download and install the latest version from the Internet. If you do not have an active Internet connection on your Web server, Secret Server will continue to install the version from your downloaded application files.

8. The install may take a few minutes to complete. Once successful, click the **Return to Home** button.
9. Create a username and password for the administrator account for Secret Server and store these credentials in a safe location.
10. Click the **Create User** button and log on after entering the username and password.

11. Once logged on Secret Server, you are prompted with the Getting Started wizard. The wizard guides you through adding your Licenses, setting up an email server, and creating your first group.

**Note:** If you skipped the wizard and would like to return, go to **HELP > Getting Started** from the top menu.

Secret Server is now installed. See our [Getting Started Tutorial](#) or contact Delinea Support about training.

## Troubleshooting Notes

- If the database name you provide does not yet exist in the specified instance of SQL Server, Secret Server attempts to create the database using the SQL or Windows account you have specified. For that account to create a database, it needs to have the dbcreator server role in SQL Server. Secret Server
- If using Windows authentication mode (recommended) you need to use a service account to run SS's application pools with appropriate permissions. See [Running the IIS Application Pool As a Service Account](#).

## Basic (Automatic) Installation

### Introduction

This is the installation guide for Windows Server 2016 and Windows 10. For other operating system installation guides, [contact Delinea Support](#).

### Secret Server Is an ASP.NET Website

Secret Server is installed as an ASP.NET website. The setup.exe file sets up the website with the correct permissions and creates the settings in IIS.

### SQL Server Is Usually Required

Secret Server requires an instance of SQL Server for the database backend and is installed by the setup.exe file, if missing. The SQL Server database will require a SQL account with *db\_owner* permission to complete the installation.

### Administrative Access

Throughout the installation, you will be required to be an administrator to perform most of these actions. Please ensure that you are logged onto your system with a Windows account that has administrative rights.

### Review the Prerequisites

**Important:** Except for the operating system, the following prerequisites are installed automatically by our installer. If you already have some of them installed or wish to install them yourself, the installer will skip over them.

Please review the full list of system requirements and recommendations on the [System Requirements for Secret Server](#) page.

### Additional Recommendations

We suggest you:

- Use an SSL certificate for Secret Server.
- Run [Microsoft Update](#) on your server to make sure all components are up to date.

## Procedure

### Step 1: Downloading the Latest Version of Secret Server

The latest version of Secret Server is available for [download](#). A setup.exe file is downloaded to your machine. We recommend running setup.exe as an administrator.

### Step 2: Running the Installer

#### Welcome Page

The first installer page you are presented is the Welcome Page. The installer should detect whether the machine has Secret Server or Privilege Manager for Windows and will declare which of those products it will install.

#### Database Page

The Database page allows you to choose to install SQL Express or connect to an existing SQL Server. If you select SQL Express, the installer



requires Internet access to download the installation for SQL Server Express.

If Internet access is not available, a link to download SQL Server Express is presented. You are expected to install SQL Server Express and then restart the installer.

If Internet access is available, SQL Server Express is installed.

## **Pre-Requisites Page**

The Pre-Requisites page ensures everything that is required to install Secret Server is setup correctly. Everything on this page *can* be installed outside of the installer. If not, the installer installs and configures them for you. This page is primarily for third party server configuration. If there are issues, please refer to support for the specific non-Delinea vendors.

## **Database Connection Page**

The Database Connection page contains the connection information that Secret Server (and Privilege Manager) uses. You must click the **Test Connection** button and have a successful result before installation can continue.

## **Create User Page**

The Create User page is where you enter the information for the initial Secret Server user.

## **Email Server Page**

Enter connection information for the email server on this page. This is also optional and you can skip it and set it up later in Secret Server. This page will configure email for both Secret Server and Privilege Manager for Windows.

## **Review Page**

Review the, mostly default, settings on the Review page, and change them if needed. Some of the settings are validated before the install can begin.

## **Install Page**

The Install page shows the status from log files as both Secret Server and Privilege Manager are installed.

## **Step 3: Reviewing the Log Files (Optional)**

After the applications are installed, the installer opens a Web browser to the Secret Server log on page. At this point, everything is installed to start using both Secret and Privilege Manager. If the installation failed or you wish you view the logs from the installation, click the **View Log Files** button.

## **Step 4: Opening Secret Server**

If the setup.exe did not automatically open a browser, navigate to where Secret Server is located, for example: <http://localhost/secretserver>.

## **Step 5: Learning Secret Server**

See our [Getting Started Tutorial](#) or contact Delinea Support about training.

## Choosing a SQL Server Edition to Use with Secret Server

Choose the Microsoft SQL Server edition to work with Secret Server that best supports the functionality you wish to achieve.

The brief guide below should help you decide which licensing model best suits the needs of your organization.

### SQL Server Express Edition

SQL Server Express is a free version of SQL that is sufficient to run most of the functionality within the Secret Server application itself.

However, advanced functionality like mirroring and clustering is not available. SQL Server Express is not recommended for use in production environments due to the database size limitation.

### SQL Server Standard Edition

SQL Server Standard provides most of the functionality administrators typically want, including the most common type of mirroring, and clustering up to two cluster nodes.

### SQL Server Enterprise Edition

SQL Server Enterprise provides all of the functionality found in the Standard Edition, plus the ability to cluster up to eight nodes and to perform asynchronous mirroring.

For more information on the different editions of SQL Server, see the [Microsoft SQL Server 2016 Licensing Guide](#).

## Creating and Using a SQL Server Privileged Account

### Overview

This document enables a user to password change SQL accounts using a privileged account. Enabling the takeover of those accounts without knowing their password.

### Procedure

#### Task 1: Creating an Account

1. Open SQL Server Management Studio and connect to your database server.
2. Expand the root level security folder.
3. Right click on the **Logins** folder and select **New Login**.
4. Type the account's login name in the **Login Name** text box.
5. Click to select the **SQL Authentication** selection button.
6. Go to Secret Server.
7. Create a secret using the **SQL Server Account** template.
8. Give it the same username as the login name you just created.
9. For best security, click the **Generate** button on the secret password field and copy that password to the account creation wizard in SQL Server Management Studio.
10. Click **OK** button to save your secret.

#### Task 2: Assigning Permissions

1. Return to SQL Server Management Studio and connect to your database server.
2. Right click the SQL login and click **Properties**.
3. Select **Securables** in the left column.
4. In the **Permissions** table on the **Explicit** tab, click to select the **Grant** check box for the **Alter any login** row.
5. Click the **OK** button.

#### Step 3: Using the Account

1. In Secret Server, select the SQL account secret for your new privileged account.
2. Select the **Remote Password Changing** tab.
3. Click the **Edit** button.
4. Click to select **Privileged Account Credentials** on the **Change Password Using** selection button.
5. Click the **No Selected Secret** link. The Select a Secret popup appears.
6. Locate and select the secret you created earlier in the folder tree.

7. Click the **Save** button. The popup disappears.
8. Click the **Change Password Remotely** button.
9. Provide or generate a new password.
10. Click the **Change** button. You have now successfully changed a SQL account password using a privileged account.

**Note:** You can also assign an account for multiple secrets by creating a secret policy and applying that policy to a folder.

## Enabling SQL Server Encryption

Administrators can enable end-to-end encryption with the SQL database by using an Encrypted connection. This is a feature that is built into Microsoft SQL Server and Secret Server supports. To enable encryption:

1. Go to **Admin** > **See All**. The admin panel appears.
2. Type Database in the **Search** text box and select **Database**. The Database Configuration page appears:

### Help

Secret Server supports Microsoft SQL Server versions 2012, 2014, 2016, 2017, and Express.

View [Collation Requirements](#). Need help installing or configuring SQL Server? View [Installing and Configuring SQL KB Article](#).

### Database Configuration

#### SQL SERVER LOCATION

Server Name	QA-CUST-SQL-01
Database	SS_Playground

#### SQL AUTHENTICATION

☒ Windows Authentication using Application Identity (GAMMA\ss\_iis\_svc) - **Recommended**  
*(Advanced Setting. Windows Authentication requires a Service Account and advanced IIS setup. Detailed in [Windows Authentication KB](#).)*

☐ SQL Server Authentication *(SQL Authentication requires Mixed Mode. See setup in [SQL Authentication KB](#).)*

**[+] ADVANCED (NOT REQUIRED)**

Edit

View Audit

3. Click the **Edit** button.
4. Click the **Advanced (Not Required)** link. A new section appears:

[-] ADVANCED (NOT REQUIRED)

SSL Encryption ?

☐ Enable

Trust Server Certificate

☐ Enable

Failover Partner ?

(Requires SQL Server Configuration change)

Multi-Subnet Failover

☐ Enable

(Enabling Multi-Subnet Failover for AlwaysOn Availability Groups requires SQL Server 2012 and higher with AlwaysOn enabled)

Connection Timeout (in seconds)

15

Save Database Connection Settings

Cancel

- Click to select the **SSL Encryption** check box.
- Click the **Save Database Connection Settings** button.

**Note:** SQL Server must be pre-configured to support encryption. This [Microsoft TechNet article](#) explains how to configure the SQL Server environment for encryption. The SSL encryption used for communicating with SQL Server is either 40 or 128 bit, depending on the Windows operating system used.

**Note:** Using this setting can adversely affect [performance](#) (KBA). See this [TechNet article](#) for additional information.

## Manual IIS Installation

IIS is an internal part of the Windows operating system, and only needs to be enabled. If IIS is not found, the Delinea Installer will install it for you. If you would prefer to install IIS manually, please refer to the instructions listed below for example steps in the Windows Server 2016 Operating System. For the most up-to-date setup instructions, see [Microsoft's Technical Documentation](#). Navigate to **Docs > Internet Information Services > Install**.

### Roles and Features

Delinea products recommend the following roles and features to be installed on the Secret Server IIS Server for maximum security and functionality options:

#### Roles

- Web Server (IIS)
- Web Server (IIS)\Web Server
- Web Server (IIS)\Web Server\Common HTTP Features
  - Default Document
  - Directory Browsing
  - HTTP Errors
  - Static Content
  - HTTP Redirection
- Web Server (IIS)\Web Server\Health and Diagnostics
  - HTTP Logging
- Web Server (IIS)\Web Server\Performance
  - Static Content Compression
  - Dynamic Content Compression
- Web Server (IIS)\Web Server\Security
  - Request Filtering
  - Windows Authentication
- Web Server (IIS)\Web Server\Application Development
  - .NET Extensibility 4.6
  - ASP.NET 4.6
  - ISAPI Extensions
  - ISAPI Filters
- Web Server (IIS)\Web Server\Management Tools

- IIS Management Console

## Features

- .NET Framework 4.x Features
  - .Net Framework 4.x
  - ASP.NET 4.x
- WCF Services
  - HTTP Activation
  - TCP Activation
  - TCP Port Sharing
- PowerShell
  - Windows PowerShell 5.1

## Step One: Windows Server 2012–2019 IIS Installation

To install Internet Information Services (IIS) Manager on Windows Server 2016, you will need to give your server the Web Server (IIS) role using the following procedure:

**Note:** If this is *not* the first time you have run the wizard (that is, when first installing IIS), the Web Server Role (IIS) and Role Services windows will not appear, and the wizard order changes a bit. Instead, role services are selectable in the Server Roles window.

1. Click the **Server Manager** button on your server. The Server Manager Dashboard appears.
2. Click the **Add Roles and Features** button. The Add Roles and Features Wizard on the Before You Begin window appears.
3. Click the **Next** button. The Select Installation Type window appears.
4. Click to select **Role-based or feature-based installation** selection button.
5. Click the **Next** button. The Select Destination Server window appears.
6. Ensure the **Select a Server from the Server Pool** selection button is selected.
7. In the **Server Pool** section, click to select your server.
8. Click the **Next** button. The Select Server Roles window appears.
9. Click to select the **Web Server (IIS)** check box.
10. Click the **Next** button. The Select Features window appears.
11. In the **Features** list, Click to select the following checkboxes (If necessary, click the **Add Features** button when prompted):
  - .NET Framework 4.x Features > WCF Services > **HTTP Activation**
  - .NET Framework 4.x Features > WCF Services > **TCP Activation**
12. Click the **Next** button. The Web Server Role (IIS) window appears.



13. Click the **Next** button. The Select Role Services Window appears.

14. In the **Roles** list, click to select the following check boxes:

**Note:** Leave all the auto-selected check boxes as is.

- Web Server (IIS) > Web Server > Common HTTP Features > **HTTP Redirection**
- Web Server (IIS) > Web Server > Performance > **Dynamic Content Compression**
- Web Server (IIS) > Web Server > Security > **Windows Authentication**

15. Click the **Next** button. The Confirmation window appears

16. Confirm your installation details.

17. Click the **Install** button. Wait for the installation to complete. The Results window appears.

18. Click the **Close** button. An IIS tile should now appear on your server.

**Note:** We recommend you run [Windows Update](#) to install the latest security patches for IIS once you have IIS installed.

## Step Two: Configure the IIS Website

Follow these steps to configure a website in IIS for Secret Server:

1. Extract the Secret Server files into C:\inetpub\wwwroot\SecretServer or your location of choice.
2. Open Internet Information Server (IIS) Manager: On the taskbar, click **Server Manager > Tools > Internet Information Services (IIS) Manager**.
3. In the Connections pane, expand the server name.
4. Click on the **Application Pools** node. The Application Pools window appears.
5. Click the **Add Application Pool** link. The Add Application Pool dialog box appears.
6. Type SecretServer in the **Name** text box.
7. Click to select **4.x** in the **.NET Framework Version** dropdown list.
8. Click to select **Integrated** in the **Managed Pipeline Mode** dropdown list.
9. Click the **OK** button to save the new application pool. The dialog box closes.
10. (optional) Customize the Windows account Secret Server runs as:
  1. Right click the new application pool and select **Advance Settings...**
  2. Click the **Identity** setting in the **Process Model** section to select the desired account. Using this, you can, for example, set Secret Server to use IWA to connect to SQL.
11. Expand the **Sites** node on the **Connections** tree.
12. Click on the Default Web Site node.
13. In the **Actions** pane, click **Bindings** to set your desired website. The Edit Bindings dialog box appears.
14. Edit or add bindings as desired. We recommend using HTTPS with a real SSL certificate.

15. Click the **Close** button.
16. In the **Connections** tree, expand the **Default Website** node.
17. **Either**, If you see the default folder, **SecretServer**, which you created earlier:
  1. Right click the **SecretServer** folder and select **Convert to Application**. The Add Application dialog box appears.
  2. Click the **Select...** button to choose the pool you created earlier for Secret Server.**Or**, If you used a custom location instead:
  1. right click the Default Website. The Add Application dialog box appears.
  2. Type SecretServer in the **Alias** text box.
  3. Click **Select...** and pick the app pool created for Secret Server.
  4. Type the path where you extracted the Secret Server files in the **Physical Path** text box.
18. Click the **OK** button.

### Step Three: Ensure IIS Does Not Stop the Worker Process

When using IIS version 7.0 and above, by default, the worker process terminates after an inactive period. If Secret Server is in its own application pool, that application pool will stop after a period of no requests. To ensure this does not happen, perform the following procedure. Additionally, by default, IIS launches a worker process when the first request for the Web application is received, so if the Secret Server application takes a long time to start, issues can result. Thus, we recommend launching the Secret Server application pool worker process as soon as IIS starts by setting the start mode to "AlwaysRunning."

Procedure:

1. Open **Internet Information Server (IIS) Manager**:
  - If you are using Windows Server 2012 or Windows Server 2012 R2: On the taskbar, click **Server Manager > Tools > Internet Information Services (IIS) Manager**.
  - If you are using Windows Server 2008 or Windows Server 2008 R2: On the taskbar, click **Start > Administrative Tools > Internet Information Services (IIS) Manager**.
2. In the **Connections** pane, expand the server name.
3. Click **Application Pools**.
4. Determine which application pool Secret Server is running as:
  1. Expand **Sites** at the left.
  2. Find the website Secret Server is running on.
  3. Click on the Secret Server website or virtual directory (if it is running on one).
  4. Click **Basic Settings** on the right panel. This indicates Secret Server's application pool.
5. Right-click the application pool and select **Advanced Settings...** The Advance Settings dialog appears.
6. In the **General** section, set **Start Mode** to **AlwaysRunning**.
7. In the **Process Model** section, set **Idle Time-out (minutes)** to **0**.

8. In the **Recycling** section, set **Regular Time Interval (minutes)** to **0**.
9. In the **Recycling** section, click the > next to **Specific Times** to ensure there are no times set. If there are, click the ... to clear them.
10. Leave IIS Manager open—we will return to it below.

#### **Step Four: Ensure the User Profile Always Loads**

As of version 10.2, Secret Server requires its application pool "Load User Profile" setting enabled. Otherwise, Secret Server reports a critical alert to system admins.

**Note:** Even without the setting enabled, Secret Server loads to give access to secrets but many internal operations may malfunction, so we recommend resolving this issue as soon as possible.

Procedure:

1. Right-click the Secret Server application pool in IIS Manager and select **Advanced Settings...** The Advance Settings dialog appears.
2. Go to the **Process Model** section in the **Advanced Settings** dialog.
3. Set **Load User Profile** to **True**.
4. Preform an `iisreset` on the server (in an administrator command prompt).

## Installing and Configuring SQL Server

For step-by-step instructions on how to install SQL 2016, see [SQL Server 2016 Standard Edition Installation](#).

Secret Server requires Microsoft SQL Server as the back-end database. All editions including the Express version of 2012–2019 are supported.

Setting up SQL Server requires:

- Installing SQL Server
- Creating a SQL Account
- Configuring database access in Secret Server
- Installing SQL Server

**Note:** If you are using SQL Express make sure to get the edition with tools that will include SQL Management Studio. Follow the link in the KB article [Download SQL Express with Tools](#).

### Creating a SQL Account

#### SQL Authentication

The fastest method to get started with Secret Server is to create a SQL Authentication account. Follow the instructions in the Database section of the [Installation Guide](#).

For troubleshooting and configuring SQL installation on a different server than the application server see [SQL Authentication Configuration](#) article.

#### Windows Authentication

A more advanced way to have Secret Server access the SQL server would be through a service account and using Windows Authentication. Because of the requirement of a service account and added IIS settings, we only recommend this for non-evaluation setups. See instructions in [Configuring Integrated Windows Authentication](#).

### Configuring Database Access in Secret Server

Once the account has been created and SQL server installed with the MSI. The third step of the Web installer will ask for database access information.

#### SQL Location

- **Server Name or IP:** If it is a local machine the server name will be (local) or localhost for the default instance, or if a named instance such as SQL Express it would be localhost\SQLEXPRESS. If you are unsure, copy the value from the "Server name" text box when connecting through SQL Management Studio.
- **Database Name:** If you have created a database, enter the name. If you have given the SQL account dbCreator permission, enter a database name for Secret Server to create.

#### SQL Authentication

- **SQL Server Authentication:** Implies a SQL account has been created that exists only with SQL Server. The account will need to be dbOwner on the database or need dbOwner permission to create the database. This is recommended for quickest setup. For more detailed information and troubleshooting see [SQL Authentication Configuration](#) article.
- **Windows Authentication:** The identity of the application pool will access the database. This requires a domain Service account that has been granted access to run ASP.Net and the database. This is an advanced setting that is not recommended for evaluations. Follow the instructions on using a service account in [Configuring Integrated Windows Authentication](#).



## Installing RabbitMQ

### Overview

#### What is RabbitMQ?

RabbitMQ is a robust message queuing software package that Secret Server uses to communicate with its distributed engines. For detailed information about RabbitMQ go to the [RabbitMQ website](#)

#### Why Install It?

RabbitMQ is an enterprise-ready alternative to MemoryMQ. While MemoryMQ is sufficient for basic and prototyping installations, RabbitMQ is the preferred messaging framework when the need for greater reliability and clustering arises.

#### RabbitMQ and Encryption

All data sent from or read by Secret Server from RabbitMQ is encrypted. If you would like to add SSL despite the data already being encrypted, please follow the "Advanced installation of RabbitMQ with TLS" use case. Please note that Delinea Support can help with non-SSL installations. For SSL installation, configuration, troubleshooting, and RabbitMQ clustering, please contact [Delinea Professional Services](#) to learn more about our Professional Services rates.

#### Downloading Delinea's RabbitMQ Helper

Please go to [Delinea RabbitMQ Helper](#) to download the most recent version.

### Prerequisites

**Important:** Secret Server only supports RabbitMQ on Windows operating systems. Secret Server is incompatible with the RabbitMQ Federation plugin.

RabbitMQ requires:

#### General

- Windows Server 2008 or higher with PowerShell v3 support
- Nodes hosting RabbitMQ need a minimum of 2 GB RAM
- Nodes hosting RabbitMQ should have at least 128 MB of memory available at all times
- Disk space is not an issue, but it should not go below 50 MB (default value), especially if you host RabbitMQ on the same server as Secret Server
- Minimum two vCPUs. This is an **absolute minimum** otherwise installation fails without much useful feedback to troubleshoot. We strongly recommend four vCPUs or more.
- Ports 5672 (non-SSL) or 5671 (SSL) opened on the machine and firewall

#### SSL Certificate

- A server certificate PFX type and a root certificate authority certificate CER type.
- The PFX certificate should have:
  - A name that matches the RabbitMQ Fully qualified machine name
  - If you plan on making a RabbitMQ cluster, add DNS names (SANs) to your certificate
  - Your certificate must be an RSA certificate. CNG is not supported and will cause the installation to fail.
- If you do not have an internal PKI and prefer not to use a public certificate, you can use a self-signed certificate.

**Note:** Delinea will not assist with creating or troubleshooting self-signed certificates.

## Installation

### Task 1: Secret Server

In Secret Server UI

1. Navigate to **Admin > Distributed Engine**.
2. Click the **Manage Site Connectors** button. The Manage Site Connectors page appears:

### Manage Site Connectors

< 1 to 2 of 2 >

SITE CONNECTOR	ACTIVE	VALIDATED	QUEUE TYPE	HOST	VERSION
Default MemoryMq Service	Yes	No	MemoryMq	QA-CUST-01	5.0.0.40
RMQ_for_BUG169089	Yes	No	RabbitMq	EARTH.solar.local	Unknown

☐ Show Inactive

← Back
+ New Site Connector

3. Click the **+ New Site Connector** button. The Site Connector Details page appears:

### Site Connector Details

Queue Type

Memory MQ

Name

Active

☒

Use SSL

☐

Host Name

Port

8672

Save

Cancel


4. Click to select **Rabbit MQ** in the **Queue Type** dropdown list.
5. Type a name for your new site connector in the **Name** text box.
6. Click to select the **Active** check box.
7. Type the host name of the machine where you plan to install RabbitMQ in the **Host Name** text box.


**Note:** The Engines need to be able to resolve this host name or the connection will fail. Also, inbound firewall rules must be

created on the machine that is hosting the connector.

8. Type either port 5672 (non-SSL) or 5671 (SSL) in the **Port** text box.
9. Click the **Save** button.
10. After the site connector is created, click the site connector's link. The Site Connector Details page appears:

### Site Connector Details


Connectivity has not been validated.


To be included in the mailing list about updates to MemoryMq, please send an email to [MemoryMQ@thycotic.com](mailto:MemoryMQ@thycotic.com).

**Queue Type** MemoryMq

**Name** Default MemoryMq Service

**Active** Yes

**Use SSL** No

**Host Name** QA-CUST-01


**Port** 8672


↩ Back
✎ Edit
👁 View Credentials
⬇ Download Site Connector Installer


✓ Validate Connectivity

11. Click the **View Credentials** button to retrieve the automatically generated credentials. The Site Connector Credentials popup appears. You can ignore the informational message that the connectivity has not been validated for now as you will be doing so after you install RabbitMQ on the host you have selected.

### Site Connector Credentials


These credentials are automatically used by the Site Connector and by Engines that use this Site Connector.

**User Name**  eFAQUJzHtIHUtDnD05YME0ZOLxF8qggv09OqAVfJudDpxJVlBER0gAzGG-7nz5F

**Password**  FHkdCq6gSRlIt3OL4Vcb1x9EZDygggJe8rho5R1hDjtxaitnaTYoya4HOQu4M3U0

✓ OK

12. Click the copy icons to copy both the **User Name** and **Password**, and store them for use in the next section.
13. Click the **OK** button.

## Task 2: RabbitMQ Host

1. Download the [Delinea RabbitMQ Helper](#).
2. Install the Delinea RabbitMQ helper by running the downloaded MSI.



3. Review the supported [installation scenarios](#).
4. Navigate to the installation folder in %PROGRAMFILES%\Thycotic Software Ltd\RabbitMq Helper
5. Launch the Delinea.RabbitMq.Helper.exe, which opens the Windows PowerShell.
6. Then, issue a cmdlet command from the scenario that applies to your need.
7. After installation completes, the helper opens a Web browser to the RabbitMQ management console. There is no need to interact with the site at this time, so you can minimize or close the page for now.
8. Return to Secret Server, and go to the site connector you created in the previous section.
9. Click the site connector's link. The Site Connector Details page appears.
10. Click the **Validate Connectivity** button.
11. If everything is set up correctly, you will see "Validation Succeeded."
12. If you see "Validation Failed," do the following:
  1. Ensure the RabbitMQ Windows service is running.
  2. Check the logs found under C:\Program Files\Thycotic Software Ltd\RabbitMq Site Connector\log.
  3. Check the Secret Server system log for a full error report.

## Troubleshooting

Please refer to [RabbitMQ Helper](#).

## Clearing RabbitMQ Message Queues

Some users note that older RabbitMQ message queues in Ready state are not clearing as expected, so messages accumulate. To clear the message queues, use the procedure below.

1. On the machine where RabbitMQ is installed, download the [utility](#) for removing old RabbitMQ queues.

SHA1(RMQ\_QueueRemoval.zip)= B8EE3CD2488AF2D7A42421B870EB8041434245C8

SHA256(RMQ\_QueueRemoval.zip)= B9AF3BF51B0E1E6E937830A6CF0974D3546183B78E1E86F6C8563E5E7243146A

2. Extract the zip file.
3. Open Windows PowerShell.
4. Navigate to the directory where you extracted the zip file.
5. Load the file by typing the following command:

```
. .\RMQ_QueueRemoval.ps1
```

6. Run the commands below in the order shown:

1. ShowAllQueues
2. ShowQueuesNoConsumer
3. DeleteQueuesNoConsumer

## Installing Secret Server via the Command Line

### Overview

ThycoticSetup.exe accepts command line arguments for a silent or automated installation. This topic discusses how to do that.

Basic usage:

ThycoticSetup.exe -q -s PARAMETER=<value> PARAMETER2=<value> (/nodetect) (/l <log file path>)

Important considerations:

- Always pass -q -s to ThycoticSetup.exe and then pass in your parameters or switches.
- There are two stages to the installer. The first (optional) stage is to install the prerequisites such as IIS and .NET 4.8. Then in a second stage, once all required pre-reqs are present, you can install Secret Server or Privilege Manager (PM).
- The installer UI performs additional validation steps, such as testing the database connection information, that a silent CLI one does not. Thus, this install can fail if you provide incorrect settings.
- The installer checks to see if Secret Server and PM are already installed by default. It will install them if either is not found. If you would like to specify which applications to install, you must use the /nodetect switch to avoid the automatic detection, so the InstallSecretServer and InstallPrivilegeManager settings are respected.
- Due to how MSI installers work, if you need to pass in parameters that contain spaces, use the special CMDLINE parameter, using extra double quotes to delineate each parameter. For instance:

```
ThycoticSetup.exe -q -s PARAM1=some_string PARAM2=1234 CMDLINE=" PARAM3=""Something with a space"" PARAM 4=""Another value with spaces"" "
```

Note:

- You can mix and match regular parameters (numerical values, or strings without spaces) with CMDLINE.
- Any parameters sent inside of CMDLINE are treated as strings. Numerical parameters inside of CMDLINE are ignored.
- Be aware of how you call ThycoticSetup.exe and what special characters need escaping in your shell. This includes passwords containing symbols. What is required is shell dependent. For example, running the installer from PowerShell (or a .ps1 script) rather than an older command prompt (or a .bat file) would require escaping a different set of special symbols.
- We recommend using the /l <logfile> option to create a log file, which you can use to verify your parameters are correctly passed to the installer. This is especially useful when using CMDLINE for parameters with spaces, which is prone to mistakes.

**Note:** For security, parameters involving passwords are not logged.

### Install Prerequisites

As of Secret Server 10.11, you can silently install all required prerequisites. These are the same prerequisites the "Fix Issues" button in the installer UI fixes. The important difference is missing prerequisites are not auto detected—you must tell the installer which ones you want installed. Older versions will not do a silent command line installation unless these necessary prerequisites are already installed.

### Parameters

#### Table: ThycoticSetup.exe Parameters

Parameter	Value	Required (if not present)	Purpose
/l	<logfile>	Yes	Creates a log file to verify parameters are correctly passed to the installer. This is especially useful when using CMDLINE for parameters with spaces, which is prone to mistakes.
/i	<logfile>	Yes	Creates a log file to verify parameters are correctly passed to the installer. This is especially useful when using CMDLINE for parameters with spaces, which is prone to mistakes.
/PRE_REQS_TO_INSTALL	Comma separated list (see below)	Yes	Specifies which prerequisites to install.

[Unexpected Link Text](#)

## Prerequisites

**Table:** Prerequisite (PRE\_REQS\_TO\_INSTALL) Values

Prerequisite	Required (if not present)	Purpose	Configure_FIPS	No	Ensures the AES 256 and 128 ciphers are enabled in Windows.
ENABLE_FIPS	No	Enables FIPS mode in Windows. Generally, not needed, unless required by your environment.	INSTALL_HTTPS_BINDING	No	Enables HTTPS binding in IIS for the default website. Tries to pick an existing valid SSL certificate and creates a self-signed certificate if necessary for temporary use. Always use HTTPS with a valid certificate in production environments.
INSTALL_IIS	Yes	Installs the Web Server (IIS) Windows Role.	INSTALL_IIS_COMPS	Yes	Installs various required IIS features.
INSTALL_NET_WCF	Yes	Installs the WCF HTTP and TCP activation features.	INSTALL_NetFx48	Yes	Installs .NET 4.8. This <b>requires a reboot</b> . <a href="#">Unexpected Link Text</a>

## Single-Line Example

```
ThycoticSetup.exe -q -s InstallPreReqs=1
PRE_REQS_TO_INSTALL=INSTALL_IIS,INSTALL_IIS_COMPS,INSTALL_NET_WCF,INSTALL_HTTPS_BINDING,INSTALL_NetFx48 /I C:\temp\install-prereqs.log
```

## Installing Applications

Secret Server or Privilege Manager can be installed and pre-configured using these parameters. If the required prerequisites are not already present, the installer exits. They can both be installed at the same time but will then share the same database and email settings.

If you need more control over configuring the website, you can create a site and configure it in advance (that is, using IIS's AppCmd.exe), and then pass the preconfigured website name as SecretServerSiteName Or PrivilegeManagerSiteName.

## Secret Server Parameters

**Table:** Secret Server Parameters

Parameter	Value	Default	Notes	CreateWebSite	Boolean	0	Required if the SecretServerSiteName website does not exist.
InstallSecretServer	Boolean	1	Whether or not to install Secret Server. Must also use the /nodetect switch to avoid this being set to 1 if not already installed.	SecretServerApplicationName	String	SecretServer	Used for the application pool name as well as the website application or subfolder.
SecretServerAppPassword	String	Optional	Only required if you are configuring SecretServerAppUserName.	SecretServerAppUserName	String		
ApplicationPoolIdentity	What identity to run the app pool as. The user must already exist.		SecretServerConfigLogFile	String			
<logname>_SS_Configuration.log	Optional. The base <logname> is specified with the /I option.		SecretServerDestinationFolderPath	String			
C:\inetpub\wwwroot\SecretServer	If you would like to use a directory containing spaces, see note above about how to use the CMDLINE parameter to pass it in.		SecretServerSiteHttpsPort	Integer	Optional		HTTPS port. Always use HTTPS in production. If using the default website, this port is an additional HTTP binding, along with the default. If you use this option to bind HTTPS on another port, configure the HTTPS binding yourself and choose a certificate after the installer completes.
INSTALL_HTTPS_BINDING	only configures the certificate on the normal 443 binding.		SecretServerSiteName	Integer	Default website		Used by both Secret Server and PM. Must already exist, unless you also use CreateWebSite=1 (see the Website Parameters section below).
SecretServerSitePort	Integer	Optional		HTTP port			If using the default website, this port HTTP binding is in addition to any defaults.
SecretServerUserDisplayName	String	None		The display name for SecretServerUserName.			
SecretServerUserEmail	String	None		The email address for SecretServerUserName.			
SecretServerUserName	String	None		The initial Secret Server administrator user. If not set, once Secret Server is installed, the first person to visit the website will be able to pick the details on the "Create Initial Administrator" page.			
SecretServerUserPassword	String	None		The password for SecretServerUserName.			<a href="#">Unexpected Link Text</a>

## Privilege Manager Parameters

**Table:** Privilege Manager Parameters

Parameter	Value	Default	Notes	CreateWebSite	Boolean	0	Required if the PrivilegeManagerSiteName website does not exist.
InstallPrivilegeManager	Boolean	1	Whether or not to install PM. Must also use the /nodetect switch to avoid this being set to 1 if not already installed.	PrivilegeManagerApplicationName	String	TMS, TMSAgent, TMSWorker	Used as the base name of the PM application pools (Regular, Agent, and Worker), plus the website application or subfolder.
PrivilegeManagerAppPassword	String	None	Only required if you are configuring				

PrivilegeManagerAppUserName. | PrivilegeManagerAppUserName | String | None | What identity to run the app pool as. User must already exist. |  
 PrivilegeManagerDestinationFolderPath | String | C:\inetpub\wwwroot\TMS | If you would like to use a directory containing spaces, see above on using the  
 CMDLINE parameter. | PrivilegeManagerLogFile | String | None | Optional | PrivilegeManagerSiteName | String | Default website | CreateWebsite=1 must  
 also be set to customize this. | [Unexpected Link Text](#)

## Required Database Parameters

**Table:** Required Database Parameters

Parameter	Value	Default	Notes
DatabaseConnectionTimeout	Integer	15	Database connection timeout in seconds.
DatabaseEnableMultiSubnetFailover	Boolean	0	If your application connects to an AlwaysOn availability group (AG) on different subnets, setting MultiSubnetFailover=true provides faster detection of and connection to the (currently) active server. For more information about SqlClient support for AlwaysOn availability groups, see <a href="#">SqlClient support for High Availability, Disaster Recovery</a> .
DatabaseEnableSslEncryption	Boolean	0	Whether or not to use SSL/TLS for the database connection.
DatabaseFailoverPartner	String	None	The name or address of the partner server to connect to if the primary server is down. Only used if DatabaseEnableMultiSubnetFailover=1.
DatabasesUsingWindowsAuthentication	Boolean	0	Whether or not to use integrated Windows authentication for MSSQL access. If enabled, before running the install, you must configure your IIS application pool to run a Windows account permission to access the DatabaseServer, and the DatabaseUserName and DatabasePassword will not be used.
DatabaseName	String	None	Database name. Is created if it does not exist. Defaults to SecretServer if installing SQL Express.
DatabasePassword	String	None	Database SQL login password. Ignored if using Windows authentication.
DatabaseServer	String	None	Database server hostname or IP.
DatabaseTrustServerCertificate	Boolean	0	Only used if DatabaseEnableSslEncryption=1 is set. Do not enable in production if you are using SSL encryption; certificate trust validation is critical to security. Certutil.exe can be used to diagnose untrusted certificates. When TrustServerCertificate is set to true, the transport layer uses SSL to encrypt the channel and bypass walking the certificate chain to validate trust. If TrustServerCertificate is set to true and encryption is turned on, the encryption level specified on the server is used even if Encrypt is set to false. The connection fails otherwise.
DatabaseUserName	String	None	Database SQL login username. Ignored if using Windows authentication.
InstallSqlExpress	Boolean	0	Whether or not to install the free SQL Express to use as a database server. If enabled, none of the other database parameters are used. We only recommended this for testing. , do not use in production due to performance limits.

| [Unexpected Link Text](#)

## Email Parameters

You can set email parameter either in the UI after installation or by using these parameters at install time.

**Table:** Optional Email Parameters

Parameter	Value	Default	Notes
EmailDomain	String (optional)	None	Domain for SMTP credentials. Used if EmailUseCredentials=1.
EmailFromAddress	String (required)	None	The "from" address to use when sending emails.
EmailPassword	String (optional)	None	Password for SMTP credentials, used if EmailUseCredentials=1.
EmailPort	Integer	25	The TCP port used to connect to the SMTP server.
EmailServerName	String (required)	None	Hostname or IP of a SMTP server.
EmailUseCredentials	Boolean	0	Whether or not SMTP credentials should be sent when connecting.
EmailUseCustomPort	Boolean	0	Whether or not to use a custom port connecting to the email server.
EmailUserName	String (optional)	None	Username for SMTP credentials. Used if EmailUseCredentials=1.
EmailUseSSL	Boolean	0	Whether or not to use SSL/TLS when connecting to the email server   <a href="#">Unexpected Link Text</a>

## Single-Line Example

This example installs Secret Server and not PM, leaving variable for the database parameters:

```
ThycoticSetup.exe -q -s InstallSecretServer=1 InstallPrivilegeManager=0 DatabaseServer=<hostname> DatabaseName=<SecretServer> DatabaseUserName=<username> DatabasePassword=<password> /I C:\temp\ss-install.log /nodetect
```

## Moving Secret Server to Another Machine

If you are moving/migrating Secret Server to a new machine and have installed IIS and .NET Framework as described in the Installation Guide on the new machine, you do not need to run the installer; you just need to follow the steps below:

1. If you use the "Force HTTPS/SSL" option, disable it by clicking **Configuration** from the **Administration** menu, and then click the **Security** tab, and **Edit**. You can re-enable the "Force HTTPS/SSL" option after you set up and install an SSL certificate on the new machine.

**Note:** If you are also moving the SQL Server database, be sure to create a new backup of the database, as this setting is written to it. To move the database, follow the steps in [Moving the Microsoft SQL Server Database to Another Machine](#).

2. If you have configured encryption of your key using DPAPI, you will also need to turn this off before continuing with Step 3. To do so, click **Configuration** from the **Administration** menu, then click the **Security** tab. Click **Decrypt Key** to *not use* DPAPI and enter your Secret Server account password.
3. Copy the folder that holds your Secret Server instance to the new computer.
4. Shut down the old web site and recycle its application pool as it is running background threads that are accessing the database.
5. Set up the new folder in Internet Information Server (IIS) as a virtual directory/application under the Default Web Site or as a separate Website. For detailed instructions, refer to [Advanced Installation](#) in the Installation Guide.
6. If your database server and credentials have not changed, skip this step. If they have changed, follow the steps below:
  1. Delete the database.config file from the secretserver folder (on the ASP.NET/IIS machine).
  2. Restart your new Secret Server website, so it is running.
  3. Browse to your Secret Server URL \dbconnectionreset.aspx http://secretserverurl/dbconnectionreset.aspx and you will be prompted to enter your new database connection details.
  4. Enter your new SQL Server and the account information.
  5. Click **Next** and the site will connect to the new database. Your site is now pointing the new database.
7. Activate the licenses for the new server by going to the **Licenses** page.
8. If you are using certs, remember to set them on your new IIS, and then browse to Secret Server over HTTPS and re-enable force HTTPS if this was set on the original machine.
9. Re-enable DPAPI if this was disabled in the earlier step.

**Note:** If you are moving Secret Server web application from Windows Server 2008 to 2012 AND your Secret Server is below version 8.5, make sure that:

- .Net extensions 3.5 and ASP.Net 3.5 when adding the IIS role on the new server.
- Change the Secret Server application pool to 2.0 and recycle the application pool after running the installer.

## Moving the Microsoft SQL Server Database to Another Machine

**Important:** This article only applies if your MS SQL Server database is only for Secret Server.

Follow the steps below for moving MS SQL Server database for Secret Server.

### Task 1: Backing up and Restoring the Database

To back up your Secret Server installation:

**Note:** Your Secret Server instance may be running during this procedure.

1. Stop the Secret Server site in Internet Information Server (IIS) to prevent any changes to the database.
2. Navigate to the directory where Secret Server is installed.
3. Copy the folder (holding the application) to your back up location.
4. Open your SQL Server Management Studio.
5. Right click the database your Secret Server is running on, and select **Tasks > Backup**.
6. Click the **Add** button. You are prompted to enter a file path for the .bak file. This can be the final destination (not recommended) or a temporary one (for later moving to a back up location).
7. Make sure SQL Server has permissions for this location. That is, create (if needed) and or grant access to the account that will access the database (see the [Installation Guide](#) for account creation instructions). See [Running the IIS Application Pool As a Service Account](#) (Task 2) for details.
8. Copy the resulting database backup file (.bak) to your backup location.

**Note:** You can also automate steps 2-4 using the command: `osql -S myserver\SQLEXPRESS -E - Q "BACKUP DATABASE SECRETSERVER TO DISK = 'c:\backup\ss.bak' .`

**Note:** We recommend taking the old database offline after all steps are complete.

### Task 2: Connecting Secret Server to the New Database

1. Restart your Secret Server website in IIS.
2. Log on Secret Server as a local admin.
3. Navigate to `https://<your_ss_url>/Setup/Database`. The Database Configuration page appears:

## Help

Secret Server supports Microsoft SQL Server versions 2012, 2014, 2016, 2017, 2019, and Express.

View [Collation Requirements](#). Need help installing or configuring SQL Server? View [Installing and Configuring SQL KB Article](#).

### Database Configuration

#### SQL SERVER LOCATION

Server Name	QA-CUST-SQL-01
Database	SS_Playground

#### SQL AUTHENTICATION

☒ Windows Authentication using Application Identity (GAMMA\ss\_iis\_svc) - **Recommended**  
*(Advanced Setting. Windows Authentication requires a Service Account and advanced IIS setup. Detailed in [Windows Authentication KB](#).)*

☐ SQL Server Authentication *(SQL Authentication requires Mixed Mode. See setup in [SQL Authentication KB](#).)*

[+] **ADVANCED (NOT REQUIRED)**

Edit

View Audit

**Note:** The setting here are stored in C:\inetpub\wwwroot\Playground\database.config. You can back that file up to revert or simply return to this page to reset the connection again. See the [Privilege Manager documentation](#) if you need to change its configuration too.

- Click the **Edit** button. The page becomes editable.
- Type your new SQL Server location (server name) and database.
- Click the **Save Database Connection Settings** button, and the site will connect to the new database.
- Your site is now pointing the new database.

**Note:** To roll back changes and restore the original database, complete both tasks again to move the database back to the original database server.

**Note:** If you are also moving the Secret Server application to another server, see [Moving Secret Server to Another Machine](#) for more information.



## Running the IIS Application Pool As a Service Account

### Overview

We recommend setting up a domain service account that can both access the Delinea product's SQL database and run the IIS Application Pool(s) dedicated to your Delinea product.

**Note:** The service account created in this KB should **not** be the same account that is created during the installation of SQL and used to manage SQL as a whole.

To set up this service account correctly you will need to:

1. Create a service account in Active Directory that will be dedicated to your Delinea product (domain).
2. Granting the service account access to the SQL Server database.
3. Assign the service account as the identity of the application pool or pools in IIS.
4. Grant folder permissions for the service account on two folders.
5. Configure User Rights Assignment to the service account.

### Procedure

**Note:** You must have IIS installed on your Web server before completing these steps.

#### Task 1: Creating a Domain Service Account

1. Create a local or domain user account (or identify one to use).
2. Open IIS (**Search > inetmgr**) on your Web server.
3. Open the **Active Directory Users and Computers** link from **Administrative Tools**.
4. Click to open the directory where you want to assign this account, such as testlab.com.
5. Select **Service Accounts**.
6. Right click and select **New > User**. The "New Object - User" wizard dialog box appears.
7. Type a name and logon name for the service account.
8. Click the **Next** button. The wizard advances to the next dialog box (same name).
9. Type a password in the Password and Confirm Password text boxes.
10. If necessary, click to deselect the **User must change password at next login** check box.
11. Click to select the **Password never expires** check box. Failing to do this could lock the account out of Secret Server.
12. " Check **Password never expires** or the account could lock you out of Secret Server.
13. Click **Next** button.
14. Click the **Finish** button. You can now give the account access to the database server and the application server.

#### Task 2: Granting Access to the SQL Database

**Note:** You must have SQL installed on your database server before completing these steps.

Grant access:

1. Open the SQL Management Studio on your database server.
2. Connect to your Delinea product's SQL database using an administrator account.
3. Click to select the Security folder in the Object Explorer.
4. Right-click the same folder and select **New > Login...** A log on dialog box appears.
5. Ensure the **Windows Authentication** radio button is selected.
6. Click the **Search...** button. The "Select User, Service Account, or Group" dialog box appears.
7. Ensure that your domain or AD server appears in the **From this location** text box. If not, click the **Locations...** button and select it.
8. Type the login name you created for your Delinea service account, such as svc\_thycotic, in the **Enter the object name to select** text box.
9. Click the **Check Names** button.
10. Click to select the correct account.
11. Click the **OK** button. The dialog box closes, returning you to the Login - New dialog box.
12. **Either**, if you have already created the database for your Delinea product:
  1. Click **User Mapping** in the **Select a page** list box.
  2. Click to select the check box for the database in the **Users mapped to this Login** list.
  3. Click to select the **db\_owner** check box in the **Database role membership...** list.
13. **Or**, if you have not yet created the database:
  1. Click **Server Roles** in the **Select a page** list box.
  2. Click to select the **db\_creator** check box.
14. Click the **OK** button.

### Task 3: Assigning the Identity of Application Pools

1. Click the **Applications** node under the server name in the **Connections** tree.
2. Right-click the node and select **Advanced Settings...** The Advance Settings dialog box appears.
3. Click the ... button for the **Identity** entry in the **Process Model** section. The Application Pool Identity dialog box appears.
4. Click to select the **Custom Account** selection button.
5. Click the **Set...** button. The Set Credentials dialog box appears.
6. Type your service account's name, such as test and password.
7. Click the **OK** button. The dialog box closes.
8. Open the command console as an Admin.
9. Change the directory to your .NET framework installation directory using the "cd" command, for example,

C:\Windows\Microsoft.NET\Framework\v4.0.30319.

10. Type `.\aspnet_regiis -ga <domain name>\<username>`, replacing `<domain name>` and `<username>` with your information. For local accounts omit the domain name parameter.

#### Task 4: Granting Folder Permissions

**Note:** You must have the Delinea product application files installed (on your Web server) before completing this section.

Following the steps below, you give the service account "Modify" access to **two** folders:

- C:\Windows\TEMP
- The folder where your Delinea product's application files are located, such as C:\inetpub\wwwroot\SecretServer

Procedure (for each folder):

1. In a file manager, navigate to the Secret Server application folder.
2. Right-click the folder and select **Properties**. The Properties dialog box appears.
3. Click the **Security** tab.
4. Click the **Advanced** button.
5. Click the **Add** button. A permissions panel appears.
6. Click the **Select a Principal** link. The "Select User, Computer, Service Account, or Group" dialog box appears.
7. Ensure that your domain or AD server appears in the **From this location** text box. If not, click the **Locations...** button and select it.
8. Type the login name you created for your Delinea service account, such as `svc_thycotic`, in the **Enter the object name to select** text box.
9. Click the **Check Names** button.
10. Click to select the correct account.
11. Click the **OK** button. The dialog box closes, returning you to the permissions panel.
12. Click to select the **Modify** check box in the **Basic Permissions** section. Your service account should have the **Modify, Read & Execute, List folder contents, Read**, and **Write** permissions selected for this folder
13. Click the **OK** button.
14. Click the **Apply** button.

**Note:** If a Windows Security pop-up appears, click the **Yes** button. The service account will now be able to access this folder.

**Note:** The application folder only needs "Write" and "Modify" permissions during the installation or during an upgrade. You can remove these once the installation process is complete.

#### Task 5: Configuring User Rights

The following settings are required for Delinea Secret Server to function:

- "Log on as a batch job"
- "Impersonate a client after authentication"

You can adjust these settings either at the **Domain** level using group policy or locally on your IIS Web server using the Local Security Policy Console. See [User Rights Assignment](#) to learn more.

## Option 1: Setting User Rights Assignment on the Domain

**Note:** This is an example of how to create a Group Policy Object (GPO), we recommend consulting with your organizational group policy administrator to create this policy.

**Note:** This overwrites any configuration in the local security policy. The local security policy is a safer option if you are not sure about usage across your domain.

1. Open the Group Policy Management Console.
2. Right-click the desired GPO folder (under the domain node) in the **Group Policy Management** Tree, and select **New**. The New GPO dialog box appears.
3. Type the name, such as "Delinea User Rights Assignment," in the **Name** text box.
4. Click the **OK** button. The dialog box closes.
5. Right-click the GPO you just created and select **Edit**. The Group Policy Object Editor appears.
6. On the **Computer Configuration** node, click to expand **Policies > Windows Settings > Security Settings > Local Policies**.
7. Click to select the **\*\*User Rights Assignment\*\*** folder.
8. Repeat the following procedure for the "Log on as a batch job" and "Impersonate a client after authentication" permissions (for this instruction we show the former):
  1. In the list on the right, right-click **Log on as a batch job** and select **Properties**. The "Log on as a batch job Properties" dialog box appears.
  2. Ensure that the **Define these policy settings** check box is checked.
  3. Click the **Add User or Group** button. A dialog box appears.
  4. Add your Delinea service account.
  5. Click the **OK** button. The dialog box closes. The new policy appears in the list.
  6. Click the **Apply** button.
9. Link your new GPO to the OU where your Delinea product machine accounts exist, that is, the Web and database servers.

## Option 2: Setting User Rights Assignment Locally

1. On the Web server hosting IIS and your Delinea Application files, open the "Local Security Policy Console" as an administrator (Run as administrator).
2. On the Local Policies node, click to expand **Local Policies > User Rights Assignment**.
3. Click to select the **User Rights Assignment** folder.
4. Repeat the following procedure for the "Log on as a batch job" and "Impersonate a client after authentication" permissions (for this instruction we show the former):
  1. Right-click on **Log on as a batch job** in the list on the right and select **Properties > Add User or Group**.
  2. Click to select your Delinea service account.

3. Click the **OK** button.

**Note:** If you get a "Service Unavailable" error after applying "Log on as a batch job" permissions, try updating your group policy settings: Open the **Command Console**, type in `gpupdate /force**`, and restart the **Windows Process Activation Service**.

## SQL Server 2016 Standard Edition Installation

### Overview

The following steps walk you through setup and configuration for SQL Server 2016 Standard Edition as an example. For the most up to date resources on installing SQL see [Microsoft SQL Technical Documentation](#) for more information.

At the completion of this article you will have:

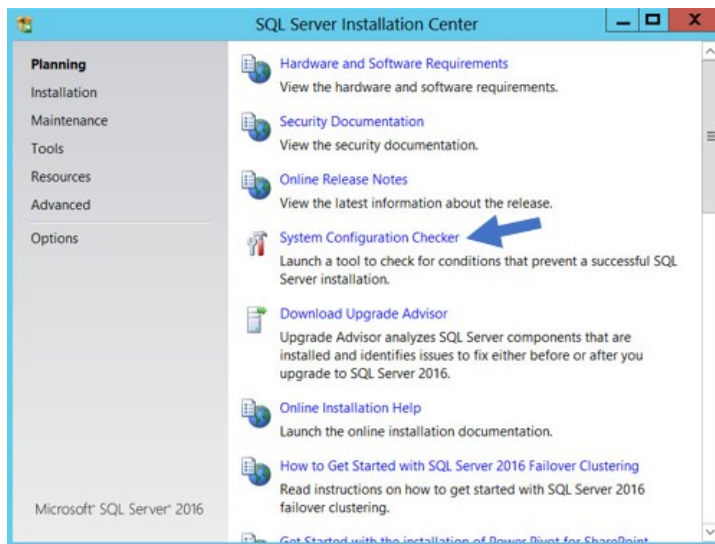
- Installed a basic stand-alone instance of SQL Server 2016 Standard with the minimum features necessary for SQL Server.
- Installed SQL Server Management Studio for managing the local database.
- Created a database in SQL for your Delinea product
- Created a new SQL Server user login for your SQL database

**Note:** This document uses Delinea's Secret Server product as example in the instructions, but the same steps apply for Privilege Manager advanced installs.

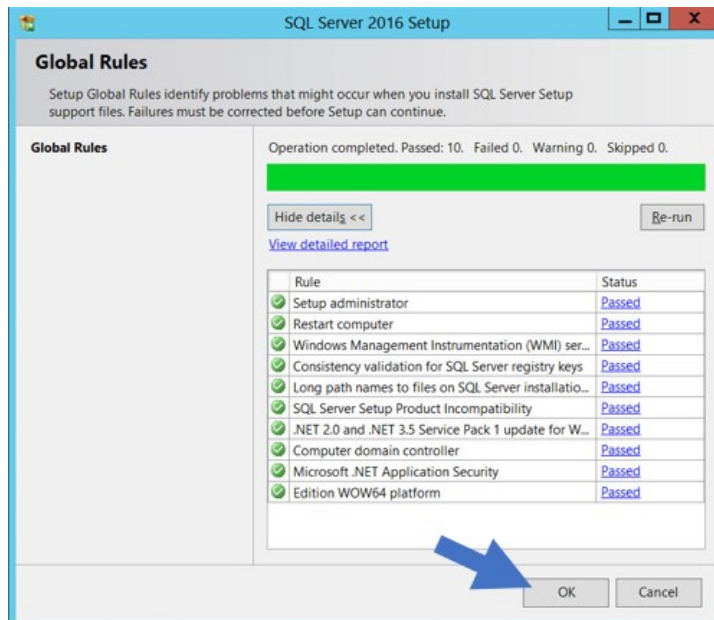
### Procedures

#### Installing SQL Server 2016

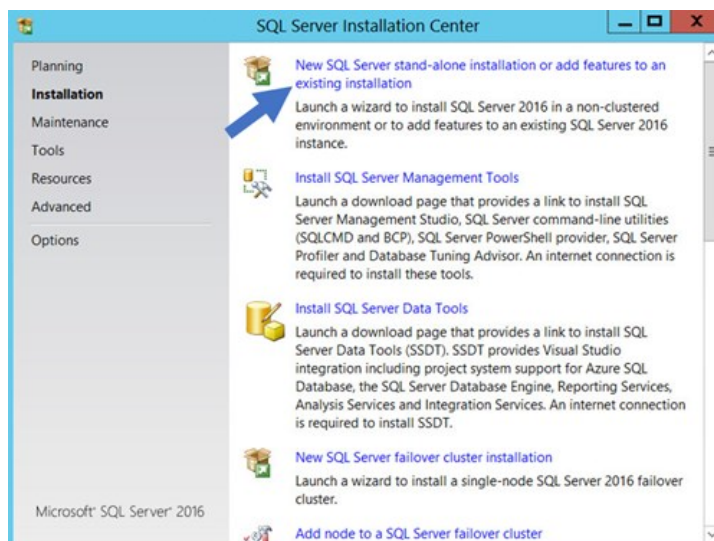
1. Launch the SQL Server installer from CD or file download. The SQL Server Installation Center opens to the Planning window:



2. Click the **System Configuration Checker** link. This runs a tool that checks for conditions on your server that could prevent SQL Server from installing.
3. When the tool launches, click the **Show details** button. A successful scan should look like the one shown below. If you encounter any issues, look at the detailed report, resolve the reported issues, and rerun the scan.



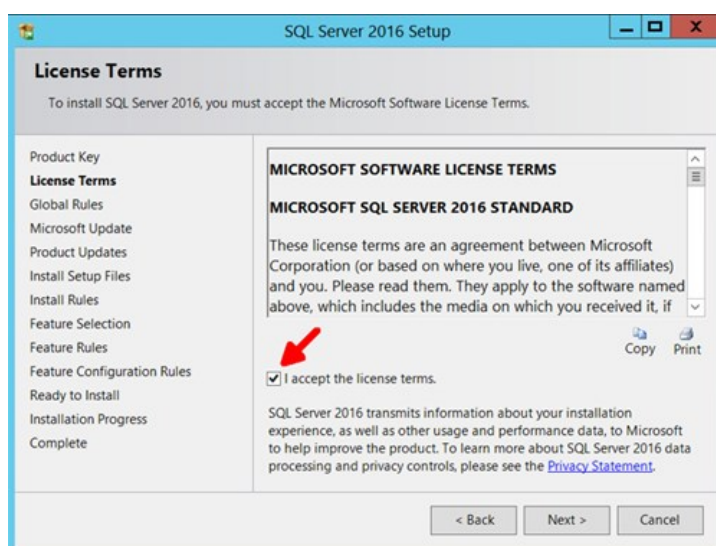
- Click the **OK** button when done to return to the "SQL Server Installation Center" window.
- In the SQL Server Installation Center window, click the **Installation** link. The Installation Window appears:



- Click **New SQL Server stand-alone installation...** link. The Product Key page appears:

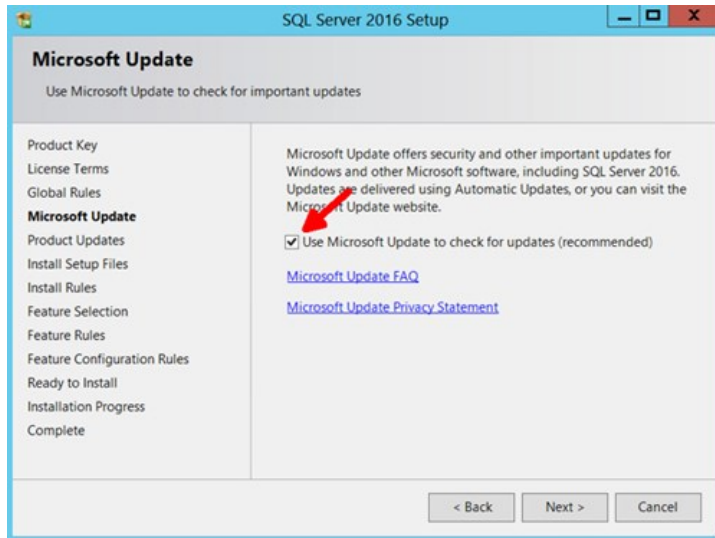


7. Click to select the **Enter the Product Key** selection button.
8. Type your product key in the the **Enter the Product Key** text box.
9. Click the **Next >** button. The License Terms page appears:

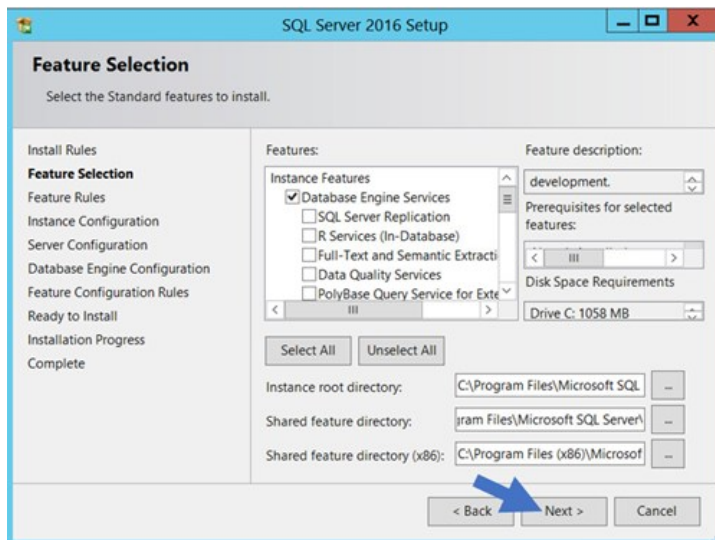


10. Click to select the **I accept the license terms.** check box.
11. Click the **Next >** button. The Global Rules page appears (not shown) after the rule check runs.
12. Click the **Next >** button. The Microsoft Update page appears:

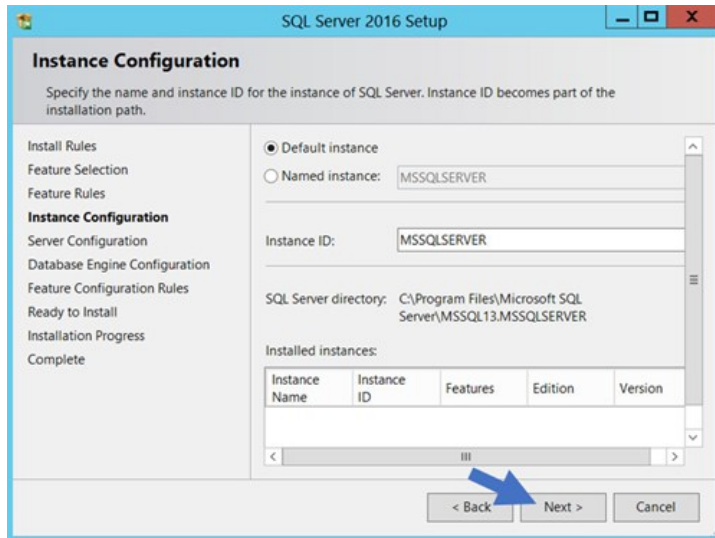




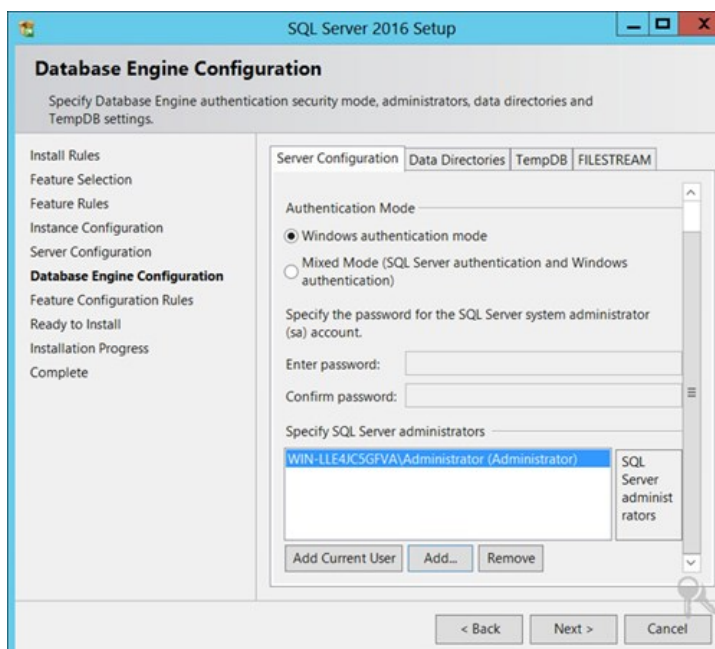
13. Click to select the **Use Microsoft Update...** check box to check for updates (recommended), unless your software update process does not use automatic updates from Microsoft
14. Click the **Next >** button twice to bypass the Product Updates page. The Install Setup Files page appears.
15. Wait for the installation to complete.
16. Ensure that all operations pass.
17. Click the **Next >** button twice to bypass the Install Rules page. The Feature Selection page appears:



18. Ensure the **Database Engine Services** check box is selected. This is the only feature necessary for Secret Server. Unless you are using Geo-Replication, you can leave everything else unchecked. Leave the directory locations unchanged.
19. Click the **Next >** button twice to bypass the Feature Rules page. The Instance Configuration page appears:



20. Ensure the **Default Instance** selection button is selected.
21. Type a name for your SQL Instance in the **Instance ID** text box.
22. Click the **Next >** button twice to bypass the Server Configuration page. The Database Engine Configuration page appears:

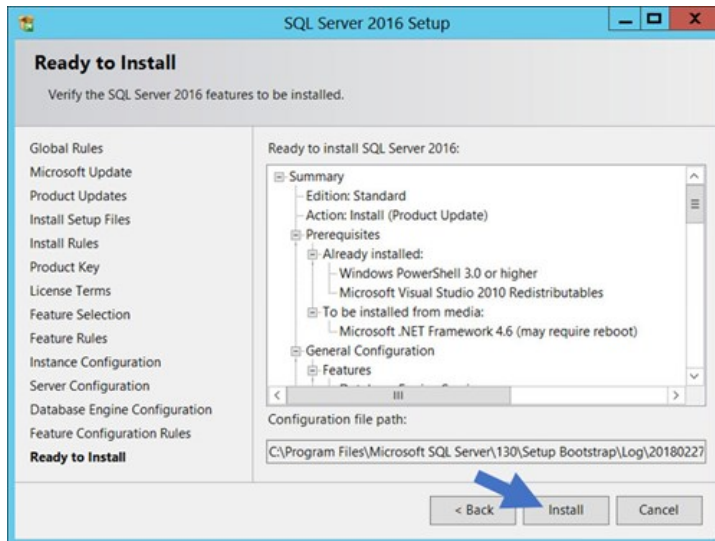


23. You have the choice to select either **Windows Authentication Mode** or **Mixed Mode**. Select the option that will work best for your environment:
  - **Mixed Mode (for easiest configuration)**: This mode is required if you intend on using a SQL Server account to authenticate Secret Server to your SQL Server instance. We recommend using mixed mode if you are setting up a test or demo environment. Selecting this option will also require you to set a password for the SQL Server system administrator (sa) account. See **Adding a SQL Server User** below for instructions on adding more users.
  - **Windows Mode (recommended for best security)**: This mode prevents SQL Server account authentication. We

recommend using Windows mode for production environments. Whatever user or group assigned will have administrative access to your SQL instance. According to best security practices, limit this number to as few users as possible.

**Note:** If choosing **Windows Mode** you will also need to [run the IIS application pool as a service account](#) later in the installation process.

24. You can leave the options in the remaining tabs at their default values or change the file locations in the **Data Directories** and **TempDB** tabs if you wish to store the database and log data in a different drive or directory.
25. Click the **Next > button** twice to bypass the Feature Configuration Rules page. The Ready to Install page appears:

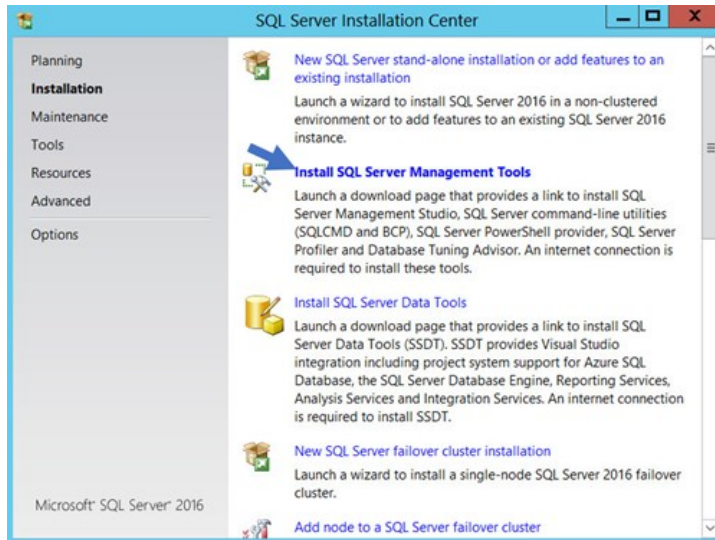


26. Click the **Install** button.
27. Wait for installation to complete. This may take several minutes.
28. Click the **Close** button.

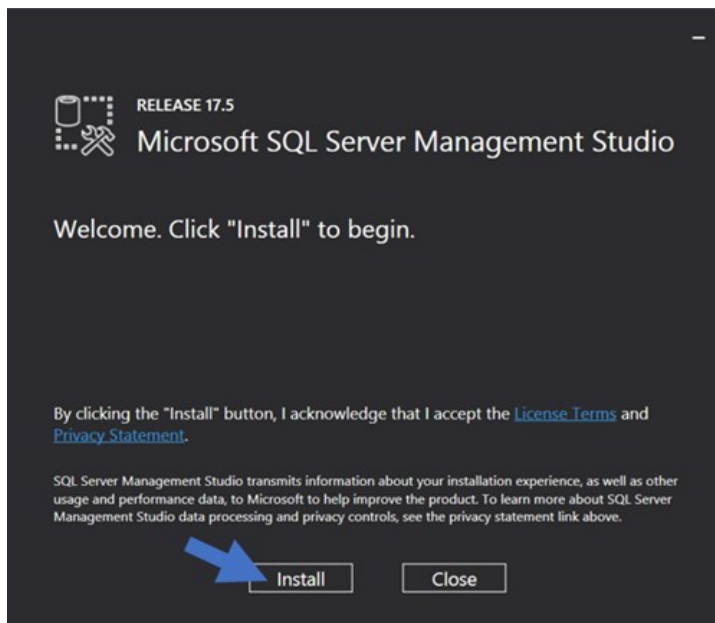
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## Installing SQL Server Management Studio

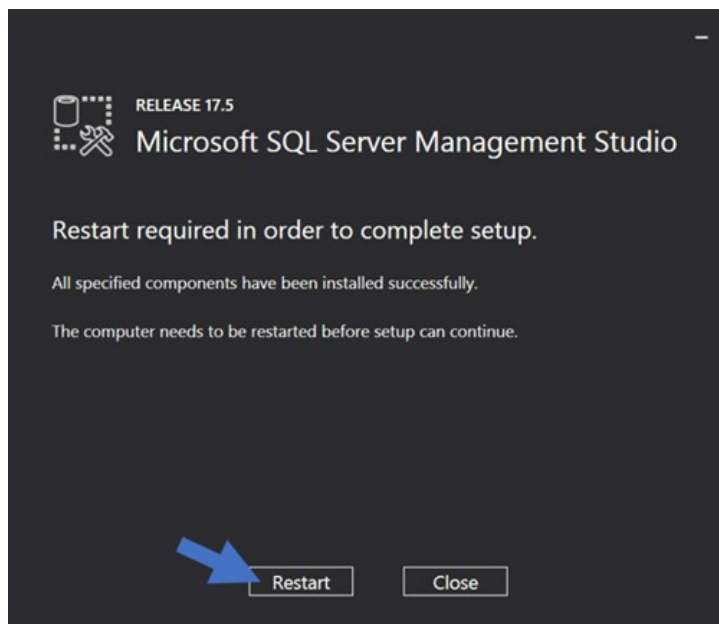
1. In the "SQL Server Installation Center" window, click the **Installation** menu item. The Installation page appears:



2. Click the **Install SQL Server Management Tools** link.
3. Wait for the Web page to load then click the **Download SQL Server Management Studio...** link. A file downloads.
4. Run the downloaded file (varies by browser). The SQL Server Management Studio installer starts.



5. Click the **Install** button.
6. Wait for the installer to complete. This may take several minutes.



7. Click the **Restart** button if prompted. Otherwise, click the **Close** button.
8. Close "SQL Server Installation Center."

## Creating the SQL Server Database

To install Secret Server, the Delinea installer creates the SQL database for you if it does not exist and if the user account has permission to create a new database, which requires the dbcreator server role.

If not using the Delinea Installer, use the following steps to create a database manually through SQL Server Management Studio:

1. Open SQL Server Management Studio.
2. Connect to your SQL Server instance.
3. Right click the **Databases** folder and select **New Database...** The New Database page appears.
4. Type a name for your database in the **Database Name** text box.
5. Click the **OK** button.

## Adding a SQL Server User

According to security best practices, limit the number of users with access to your SQL database as much as possible. Use the following instructions to add a SQL Server account for Secret Server to use to access the SQL database:

1. Open SQL Server Management Studio.
2. Connect to your SQL Server Database.
3. Expand the **Security** folder.
4. Right-click the **Logins** folder and select **New Login...**
5. Select a method of authentication:

- **SQL Server Authentication:** Use this option to create a new SQL Server account (this requires mixed mode to be enabled). To create the account, enter a new username and password and then deselect the **Enforce Password Policy** check box to prevent the account from expiring.
  - **Windows Authentication:** Use this option to add access to SQL Server for an existing Windows account. To add the account, enter the login name or click **Search** to find the account. It is recommended to use a domain account rather than a local Windows account.
6. Click **User Mapping** in the left menu.
  7. Click to select the check box next to your Secret Server database.
  8. In the **Database Role Membership** window, click to select the **db\_owner** check box.
  9. Click the **OK** button.

## SQL Server Authentication Configuration

SQL Authentication requires:

- Creating a new SQL account
- Enabling mixed mode
- Enabling named pipes and SQL Browser a non-local SQL Server

**Note:** For instructions on Creating the SQL account or Installing SQL Server see [Installing and Configuring SQL Server](#) article.

### Enabling Mixed Mode

1. Connect to SQL Server in SQL Management Studio.
2. Right click on the instance node and select **Properties**.
3. Go to the **Security** tab.
4. In the **Server Authentication** section, select **SQL Server and Windows Authentication Mode**.
5. Click the **Ok** button.
6. Restart the SQL Server, by right clicking on the instance node and selecting **Restart**.

**Note:** If your SQL server is running on a separate machine, you need to turn on named pipes and SQL browser to ensure the SQL server can be accessed from an external machine.

### Enabling Named Pipes and SQL Browser

1. Open SQL Server Configuration Manager.
2. Click the **SQL Server Network Configuration** node.
3. Select **Protocols for MSSQLSERVER**.
4. Enable the following:
  - Shared memory
  - Named pipes
  - TCP/IP
5. Enable **SQL Browser**.
6. Click to select the **SQL Server Services** node.
7. Right click **SQL Server Browser** and select **Start**.

## SQL Server 2014 Express Edition Installation

### Overview

**Important:** Delinea recommends using SQL Express in sandbox or trial environments **only** due to size and performance limitations.

SQL Express is a free edition of SQL and is available for use with Delinea products. The following steps walk you through setup and configuration for SQL Server 2014 Express Edition as an example. For the most up to date resources on installing SQL see [Microsoft SQL Technical Documentation](#) for more information.

At the completion of this article you will have:

- Installed a basic stand-alone instance of SQL Server 2014 Express with the minimum features necessary for SQL Server. This includes SQL Server Management Studio and other tools.
- Created a database in SQL for your Delinea product
- Created a new SQL Server user login for your SQL database

**Note:** This document uses Delinea's Secret Server product as example in the instructions, but the same steps apply for Privilege Manager advanced installs.

### Procedures

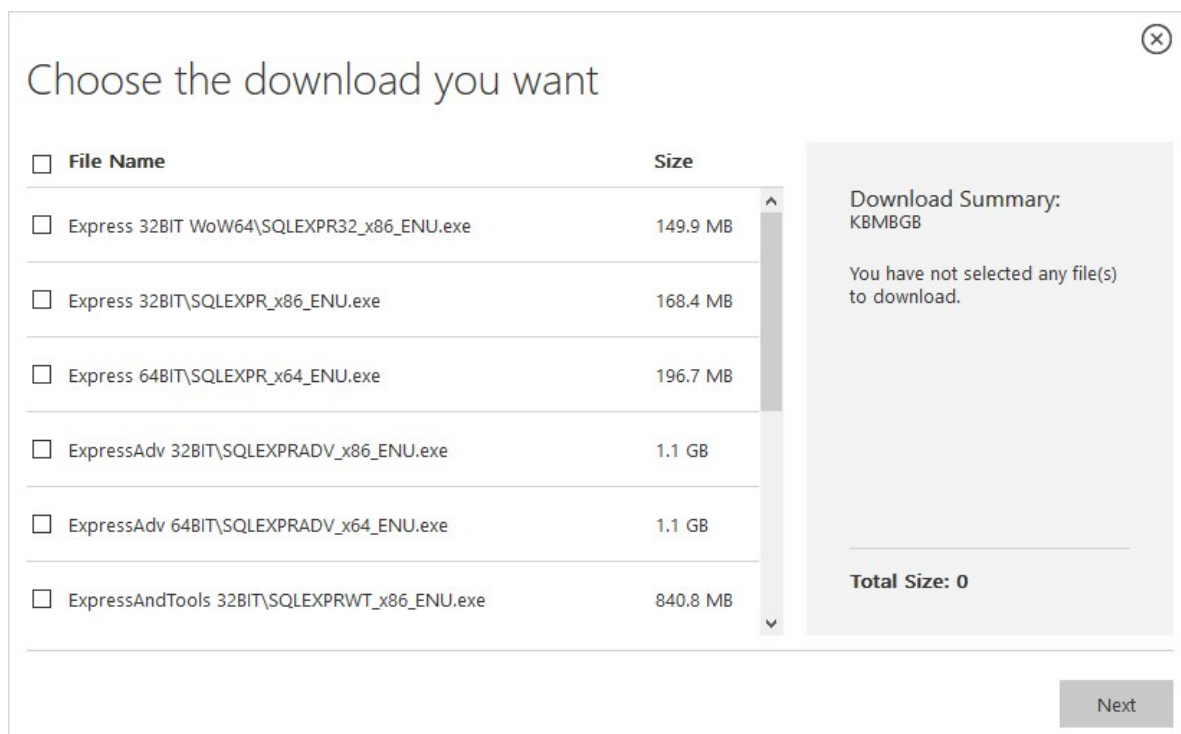
#### Downloading SQL Server Express with Tools

If you plan to use SQL Server Express, we strongly recommend downloading the package that includes **Tools**. This also installs SQL Server Management Studio that allows you to connect to the database directly and gives access to server settings.

Procedure:

1. Go to the [SQL Server 2014 Express download page](#).
2. Click the **Select Language** list box and select **English**.
3. Click the **Download** button. A popup page appears:





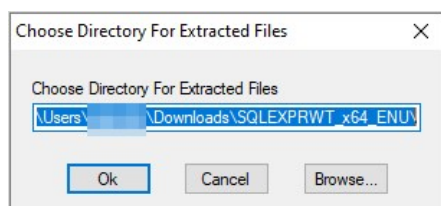
4. Click to select the following check boxes (you may need to scroll down):

- **ExpressAndTools 64BIT\SQLEXPRWT\_x64\_ENU.exe**
- **MgmtStudio 64BIT\SQLManagementStudio\_x64\_ENU.exe**

5. Click the **Next** button. SQLEXPRWT\_x64\_ENU.exe and SQLManagementStudio\_x64\_ENU.exe\* download to your computer.

## Installing SQL Server Express 2014

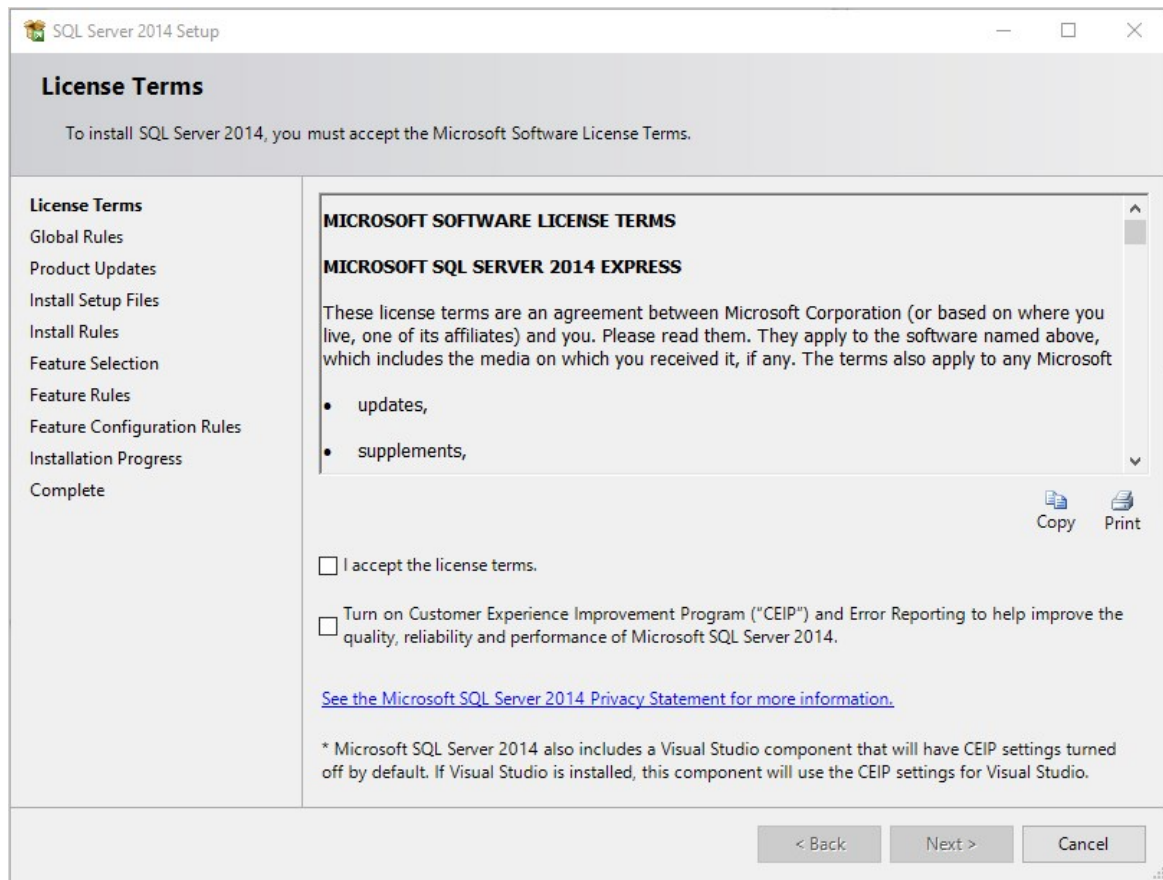
1. If necessary, download and install the latest version of .NET Framework. See [Microsoft .NET Framework 4.8 offline Installer for Windows](#) for the latest version as of when this topic was written. If you have already installed Secret Server, you have already done this.
2. Double click the SQLEXPRWT\_x64\_ENU.exe you downloaded to run it. The User Account Control appears.
3. Click the **Yes** button. The Choose Directory... dialog box appears:



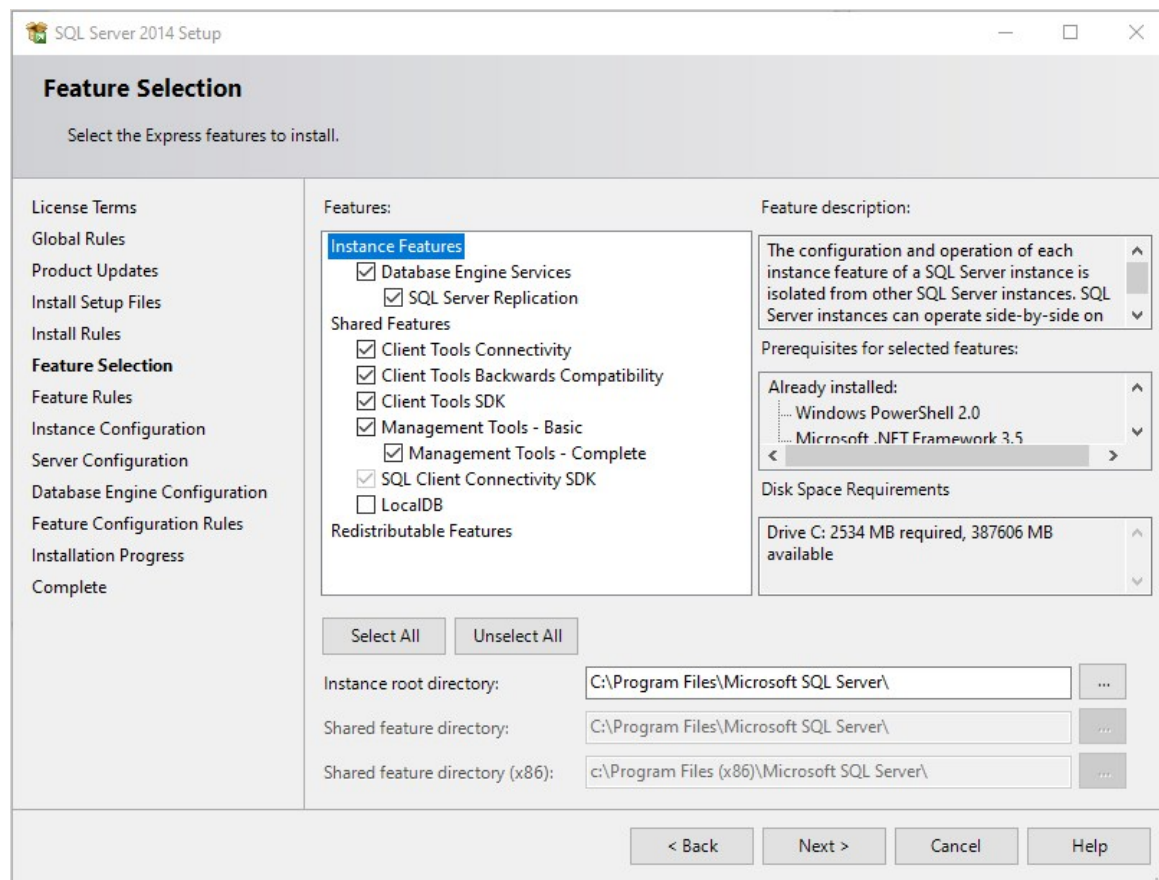
4. Click the **OK** button. The files are extracted to that location, and the SQL Server Installation Center appears:



5. Click the **New SQL Server stand-alone...** link. The License Terms wizard page appears:



6. Click to select the **I accept the license terms** check box.
7. Click the **Next >** button. The installation processes four pages with no input from you and stops on the Feature Selection page:



8. Ensure that the **Database Engine Services** and **Management Tools – Basic** check boxes are selected. Leave the others as is.

**Note:** A SQL Server instance is isolated from other SQL Server instances. SQL Server instances can operate side-by-side on the same computer.

**Note:** Management tools include Management Studio support for the database engine and SQL Server Express, SQL Server CLI (SQLCMD), SQL Server PowerShell provider, and the distributed replay administration tool.

9. Click the **Next >** button. The installation processes one page with no input from you and stops on the Instance Configuration page:

**SQL Server 2014 Setup**

## Instance Configuration

Specify the name and instance ID for the instance of SQL Server. Instance ID becomes part of the installation path.

License Terms

Global Rules

Product Updates

Install Setup Files

Install Rules

Feature Selection

Feature Rules

**Instance Configuration**

Server Configuration

Database Engine Configuration

Feature Configuration Rules

Installation Progress

Complete

☐ Default instance

☒ **Named instance:**

Instance ID:

SQL Server directory: C:\Program Files\Microsoft SQL Server\MSSQL12.

Installed instances:

Instance Name	Instance ID	Features	Edition	Version
SQLEXPRESS	MSSQL14.SQLEXPRESS	SQLEngine_VNext	Express	14.0.2027.2

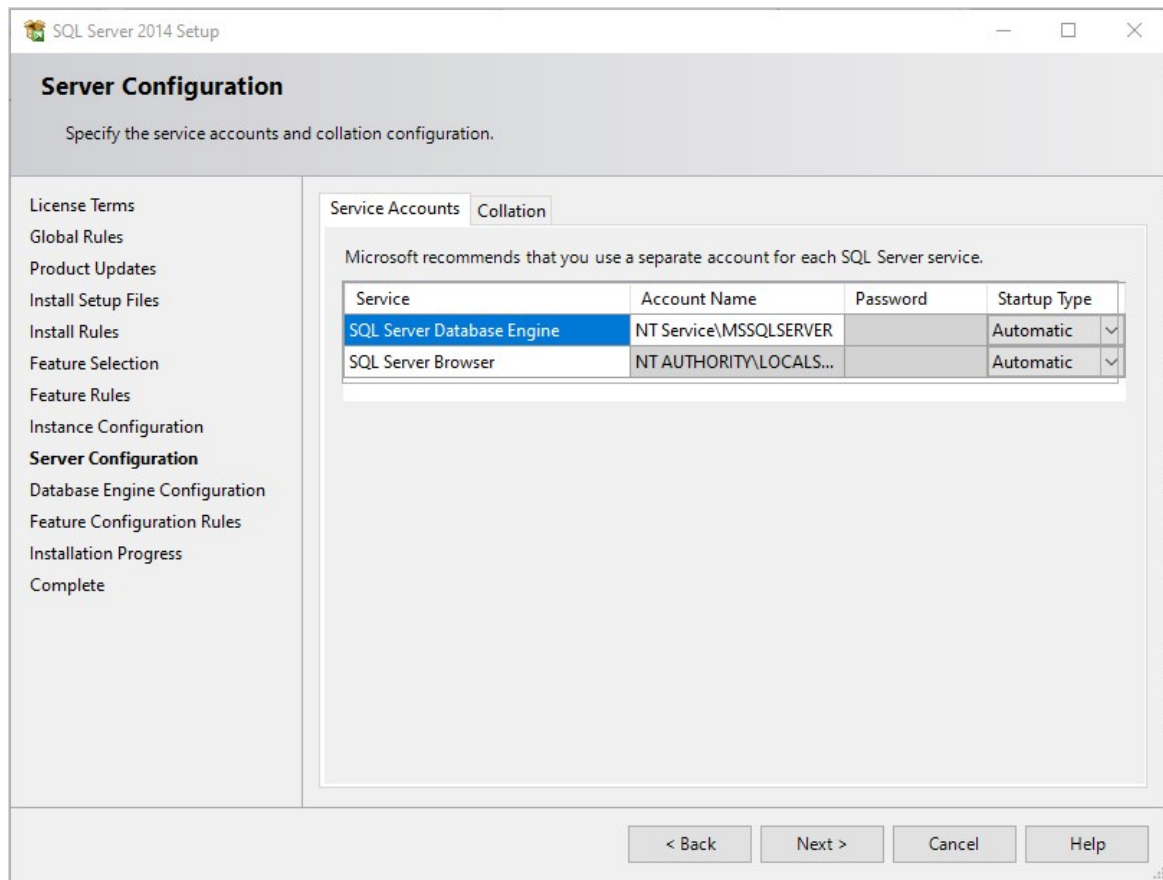
< Back

Next >

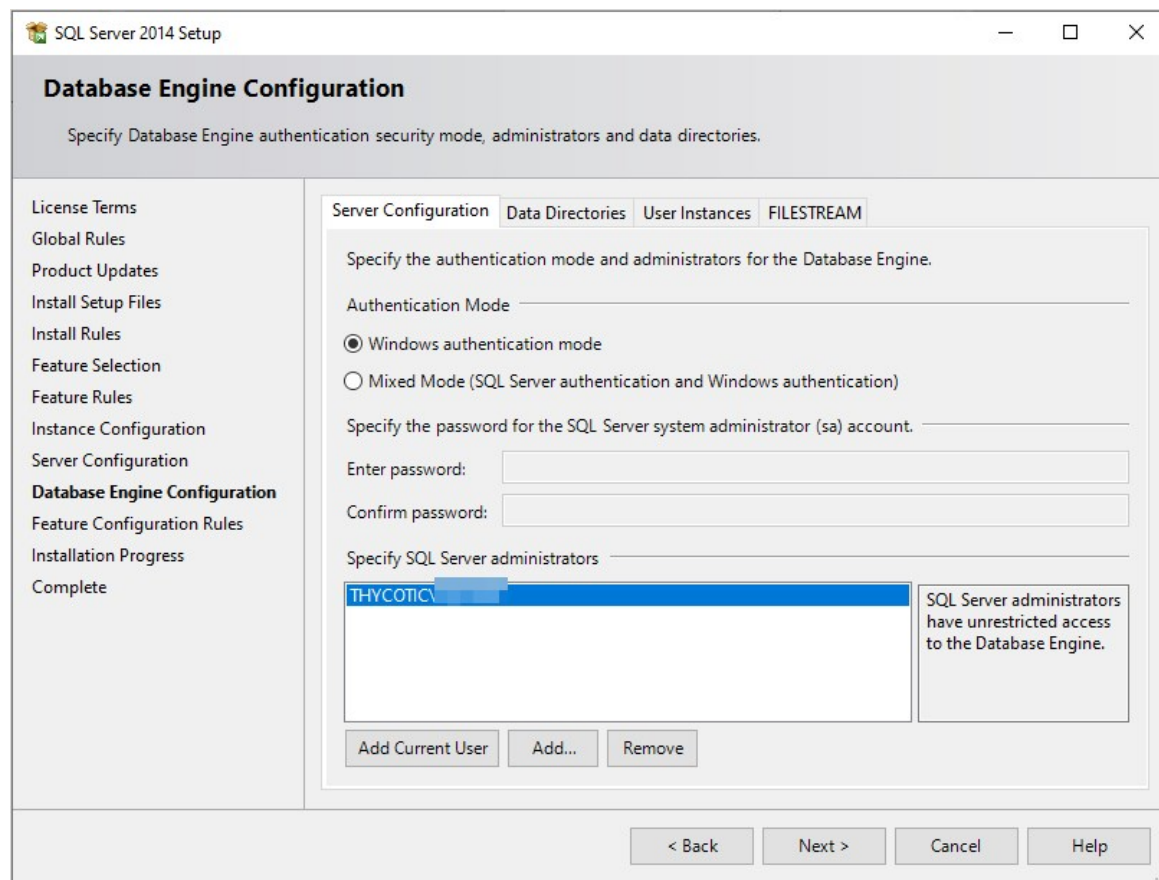
Cancel

Help

10. **Ether** click to select the **Default instance** selection button, which uses an already present instance called SQLEXPRESS.
11. **Or** type your desired name in the **Named instance** text box.
12. Type your instance ID in the **Instance ID** text box. We chose MySQLInstance. The instance ID will become part of the installation path.
13. Click the **Next >** button. The Server Configuration page appears:



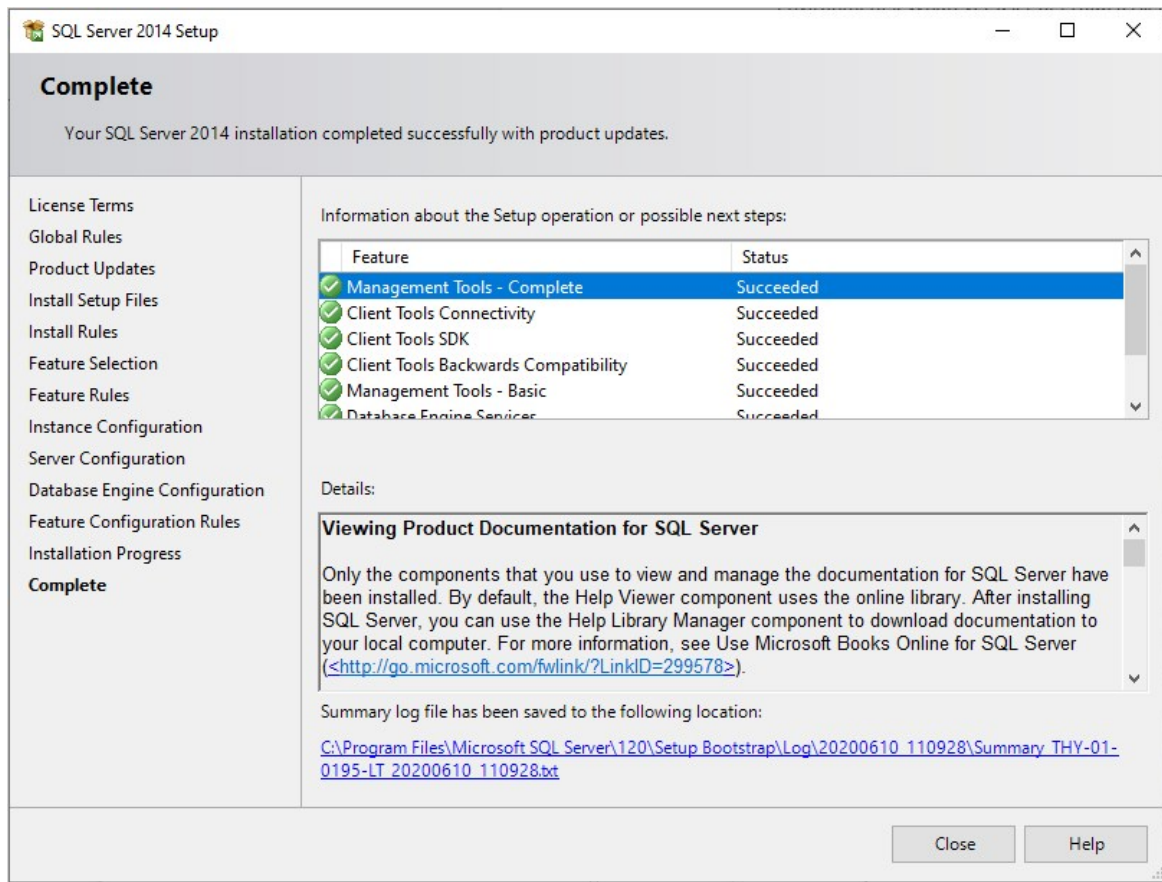
14. Leave the page as is, and click the **Next >** button. The Database Engine Configuration page appears:



15. You have the choice to select either **Windows Authentication Mode** or **Mixed Mode**. Click to select the option that works best for your environment:
  - **Mixed Mode (for easiest configuration)**: This mode is required if you intend on using a SQL Server account to authenticate Secret Server to your SQL Server instance. **We recommend using mixed mode if you are setting up a test or demo environment.** Selecting this option will also require you to set a password for the SQL Server system administrator (sa) account. See **Adding a SQL Server User** below for instructions on adding more users.
  - **Windows Mode (recommended for best security)**: This mode prevents SQL Server account authentication. We recommend using Windows mode for production environments. Whatever user or group assigned will have administrative access to your SQL instance. According to best security practices, limit this number to as few users as possible. Only choose this if you have experience and require this for a specific issue—we do **not** recommend SQL Server Express for production accounts.

**Note:** If choosing **Windows Mode** you will also need to [run the IIS application pool as a service account](#) later in the installation process.
16. If you selected mixed mode, which you almost certainly did, type your SQL Server system administrator (sa) account password in the **Enter password** and **Confirm password** text boxes. The password must meet Microsoft's definition of a strong password. Click the **Help** button and search for "Database Engine Configuration - Account Provisioning" if you what to find out what that is. A 16 character mixture of lower and uppercase letters and numerals works fine.
17. Your user account should already be shown in the **Specify SQL Server administrators** text box. If not, click the **Add Current User** button.
18. Click the **Next >** button. The Installation Progress page appears and SQL Server Express is installed. This can take awhile. Eventually, the Complete page appears:





19. Click the **Close** button.

## Creating the SQL Server Database

To install Secret Server, the Delinea installer creates the SQL database for you if it does not exist and if the user account has permission to create a new database, which requires the dbcreator server role.

If not using the Delinea Installer, use the following steps to create a database manually through SQL Server Management Studio:

1. Open SQL Server Management Studio.
2. Connect to your SQL Server instance.
3. Right click the **Databases** folder and select **New Database...** The New Database page appears.
4. Type a name for your database in the **Database Name** text box.
5. Click the **OK** button.

## Adding a SQL Server User

According to security best practices, limit the number of users with access to your SQL database as much as possible. Use the following instructions to add a SQL Server account for Secret Server to use to access the SQL database:



1. Open SQL Server Management Studio.
2. Connect to your SQL Server Database.
3. Expand the **Security** folder.
4. Right-click the **Logins** folder and select **New Login...**
5. Select a method of authentication:
  - **SQL Server Authentication**: Use this option to create a new SQL Server account (this requires mixed mode to be enabled). To create the account, enter a new username and password and then deselect the **Enforce Password Policy** check box to prevent the account from expiring.
  - **Windows Authentication**: Use this option to add access to SQL Server for an existing Windows account. To add the account, enter the login name or click **Search** to find the account. It is recommended to use a domain account rather than a local Windows account.
6. Click **User Mapping** in the left menu.
7. Click to select the check box next to your Secret Server database.
8. In the **Database Role Membership** window, click to select the **db\_owner** check box.
9. Click the **OK** button.

## Understanding Licenses

The Secret Server licensing model allows for scalability and enhanced core functionality in the form of edition enhancements (Professional, Premium Edition) and user packs. Licenses can be purchased for these items as follows:

- **Users:** Secret Server ships with one free license for a single user. Additional user licenses can be purchased through <https://thycotic.com>.
- **Support:** Support licenses allow you to receive technical assistance from the Secret Server support team, and software updates for installed versions of Secret Server. To be eligible for updates, the number of support licenses and user licenses must match.

After installation is complete, you need to enter your licenses using the Getting Started Wizard or from the Licenses Administration page. Entering your licenses allows you to add more users and enables additional features in Secret Server.

**Note:** For more information, see [Adding, Activating, Converting, and Deleting Licenses](#).

For the Express edition, you have one license to enter. For Professional edition and higher, you have, at minimum:

- An edition license
- A user license
- A support license

If you purchased additional licenses for sites or distributed engines, you may have more licenses to add.

**Note:** If you have purchased the installed edition of Secret Server but did not purchase support or upgrade protection, you will not have a support license.

## Activating Licenses

After entering your license information, you must activate your (non-evaluation) licenses. For more information, see [Adding, Activating, Converting, and Deleting Licenses](#) and the [License Activation FAQ](#).

## Licensing Limited Mode

If you fail to activate your licenses, your system is placed in limited mode, which prevents the following actions:

- AD sync
- Creating and editing secrets
- Importing secrets
- Creating and editing secrets
- Web services (mobile applications)

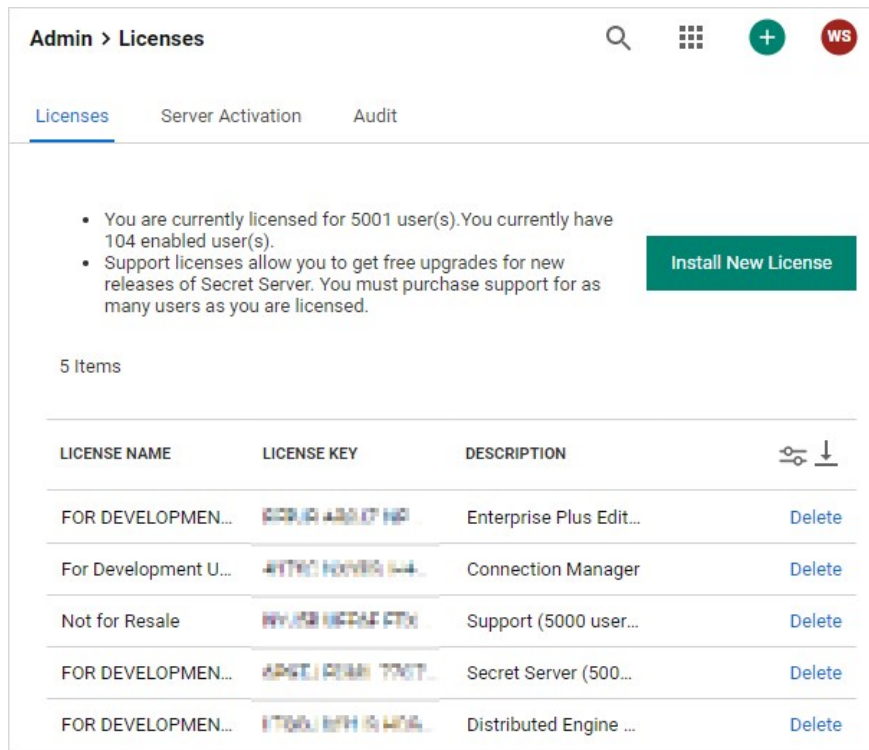
## Adding, Activating, Converting, and Deleting Licenses

This section explains how to add and activate Secret Server licenses (both online and offline) how to delete licenses, and how to convert from a trial license.

**Note:** For more information on understanding Secret Server licensing, see the [Licensing](#) page.

### Adding and Activating Secret Server Licenses Online or Offline

1. Log on to Secret Server as an administrator.
2. Go to **Admin > Licenses**. The Licenses page appears:



**Admin > Licenses**

Search, Grid, Add, WS

Licenses | Server Activation | Audit

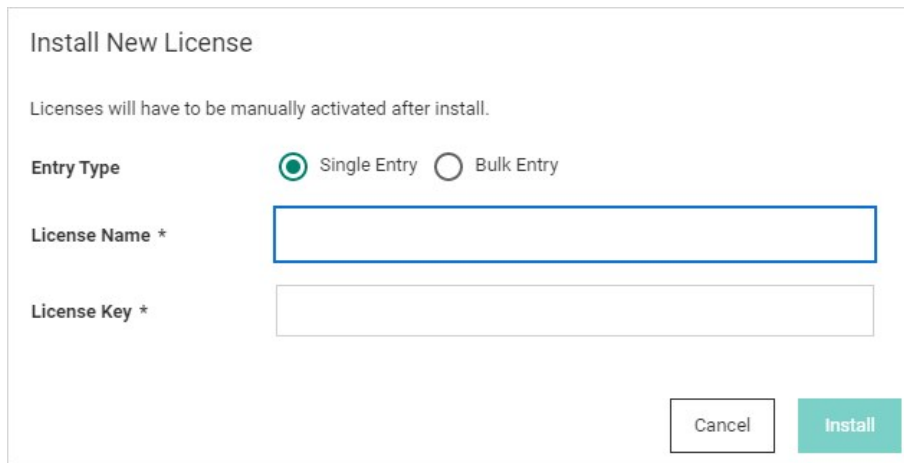
- You are currently licensed for 5001 user(s). You currently have 104 enabled user(s).
- Support licenses allow you to get free upgrades for new releases of Secret Server. You must purchase support for as many users as you are licensed.

[Install New License](#)

5 Items

LICENSE NAME	LICENSE KEY	DESCRIPTION	⚙️ ↓
FOR DEVELOPMEN...	8C0P4R 420 07 H21	Enterprise Plus Edit...	<a href="#">Delete</a>
For Development U...	4HT60 10000 0-4...	Connection Manager	<a href="#">Delete</a>
Not for Resale	8V 020 00000 070...	Support (5000 user...	<a href="#">Delete</a>
FOR DEVELOPMEN...	8P4S0 00000 7707...	Secret Server (500...	<a href="#">Delete</a>
FOR DEVELOPMEN...	17000 0000 0000...	Distributed Engine ...	<a href="#">Delete</a>

3. Click the **Install New License** button. The Install New License popup appears:



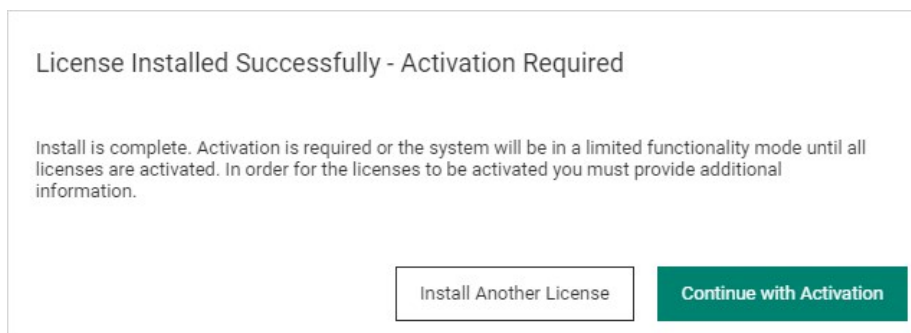
The 'Install New License' dialog box contains the following elements:

- Title:** Install New License
- Instruction:** Licenses will have to be manually activated after install.
- Entry Type:** A section with two radio buttons: 'Single Entry' (which is selected) and 'Bulk Entry'.
- License Name \*:** A text input field with a blue border.
- License Key \*:** A text input field with a gray border.
- Buttons:** 'Cancel' and 'Install' buttons at the bottom right.

- Click to select **Single Entry** in the **Entry Type** selection button.

**Note:** If you have numerous licenses, you can click the license **Bulk Entry** selection instead. It allows you to paste an entire licensing email or a formatted list of licenses, adding all licenses in a few clicks. For a small number of licenses, especially if you are new to the process, we recommend using single entry, which provides better feedback on what you are doing.

- Type (or paste) the **License Name** and **License Key** for the license that you received from your account manager.
- Click the **Install** button. The License Installed Successfully popup appears:



The 'License Installed Successfully - Activation Required' popup contains the following elements:

- Title:** License Installed Successfully - Activation Required
- Message:** Install is complete. Activation is required or the system will be in a limited functionality mode until all licenses are activated. In order for the licenses to be activated you must provide additional information.
- Buttons:** 'Install Another License' and 'Continue with Activation' buttons at the bottom.

- If you have another license, click the **Install Another License** button to repeat the process.
- Click the **Continue with Activation** button. The License Activation page appears:

Admin > Licenses > License Activation

Search

Grid

+

WS

Activation Details

The following information is only used for activation purposes.

What is Activation?

Name \*

Email \*

Phone Number \*

Activation Type

If your server has outbound network access, then select Online, to activate licenses online. Otherwise, select Offline, to manually activate licenses offline.

Activation Type \*

Online

Cancel

Activate

Need to activate on an AirGap Network?

9. Ensure your name, email address, and phone number are present and correct.
10. If you have an internet connection and want to activate **online**:
  1. Click the **Activation Type** dropdown list and select **Online**.
  2. Click the **Activate** button. An Activation Successful popup briefly appears and then disappears, and you are returned to the Licenses page where your new license now appears. The procedure is complete. **Do not do the remaining steps.**
11. If you do not have an internet connection and want to activate **offline**:
  1. Click the **Activation Type** dropdown list and select **Offline**. The Offline Activation section appears:

## Offline Activation

If Secret Server is unable to connect to the Activation Server, you will have to manually activate the licenses. Go to the Activation Center and paste the Request value there. Once you get a Response, copy it and paste here.

**Request \***

```
27daf9b50738fab1ac1
468306255f87c171727
066517bfac443fa0ad8
d34a73d1efb286e0553
230574586fd88398974
6bf2cced5860963a10b
e2a3d61960d19c23a13
f328daa5f90a9e624b5
b7da70c2aad3ac16d4c
```

[Copy to Clipboard](#)

**Obtain Response \*** [Activation Center](#)

**Response \***

[Paste from Clipboard](#)

[Cancel](#) [Activate](#)

[Need to activate on an AirGap Network?](#)

- Click the **Copy to Clipboard** link to copy the text in the **Request** text box.
- Click on the **Activation Center** link in the **Obtain Response** section. The License Activation Center page appears. Do not close the Secret Server browser tab.
- Paste the copied text into the text box.
- Click the **Activate** button. Activation Successful! appears at the top of the page and the text box now contains the activation confirmation.
- Copy the entire text box contents.
- Return to Secret Server License Activation page and paste the response into the **Response** text area.
- Click the **Activate** button. An Activation Successful popup briefly appears and then disappears, and you are returned to the Licenses page where your new license now appears.

**Note:** For more information on activating Secret Server licenses, see the [License Activation FAQ](#). Secret Server may be activated on an air gap network for both trials and licensed products. Please let your Account Manager know you will be using Secret Server on an air gap network for more information.

If you receive an error message, please take note of the error code and call the phone number contained in the message.

If an error message persists after successful activation, remove expired and invalid licenses from Secret Server by following the steps

below, under **Deleting Secret Server Licenses**.

If you need help and your Secret Server has a current support license for each user license, please contact our [technical support team](#).

**Note:** For more information on Secret Server licensing and license activation, see [Licensing](#) and the [License Activation FAQ](#).

## Converting Evaluation Licenses

If you had evaluation licenses initially and you recently purchased Secret Server, you need to remove all evaluation licenses before you install your purchased licenses. Follow the steps below, under **Deleting Secret Server Licenses**.

## Deleting Secret Server Licenses

1. Log on to Secret Server as an administrator.
2. Go to **Admin > Licenses**.
3. In the **Licenses** dialog, click the **License Name** of the license you want to remove.
4. Click **Delete**. The license information will remain available to you from your account at [Delinea.force.com](https://delinea.force.com).
5. Click **OK**.
6. Verify that the selected license key has been removed from the list.

## License Activation FAQ

### What happens if we find that we had more named users than licenses after activation? Will the account lock us out?

The user licenses are per named individual. You can simply disable any excess users so you are within your license count—these users can be re-enabled later and all audit log information is kept.

### Why is license activation required?

Activation of license keys is standard practice in the software industry. We try to focus exclusively on implementing customer requests but occasionally we must spend time on licensing especially as Secret Server goes into new geographical markets.

### Is there a grace period before we must activate?

Existing customers have 30 days to activate their licenses after upgrading. New licenses must be activated immediately on adding them to Secret Server. Evaluation licenses do not require activation.

**How is license activation implemented in Secret Server?** Activation is per license and Web server (the combination of the two). Therefore, even if a Web server was already activated, if you bring up a new Web server, it also needs activation. The activation process gathers the name, email, and phone number of the individual activating, for internal purposes only. No other personal information is sent to Delinea.

### What will happen if we don't activate our licenses?

Secret Server will go into limited mode if you do not activate your licenses. Limited mode allows you to view passwords, but many other features are disabled such as creating secrets, editing secrets, changing permissions, and using Web services. Activate your licenses to get out of limited mode.

### We have several license keys. Do we need to activate each license key individually?

No, the license activation process will activate all license keys that are currently added to your Secret Server. However, additional license key for distributed engine may need to be activated individually if you receive the key after the other licenses.

**What if we have been using our license keys on more than one instance of Secret Server?** Secret Server software licenses (user, professional, enterprise, or enterprise plus edition licenses) may only be used on a **single production instance** of Secret Server. You may use your same licenses for a single testing (non-production) environment. If you have used your licenses on multiple production instances of Secret Server, please [contact us](#).

### What information is collected and sent during license activation?

License Activation is required for each web server that will be running Secret Server. The request and the response to or from [thycotic.com](https://thycotic.com) are encrypted for added security.

The following information is sent to [thycotic.com](https://thycotic.com) when you activate:

- Name (user entered)
- Phone number (user entered)
- Email (user entered)
- All licenses (license name, license key)
- Hardware hash of each Web server

The following information is one-way hashed or omitted before it is sent to ensure it does not reveal any identifiable hardware information.

- Secret Server version
- An encrypted value to identify the instance
- Secret data or the `encryption.config` file (both omitted).
- The data that is gathered for is for contacting you if there is a licensing issue. Delinea will not sell or distribute the information provided



during activation. The only information available to Delinea staff is the contact information for technical support and customer service.

**Our Secret Server does not have outbound access to the Delinea.com Web site. Can activation be done while offline?**

Yes, there is an offline option for activating licenses. See [Adding, Activating, and Deleting Licenses](#).

**If we have trouble activating our licenses, what should we do?**

1. If your Secret Server is currently supported, with an equal number of current support licenses and user licenses, our technical support team can help you. Please [contact us](#).
2. If an error message persists after successful activation, remove expired or invalid licenses from Secret Server by clicking the license name and then deleting it (the license information will remain available to you from your account at [Delinea.force.com](#)).

**My Server is a VM that moves to different hardware often. Will this cause me to need to reactivate over and over?**

You do not need to reactivate over and over. When you activate, you can use Secret Server for a year without needing to reactivate, regardless VM hardware changes. However, if your machine name changes as well as your hardware, you will need to reactivate. If you are using a version older than 7.8.000000, you must reactivate when the VM moves.

Download hash codes or hashes are used to verify the integrity and authenticity of downloaded software. Hash codes are unique mathematical values that are generated based on the content of the software file and can be used to confirm that the downloaded file matches the original version and has not been tampered with. By comparing the hash code of the downloaded file with the hash code provided by the software developer, you can ensure that the software you downloaded is genuine and has not been corrupted during the download process.

## 11.5.000000

**Note:** Calculated on 2023-06-05 16:28:50-04:00

DelineaSetup.exe (11.5.000000):

- SHA1 = 33817b6b2d6aa3c0e32171a1756e084ee8631f9f
- SHA256 = bc75aab5bb7ec1e6335e8f743791d13324ded407c542f0cad5935f02eacd848c

Version\_11\_5\_000000.zip:

- SHA1 = 9a1cf2ba64ed513283833cf2ededd0fea35bd9a9
- SHA256 = c2b75f8ffdb91a862ab6223caaffbaa4071460c20fffbecdea294ace4f50daf28

## Earlier Versions

### 11.4.000031

**Note:** Calculated on 2023-05-09 18:33:08-04:00

DelineaSetup.exe (11.4.000031):

- SHA1 = a5cfb030398ded365ee7ea184f737d9a49d6c377
- SHA256 = efe2ce041bcc7d9864d8b396ceb015e4ac2b3f9cf5e8e5124e7ab18ba9238473

Version\_11\_4\_000031.zip:

- SHA1 = 1cb41fcfd717692b13b21856d7b9055234dab1fe
- SHA256 = 06e0813ddc592a88054ca59e59c93006d2a2e22bec75cc0a4f55190ade77cf90

### 11.4.000030

**Note:** Calculated on 2023-04-26 12:27:23-04:00

DelineaSetup.exe (11.4.000030):

- SHA1 = ae2c2441cf5fa0dd9b9d6c733906cc67dec4b245
- SHA256 = a97748c6315cb2d0540954f8e26d0baef0bbd16c26b2b5a2bcafc8231bc0b84

Version\_11\_4\_000030.zip:

- SHA1 = eb438fdf1339cbd9c1b6ffd86aea52027bfd6781
- SHA256 = b43073d69a60884b6419dabe04d059d1c6c317831cdd340aae17cbc712c1696f

### 11.4.000002 (GA)

**Note:** Calculated on 2023-03-02 11:06:16-05:00

DelineaSetup.exe (11.4.000002):

- SHA1 = eac97741e09a79fc1cea04d4dce7a7c639ad6705
- SHA256 = edee604d844ad6ebbe33fe4b6cf0db1576bac67c33a0a65573be76ba275ac791

Version\_11\_4\_000002.zip:

- SHA1 = 53295e58c75875d7e0e6ac3c687cf2e97ab4eca3
- SHA256 = ff4a3d7115d7fd39b86a6e58e268044adac2bb1a91a8495915831d5811c26332

## 11.4.000000 (EA)

**Note:** Calculated on 2023-02-15 16:08:14-05:00

DelineaSetup.exe (11.4.000000):

- SHA1 = 9b905c8cb0dc891a1a15dc4ad0ac05b4de77fd57
- SHA256 = c2189de5e70baaa00c7998e58036a49812ebdf857d17d719909352ccad7fc0fb

Version\_11\_4\_000000.zip:

- SHA1 = 0f3f369995434c942a56190b270954f0093e9c84
- SHA256 = dac53799fddd6063b066bec58298de831e28864a4fb668b3c78b61aad714ad9

## 11.3.000003

**Note:** Calculated on 2023-02-07 12:11:45-05:00

DelineaSetup.exe (11.3.000003):

- SHA1 = f1adb355fcd89fdaeef559b06f3dcfb8e3c113f
- SHA256 = 4d98bd57f9a76ffb734845a1568e3a144fcaec4fec4e034befbbf604b942036b

Version\_11\_3\_000003.zip:

- SHA1 = 3a49a3f3a793b85b8c386cfd2e21b69e678fd247
- SHA256 = 9bac7eb0c7594ba65800236360108f71e4271d0f79d88b476d7cd9a8ef2aa487

## 11.3.000002

**Note:** Calculated on 2022-11-11 16:01:03-05:00

DelineaSetup.exe (11.3.000002):

- SHA1 = 0af50b281fa21a369be353f7f3d1926e2d6507ca
- SHA256 = 43140de5379af399f808396996827242089cf08992811a0e662fd3b08d1de1d2

Version\_11\_3\_000002.zip (11.3 GA):

- SHA1 = 1142e3503b05eb7c7b8fcb08868688129b123733
- SHA256 = 54f9893932ca9922e056865d2eeaaab005a76528dde267de3f3a0366b35ee4c

## 11.3.000001 (GA Version)

**Note:** Calculated on 2022-11-01 17:41:56-04:00

DelineaSetup.exe (11.3 GA):

- SHA1 = 77ae1be98efd44c8951a46ee715e3d85629b41bd
- SHA256 = 15daabd705677b1431dbacd540c83d04d26630c793776847a9a10191101dd760

Version\_11\_3\_000001.zip (11.3 GA):

- SHA1 = 0ee91c597e81d28107ac2e2a5350304e7961b161
- SHA256 = fe331cb5fb090c9a237e340db75aae502e813a32002045d6f3718aabfcd5c4b9

### 11.3.000000 (EA Version)

**Note:** Technically, the release number for 11.3 EA is 11.2.000050. GA will have the correct numbering.

**Note:** Calculated on 2022-10-04 12:03:34-04:00

DelineaSetup.exe:

- SHA1 = 9397f63f6ca6b4e3b47a89c8f535192065e2e6ca
- SHA256 = 49152c8a91786bcf318d7ecb55cc53a908a13b7e9c0c6d99fb6fc408d303847e

Version\_11\_2\_000050.zip (11.3 EA):

- SHA1 = 06754f9898bccf95682913a218102f2a6cfb7b96
- SHA256 = 0c97b1968176a10e87288d9f4510ad167e8787ca33c15e2b356a47d57d576fd8

### 11.2.000003 (Security Release)

**Note:** Calculated on 2022-09-27 14:50:40-04:00

DelineaSetup.exe:

- SHA1 = 0a3f0ee7a735b4257b0b9bf793a28087b398050b
- SHA256 = d69e546d445e44833d9dc87f3805d2273dd7f616ed132d2ff410f130d5872a3a

Version\_11\_2\_000003.zip:

- SHA1 = 849867ce2447c88ca81df90428ed3ac1878dfd4e
- SHA256 = 0f17f998c8e5c935081f5c0430bcdddb538fff6e77824ee46d9ea01b5bb2de3

### 11.2.000002 (GA Version)

**Note:** Calculated on 2022-07-06 17:25:22-04:00

DelineaSetup.exe:

- SHA1 = 3d1ea696aeb08f4c15339ab15e3cbb7f841f8866
- SHA256 = 0e91cd6f34a8667cf876445ea968540dfd65262fa7250b0f7ed36cb510f45c33

Version\_11\_2\_000002.zip:

- SHA1 = 65e0bd2e1d99ff1350dc35114c4b3c76522af41a
- SHA256 = 05a4b735ecaa5329e110fb773f29199a582d3a43f0b63a779c6dfdf7e889556f

### 11.2.000000 (EA Version)

**Note:** Calculated on 2022-05-04 22:11:30-04:00

Version\_11\_2\_000000.zip:

- SHA1 = bcb9f7a5dd0effe825d6cc1054bf63be9ee1a3f5
- SHA256 = 8246742e7b5d0c8b8cd601cbe970be8ce1f2927daca1ac4eeefc84aff83898b3c

## 11.1.000012 (Security Release)

**Note:** Calculated on 2022-05-05 10:20:39-04:00

ThycoticSetup.exe:

- SHA1 = a5d9b6f6b99234d91f70be4c23025583a4dcb32e
- SHA256 = 4d2a8fe7420ef27645971df3391e1a6638f71448bcdcb0589ef81b6c79e70d1e

Version\_11\_1\_000012.zip:

- SHA1 = eb2c75a1c616fea2df14ea32b06268107b4bec16
- SHA256 = 4952a541814d2f2aba439c620e550e4c7df28b6623a63edb7f70482fc30eb600

## 11.1.000007 (GA Version)

**Note:** Calculated on 2022-01-24 16:28:53-05:00

ThycoticSetup.exe:

- SHA1 = 947d48da08bf6ab63381132fd3719dbcc35dffc2
- SHA256 = d1664e7ff2e4961f251dc58ca12918335658ed7f27f7752b9f465af0deb83d7a

Version\_11\_1\_000007.zip:

- SHA1 = 36038fd831ac038ea8aa0082c0032f98df21e9f4
- SHA256 = b3cc1b1884f67c0bf382b8b03b2e57ce9b9b2d5792ee607aa37b44770534b84c

## 11.1.000006

**Note:** Calculated on 2022-01-14 11:52:53-05:00

ThycoticSetup.exe:

- SHA1 = a23e086c85c0b526c8b824221485b6906b07d290
- SHA256 = 89deea52f03f9854a88b909974eb625db3815175a0c84110853f23d9db9f26b8

Version\_11\_1\_000006.zip:

- SHA1 = 8e8bb603dc6441c0808bef8cd5a435f8aa95610d
- SHA256 = f063c0a57513f08332d40457996c9cf0bb203a0425f344fc2d322b6002d07c8a

## 11.1.000000 (EA Version)

**Note:** Calculated on 2021-11-29 14:15:45-05:00.

ThycoticSetup.exe:

- SHA1 = e719e40d932c9acec3b5f35c3243074c4ee8aaba
- SHA256 = 90e9abe510f9cd30e5e3804e88875b66e05934606bdcbae960019cd20813c542

Version\_11\_1\_000000.zip:

- SHA1 = 87c84f7141285ecbaf8d68655f6ea6a31b8c2247

- SHA256 = 2bbbebec5fe8c66125a9baf046141542368ef40edaf79ad28efe5667d6fbc0b5

## 11.0.000008

**Note:** Calculated on 2021-12-13 16:06:20-05:00.

ThycoticSetup.exe:

- SHA1 = 1be211f3a870b6d53f1a9ac2dc069dac469f609
- SHA256 = 5aae7c1e697f3ba1f01d167b33ea93e5300e51b1d3b6ee1e27303c1fc8cbee8c

Version\_11\_0\_000008.zip:

- SHA1 = 661c39feadb0bb98cf80d9c0fee4d25f41062f1f
- SHA256 = 9ee6ea74d841109c34ef14815dca77586d58e6ef64375295d82974c211bbbc38

## 11.0.000007

**Note:** Calculated on 2021-09-13 13:23:59-04:00.

ThycoticSetup.exe:

- SHA1 = 8cac67d4e41116249de860059835d9c26732b2d0
- SHA256 = 2f151eb6689e782043a03ecc0e0e4930ef64e14c9155f4ee81d1365815cb403b

Version\_11\_0\_000007.zip:

- SHA1 = 71a339f2f74565091d2e2f50056dda2128771fbc
- SHA256 = 69e1bdc20a6493060fc3e94243973e40b467f9e12dd4b2bc83dcd78455da5cc4

## 11.0.000006

**Note:** Calculated on 2021-08-21 16:08:39-04:00.

ThycoticSetup.exe:

- SHA1 = 216814721746f98a0887fd15f573397a5d6e58af
- SHA256 = fd16aaa367248eb79339bfefdc7705ff6a4c60574cb9bba161ed6c0e1c659729

Version\_11\_0\_000006.zip:

- SHA1 = b2a46956a9c5a56923b380893b3922230ba26356
- SHA256 = c9bc00a82475911d9d2d38de5007fb60102e0ef1461e443e3a41b76455e4d93b

## 11.0.000005

**Note:** Calculated on 2021-08-16 13:39:22-04:00.

ThycoticSetup.exe:

- SHA1 = 1d4cd40964ec54281f75bea7fc49cea26449899c
- SHA256 = 3eb79053aed18462d2579e73726b902108e6bb30749b7a48fa7582781b148817

Version\_11\_0\_000005.zip:

- SHA1 = 982f5cfd74c5f231fa620cbaed60de3a7b8362ae
- SHA256 = fcb694990f5649e89a99d25290829efa9f65d95aae13065a6f21ea66d1d4616e

## 10.9.000064

**Note:** Calculated on 2021-06-02 19:32:10-04:00.

ThycoticSetup.exe:

- SHA1 = 340eae40a405ece446dfde698c469316bba1a331
- SHA256 = cee3168cfe5c745e79c6d0509385c4d06547acd640e5a5eaa889dc31cc6f73ce

Version\_10\_9\_000064.zip:

- SHA1 = aec38df961ccc88650188ee4158c15b6a7a4a107
- SHA256 = b896ef24904beeb2414edcfc259ef14c9eadb2fdd442289a2781d3e1ac8fa411b

Below are the hashes for the step-upgrade version. When upgrading from a version prior to 8.4.000004, the upgrade process will upgrade Secret Server to 8.4.000004.

If Secret Server is version 8.4.000004 to 9.1.000000 the upgrade process will upgrade to 9.1.000001 and from there Secret Server can be upgraded to the latest release.

## 10.9.000063

**Note:** Calculated on 2021-03-22 16:43:23-04:00.

ThycoticSetup.exe:

- SHA1 = 326f59abdc61976b9e7d589247fd94952657458b
- SHA256 = b6abecd7be6016d7524a4a57b5b5e0cf488305df085eb273aeefa931a697d3d5

Version\_10\_9\_000063.zip:

- SHA1 = a6da7bdee1d5018f050b10317299c8993a6dd14a
- SHA256 = 853de55ba231e37d2a8787e253cfd1037c9c8d3a89fa697cdd425a87c258481d

## 10.9.000033

**Note:** Calculated on 2021-02-22 14:14:09-05:00.

**Downloaded February 24th 2021 or Later**

The following are the download hashes for the current version installation files of Secret Server. This download hash is for the combined Secret Server and Privilege Manager version release on February 24, 2021.

**Note:** Calculated on 2021-02-22 14:14:09-05:00.

ThycoticSetup.exe:

- SHA1 = 3df5f61ceb50a5f1e84d1f76a5e0d5db05f99bc0
- SHA256 = e67f06e0052a826196438c9c09178aa4d2391f731d8307ff21f68722fbbe868c

Version\_10\_9\_000033.zip:

- SHA1 = e9dda8a53e301a950f697e628d22d1aea485768b
- SHA256 = ba85391275bbcc1e1e9ce2a53727de660b358a6fad35b61861cff1ab1d68e948

**Downloaded Before February 24th 2021**

For ThycoticSetup.exe downloaded before February 24th 2021, use the below hash for the installer:

**Note:** Calculated on 2020-12-12 16:07:09-05:00.

ThycoticSetup.exe:

- SHA1 = d64257d3489d31e7af8554e2dd69d1b2dd8ca181
- SHA256 = bd58ac1a0946ed4b3b8b7d5bf91eb5fe701b67a21ffd5532315dafbd6cce09e6

Version\_10\_9\_000033.zip:

- SHA1 = e9dda8a53e301a950f697e628d22d1aea485768b
- SHA256 = ba85391275bbcc1e1e9ce2a53727de660b358a6fad35b61861cff1ab1d68e948

## 10.9.000005

The following are the download hashes for the first half of the combined "step upgrade" installation files of Secret Server.

ThycoticSetup.exe:

- SHA1 = 47a1e5eafa8797f9c6012a2b54efaa09e8ff0649
- SHA256 = 6ccb2e6a9b695a432a006a143ad7fa672a8191c5aba9556eb4cff59180d1f82c

Version\_10\_9\_000005.zip:

- SHA1 = e1f8f6dd8e8e43f81d4b30d9a6cabafe08c46023
- SHA256 = 0e31766c54af67944e0ef16f8ad6512672640d0a5988ff7e03b99a40a1525de5

## 10.9.000032

ThycoticSetup.exe:

- SHA1 = 332006c38327bf5f48e4d687239fad3f7798849b
- SHA256 = 173f3a796412684808c256341995c50713e6b61ddef4510f9471748d9fa29b98

Version\_10\_9\_000032.zip:

- SHA1 = d03cad17517e5b5054b93086d992d34909182c39
- SHA256 = 4d5365b93670d33f3c9b9f02573c0b53e971943a1e35adf1950750e69821ee41

## 10.9.000002

The following are the download hashes for the combined installation files of Secret Server and Privilege Manager as of Secret Server version 10.9.000002.

ThycoticSetup.exe:

- SHA1 = fdd1667fa445cdfe2b90a74fb61e3846b76e53b2
- SHA256 = 3697f03c44a9d0439ed368ee95e4a5b5ce96c092ca9ed76f1d9ef0f970b63d09

Version\_10\_9\_000002.zip:

- SHA1 = 61f19f05aa32597aa93c9590c7fa254129ba2577
- SHA256 = f8d737cf3e60e81c89b6edee0f8d14236e90c831eda3814a353f0744a5e61c0c

## 10.9.000000



The following are the download hashes for the combined installation files of Secret Server and Privilege Manager as of Secret Server version 10.9.000000.

ThycoticSetup.exe:

- SHA1 = e507431a5312bc732501227726b35d3979c8036c
- SHA256 = 6947cdda490735bb7e876bf7ae49da417b083788da4711aefaeffcf56e551798

Version\_10\_9\_000000.zip:

- SHA1 = f260f2ca5974d83770087f4f4c16744fe37b5c10
- SHA256 = aaf98a57062c8e11600e5767ee08dd5af2aae34dc37aa574b7a44d0be2011f6d

## 10.8.000004

The following are the download hashes for the combined installation files of Secret Server and Privilege Manager as of Secret Server version 10.8.000004.

ThycoticSetup.exe::

- SHA1 = 4e1afea043e7c78005b39cf9eb1c97afcd7239de
- SHA256 = 6507c104d7224200552406c7ced0ce65dfcda9f76e564b1c9c257fe22c0162bc

Version\_10\_8\_000004.zip:

- SHA1 = ac498f2f8de667e860c3eecf8ad324c5b7dd2019
- SHA256 = c65aec870e6b67df1faf8f20cf892eb8f43d9d7e2f936c2bf817545b0055022f

## 10.8.000000

The following are the download hashes for the combined installation files of Secret Server and Privilege Manager as of Secret Server version 10.7.000059.

ThycoticSetup.exe:

- SHA1 = eda25d63b9538ec0cffaf62b7ed27c594ba3b606
- SHA256 = 74b897a5ce011a4d0e32d714dcb1d4f6aa86c4d8453be84798c13f64a89a04ec

Version\_10\_8\_000000.zip:

- SHA1 = 53eb1a460db1476ac96a1df4b762f0525afbc3de
- SHA256 = 6560528ac2270faf721c52671f6252d8e7e162ee79a0077480a320e63552544e

## 10.7.000059

The following are the download hashes for the combined installation files of Secret Server and Privilege Manager as of Secret Server version 10.7.000059.

ThycoticSetup.exe:

- SHA1 = a43267c43a5f5752830a705cb473b92ff298b5e9
- SHA256 = a09954b86c04ce1dfe2ef94e0e5dcacf350cc2fac6cbe98e65ddec8f20c65968

Version\_10\_7\_000059.zip:

- SHA1 = cc94fc953504d9b9ec854af5b94ae3d58e69cd33
- SHA256 = 0d99abd35ea1e6bda96018613071b1ab8ad96e2bdf10d645e72587a631f4669e

## 9.1.000001

Version\_9\_1\_000001.zip:

- SHA1: F9E3B771A71AAED1CD2D31B465690A200471B34F
- SHA256: CC1F977FE748E5925AA694240E4C66814393DCC64F37CE920966C45F5E999D2B

## 8.4.000004

Version\_8\_4\_000004.zip:

- SHA1: f67f2331cf84ac1716a7673a0c8293add8d9270f
- SHA256: 17515f5ab81f9f0537fd74ff4edaa89e8af6486439219d2cc6f8538082f15a37

**Important:** Please read the notes at the bottom of this article.

## Minimum Requirements for Basic Deployments

2 CPU Cores	2 CPU Cores
4 GB RAM	4 GB RAM
25 GB Disk Space	50 GB Disk Space
Windows Server 2012	Windows Server 2012
IIS 7 or newer (64-bit applications only)	SQL Server 2014-2022
.NET 4.8 or newer	Collation SQL_Latin1_General_CP1_CI_AS

## Recommended Requirements for Basic Deployments

4 CPU Cores	4 CPU Cores
16 GB RAM	16 GB RAM
25 GB Disk Space	100+ GB Disk Space
Windows Server 2012-2022	Windows Server 2012-2022
IIS 7 or newer (64-bit applications only)	SQL Server 2014-2022
.NET 4.8 or newer	Collation SQL_Latin1_General_CP1_CI_AS

**Note:** Windows Server 2022 is supported by Secret Server 11.0 or later. It may work with earlier versions, but that has not been officially confirmed.

## Minimum Requirements for Advanced Deployments

Recommended for organizations deploying discovery, session recording, or increased numbers of distributed engines:

**Note:** Also see feature-specific guides listed below.

8 CPU Cores	8 CPU Cores
16 GB RAM	16 GB RAM

25 GB Disk Space	100+ GB Disk Space
Windows Server 2012-2022	Windows Server 2012-2022
IIS 8 or newer (64-bit applications only)	SQL Server 2014-2022
.NET 4.8 or newer	Collation SQL_Latin1_General_CP1_CI_AS

**Note:** Windows Server 2022 is supported by Secret Server 11.0 or later. It may work with earlier versions, but that has not been officially confirmed.

4 CPU Cores	4 CPU Cores
4 GB RAM	4 GB RAM
25 GB Disk Space	40 GB Disk Space

[Unexpected Link Text](#)

**Note:** Further adjustments to system requirements for both RabbitMQ and distributed engines are at the discretion of Delinea Professional Services engineers.

## Recommended Requirements for Specific Features

[Session Recording Requirements: Basic and Advanced](#)

[Ports Used By Secret Server](#)

## Notes

**Important:** This section contains caveats potentially having a significant effect on any installation.

- The use of Server Core for Secret Server installations is not recommended; All QA and testing is based non-core versions of Windows Server.
- To comply with Microsoft licensing requirements, there is an additional constraint on which Microsoft Windows Server version you can use as the RDS server for session connector.

If you use Microsoft User Client Access Licenses (CALs), you cannot use Windows Server 2019. You must use Windows Server 2012 or 2016. If you use Microsoft Device CALs, you can use any supported version of Windows Server.

- Secret Server requires that Microsoft SQL Server and its database be set to the collation SQL\_Latin1\_General\_CP1\_CI\_AS. See [Microsoft SQL collation requirements](#) and check your server collation settings before upgrading.
- System Requirements apply to both physical and virtual machines.
- For best performance, we recommend using dedicated (clean) servers for hosting Delinea products.
- If .NET or IIS features are not already installed on the web server, the Delinea Installer will add and configure them automatically.

- If SQL is not already installed on a database server, the Delinea installer can setup SQL Express on the web server; however, SQL Express is intended for trials and sandbox environments **only**. Though Delinea will support SQL Express, users will likely experience performance issues due to the memory and product limitations. If experiencing performance issues while using SQL Express, we highly recommend upgrading to SQL Server prior to contacting Delinea Support.
- A link to Microsoft documentation on the use and limitations of SQL Express can be found at: <https://docs.microsoft.com/en-us/sql/sql-server/editions-and-components-of-sql-server-2017>.
- Installing Secret Server with Azure SQL: Currently, we do not recommend using Secret Server with Azure SQL when the Web host and the Azure SQL instance are in different datacenters. According to Microsoft, applications, such as Secret Server, that use frequent, high-volume, ad hoc queries use substantial response time on network communication between the application and Azure SQL database tiers. Thus, network latency with many data access operations across datacenters can become an issue.
- Unsupported Web Servers: Small Business Server (SBS), The Essentials Edition, Any client OS, domain controllers, SharePoint servers.
- Secret Server Cloud requires an on-premise machine to use a distributed engine.
- SQL launchers do not support SSMS 18.0 or higher.
- Discovery scanning for Windows Server 2016 scheduled tasks requires that either the Secret Server node or the distributed engine that is executing the scan must run on Windows Server 2016 or later. This is due to changes in Windows Server 2016 API used for scheduled task dependency scans.
- AWS RDS: Currently, we do not recommend using Secret Server with AWS Relational Database Service when the Web host and the SQL instance are in different datacenters. Applications, such as Secret Server, that use frequent, high-volume, ad hoc queries depend on fast network communication response time between the application and SQL database. Thus, network latency with many data access operations across datacenters can become an issue.
- Secret Server requires the application pool to have the "load user profile" setting enabled. Secret Server will report a critical alert to notify admins if this setting is not enabled.
- Supported Web browsers:
  - Google Chrome
  - Mozilla Firefox
  - Microsoft Edge. Edge Chromium only. Legacy Microsoft Edge is not supported.
  - Safari

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

To upgrade Secret Server, you need valid support licenses. To renew your support, please use our [online Web form](#) or contact sales. Once you have valid support licenses, see [Upgrading with Web Clustering](#) to upgrade.

**Important:** Please see the [Secret Server On-Premises Upgrade Checklist](#) prior to upgrading.

## Ensuring the Upgrade Is Secure

We take the following measure to ensure the upgrade is secure:

Secret Server on-Premises upgrades are packaged in a wrapper zip file for delivery. These upgrade zip files are named with the release version, such as Version\_11\_1\_000006.zip. Each wrapper zip file contains two files, a security catalog file named hashes.crt and yet another zip file named ss\_update.zip.

The ss\_update.zip file holds the changes for the new Secret Server version (database and file changes). The hashes.crt file is a signed security catalog containing the hash of the ss\_update.zip file, which is used to ensure the authenticity and integrity of the ss\_update.zip file.

A hash is a long string of characters that represents a unique digital "fingerprint" of any file the hash function is run on. Any change to a hashed file causes future hashes of the altered file to differ from the original hash, proving the file is different.

When the upgrader processes ss\_update.zip, the following occurs:

1. The hashes.crt file is validated to ensure that its digital signature is the original produced by Delinea.
2. The same hash function that created the original hash is run on the ss\_update.zip file, creating a new hash.
3. The original hash is compared to the new hash, ensuring the two match and ss\_update.zip has not been tampered with.
4. The original wrapper zip file is inspected to ensure it does not contain any unexpected, likely malicious, files.

As a result of this inspection process, the upgrader is positive both ss\_update.zip and hashes.crt are genuine and there are no foreign files present.

## Minimizing Upgrade Downtime

### Introduction

Large enterprise Secret Server customers with clustered environments often have a strong interest in minimizing downtime during their upgrade process. This document details our recommendations for accomplishing that.

**Note:** This strategy may require close coordination between networking, server administration, and SQL DBA teams. We recommend they are available at the same time during the upgrade to minimize downtime. This procedure works best for those upgrading from the prior most recent version of Secret Server.

We recommend that you have a QA or test environment mirroring your production environment and that you first run this procedure through that environment to ensure the desired results occur, prior to attempting this in a production environment. As with any third-party application upgrade, we strongly recommend taking snapshots or virtual machine backups of your web, Secret Server distributed engine, and database servers so you can easily revert to a pre-upgrade state if issue arise during the upgrade.

**Note:** Distributed engines auto-upgrade as part of the upgrade process to the latest release. It is possible that you will have up to 10 minutes of downtime while the engines upgrade, regardless of this procedure.

**Note:** Customers using IWA and upgrading from 10.6 or lower to 10.6 or greater need to follow the steps in [Configuring Integrated Windows Authentication](#) to configure their distributed engines.

### Procedures

#### Load Balanced Configuration Upgrade

#### Prerequisites

The upgrade procedure requires that you do these steps outside of the Secret Server install.

- Download the upgrade package (step 1)
- Backup your database (step 2)
- Obtain the database upgrade script from support (step 4)
- Backup any customized web.config or web-appsettings.config files (step 10)

#### Procedure

1. Download the latest version of Secret Server from the [Delinea Support Website](#).
2. Perform a full backup of your Secret Server database using the preferred backup method used by your company. For a quicker recovery procedure in case of disaster, we recommend creating a local SQL backup, engaging your SQL DBA team as needed. If you use an AlwaysOn configuration, perform the backup from your primary node. If desired, you can choose the option to do a "copy only" backup to avoid interrupting any log truncation performed by your enterprise backup tool.
3. Restore the database onto a separate SQL server or separate instance within your environment. This restored backup is used to test the upgrade process. For this instruction, we call this server the "Test SQL Server."

**Note:** Depending on your circumstances, you might want to provision a standalone SQL server to accommodate this need in the future.

4. Request a database upgrade script from the Delinea Support team. You must provide them the current **exact** version of software you are on. The script can **only** be provided by Delinea. You can request it prior to your upgrade.
5. Run the upgrade script on the Test SQL Server to verify the upgrade script runs without errors. If the upgrade script completes without errors, you can proceed.

6. Remove the database from the Test SQL Server. This may require your restarting SQL Server Engine services prior to removal.
7. Choose one of the web servers in a load balancer pool. For this instruction, we call this the "Target Web Server A." The pool has three servers total (Target Web Server A, B, and C).
8. Stop IIS on Target Web Server A. That server will appear offline in the pool list on your load balancer configuration application. For now, leave the other target web servers as is.
9. Temporarily remove Target Web Server A from the load balancer pool using your load balancer configuration application. Leave the server itself running. For example, on a F5 Big-IP load balancer:
  1. Click Local Traffic.
  2. Click Pools.
  3. Click to select the desired pool.
  4. Click Advanced in the Configuration section.
  5. Ensure Reject is selected for Action on Service Down.
10. Copy the Secret Server application files you downloaded to Target Web Server A. Copy all files in the SS\_update.zip file into Secret Server directory on Target Web Server A. This typically takes less than five minutes, depending on VM resources.

**Important:** If you have any customized settings that are per-node-specific in the existing web.config or web-appsettings.config files on the target servers, consider whether you want to protect those changes from being overwritten during the upgrade. Because the default contents of those files might change with the upgrade, we strongly recommend copying any customizations line-by-line to the new files, rather than simply replacing the new files with your customized ones. We suggest running a diff or comparison operation on the file pairs to see what, if anything, was customized in the existing files or changed in the new files.

11. When you are prompted, instruct the system copy dialog to overwrite all files.
12. Modify the script you received earlier for use on your production database. You can probably do this while the Secret Server files are copying. For this instruction, we call this the "Production SQL Server."
13. (Optional) When the Secret Server files are finished copying, enable maintenance mode on Target Web Servers B and C to eliminate the possibility of password changes occurring during your database upgrade. The Secret Server read-only vaulting function is still possible from these nodes.

**Note:** See [Maintenance Mode FAQ](#) for more on maintenance mode.

14. Start IIS on Target Web Server A. Wait until the site fully loads. This may take some time.

**Note:** Once the site loads, when you locally access that web server, you will see a Secret Server error message saying your database does not match your Secret Server. You can ignore that and click the Continue button.

15. Run the script you modified on the Production SQL Server.
16. Once the script completes, disable Target Web Servers B and C on your load balancer pool.
17. Enable Target Web Server A on your load balancer pool.
18. Access the web server through the load balancer URL. The Secret Server Login page should appear, and you should be able to log on immediately.

**Note:** If the warning message about the database not matching Secret Server appears, ignore it and click the Continue button.

19. Make Target Web Server A the primary load balancer node in the load balancer pool until the other target web servers are upgraded and online.
20. Disable IIS on Target Web Servers B and C.



21. Manually upgrade the Secret Server application files as previously discussed.
22. Enable IIS on Target Web Servers B and C.
23. Enable Target Web Servers B and C in the load balancer pool.
24. If you earlier put any of the target web servers in maintenance mode as a precaution, return them to normal function.

## Manual Rolling Upgrade

### Introduction

The manual rolling upgrade provides a way to upgrade Secret Server with little to no downtime. That is, users will continue to have secret access during the upgrade.

**Note:** This procedure only applies to clustered (multiple Web node) Secret Server environments environment.

### Prerequisites

The administrator role needs the following permissions:

- Administer Configuration
- Administer Nodes
- Administer Backup

In addition, the role:

- Needs a database login with permission to change the database
- Requires access with permission to update files on web servers
- Must go through the current upgrade process
- Must not turn on maintenance mode until needed

### Procedure

#### Task One: Uploading the Upgrade

1. Download the latest version of Secret Server from the [Delinea Support Website](#).
2. Navigate to **Admin > See All > Upgrade Secret Server:**

## Upgrade Secret Server



How do I upgrade Secret Server with little to no downtime? Click [here](#) to learn more.

### MAINTENANCE MODE

A user should enable Maintenance Mode before upgrading Secret Server to ensure limited downtime during the upgrade process. Be aware that a user cannot make changes to the database while in Maintenance Mode, this includes changing Secrets or Secret-related data. Want to learn more about Maintenance Mode? [Click here](#).



**Maintenance Mode has not been enabled on all nodes. Please enable to make Secret Server read-only during the upgrade.**

☒ **Enable Maintenance Mode**

☒ Do not put Secret Server in Maintenance Mode during the upgrade process.

### BACKUP



**Last Successful Backup - 08/30/2019 14:19:36**

1) Backup your Secret Server application folder.

**IMPORTANT:** All your data is encrypted using a file named encryption.config in your Secret Server application folder and cannot be decrypted without it. Please be sure to make a backup of the application folder and its contents to avoid any complications.

Secret Server application folder location: C:\inetpub\wwwroot\SecretServer\encryption.config

2) Backup the database SecretServer on SQLSERVER

**Backup**

☒ The Secret Server database and application folder have been backed up.



**Continue**

3. **Important:** Click to select the **Do not put Secret Server in Maintenance Mode during the upgrade process** check box.

4. Backup the Secret Server application folder.

**Important:** Ensure the encryption.config file is backed up. It is located at c:\inetpub\wwwroot\SecretServer\encryption.config.

5. Click the **Backup** button to back up the Secret Server database.

6. Click the **Continue** button. The Upgrade Secret Server page appears:

## Help

This page is used to apply patches to Secret Server that have been delivered from support or to apply upgrades of Secret Server. Before continuing ensure that the Secret Server application and database have been backed up successfully.

### Upgrade Secret Server

Current Version	10.7.000000	
Latest Version	10.6.000027	The latest version is already installed.

[Advanced \(not required\)](#)

- Click the **Advanced (not required)** link. The Advanced section appears:

#### Advanced (not required)



#### WARNING!

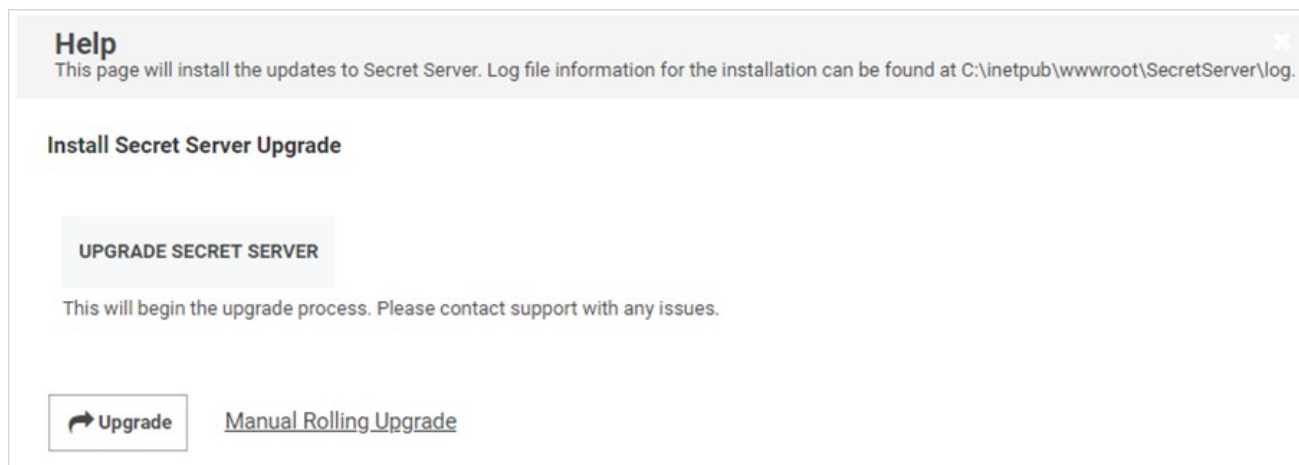
This option is for advanced users only. Use this option only if you are unable to update Secret Server from our servers. Providing an invalid upgrade file may result in permanent loss of data.

Make sure you have backed up your installation before continuing. For more information, please see our [knowledge base article](#).

If you are currently connected to the Internet the latest version can be downloaded from here: [Download Latest Version](#). Once downloaded choose to upload that file from the option below. After upload is complete an option will appear to install that version.

No file chosen

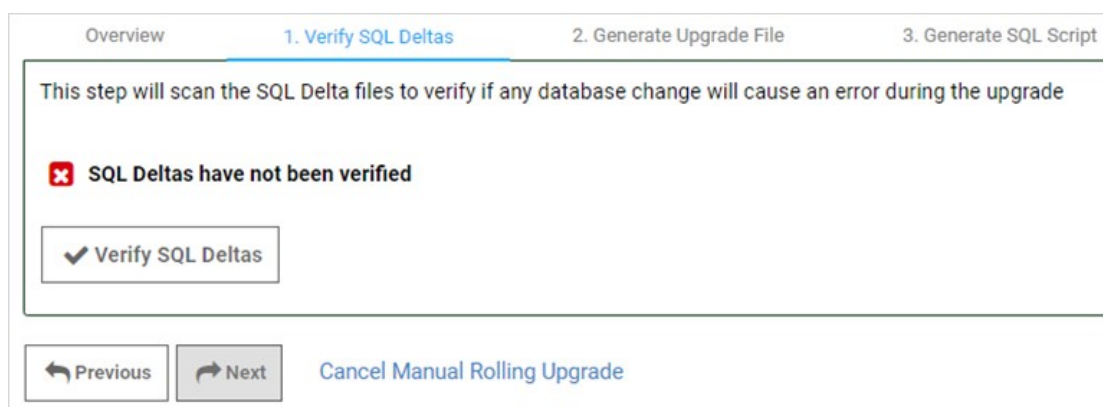
- Click the **Choose File** button, and select the zip file you downloaded earlier to upgrade to.
- Click the **Upload Upgrade File** button. The new version appears as available for installation:



10. Click the **Manual Rolling Upgrade** link. The Manual Rolling Upgrade wizard appears.

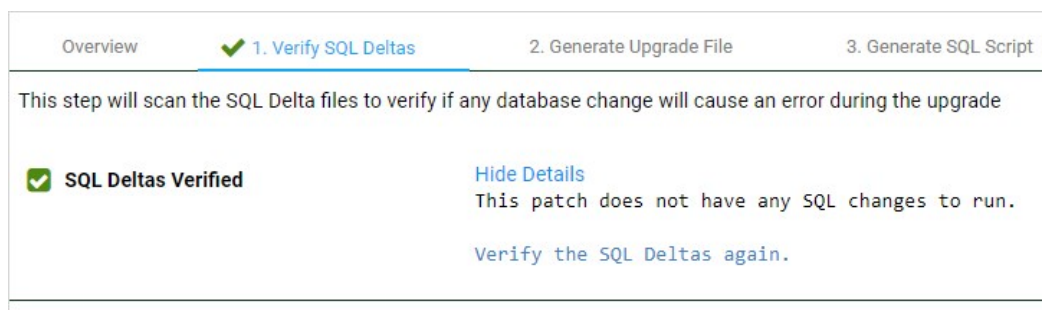
## Task Two: Verifying SQL Changes (Wizard Step One)

1. Click the **Next** Button. The Verify SQL Deltas tab appears:



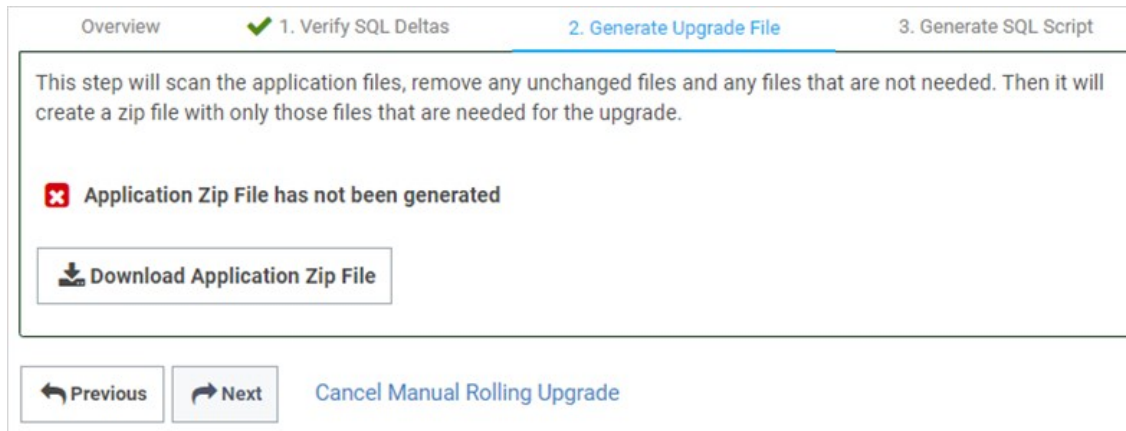
**Note:** Clicking the "Cancel Manual Rolling Upgrade" link, at any time, will take you to the Install Secret Server Upgrade page.

2. Click the **Verify SQL Deltas** button. This tests the prospective changes to see if errors result. If errors result, please contact Delinea Technical Support. If the verification succeeds:



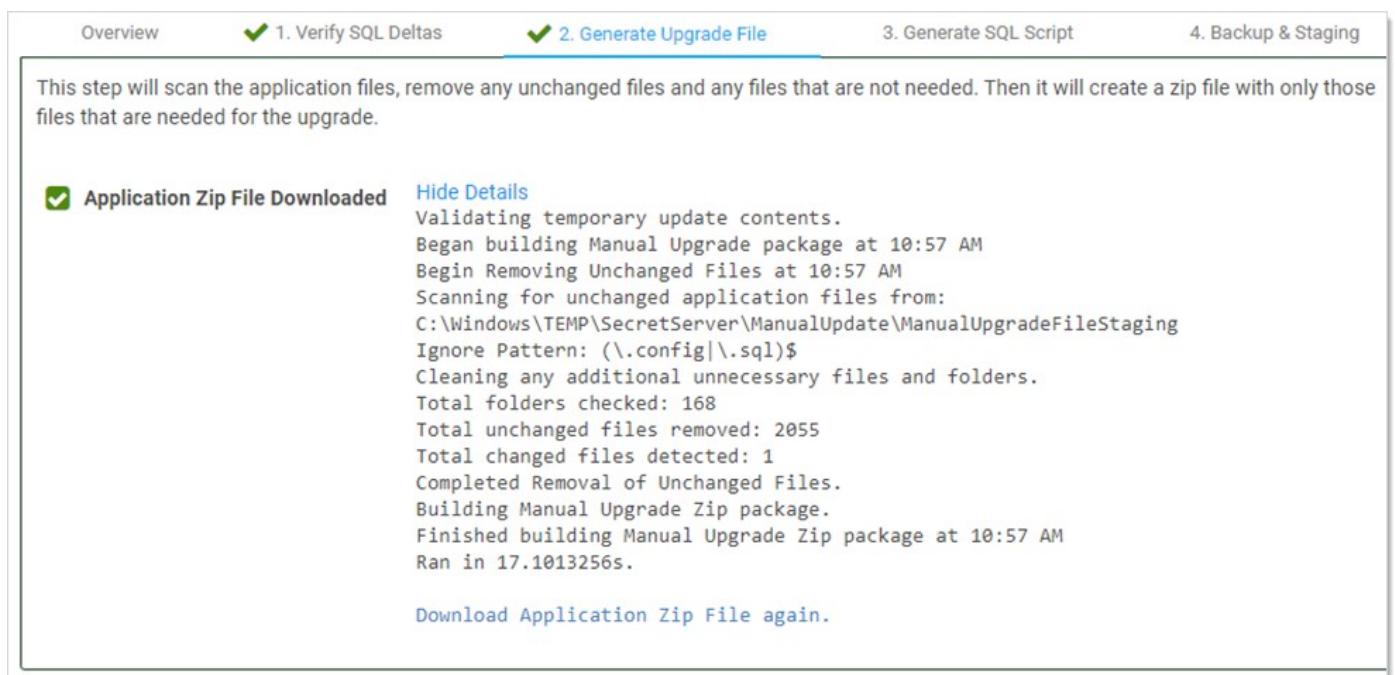
## Task Three: Generating the Upgrade File (Wizard Step Two)

1. Click the **Next** button. The Generate Upgrade File tab appears:



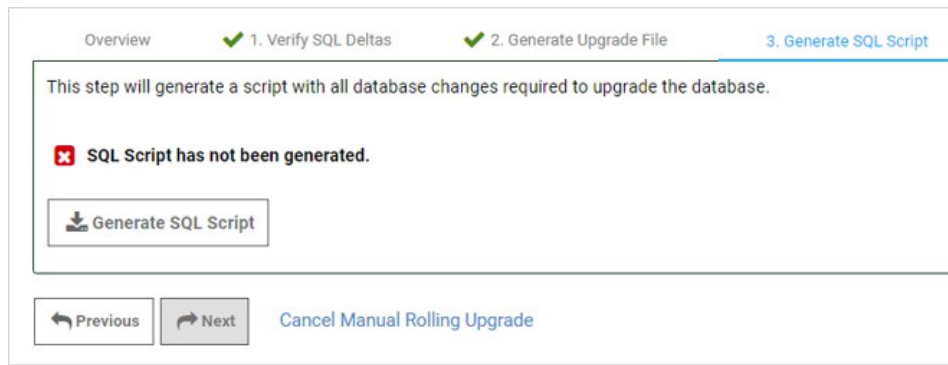
2. Click the **Download Application Zip File** button. This generates a zip file with only the changed files needed to upgrade the application files on the Web server nodes.

**Note:** This may take a few minutes to generate and download.

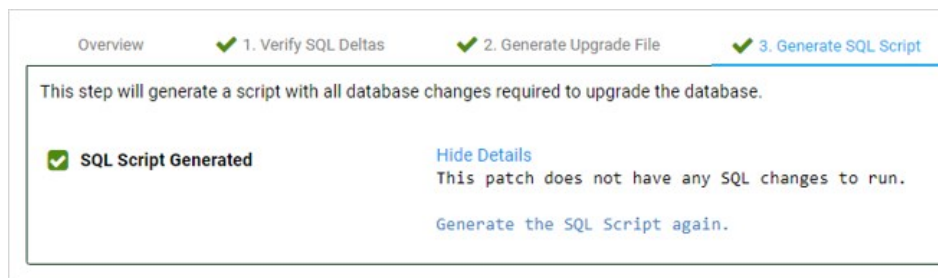


## Task Four: Generating the SQL Script (Wizard Step Three)

1. Click the **Next** button. The Generate SQL Script tab appears:



- Click the **Generate SQL Script** button. This generates script file with all the database changes needed to upgrade the database. When finished:





The wizard proceeds to step four:

## Task Five: Backing up and Staging (Wizard Step Four)




Overview
1. Verify SQL Deltas
2. Generate Upgrade File
3. Generate SQL Script
4. Backup & Staging

 **Maintenance Mode has not been enabled on all nodes. Please enable to make Secret Server read-only during the upgrade.**

 **Enable Maintenance Mode**


The purpose of this step is to run through upgrading Secret Server in a staging environment, using a current back up of Secret Server. This will verify that the upgrade will be successful, before performing the upgrade in your production environment. Follow these manual steps to ensure a successful upgrade before proceeding to the next tab:


1. Enable maintenance mode. This will ensure that the staging system will start in maintenance mode.
2. [Backup Secret Server](#).
3. Disable maintenance mode.
4. Restore Secret Server files to staging location.
5. Restore Secret Server database to a staging database.
6. Go to ADMIN > Server Nodes to confirm that the staging system is in Maintenance Mode.
7. Copy the contents of the generated application ZIP file to the staging location's web application folder.
8. Run the generated SQL script on the staging database.
9. Log into the upgraded staging Secret Server and verify the upgrade was successful.
10. (Optional) Delete the restored staging location and database.

 **Important:** Keep your backup files until you have finished this entire upgrade process in case complications arise.

Check to signify that your staging upgrade was successful before proceeding to the production upgrade:

☐ Staging Test Successful

 Previous

 Next

Cancel Manual Rolling Upgrade

1. Click the **Enable Maintenance Mode** button.
2. Back up Secret Server: Type "backup" in the Admin search text box, and click the item that appears in the dropdown list to access the Backup Configuration page. Click the **Backup Now** button.
3. Click the **Disable Maintenance Mode** button.
4. Restore Secret Server files to the staging location:
  1. Copy the backup zip file to the staging location.
  2. Unzip the backup file.
  3. Copy the files to the web application folder.
5. Restore the Secret Server database to a staging database:
  1. In SQL Server Management Studio, right click on **Databases**.
  2. Click **Restore Database**.
  3. In **Source**, select **Device**.
  4. Select and add the backup database file location.
  5. Click **Ok**.

6. Go to **Admin > Secret Nodes** to confirm the staging system is in maintenance mode.
7. Copy the contents of the generated application Zip file to the staging location's web application folder. Typically, this is `C:\inetpub\wwwroot\SecretServer`.
8. Run the generated SQL script on the staging database.
9. Log on the upgraded staging Secret Server to verify the upgrade was successful.
10. (Optional) Delete the restored staging location and database.

**Important:** Keep the backup files till you verify the upgrade was successful. You may need them if an issue develops.

11. Click to select the **Staging Test Successful** check box to confirm your staging upgrade was successful. This is your confirmation that there were no errors before performing the actual upgrade in your production environment. The confirmation is recorded.

## Task Six: Starting Upgrade Mode (Wizard Step Five)

1. Click the **Next** button. The Enter Upgrade Mode tab appears:

Overview ✓ 1. Verify SQL Deltas ✓ 2. Generate Upgrade File ✓ 3. Generate SQL Script ✓ 4. Backup & Staging 5. Enter Upgrade Mode

**IMPORTANT:** This must be done first before any updates to database or application files. Without enabling these two settings, Secret Server users may experience some downtime during the upgrade.

Maintenance Mode must be enabled for a manual upgrade to prevent database changes from occurring during the upgrade process.

✗ Maintenance Mode has not been enabled on all nodes. Please enable to make Secret Server read-only during the upgrade.

✓ Enable Maintenance Mode

Enable Ignore Version Mismatch along with Maintenance Mode before manually upgrading Secret Server to ensure little to no downtime will occur for users during the upgrade process. Be aware that a user still cannot make changes to the database while in Maintenance Mode, this includes changing Secrets or Secret-related data. The Ignore Version Mismatch setting will prevent the version mismatch page from being displayed when the web application and the database versions do not match.

✗ Ignore Version Mismatch has not been enabled. Please enable to make sure Secret Server users are not interrupted during the upgrade.

✓ Enable Ignore Version Mismatch

↩ Previous Next ➔ [Cancel Manual Rolling Upgrade](#)

2. Click the **Enable Maintenance Mode** button. This mode limits the activities of users on secrets, secret templates, password requirements, and others and can take several minutes to start. A confirmation popup appears.
3. Click the **Enable** button to confirm the mode change. The popup disappears.
4. Click the **Enable Ignore Version Mismatch** button. This prevents users from being redirected to the Version Mismatch page. A confirmation popup appears.
5. Click the **Enable** button to confirm the setting change. The popup disappears.
6. Click the **Next** button. The Manual Steps tab appears:



Overview
1. Verify SQL Deltas
2. Generate Upgrade File
3. Generate SQL Script
4. Backup & Staging
5. Enter Upgrade Mode
6. Manual Steps
Finish

### SUMMARY

- Verify SQL Deltas
- Generate Upgrade File
- Generate SQL Script
- Backup & Staging
- Enter Upgrade Mode

### MANUAL STEPS TO UPGRADE WEB NODES

Once you are ready to perform the upgrade in your production environment, these steps will guide you through completing the manual rolling upgrade.

For more details about the Manual Rolling Upgrade process [click here](#).

Divide your nodes so that traffic can be routed to one set of nodes (group A) while you upgrade the other nodes (group B).

To upgrade the nodes in group B, follow these steps:

1. Make sure Maintenance Mode is enabled on all nodes and that Ignore Version Mismatch is enabled. Go to the Enter Upgrade Mode tab to change these settings.
2. On the load balancer, force all traffic to group A nodes by disabling traffic to group B nodes. To prevent end user interruption wait until all connections are drained from group B before proceeding with the next step.
3. Unzip the Application zip file and copy all the files to the web application folder on all the nodes in group B.
4. Log into a node in group B and confirm that the site loads and logs in correctly.
5. On the load balancer, force all traffic to group B nodes by enabling them back into the pool and disabling group A nodes. To prevent end user interruptions you will want to wait until all connections are drained from group A nodes prior to proceeding with the next step.
6. Run the SQL script on the database and confirm that there are no errors. If you encounter any errors, follow the rollback instructions below.
7. Log into a node in group B again and confirm that the site loads and logs in correctly.

Next, complete upgrade on the other web nodes:

1. Unzip the Application zip file and copy all the files to the web application folder on all the nodes in group A.
2. Log into a node in group A and confirm that the site loads and logs in correctly.
3. On the load balancer, restore the original configuration, sending traffic to all nodes.

If you encounter any errors at any step of the upgrade, rollback to the previous version by doing the following:

1. Restore your database from backup.
2. Restore your application files from backup to the web application folder on all nodes.
3. On the load balancer, restore the original configuration, sending traffic to all nodes.
4. [Contact support](#) for assistance.

[Show Server Nodes](#)

Check to signify that your manual rolling upgrade was successful before proceeding:

☐ Upgrade Successful

Need Help? [Contact Support](#)

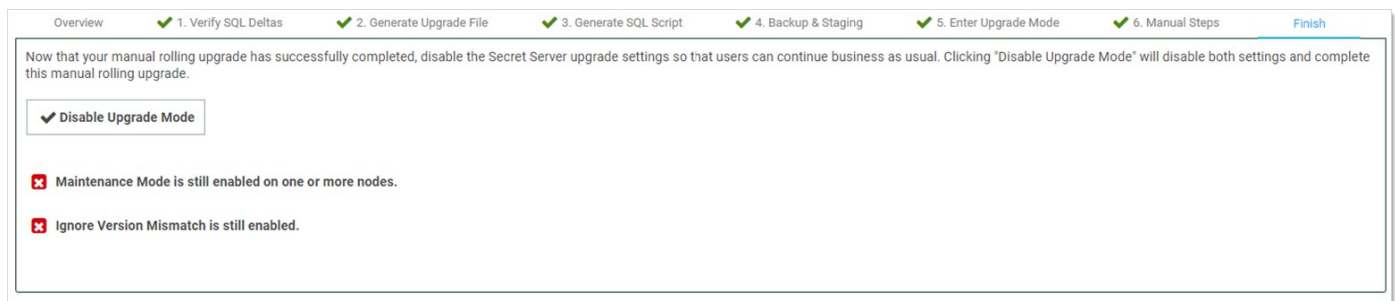
Previous
Next
Cancel Manual Rolling Upgrade

## Task Seven: Upgrading Web Nodes (Wizard Step Six)

To upgrade Web nodes:

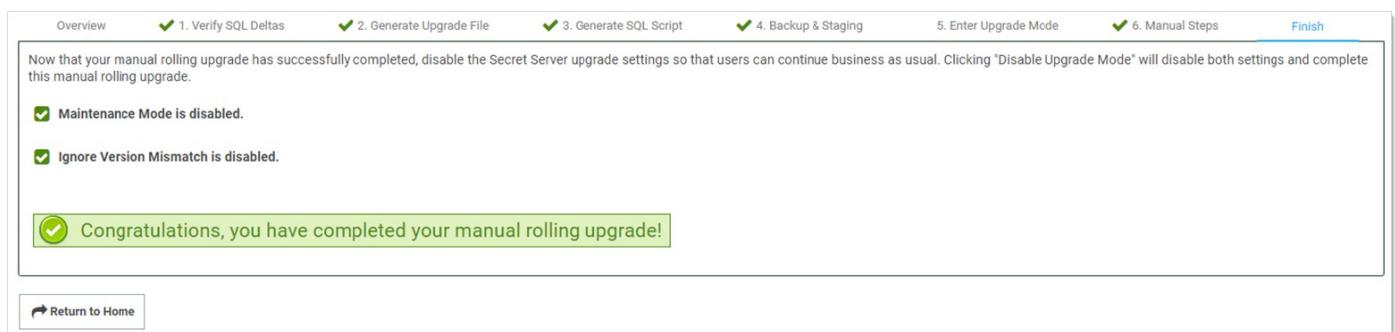
1. Split your nodes into two approximately even groups (A and B) so that one group can service traffic while the other is upgrading.
2. Ensure "maintenance mode" and "ignore version mismatch" are enabled on each node. You can change them from the Enter Upgrade Mode tab.
3. On the load balancer, disable traffic to group B. To prevent traffic interruptions, ensure those nodes are all completely disabled before proceeding to the next step. Group A, alone, now handles the traffic. For example, on a F5 Big-IP load balancer you:
  1. Select the Members tab on the pool page.
  2. Select the node to disable.
  3. Click Force Offline.
4. For each node in group B:
  1. Navigate to the Downloads folder.
  2. Extract all the files from the application zip file downloaded earlier.
  3. Copy the extracted files to the Web application folder.
  4. Log onto the node to ensure the site correctly loads and logs on.

5. On the load balancer, enable the group B nodes to return them to the pool.
6. Disable traffic to group A. To prevent traffic interruptions, ensure those nodes are all completely disabled before proceeding to the next step. Group B, alone, now handles the traffic.
7. Execute the script you created on the database, confirming there are no errors. If there are errors, follow the [rollback instructions](#).
8. Log onto each group B node again to ensure the site correctly loads and logs on.
9. For each node in group A:
  1. Navigate to the Downloads folder.
  2. Extract all the files from the application zip file downloaded earlier.
  3. Copy the extracted files to the Web application folder.
  4. Log onto the node to ensure the site correctly loads and logs on.
10. On the load balancer, enable the group A nodes to return them to the pool, restoring the original configuration and returning traffic to all nodes.
11. Click to select the **Upgrade Successful** check box.
12. Click the **Next** button. The Finish tab appears:



## Task Eight: Finishing up (Wizard Step Seven)

1. Click the **Disable Upgrade Mode** button. A Finish Manual Rolling Upgrade popup appears. This popup both disables maintenance mode and disables the ignore version mismatch setting.
2. Click the **Disable** button. The popup disappears, and a completion message appears:



## Troubleshooting and Notes

### Rolling Back to the Previous Version

If you encounter errors at any step of the upgrade, rollback to the previous Secret Server version:

1. Restore the database from the backup.
2. Restore the application files from the backup files to the Web application folder on all nodes.
3. On the load balancer, restore the original configuration, sending traffic to all nodes.
4. For assistance, contact us at the [Delinea Support Website](#).

## Version Guard

If an uploaded upgrade file cannot be used to upgrade the current version of Secret Server, then "Version Guard" will block the upgrade and provide instructions on how to continue:

### Help

Welcome to the Manual Rolling Upgrade Process for Secret Server. The process below is designed to apply a Secret Server upgrade with little to no downtime for your organization. This process is only available for organizations with a clustered (multiple web node) environment.

Completing all required steps will take varying amounts of time to complete, depending on your environment. Please be prepared to complete all steps of the process at once.

Before continuing, ensure that the Secret Server application and database have been backed up successfully.

For more details about the Manual Rolling Upgrade process [click here](#).

### Secret Server Manual Rolling Upgrade

**VERSION GUARD**

Unable to upgrade Secret Server from 10.7.000000 to version Version.xml file does not exist.

Return To Upgrade

This usually occurs when not completing the prerequisite steps in order. Click the **Return To Upgrade** button to return you to the first upgrade page to remedy the situation.

### Secret Server Manual Rolling Upgrade

**VERSION GUARD**

Unable to upgrade Secret Server from 10.7.000002 to version 10.8.000001.

Secret Server must be upgraded to the following versions, in order, before upgrading to version 10.8.000001:

1. Version **10.7.000050**

Return To Upgrade

This page also list the blocking versions that you must upgrade to prior to running the manual rolling upgrade.

## **New Advanced Configuration Setting**

There is a new setting called "Manual Upgrade: Allow version mismatch while in Maintenance Mode." This setting, which only applies in maintenance mode, prevents Secret Server from redirecting users to the version mismatch message page.

## **New Audit Type**

To support the manual rolling upgrade, there is a new audit type—ManualUpgrade. Its audits are stored in the tbAudit table and record the following actions:

- CANCEL
- COMPLETED
- GENERATE DB SCRIPT
- GENERATE UPGRADE ZIP
- STAGING TEST
- STARTED
- VERIFY DELTAS

## Secret Server and Secret Server Cloud .NET Framework 4.8 Mandatory Upgrade

**Important:** This is a major part of the 10.9.000005/33 step upgrade. Please see [Upgrading to 10.9.000005/33](#).

### Introduction

This topic explains the steps to prepare your environment for the December 2020 upgrade to Secret Server and Secret Server Cloud (SSC). These changes must be made before the December release is deployed. Secret Server Online is not affected by these changes.

The Microsoft .NET Framework is a core component of the Secret Server architecture. Secret Server versions up to and including 10.9.000002 require version 4.5.1 or higher of the .NET Framework.

The December 2020 releases of Secret Server and SSC will change this requirement. From December 2020 onwards, version 4.8 or higher of the .NET Framework will be required.

This change improves the security of communication between Secret Server and distributed engines. It also allows Delinea to maintain compatibility with other third party libraries required by Secret Server and SSC. Secret Server online is not impacted by these changes.

The December release is scheduled for Secret Server installed (on-premise) customers on 8 December 2020. The December release is scheduled for SSC customers on 12 December 2020.

### Preparing Secret Server for the December Release

To accommodate this change in software requirements, Secret Server and SSC customers may need to install .NET Framework 4.8 runtime on the computer systems hosting components of Secret Server in their environment. These changes can be made in advance without impacting the operation of your current version of Secret Server or SSC. The required actions, workarounds, and the impact of not taking action are listed here for each component of Secret Server infrastructure:

#### Secret Server Web Nodes

##### Products

Secret Server

##### Required Action

Installing .NET Framework 4.8 on servers running web nodes.

##### Impact of Inaction

Upgrade to the December 2020 release will not proceed until .NET Framework 4.8 has been installed.

##### Notes

The web node components of SSC are managed directly by Delinea.

#### Distributed Engines

##### Products

- \$1Secret Server\$2\$1Secret Server\$2

- Secret Server Cloud

##### Required Action

Installing .NET Framework 4.8 on servers running web nodes.

## Impact of Inaction

- Secret Server upgrade will request confirmation before upgrading if any connected distributed engines do not have .NET Framework 4.8 installed. Any distributed engines which do not have .NET framework 4.8 installed will fail to upgrade.
- SSC will be upgraded whether or not distributed engines have .NET Framework 4.8 installed. Any distributed engines which do not have .NET framework 4.8 installed will fail to upgrade.

## Notes

Installing .NET Framework 4.8 after the upgrade will allow a distributed engine to start and reconnect to Secret Server.

## Protocol Handler

## Products

- \$1Secret Server\$2\$1Secret Server\$2

- Secret Server Cloud

## Required Action

- New installations of the protocol handler on Windows systems after the December release will require .NET Framework 4.8 installed.
- Fully patched Windows 10 systems should already have the framework in place.
- Customers with existing deployments of protocol handler have two options:
  - Ensure that .NET Framework 4.8 is installed on all endpoints using protocol handler before the Secret Server or SSC update.
  - Disable automatic updating of protocol handler:
    1. Go to **Admin > Configuration**.
    2. Set **Enable Protocol Handler Auto-Update** to **No**.
- Secret Server is compatible with older versions of protocol handler. Older versions will continue to function when used with the Secret Server December release.

## Impact of Inaction

Any updated installs of protocol handler will fail on systems that do not have .NET Framework 4.8 installed.

## Notes

None.

## Advanced Session Recording Agent (ASRA)

## Products

- \$1Secret Server\$2\$1Secret Server\$2

- Secret Server Cloud

## Required Action

Existing installations of ASRA will continue to operate. New installations of ASRA after the December release will require .NET Framework 4.8 installed on the servers where ASRA is deployed.

## Impact of Inaction

Existing installations of ASRA will continue to operate.

## Notes

None.

## Session Connector

## Products

- \$1Secret Server\$2\$1Secret Server\$2

- Secret Server Cloud

## Required Action

None. This release will not require .NET Framework 4.8 for session connector.

## Impact of Inaction

None. Session connector will continue to function.

## Notes

Although the December release will not require .NET Framework 4.8, future updates to session connector will require it. Therefore, we recommend installing .NET Framework 4.8 on any Microsoft Remote Desktop Services (RDS) servers used as part of the session connector infrastructure.

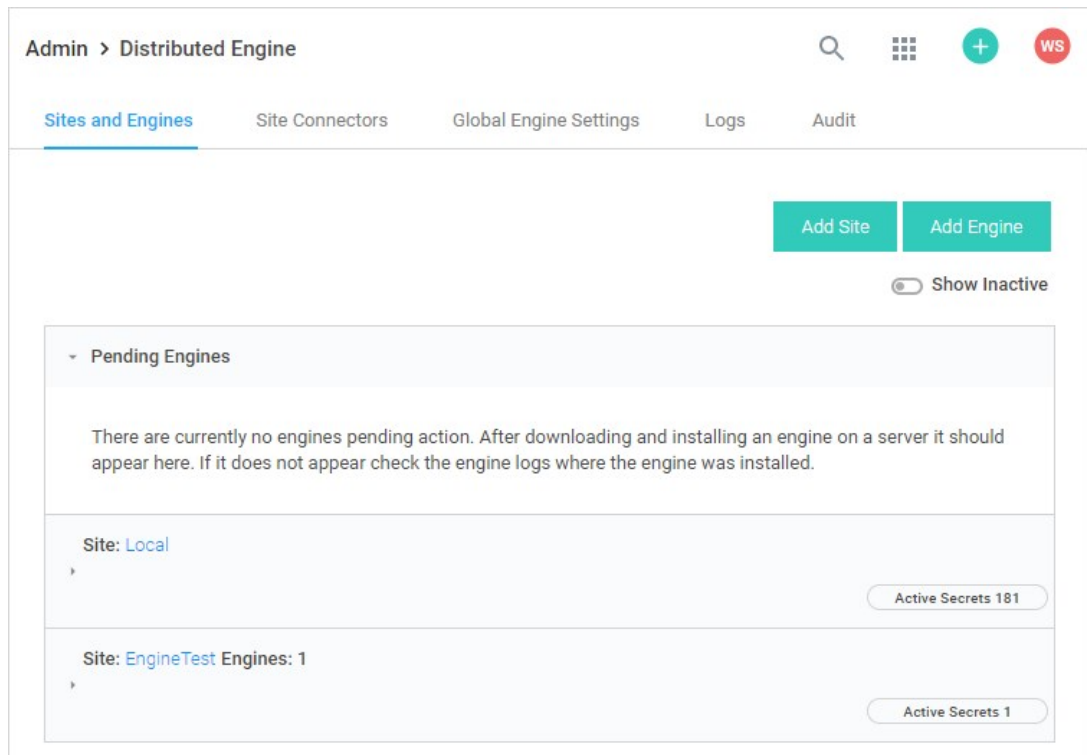
## Effects on Connection Manager

None: Connection Manager will be updated to require .NET Framework 4.8 at a later date.

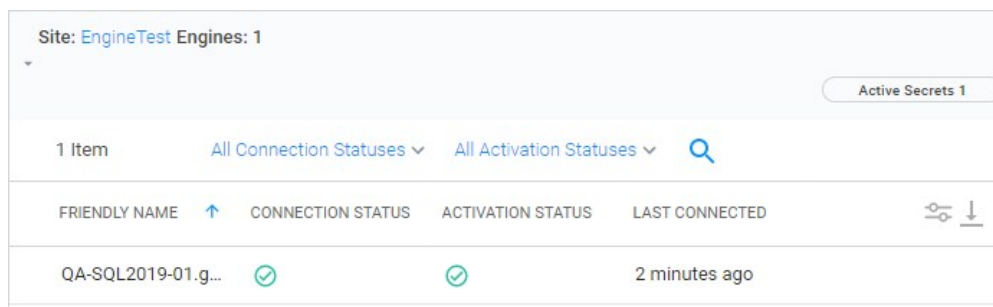
## Identifying Distributed Engine Servers

To identify which servers in your environment are running Distributed Engines and may require a .NET Framework 4.8 update:

1. In Secret Server, go to **Admin > Distributed Engine**. The Distributed Engine Configuration page appears:



- Click the site panel button for the desired DE. The panel expands, displaying the DEs for that site:



- Note the servers in your environment that currently have distributed engines installed. These are the machines where you need to install the .NET 4.8 runtime.

## Unaffected Secret Server Components

The following components of Secret Server and SSC are not affected by this change:

- SQL Server. Database system requirements are not affected by this change.
- Web password filler
- Secret Server Desktop Application Secret Server
- Secret Server Mobile

## Determining Your .NET Framework Version

- Microsoft provides several methods to determine the installed versions of .NET Framework. Please see [How to: Determine which .NET](#)



## [Framework versions are installed.](#)

- See [.NET Framework versions and dependencies](#) for additional Microsoft .NET Framework version information.
- You can run the following command at a Windows PowerShell prompt to view currently installed .NET Framework version number: (Get-ItemProperty "HKLM:\SOFTWARE\Microsoft\NET Framework Setup\NDP\v4\Full").version
- Secret Server on-premises (not SSC) displays the .NET framework version on the Admin > Diagnostics page. The version displayed is for the Web server being accessed. It does not include information about the .NET Framework version installed on any other server.

**Important:** The version displayed on the Diagnostics page incorrectly identifies .NET Framework 4.8 as version 4.5.1 followed by a release number, such as 4.5.1.528040. If the release number is 528040 or higher, the framework version number is 4.8. If the release number is lower than 528040 or the release number is not displayed at all, the framework version is lower than 4.8 and an the mandatory update is required.

## Installing .NET Framework 4.8

- Microsoft .NET Framework 4.8 is available as a recommended update for customers using Windows Update, Windows Server Update Services (WSUS), and Microsoft Update (MU) Catalog. Please see [.NET Framework 4.8 is available on Windows Update, WSUS and MU Catalog](#).
- Microsoft provides a Web installer for .NET Framework 4.8. Please see [Download .NET Framework 4.8](#).
- Microsoft also provides an offline installer package for .NET Framework 4.8. Please see [Microsoft .NET Framework 4.8 offline installer for Windows](#).

**Note:** If there is an exception while monitoring ASP .NET applications, see [Troubleshooting steps when there is an exception while monitoring ASP .NET applications](#) for more information

## Secret Server Cloud IP Address Change for March to May 2021

### Overview

Delinea is making infrastructure upgrades to Secret Server Cloud (SSC) over the next few weeks. As part of this work, the IP addresses for SSC will change. Your SSC subdomain will not change.

You may need to modify your inbound or outbound firewall configurations to maintain uninterrupted service.

### FAQ

#### Who Is Affected?

Customers using inbound or outbound firewall rules to control traffic to and from SSC are affected.

Inbound firewall rules are necessary for customers using Remote Authentication Dial-In User Service (RADIUS) authentication.

#### What Other Delinea Products Are Affected?

None—these products are **not** affected:

- All other Delinea cloud products
- Secret Server private cloud customers Secret Server
- Secret Server on-premises customers

#### What Delinea Domains Are Affected?

If you use IP filtering, the following domains are affected:

**Table:** Affected Domains by Region

America	secretservercloud.com
Australia	secretservercloud.com.au
Canada	secretservercloud.ca
Europe	secretservercloud.eu
Singapore	secretservercloud.com.sg

[Unexpected Link Text](#)

#### How Do I Verify My Domain Is Affected?

Review the table above to see if any of those domains appear in your SSC URL. For example, if your domain were `https://acmewidgets.secretservercloud.eu` you would be affected.

#### What Do I Need to Change?

If you confirmed your domain is affected, you need to change your inbound IP address and outbound hostnames for your firewall rules prior to

the dates in the **New IP Addresses and Hostnames** table below.

## When Are The IP Addresses and Hostnames Changing?

The IP addresses and host names for the listed regions are **not** changing at the same time. Please see the **New IP Addresses and Hostnames** table below for the date or dates applying to you.

## Will I Lose Connectivity During the Change?

It is unlikely you will lose connectivity with SSC unless you use inbound or outbound IP filtering and have not updated to the new IP addresses or hostnames found the table below.

## How Will I Know When the Change Is Complete?

Delinea will update the SSC banner as we complete the IP address change.

## Who Do I Contact If I Have Issues After the Change?

Contact Delinea technical support at any of the phone numbers below or by opening a case using the [Support Portal](#).

## Delinea Support

### Support Portal

[Support Portal](#)

### Telephone

#### Americas

+1 202 991 0540 (US)

#### EMEA

- +44 20 3880 0017 (UK)
- +49 69 6677 37597 (Germany)

#### APAC

- +61 3 8595 5827 (Australia)
- +63 2 231 3885 (Philippines)
- +64 9-887 4015 (New Zealand)
- +65 3157 0602 (Singapore)

## IP Addresses and Hostnames

### New IP Addresses and Hostnames

**Note:** The outbound address for DR is included for those that have configured RADIUS authentication and need to allow list IP for initial communication into RADIUS servers.

**Table:** New IP Addresses and Hostnames

---

secretservercloud.com	52.224.253.7 52.224.253.4	52.160.67.39 52.160.67.38	thycotic-ssc-us-er-sb-01-prod-b.servicebus.windows.net (primary) thycotic-ssc-us-er-sb-01-prod-g.servicebus.windows.net (primary) thycotic-ssc-us-er-sb-02-prod-b.servicebus.windows.net (dr) thycotic-ssc-us-er-sb-02-prod-g.servicebus.windows.net (dr)	24 April 2021 8 May 2021
secretservercloud.com.au	20.37.251.37 20.37.251.120	20.53.142.34 20.53.142.37	thycotic-ssc-au-er-sb-01-prod-b.servicebus.windows.net (primary) thycotic-ssc-au-er-sb-01-prod-g.servicebus.windows.net (primary) thycotic-ssc-au-er-sb-02-prod-b.servicebus.windows.net (dr) thycotic-ssc-au-er-sb-02-prod-g.servicebus.windows.net (dr)	10 April 2021
secretservercloud.ca	52.228.117.246 52.228.113.119	52.229.119.193 52.229.119.89	thycotic-ssc-ca-er-sb-01-prod-b.servicebus.windows.net (primary) thycotic-ssc-ca-er-sb-01-prod-g.servicebus.windows.net (primary) thycotic-ssc-ca-er-sb-02-prod-b.servicebus.windows.net (dr) thycotic-ssc-ca-er-sb-02-prod-g.servicebus.windows.net (dr)	3 April 2021
secretservercloud.eu	20.79.64.213 20.79.65.3	20.50.180.242 20.50.180.187	thycotic-ssc-eu-er-sb-01-prod-b.servicebus.windows.net (primary) thycotic-ssc-eu-er-sb-01-prod-g.servicebus.windows.net (primary) thycotic-ssc-eu-er-sb-02-prod-b.servicebus.windows.net (dr) thycotic-ssc-eu-er-sb-02-prod-g.servicebus.windows.net (dr)	1 May 2021 15 May 2021
secretservercloud.com.sg	20.195.97.220 20.195.98.154	65.52.165.108 65.52.160.251	thycotic-ssc-sea-er-sb-01-prod-b.servicebus.windows.net (primary) thycotic-ssc-sea-er-sb-01-prod-g.servicebus.windows.net (primary) thycotic-ssc-sea-er-sb-02-prod-b.servicebus.windows.net (dr) thycotic-ssc-sea-er-sb-02-prod-g.servicebus.windows.net (dr)	3 April 2021

[Unexpected Link Text](#)

**Note:** The US and EU regions have two dates listed for changes because the upgrade work will be performed over two days.

Please make any necessary changes before the earlier date.

## Old IP Addresses and Hostnames

For reference, the original IP addresses and hostnames were as follows:

**Table:** Old IP Addresses and Hostnames

secretservercloud.ca	13.88.237.67 52.228.62.157	thycotic-ssc-02-prod-ca-bus-er.servicebus.windows.net thycotic-ssc-02-prod-ca-bus-er-g.servicebus.windows.net
secretservercloud.com	40.76.197.147 40.121.181.52	thycotic-ssc-02-prod-use1-bus-er.servicebus.windows.net thycotic-ssc-02-prod-use1-bus-er-g.servicebus.windows.net
secretservercloud.com.au	20.36.47.199 20.36.45.106	thycotic-ssc-02-prod-auce-bus-er.servicebus.windows.net thycotic-ssc-02-prod-auce-bus-er-g.servicebus.windows.net
secretservercloud.com.sg	137.116.141.200 137.116.143.17	thycotic-ssc-02-prod-sea-bus-er.servicebus.windows.net thycotic-ssc-02-prod-sea-bus-er-g.servicebus.windows.net
secretservercloud.eu	51.116.228.208 51.116.228.152	thycotic-ssc-02-prod-dewc-bus-er.servicebus.windows.net thycotic-ssc-02-prod-dewc-bus-er-g.servicebus.windows.net

## Upgrading Secret Server

**Important:** Please see the [Secret Server On-Premises Upgrade Checklist](#) prior to upgrading.

**Note:** See [Upgrading to Secret Server 10.9.000005/10.9.000032](#) for instructions specific to that upgrade.

**Important:** If upgrading to 10.7.000000 or later, using SQL Server 2008 R2 as the Secret Server database is no longer supported. In addition, the *existing* MS SQL database must be version 2012 or later for this upgrade. Otherwise, if the upgrade fails and you attempt to roll it back, the previous installation will not work. For more information, see the [release notes](#).

**Important:** Customers upgrading to 10.6.000000 or later and are using RabbitMQ, please see [Clearing RabbitMQ Message Queues](#).

**Important:** Customers using the Integrated Windows Authentication (IWA) feature need to perform a workaround when upgrading to Secret Server 10.6 with a Distributed Engine. IWA is the Windows feature where users log on their Windows domain only once—once logged on, any additional domain logons are done automatically without having to reenter a user name and password.

**Important:** Upgrading to Secret Server version 8.9.000000 and above will require **Windows Server 2008 R2 or greater**.

**Important:** If you are upgrading to Secret Server version 8.5.000000 and above, there are changes in the .NET Framework version you will need to be aware of along with some additional steps in the upgrade process. For more information, see [Secret Server and Secret Server Cloud .NET Framework 4.8 Mandatory Upgrade](#).

**Important:** Upgrading to Secret Server version 10.0.000000 and above will require configuring integrated pipeline mode on the Secret Server Application Pool. Please see [Manual IIS Installation](#) for details on configuring integrated pipeline mode in IIS. If using Integrated Windows Authentication you will also need to update IIS authentication settings as detailed in [Configuring Integrated Windows Authentication](#). If you are at version 9.1.000000 and below, you will need to first upgrade to 9.1.000001 before you can upgrade to 10.0.000000 and above.

**Important:** If you are doing an incremental upgrade from Version 9.1.000000 to a higher version, the system may require additional time to process the changes before proceeding. A typical symptom of this behavior will be the software will redirect you to the home page. If this happens, please allow up to 24 hours before retrying the upgrade. If the issue persists, please contact technical support. You should lose no other functionality of the software whilst this occurs.

**Important:** If you have Privilege Manager installed, the Secret Server upgrade process will begin an upgrade for Privilege Manager as well.

## How Upgrades Work

Secret Server periodically polls the update server to detect new updates. If the "Allow Automatic Checks for Software Updates" option is enabled in the Admin > Configuration menu, you will see the "An update is available (xx.x.xxxxxx)" link after logging in with an administrator account. The steps below can be used to perform an upgrade for versions 7.1.000015 and higher. If you have an older version of Secret Server, please contact Delinea technical support for assistance.

## Before You Begin


1. Ensure you will have access to account credentials for the server hosting Secret Server AND the SQL Server instance hosting your Secret Server database.
2. Ensure you have a recent backup of the application files and database available.
3. If you use clustering, stop the application pools on all of the servers except the one that is currently the "primary."

## How to Upgrade

1. From a computer that has outbound network access, click on the upgrade link to go to: <http://<yourinstance>/Setup/Home>. If you are upgrading from a version lower than 10.2.000000, the URL will be <http://<yourinstance>/installer.aspx>. The Secret Server Setup Home page appears:

**Note:** If your computer does not have outbound network access, please see [Upgrading Secret Server Without Outbound Access](#).

## Secret Server Setup Home


**Secret Server Version 10.2.000000**


Please note the following configuration settings that will need to be configured in order to use certain features.

[Secret Server Upgrade Available ?](#)


[No RabbitMq Internal Communication Site Connector ?](#)

**Online Setup Resources**

- [Getting Started with Secret Server](#)
- [User Guide](#)


**Privilege Manager for Windows**


- [TMS Setup](#)
- [Privilege Manager](#)


**Privileged Behavior Analytics**

- [Configure PBA ?](#)
- [Access PBA ?](#)

2. Click the **Secret Server Upgrade Available** link to continue. The Upgrade Secret Server page appears:

## Upgrade Secret Server ?




Please be sure to backup the Secret Server application folder and database before continuing the upgrade.

- 1) Backup your Secret Server application folder.
 

**IMPORTANT:** All your data is encrypted using a file named encryption.config in your Secret Server application folder and cannot be decrypted without it. Please be sure to make a backup of the application folder and its contents to avoid any complications.

Secret Server application folder location: C:\inetpub\wwwroot\SecretServer\encryption.config
- 2) Backup the database SecretServer on 10.12.30.3

☐ The Secret Server database and application folder have been backed up.


**Continue**

3. Backup your Secret Server application folder.

**Important:** All your data is encrypted using the encryption.config file in your Secret Server application folder. **Your data**

**cannot be decrypted without it.** Thus, it is critical that you backup the application folder and its contents before proceeding.

4. Backup the database named SecretServer at the IP address listed.
5. When finished backing up both, click to select the **The Secret Server database and application folder have been backed up** check box.
6. Click the **Continue** button. Another Upgrade Secret Server page appears:

### Upgrade Secret Server

Current Version	10.2.000000
Latest Version	10.2.000001

 **Download Latest Version**


[Advanced \(not required\)](#)

7. Click the **Download Latest Version** button to download Secret Server. Wait for the download to finish. The Install Secret Server Upgrade page appears:

### Install Secret Server Upgrade


Upgrade Secret Server

This will begin the upgrade process. Please contact support with any issues.


 **Upgrade**

8. Click the **Upgrade** button. The upgrade starts. When it is finished, the Secret Server Upgrade Installation Status page appears:

### Secret Server Upgrade Installation Status

 **CONGRATULATIONS! Installation is complete.**

[Show Details](#)

 **Return to Home**

9. Click the **Return to Home** button to return to the dashboard. The upgrade is complete.



10. If you intend to use Web clustering, proceed to [Upgrading Secret Server with Web Clustering](#).

## Upgrading Secret Server with Web Clustering

### Introduction

Secret Server has a built-in Web installer. The Web installer is a series of pages inside Secret Server that allow you to download and run updates. Secret Server is accessible by users for most of the upgrade process. You can bring down outside access to the site if you want to prevent users from making changes during the upgrade. Preventing user access makes restoring the database and site backups simpler if you decide to roll back the upgrade immediately afterward.

**Note:** You do not need to download the installer or `setup.exe`.

**Important:** Please see the [Secret Server On-Premises Upgrade Checklist](#) prior to upgrading.

**Important:** Never overwrite or delete your `encryption.config` file.

**Important:** Back up your Secret Server folder and database before performing the upgrade.

**Important:** Upgrading to Secret Server version 10.7.000000 and above, requires SQL Server 2012 or later as the database for Secret Server. For more information, see the [Release Notes](#).

**Important:** Upgrading to Secret Server version 10.0.000000 and requires configuring integrated pipeline mode on the Secret Server Application Pool. Please see [Configuring IIS for installing or upgrading to Secret Server 10](#) (KBA) for details on configuring integrated pipeline mode in IIS. If using Integrated Windows Authentication, you will also need to update IIS authentication settings as detailed in [Configuring Integrated Windows Authentication](#). If you are at version 9.1.000000 and below, you need to first upgrade to 9.1.000001 before you can upgrade to 10.0.000000 and above.

**Important:** Upgrading to Secret Server version 8.9.000000 and above requires Windows Server 2008 R2 or later.

**Important:** Upgrading to Secret Server version 8.5.000000 and above, there are changes in the .NET Framework version you will need to be aware of along with some additional steps in the upgrade process. For more information, see [Secret Server Moving to .NET Framework 4.5.1](#).

### Before Beginning

1. Ensure that you have account credentials information and access for the server hosting Secret Server *and* the SQL Server instance hosting your Secret Server database.
2. Have a recent backup of the application files and database available.
3. If you use clustering, stop the application pools on all of the servers.

### Upgrading a Clustered Environment

1. Follow the instructions in [Upgrading Secret Server](#) or [Upgrading Secret Server Without Outbound Access](#) as applicable to upgrade one server.
2. Once upgraded and working, copy the Web application folder (without the `database.config` or the `encryption.config` files) to all secondary servers, and replace the content of the existing Web application folder with the new.
3. If Delinea Management Server (TMS) is installed and clustered, you need to copy the TMS directory to the secondary servers as well. The TMS directory is included by default for new installs of Secret Server 10.2 and above. TMS is used by advanced session recording and Privilege Manager. If the TMS folder and site does not exist in IIS, then no additional actions are needed beyond copying the Secret Server directory.
4. Start secondary servers and confirm they still work.

## EFS and DPAPI Encryption

When upgrading, after the initial cluster configuration, you do not need to copy the `database.config` or `encryption.config` files to the other servers. If you need to copy those files because the database configuration changed and are using DPAPI, disable DPAPI encryption in Secret Server by going to **Admin > Configuration** and click **Decrypt Key to not use DPAPI** on the **Security** tab before copying those files to secondary servers.

**Note:** EFS encryption is tied to the user account running the Secret Server application pool, so it is not machine specific. Copying EFS encrypted files between Secret Server instances will not result in errors, but is not needed.

## Upgrading Database Mirroring

1. If there is more than one Web server running Secret Server, ensure all instances are pointing to the same database.
2. Stop all but one of the web servers.
3. Perform the upgrade on that single instance.
4. Once upgraded and working, copy the Web application folder to all secondary servers.
5. Start the secondary servers, and confirm they work.
6. Ensure all instances are properly activated.
7. Ensure that the database changes have been replicated to the mirror database.
8. If the secondary Web server was pointing originally to the secondary database, adjust it to point back to the secondary database.

## Upgrading Remote DR Instances

1. Perform the upgrade on one instance.
2. Backup that instance.
3. Copy the database backup to the remote DR instance.
4. Restore the database.
5. Once the instance is upgraded and working, copy the Web application folder (but not the `database.config` or `encryption.config` files) to the remote DR instance (overwriting the existing files).
6. Restart IIS or recycle the application pool running Secret Server on the remote DR instance.
7. Confirm that the remote DR instance is working correctly.

## Error Conditions

Error that may arise:

- Version does not match: If a node is not properly updated from the source node after an upgrade, that node will not run because the application version does not match the database. The solution is to copy the application folder (minus the `database.config` or `encryption.config` files) to replace the files on the secondary server.

## Upgrading Secret Server Without Outbound Access

**Important:** Upgrading to Secret Server version 8.9.000000 and above will require **Windows Server 2008 R2 or greater**.

**Important:** Upgrading to Secret Server version 8.5.000000 and above, there are changes in the .NET Framework version you will need to be aware of along with some additional steps in the upgrade process. For more information, see [Secret Server and Secret Server Cloud .NET Framework 4.8 Mandatory Upgrade](#).

**Important:** Upgrading to Secret Server version 10.0.000000 and above will require configuring integrated pipeline mode on the Secret Server Application Pool. Please see [this KB](#) for details on configuring integrated pipeline mode in IIS. If using Integrated Windows Authentication you will also need to update IIS authentication settings as detailed in [this KB](#). If you are at version 9.1.000000 and below, you will need to first upgrade to 9.1.000001 before you can upgrade to 10.0.000000 and above.

### How Upgrades Work

Secret Server periodically polls our update server to detect updates. If your Secret Server is on an internal network that has no outbound access or goes through a proxy, Secret Server will not be able to perform updates automatically, therefore, outbound access to the below connections on your firewall is needed if you want to perform updates automatically:

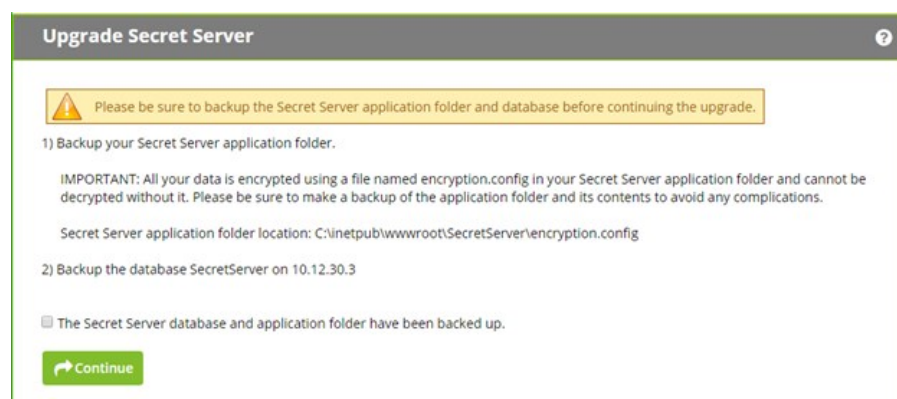
- d36zgw9sidnotm.cloudfront.net:443
- updates.thycotic.net:443
- updates.thycotic.net:80

The steps below can be used to perform an upgrade for versions 7.1.000015 and higher. If you have an older version of Secret Server, please contact Delinea technical support for assistance.

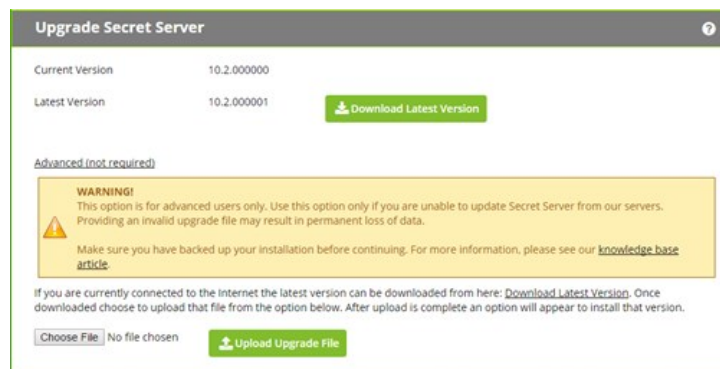
### Procedure

#### Step 1: Open the Upgrade Secret Server Wizard

1. From a computer that does have outbound network access and Secret Server access, go to the Secret Server Upgrade page by browsing to: `http://<yourinstance>/Installer.aspx?patch=true` (filling in your Secret Server URL for <yourinstance>). The wizard appears:



2. Backup your Secret Server application folder and your Secret Server database.
3. Click to select the **The Secret Server database...** check box on the page.
4. Click the **Continue** button. The next page appears:



## Step 2: Get and Upload the Latest .zip File

1. Download the latest version .zip file by clicking the **Download Latest Version** button on the installer page. The file name will appear something like Version\_10\_2\_000000.zip. Note where you save it.

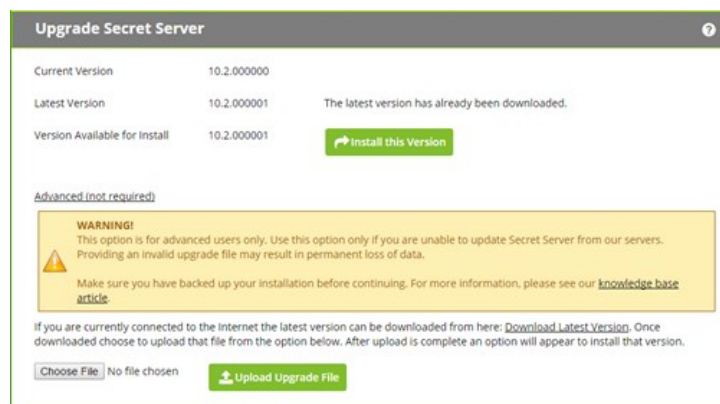
**Note:** You also can find the downloadable update files [below](#).

2. Click the **Choose File** button to select the Secret Server .zip file you just downloaded.

**Note:** To verify the file hashes for the latest version using the posted hash values, refer to [Secret Server Download Hashes](#).

**Note:** You should **not** use the fresh install SecretServer.zip or setup.exe that is first downloaded from [Delinea.com](#). Only use the Get Latest Version link—there is a difference between the upgrade file and fresh install zip.

3. Click the **Upload Upgrade File** button. You see a message confirming the file was successfully uploaded, and the Install This Version button appears.



4. Click the **Install this Version** button. The Upgrade Secret Server page appears (not shown).

## Step 3: Upgrade Secret Server

1. Click the **Upgrade** button. The upgrade automatically processes and once it has finished you will see a confirmation page.
2. Click **Return to Home** to return to the dashboard.

## Offline Installation Download Files

If you do not have access to another installation of Secret Server or you are upgrading from an earlier version, click one of the following links,

depending on your *current* installed version:

- [8.4.000003 or earlier](#)
- [8.4.000004 to 9.1.000000](#)
- [9.1.000001 to 10.9.000003](#)
- [10.9.000005 or later](#)

## Upgrading to 10.9.000005/33

This upgrade of Secret Server is a two-step process where you first upgrade to version 10.9000005 and then to 10.9.000033. The reasoning behind this is to provide a safeguard that warns you if the new .NET system requirement is not met *prior* to the installation making irreversible changes, potentially resulting in a non-functioning Secret Server installation. The second step to 10.9.000033 depends on the .NET update in the first step and deploys the new features for this release.

**Important:** Customers upgrading to 10.6.000000 or later and are using RabbitMQ, please see [Clearing RabbitMQ Message Queues](#).

**Important:** Upgrading to Secret Server version 10.0.000000 and above requires configuring integrated pipeline mode on the Secret Server Application Pool. Please see [Manual IIS Installation](#) for details on configuring integrated pipeline mode in IIS. If using Integrated Windows Authentication you will also need to update IIS authentication settings as detailed in [Configuring Integrated Windows Authentication](#). If you are at version 9.1.000000 and below, you will need to first upgrade to 9.1.000001 before you can upgrade to 10.0.000000 and above.

**Important:** If you have Privilege Manager installed, the Secret Server upgrade process will begin an upgrade for Privilege Manager as well.

**Important:** The **existing MS SQL database must be version 2012 or later for this upgrade**. Otherwise, if the upgrade fails and you attempt to roll it back, the previous installation will not work.

## How Upgrades Work

Secret Server periodically polls the update server to detect new updates. If the "Allow Automatic Checks for Software Updates" option is enabled in the Admin > Configuration menu, you will see the "An update is available (xx.x.xxxxx)" link after logging in with an administrator account. The steps below can be used to perform an upgrade for versions 7.1.000015 and higher. If you have an older version of Secret Server, please contact Delinea technical support for assistance.

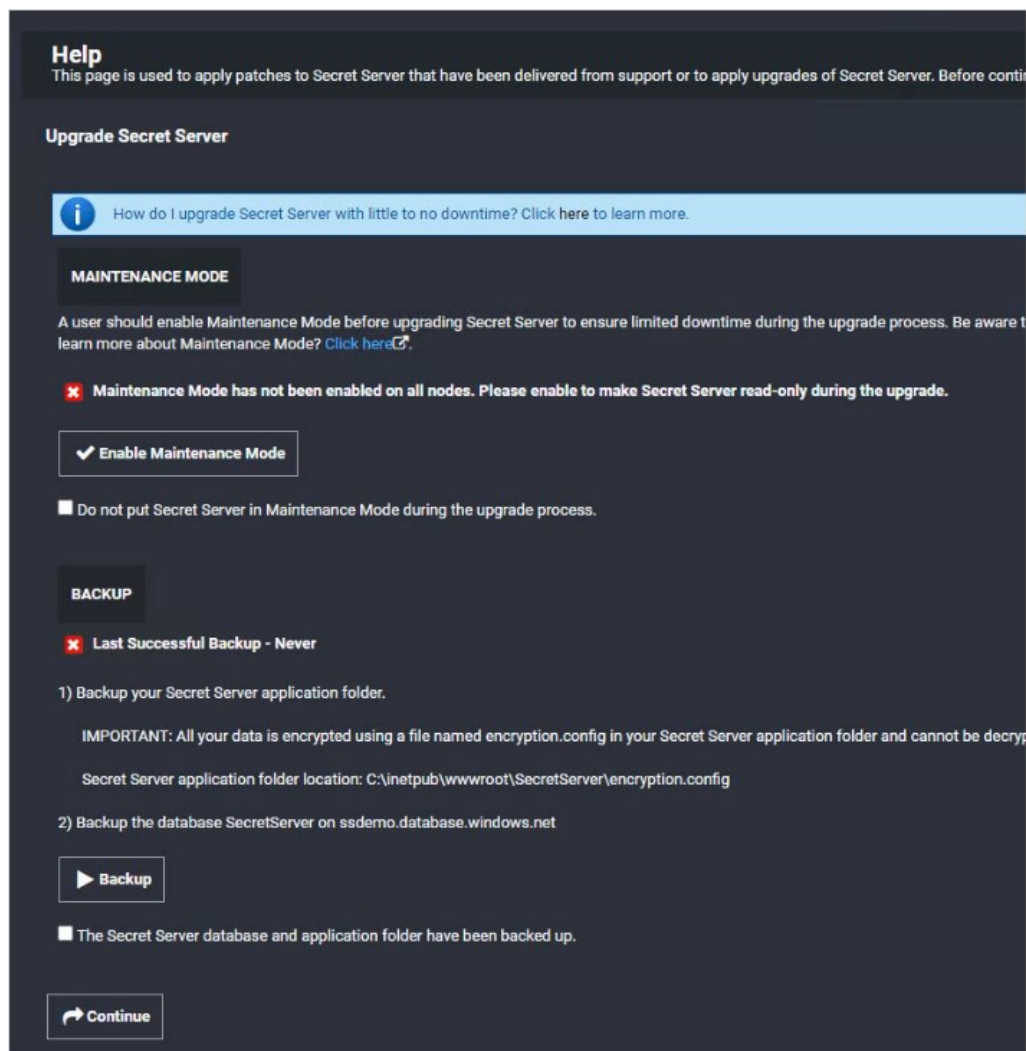
## Before You Begin

1. Ensure you will have access to account credentials for the server hosting Secret Server AND the SQL Server instance hosting your Secret Server database.
2. Ensure you have a recent backup of the application files and database available.
3. If you use clustering, stop the application pools on all of the servers except the one being upgraded.
4. Conduct the [Secret Server and SSC .NET Framework 4.8 Upgrade](#).

## How to Upgrade

1. From a computer that has outbound network access, click on the upgrade link to go to: `http://<yourinstance>/SecretServer/Setup/Upgrade`. The Secret Server Setup Home page appears:

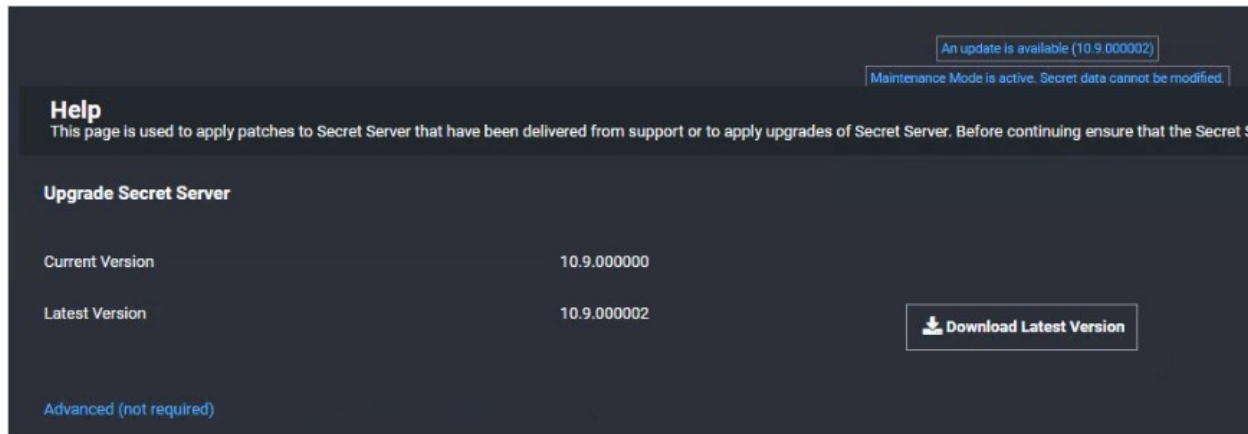
**Note:** If your computer does not have outbound network access, please see [Upgrading Secret Server Without Outbound Access](#).



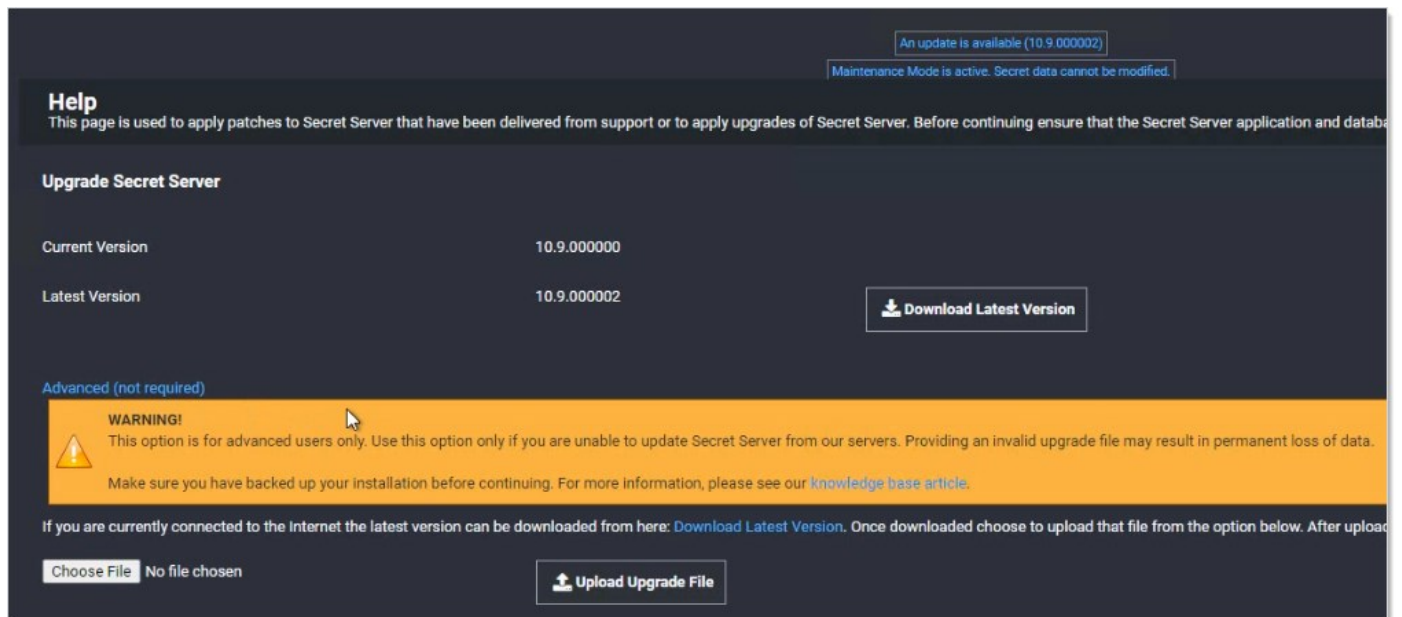
2. Download the two zip files (Version\_10\_9\_000005.zip and Version\_10\_9\_000033.zip), which contain the installs, using the link at the top of the page.
3. Click the **Enable Maintenance Mode** button to enter maintenance mode.
4. Backup your Secret Server application folder.
 

**Important:** All your data is encrypted the encryption.config file in your Secret Server application folder. **Your data cannot be decrypted without it.** Thus, it is critical that you make a backup of the application folder and its contents before proceeding.
5. Backup the database named SecretServer at the IP address listed.
6. When finished backing up both, click to select the **The Secret Server database and application folder have been backed up** check box.
7. Click the **Continue** button. The download page appears:

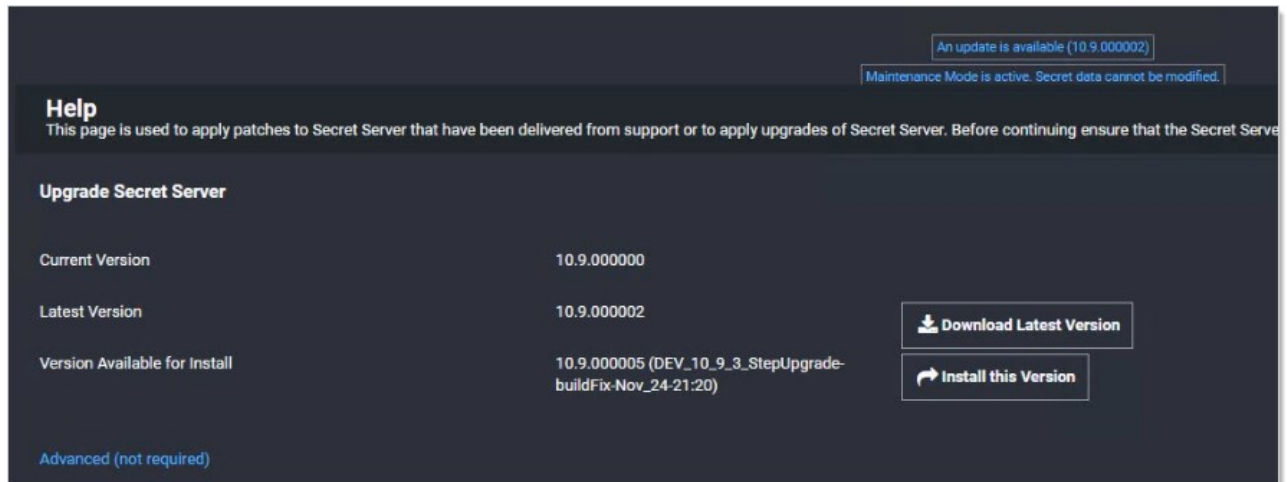




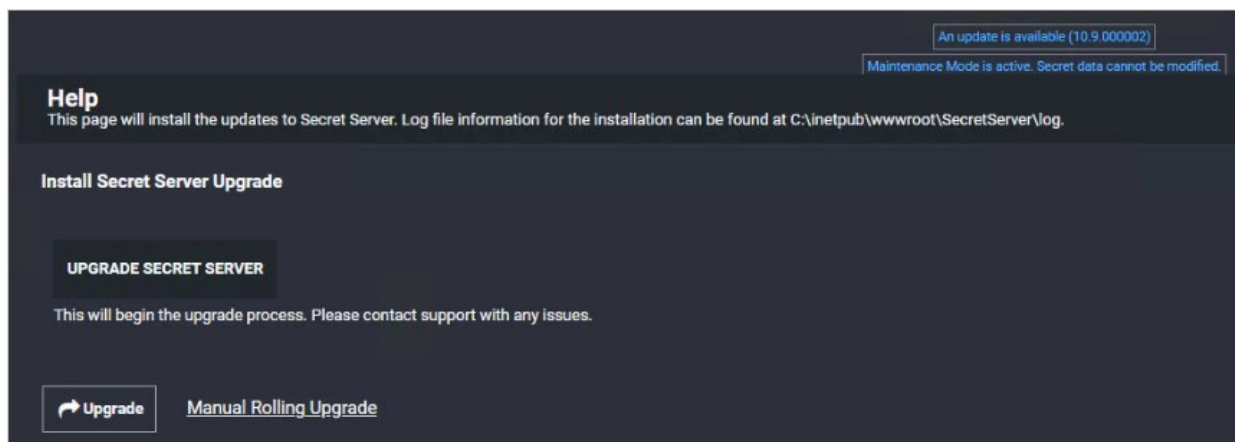
- Click the **Advanced (not required)** link. The section appears:



- Click the **Choose File** button and locate the Version\_10\_9\_000005.zip file you downloaded.
- Click the **Upload Upgrade** button. The file uploads, which can take several minutes. When the upload is complete the 10.9.000005 version appears:



- Click the **Install this Version** button. The Install Secret Server Upgrade page appears:



- Click the **Upgrade** button. An upgrade installation status page appears (not shown), and the upgrade begins. This will take several minutes. When done, an "Installation Complete" message appears.
- Click the **Show Details** link to view the entire upgrade process:

An update is available (10.9.000002)
Maintenance Mode is active. Secret data cannot be modified.

## Help

This page will report the progress of the Secret Server Upgrade process. During this process Secret Server may restart and this page may become unresponsive. This web

More detailed logging information can be found at C:\inetpub\wwwroot\SecretServer\log\ss.log.

### Secret Server Upgrade Installation Status

Process Started 11/25/2020 5:04 PM

✓ Setup	Show Details
✓ Remove Unchanged Files	Show Details
✓ Verify SQL Deltas	Show Details
✓ Upgrade Database	Show Details
✓ Update Script Resources	Show Details
✓ Update Web Resources	Show Details
✓ Create New Web Resources	Show Details
✓ Upgrade Themes	Show Details
✓ Update Application Files	Show Details
✓ Update Config Files	Show Details
✓ Clean Up	Show Details
✓ Turn Off Maintenance Mode	Show Details
✓ Upgrade Success	

Process Completed 11/25/2020 5:06 PM

Return to Home

- Click the **Return to Home** button. You return to the previous page. The first installation of the two is complete. The new installation of Secret Server starts, which may take a bit of time. Secret Server opens to the All Secrets page:

All Secrets					
28 Items    Active ▾    All Templates ▾    🔍					
NAME	↑	SECRET TEMPLATE	FOLDER	HEARTBEAT	OUT OF SYNC
AWS discovery		Amazon IAM Key	Personal Folders/SSAdmin/AWS Demo	Success	No
Azure		Web Password Extended	Personal Folders/SSAdmin/WPF demo		No
BBC login		Web Password Extended	Personal Folders/SSAdmin/WPF demo		No
Citi Test 1000		Web Password 1000 URL	URL testing		No
Citi Test 1000 with URLs		Web Password 1000 URL	URL testing		No
GCP Account Manager		Google IAM Service Account ...	Personal Folders/SSAdmin/GCP Demo	Success	No
GCP discovery		Google IAM Service Account ...	Personal Folders/SSAdmin/GCP Demo	Success	No
Launchers		Launcher demo	Personal Folders/SSAdmin/Launchers		No

15. If you intend to use Web clustering, proceed to [Upgrading Secret Server with Web Clustering](#).
16. Repeat the install procedure using the Version\_10\_9\_000033.zip file you downloaded.
17. Once again, if you intend to use Web clustering, proceed to [Upgrading Secret Server with Web Clustering](#).

## System Requirements

Please review the detailed [System and Memory Requirements for Secret Server](#). The *Minimum Requirements* are for trial, sandbox, and POC environments. The *Recommended Requirements* are for production deployments.

## Hardware Requirements

Secret Server can be installed on a physical server or virtual machine.

If you would like to set up front-end (application) clustering, you need to have two or more servers available.

For testing of high availability for the SQL Server, you can use either existing Microsoft AlwaysOn infrastructure or database mirroring. If you choose to test this, this is something your database team needs to prepare in advance.

## Software Requirements

### Checklist

- Windows Server 2012 or newer (recommended) (one server, minimum)
- SQL Server (one instance, minimum)
- Application server prerequisites
- SSL certificate

### SQL Server

You can create the SQL database in an existing SQL instance, or a new installation of SQL Server. For high availability, this needs to be a paid edition of SQL Server (not SQL Express). If you are using a new installation of SQL Server, please have this installed beforehand.

Detailed instructions for installation and configuration of SQL Server are included in one of the installation guides below (choose the guide matching the OS that SQL server will be installed on).

### Application Server

We recommend installing Secret Server on Windows Server 2012 or greater. Include IIS, ASP.NET and .NET Framework. Refer to the System Requirements KB above to view prerequisite details.

## Secret Server Major Browser Support Secret Server

Secret Server can accommodate most major browsers available today. This article covers each major browser and version supported by Secret Server, as well as support for the copy-to-clipboard feature.

For the best security, always keep your browser updated to the latest version.

Chrome	v25.0 and later	v25.0 and later; requires extension (all platforms)
Edge	v20.10240 and later	Not supported
Firefox	v57.0 and later	v57.0 and later; requires add-on (all platforms)
Internet Explorer	Not supported	Not supported
Safari	Not supported	v5.0 - v11; requires add-on for MacOS X Snow Leopard and later. Safari for Windows does not support copy-to-clipboard.
Opera	Not supported	Not supported

### Using Chrome to Access Secret Server

The Chrome extension prompts users for "tabs" permissions, which Chrome uses to detect your browsing history, including what tabs you open and the URLs they open to. Secret Server uses the tabs permission function only to clear passwords on exit. No history is recorded.

Following these instructions ensures there is absolutely no residue or trace of Secret Server on the server.

Uninstalling Secret Server is a quick, three-step process:

1. Delete the database.
2. Delete the virtual directory.
3. Delete Secret Server files.

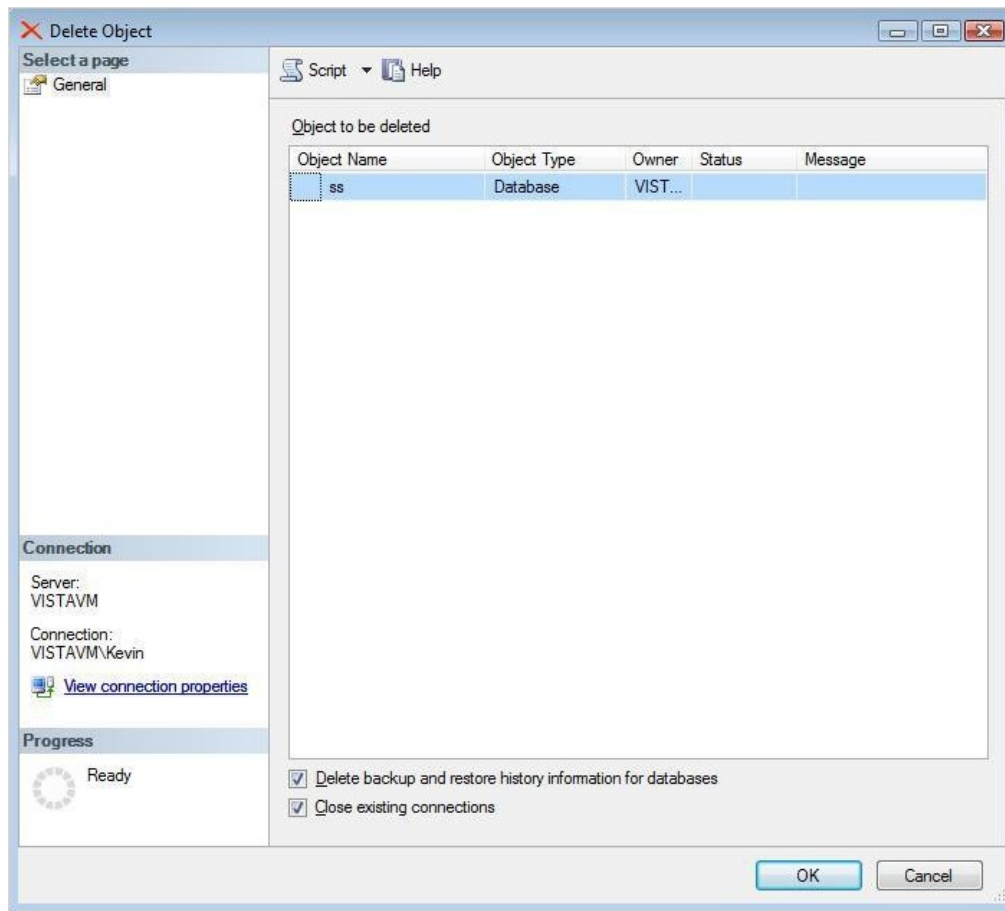
## Task 1: Deleting the Database

Dropping the database deletes all of your data.

**Warning:** You cannot undo this procedure once you are done. We strongly suggest backing up the installation first in case you need to restore it.

Procedure:

1. Open the Microsoft Management Studio.
2. Connect to the database.
3. Locate your Secret Server database in the object explorer, which is normally in the **Databases** folder. If necessary press F8 to show the object explorer.
4. Right click the database and select **Delete**. The Delete Object dialog appears:



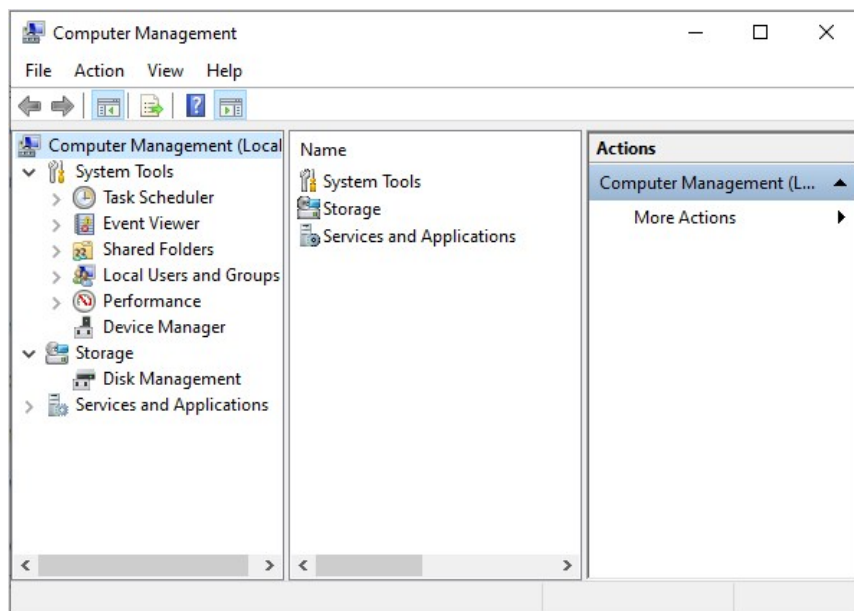
5. Ensure the **Drop Existing Connections** check box is selected. This disconnects all connections to the Secret Server database.
6. Ensure the **Delete backup and restore history information for databases** check box is selected.
7. Click the **OK** button. The database is permanently deleted.

## Task 2: Deleting the Virtual Directory

If you installed Secret Server as a virtual directory, the virtual directory must be deleted first. If Secret Server is not configured as a virtual directory, skip this task.

1. In the search text box in your **Start Menu**, type Computer Management.
2. Click the **Computer Management** result. The Computer Management Console appears:





3. Click to expand the **Services and Applications** node.
4. Click the **Internet Information Services (IIS) Manager** node.
5. Click to expand the **Web Sites** subfolder.
6. Click to expand the Secret Server Web site.
7. Right click the virtual directory and select **Delete** or **Remove**. The directory is deleted.
8. (Optional) Delete ASP.NET's cached version of Secret Server:
  1. Open the directory C:\Windows\Microsoft.NET\Framework\<version number>\Temporary ASP.NET Files, substituting your ASP.NET version number.
  2. Delete the subfolder with the same name as your virtual directory.

**Note:** These files are not a security risk, but removing them eliminates any evidence that Secret Server was installed.

### Task 3: Deleting Secret Server Files

**Warning:** The encryption.config file is crucial to restoring any backup. Ensure this file is backed up if you may want to restore Secret Server.

1. Locate the directory where Secret Server is was installed.
2. Click to select it.
3. Press **<Shift> + <Delete>** to **permanently** delete the files. Holding shift bypasses the recycle bin. Secret Server is now permanently removed from the system.

**Note:** Even "permanently" deleted files can sometimes be recovered with special tools. If that is a concern, we suggest using a file shredding application to delete the folder.

## Decommissioning a Secret Server Node

To remove a Secret Server node from the list of active nodes, for example after you migrate an instance of Secret Server to another server, use the procedure below to decommission the node.


1. Click **Admin > Licenses**.
2. Click **View Server Activation (Advanced)** to open a list of Secret Servers designated as activated.

Licenses

You are currently licensed for 100 user(s). You currently have 17 enabled user(s).

Save To File < 1 to 5 of 5 >

LICENSE NAME	LICENSE KEY	DESCRIPTION
FOR DEVELOPMENT PURPOSES ONLY		Secret Server (100 users)



Support licenses allow you to get free upgrades for new releases of Secret Server. You must purchase support for as many users as you are licensed.

View Server Activation (Advanced)

< 1 to 1 of 1 >

MACHINE NAME (ID)	JOINED	STATUS
	5/15 09:39 AM	Activated <a href="#">Decommission</a>

Back

+ Install New License

View Audit

3. In the row of the server you wish to decommission, click **Decommission**.

## Ticketing System Integration

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server can allow users to enter a ticket number when viewing a secret. This number can be validated through a regular expression, and can also be marked as required, if needed. Secret Server can integrate with third party ticket systems. See below for more information.

You can add multiple ticket systems from the **Ticket System** tab. To add a new system, click **New Ticket System**.

You can make a select ticket system be Secret Server's default ticketing system by clicking on the link of the desired system, then clicking **Set as Default**.

### Overview

Secret Server can require users to enter a ticket number when viewing a secret. Admins can track access to secrets based on an external ticket system. On the **Ticket System** tab of the **Configuration** page, an administrator can enter the settings to match the ticket system.

After the ticket system is enabled in Secret Server, a user can enter a ticket number on the Comment screen or the Request Access screen.

The secret needs to have Require Comment or Requires Approval for Access enabled to allow the user to enter a ticket number. When a ticket number is required, this secret setting is displayed as "Require Comment/Ticket Number" on the Security tab.

### Configurable Settings

- **Auditing:** The ticket number appears in the audit log and can be queried in reports. If the **View Ticket URL** has been set, the log shows the ticket number as a hyperlink linking to the external ticket system. See the next bullet for more.
- **View Ticket URL Template:** The format of the URL to be used for viewing the ticket. This is placed in the audit log so you can easily view the corresponding ticket from Secret Server. The Ticket URL Format field can be edited on the "Ticketing System Integration" tab of the configuration page. In this field, the \$TICKETID parameter will be replaced by the ticket number that is entered by the user. For example, if you specify the template as `http://myticketingsystem/ticket.aspx?ticketid=$TICKETID`, and a user enters 5125-242 as the ticket number, a link will appear in the audit log to `http://myticketingsystem/ticket.aspx?ticketid=5125-242`.
- **Ticket Number and Reason Options:** This option allows fine-grained control of what the user must enter when Require Comment is enabled and ticket system integration is turned on.
  - **Reason Only Required:** Ticket number is optional, reason is required.
  - **Both Required:** Ticket number and reason are required.
  - **Ticket Number or Reason Required:** Either ticket number or reason must be entered.
  - **Ticket Number Only Required:** Ticket number is required, reason is optional.
- **Ticket Number Format Pattern (Regex):** A regular expression to use for validating the ticket number entered. This can help prevent typos in the number. For details on creating this expression, see the [Setting a Ticket Pattern Regex](#).
- **Ticket Number Label:** The text that displays next to the Ticket Number box on the Comment or Request Access page.

- **Ticket Number Validation Error Message:** The error message to display to the user when their entered ticket number fails the validation pattern regex.

## Setting a Ticket Pattern Regex

If you are using ticketing system integration, you can set a ticket pattern on the Ticket System Integration tab of the Configuration page. If you do not want to restrict what ticket numbers a user can enter, you can leave the Ticket Number Validation Pattern (Regex) text box empty. If you do want to restrict it, you can enter a regular expression in the text box. The ticket number entered must match the regular expression.

For more information on regular expressions, please refer to [Regular Expressions](#).

If you are supported and need assistance setting up a validation pattern, feel free to email [support@thycotic.com](mailto:support@thycotic.com).

Here is an example for a ticket pattern that must be a valid number: `^[0-9]+$`

Secret Server can integrate into third-party ticket systems as well. Those supported are listed below. You can add multiple ticket systems to Secret Server by clicking New Ticket System. You can make a specific ticket system the default system used by Secret Server by clicking the System link and then clicking the Set as Default button.

The third-party integrations:

- [Atlassian JIRA](#)
- [BMC Remedy](#)
- [ManageEngine](#)
- [PowerShell](#)
- [ServiceNow](#)

Secret Server can integrate with Atlassian JIRA via PowerShell. This integration includes validating ticket numbers and their status, and adding comments.

For more information about integrating ticket systems with PowerShell, see [PowerShell Ticketing Integration](#).

## Requirements

- PowerShell, see [Creating and Using PowerShell Scripts](#).
- [Configuring CredSSP for WinRM with PowerShell](#).

**Note:** Atlassian has deprecated TLS 1.0 and 1.1, and will support only TLS 1.2 and 1.3 going forward. See [Deprecating TLSv1 and TLSv1.1 for Atlassian Cloud Products](#).

## Ticket Number Validation Pattern (Regex)

Before making a call to the ticket validation script, you can have Secret Server validate that the number matches a pattern. For example, you will probably have multiple JIRA projects and will want your users to specify these correctly. One regex would be to simply allow any project name followed by a dash and numbers:

```
^w{3}-d+$
```

Or perhaps you want to specifically match projects that you know are real followed by a dash and numbers:

```
^((PRO1)|(PRO2))-d+$
```

For more information, see **Setting a Ticket Pattern Regex** on the [Ticketing System Integration](#) page.

## Validating Ticket Status

You need to create a PowerShell script to retrieve and validate tickets. This integration assumes that the user will pass in the full ticket name, including the project name. For example: (PROJ-123). This could easily be extended so that multiple JIRA instances could be made for each project. In that case, you could have the user provide only the ticket number and pass in an argument to the script that specifies the project. This implementation also assumes that any ticket not in "Closed" status is invalid.

```
$ticket = $args[0]
$user = $args[1]
$password = $args[2]
$url = $args[3]
$closedStatus = "Closed"
$fields = "status"

$p = $password | ConvertTo-SecureString -AsPlainText -Force

$credentials = New-Object System.Management.Automation.PsCredential($user,$p)
$getStatusMethod = "$url/rest/api/latest/issue/$ticket"

function ConvertTo-UnsecureString([System.Security.SecureString][parameter(mandatory=$true)]$SecurePassword)
{
    $unmanagedString = [System.IntPtr]::Zero;
    try
    {
        $unmanagedString = [Runtime.InteropServices.Marshal]::SecureStringToGlobalAllocUnicode($SecurePassword)
        return [Runtime.InteropServices.Marshal]::PtrToStringUni($unmanagedString)
    }
    finally
    {
        [Runtime.InteropServices.Marshal]::ZeroFreeGlobalAllocUnicode($unmanagedString)
    }
}
```

```
function ConvertTo-Base64($string)
{
    $bytes = [System.Text.Encoding]::UTF8.GetBytes($string);
    $encoded = [System.Convert]::ToBase64String($bytes);
    return $encoded;
}

function ConvertFrom-Base64($string)
{
    $bytes = [System.Convert]::FromBase64String($string);
    $decoded = [System.Text.Encoding]::UTF8.GetString($bytes);
    return $decoded;
}

function Get-HttpBasicHeader($Credentials, $Headers = @{})
{
    $b64 = ConvertTo-Base64 "$($Credentials.UserName):$(ConvertTo-UnsecureString $Credentials.Password)"
    $Headers["Authorization"] = "Basic $b64"
    return $Headers
}

try
{
    $headers = Get-HttpBasicHeader $credentials
    $response = Invoke-RestMethod -Method Get -uri $getStatusMethod -Headers $headers -ContentType 'application/json'

    if($response.fields.status.name -eq $closedStatus)
    {
        throw "JIRA ticket ($ticket) is closed."
    }
}
catch
{
    $exception = $_.Exception
    if ($exception.Response.StatusCode.value__ -eq 404)
    {
        throw "JIRA ticket ($ticket) does not exist."
    }
}
}
```

## Adding Comments to Tickets

To add comments to tickets, you will need to create the script below.

```
$ticket = $args[0]
$comment = $args[1]
$user = $args[2]
$password = $args[3]
$url = $args[4]

$P = $password | ConvertTo-SecureString -AsPlainText -Force
$credentials = New-Object System.Management.Automation.PSCredential($user,$P)

function ConvertTo-UnsecureString([System.Security.SecureString][parameter(mandatory=$true)]$SecurePassword)
{
    $unmanagedString = [System.IntPtr]::Zero;
    try
    {
        $unmanagedString = [Runtime.InteropServices.Marshal]::SecureStringToGlobalAllocUnicode($SecurePassword)
        return [Runtime.InteropServices.Marshal]::PtrToStringUni($unmanagedString)
    }
    finally
    {
        [Runtime.InteropServices.Marshal]::ZeroFreeGlobalAllocUnicode($unmanagedString)
    }
}

function ConvertTo-Base64($string)
{
    $bytes = [System.Text.Encoding]::UTF8.GetBytes($string);
    $encoded = [System.Convert]::ToBase64String($bytes);
    return $encoded;
}
```

```
function ConvertFrom-Base64($string)
{
    $bytes = [System.Convert]::FromBase64String($string);
    $decoded = [System.Text.Encoding]::UTF8.GetString($bytes);
    return $decoded;
}

function Get-HttpBasicHeader($Credentials, $Headers = @{})
{
    $b64 = ConvertTo-Base64 "$($Credentials.UserName):$(ConvertTo-UnsecureString $Credentials.Password)"
    $Headers["Authorization"] = "Basic $b64"
    return $Headers
}

try
{
    $updateObject = @{'body'=$comment}
    $body = $updateObject | ConvertTo-Json
    $addComment = "$url/rest/api/latest/issue/$ticket/comment"
    $headers = Get-HttpBasicHeader $credentials
    $response = Invoke-RestMethod -uri $addComment -Headers $headers -Method Post -ContentType "application/json" -Body $body

    if ($response.body -ne $comment)
    {
        throw "There was an issue adding a comment to the ticket ($ticket)."
    }
}
catch
{
    $exception = $_.Exception
    if ($exception.Response.StatusCode.value__ -eq 404)
    {
        throw "The ticket ($ticket) does not exist.";
    }
    if ($exception.Response.StatusCode.value__ -eq 400)
    {
        throw "There was an issue adding a comment to the ticket ($ticket)."
    }

    throw "There was an unhandled issue with adding a comment: " + $exception.ToString()
}
```

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Overview

Secret Server can integrate with BMC Remedy's Incident and Change Management. This integration includes validating ticket numbers, their status, and adding work detail items to the request.

The integration with BMC Remedy leverages the out-of-the-box, SOAP-based Web services that are installed with the ITSM product installation. These services must be installed on your mid-tier BMC Remedy server to allow for this integration if they are not already installed and configured.

## Requirements

- BMC Remedy SOAP Web Services enabled
- A username and password that has access to execute the Web services. This can be set up in the developer studio by accessing the application in the navigator and viewing Permissions for the CHG\_ChangeInterface\_WS or HPD\_IncidentInterface\_WS. This user should also have access to query requests and add work items to requests for the appropriate module.
- Secret Server environment needs to be able to connect to the BMC Remedy Web services via port 80 or 443. SSL is highly recommended because the SOAP messages contain a username and password.

## Configurable Settings

### Validating Ticket Status

When a BMC Remedy request number is entered into Secret Server, the status of that request is retrieved to ensure that it is an open state. For example, if an incident number is entered that is in the "Closed" state, the user is informed that the ticket is closed.

Incident Management: Service Incident request cannot be closed or canceled. Change Management: Change management requests cannot be complete, closed, or canceled.

### View Ticket URL Template

The format of the URL to be used for viewing the ticket. This is placed in the audit log so you can easily view the corresponding ticket from Secret Server. Depending on your version of BMC Remedy, the URL to link directly to a request may be slightly different.

Incident management:

`https://<midtier_server>/arsys/forms/<servername>/SHR%3ALandingConsole/Default+AdmSearchTicketWithQual&F304255610='Incident Number'%3D%22$TICKETID%22`

Change management:

`https://<midtier_server>/arsys/forms/<servername>/SHR%3ALandingConsole/Default+AdmSearchTicketWithQual&F304255610='Change Number'%3D%22$TICKETID%22`

### Ticket Number Format Pattern (Regex)

Before even making a call to the BMC Remedy Web service, you can have Secret Server validate that the number matches a pattern. For example, your incident numbers might all be prefixed with "INC" and you want to ensure users enter the prefix. Some sample expressions to validate the ticket number are listed below:

Incident management: `^INC_CAL_[d]{7}$`

Change management: `^CRQ_CAL_[d]{7}$`



## Ticket Number Validation Error Message

The error message to display to the user when their entered ticket number fails the validation pattern regex.

## Service Endpoint URL

This is the URL for the SOAP-based Web services. Below are some samples for what is expected. You can find the actual endpoint using BMC Remedy Developer Studio and accessing the correct application from the AR System Navigator and viewing the Web services section of the application.

Incident management: HPD\_IncidentInterface\_WS

Change management: CHG\_ChangeInterface\_WS

## System Credentials

Select or create a secret that contains the username and password for a user that has access to execute the SOAP Web services. The username and password are added to the authentication header for the SOAP request.

## Authentication

If your installation of BMC Remedy uses an authentication server, enter it in this text-entry field. Most installations allow this text-entry field to be blank.

## Add Comments to Ticket

Check this box if you want the comment that a user enters to be added to the request in BMC Remedy. This adds information such as the secret for which access is requested, who requested access, and the requester's comments.

## Comment Work Type

When a comment is added to a request as a work item, the Work Item type is required. "General Information" is selected by default, but all default Work Type options are supported.

## Testing Your Integration Setup

After configuring the ticket system (see configurable settings below), use the **Test Validation** button to verify that Secret Server can successfully access BMC Remedy. This button opens a dialog in which you can enter a ticket number from BMC Remedy. This validation process returns success or an error code. BMC Remedy may not return much detail in the error message so you need to look at the BMC Remedy API log to see a detailed error message, see the next section.

## BMC Remedy Error Messages

When Secret Server calls the BMC Remedy SOAP-based web services, there are times that BMC will only return a 500 error without any details of the exception. You can see the details of this exception from the BMC Remedy server logs as described below:

1. Log on BMC Remedy as a user with access to the administrative console.
2. Navigate to **AR System Administration** from the main menu.
3. Navigate to **System > General > Service Information**.
4. Click the **Log Files** tab.
5. Click to enable the **API Log** check box.

6. Click the **Apply** button.
7. Once enabled, you can click **View** from this window to see the log or navigate to the mid-tier server's file system at the location specified. Details of the SOAP web service exception are written to the log file including a stack trace.

Secret Server can integrate with ManageEngine ServiceDesk Plus via PowerShell. This integration includes validating ticket numbers and their status, and adding comments (referred to as notes in ServiceDesk Plus).

For more information about integrating ticket systems with PowerShell, see [PowerShell Ticketing Integration](#).

## Requirements

- PowerShell, see [Creating and Using PowerShell Scripts](#).
- Access to the REST API for your ManageEngine ServiceDesk Plus instance.
- [Configure CredSSP for use with WinRM/PowerShell](#).

## Ticket Number Validation Pattern (Regex)

Before making a call to the ticket validation script, you can have Secret Server validate that the number matches a pattern. For more information, see **Setting a Ticket Pattern Regex** on the [Ticketing System Integration](#) page.

## Validating Ticket Status

You need to create a PowerShell script to retrieve and validate tickets. This integration assumes that the administrator will set the technician key for accessing ServiceDesk Plus in the script. This could easily be extended to pass in the key as an argument so that it can be managed from the ticket system interface.

```
$ticket = $args[0]
$user = $args[1]
$password = $args[2]
$url = $args[3]
$validStatus = "Open"
$fields = "status"
$technicianKey = "<YOUR API GUID>"

$p = $password | ConvertTo-SecureString -AsPlainText -Force

$credentials = New-Object System.Management.Automation.PsCredential($user,$p)
$getStatusMethod = "$url/sdpapi/request/$ticket"

try
{
    $postParams = @{OPERATION_NAME='GET_REQUEST';TECHNICIAN_KEY=$technicianKey}
    [xml]$response = Invoke-WebRequest -Uri $getStatusMethod -Method POST -Body $postParams -Credential $credentials

    if ($response.API.response.operation.result.status -ne "Success")
    {
        throw "Response not successful." + $response.API.response.operation.result.message
    }

    $statusNode = $response.API.response.operation.Details.ChildNodes | Where-Object { ($_.name -eq "status") }
    if($statusNode.value -ne $validStatus)
    {
        throw "Manage Engine Service Desk Plus ticket ($ticket) is not in Open status."
    }
}
catch
{
    if ($response.operation.result.message -eq "Invalid requestID in given URL")
    {
        throw "Manage Engine Service Desk Plus ticket ($ticket) does not exist."
    }
    throw "Manage Engine Service Desk Plus encountered an error: " + $response.operation.result.message
}
```

## Adding Comments (Notes) to Tickets

To add comments (notes) to tickets you will need to create the script below. Other considerations are to pass in whether or not the note should be public.

```
$ticket = $args[0]
$comment = $args[1]
$user = $args[2]
$password = $args[3]
$url = $args[4]
$technicianKey = "<YOUR API GUID>"
$isPublic = 'true'

$P = $password | ConvertTo-SecureString -AsPlainText -Force
$credentials = New-Object System.Management.Automation.PSCredential($user,$P)

#Clean comment input for use in XML
$comment = $comment.replace('&', '&amp;').replace("'", '&apos;').replace('"', '&quot;').replace('<', '&lt;').replace('>', '&gt;')

$inputData = @"
<Operation>
  <Details>
    <Notes>
      <Note>
        <isPublic>$isPublic</isPublic>
        <notesText>$comment</notesText>
      </Note>
    </Notes>
  </Details>
</Operation>
"@

$URI = "$url/sdpapi/request/$ticket/notes"
$postParams = @"{OPERATION_NAME='ADD_NOTE';TECHNICIAN_KEY=$technicianKey;INPUT_DATA=$inputData}"
$response = Invoke-WebRequest -Uri $URI -Method POST -Body $postParams
$xml]$responseContent = $response.Content

if ($responseContent.API.response.operation.result.status -ne "Success")
{
    $message = $responseContent.API.response.operation.result.message;
    throw "Unable to add comment to ticket ($ticket). Message: " + $message
}
```

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server can integrate with your ticketing system via PowerShell. This integration includes validating ticket numbers, their status, and adding comments. In our example we are connecting to a ServiceNow instance.

**Note:** See [Creating and Using PowerShell Scripts](#).

## Configurable Settings

### View Ticket URL Template

You can configure the view ticket URL if you have a web based ticketing system to allow easy access to link to your ticketing system from Secret Server.

### Ticket Number Validation Pattern (Regex)

Before making a call to the PowerShell script you can have Secret Server validate the number matches a pattern. For example, your incident numbers might all be prefixed with "INC" and you want to ensure they enter this prefix. See [Setting a Ticket Pattern Regex](#).

### Ticket Number Validation Error Message

The error message to display to the user when their entered ticket number fails the validation pattern Regex.

### The PowerShell RunAs Credentials

In Secret Sever a domain credential is required to execute the PowerShell script. This is a required field.

### System Credentials

The system credentials are specific to your ticketing system. Any secret using the Username and Password extending mapping can be used as your system credential. Additional arguments can be populated from field on this secret and reference in your script.

## Validating Ticket Status

### Overview

To validate tickets you will need to create a PowerShell script to retrieve and validate the ticket. The integration will use arguments to pass custom values to your script. By default we will map certain fields to the first set of arguments. The ticket number will be collected by user input and assigned to the first parameter. When you have your ticketing system credentials mapped to a secret and assigned to the "System Credentials" field in the ticketing system setup, Secret Server inserts Username and Password as the second and third parameters.

Therefore, for the sample script below, the Ticket Status Script Arguments text box should be only contain \$url (which is also retrieved from the System Credentials secret), as \$ticket, \$user and \$password are supplied automatically by the system.

### Sample Script

```
$ticket = $args[0]
$user = $args[1]
$password = $args[2]
$url = $args[3]
$validStatus = "2"
$fields = "state"
$sp = $password | ConvertTo-SecureString -AsPlainText -Force
```

```
$credentials = New-Object System.Management.Automation.PsCredential($user,$p)
$getStatusMethod = "$url/api/now/table/incident?sysparm_limit=10&sysparm_query=number=$ticket&sysparm_display_value=&sysparm_fields=$fields"
$response = Invoke-RestMethod $getStatusMethod -Method Get -ContentType 'application/json' -Credential $credentials
if($response.result.state -ne $validStatus)
{
    throw "Invalid State"
}
```

## Adding Comments to Tickets

To add a comment to tickets, create another script to do so. Example:

```
$ticket = $args[0]
$comment = $args[1]
$user = $args[2]
$password = $args[3]
$url = $args[4]
$p = $password | ConvertTo-SecureString -AsPlainText -Force
$credentials = New-Object System.Management.Automation.PsCredential($user,$p)
$restEndpoint = "$url/api/now/table/incident?sysparm_limit=10&sysparm_query=number=$ticket&sysparm_display_value=&sysparm_fields=sys_id"
$response = Invoke-RestMethod $restEndpoint -Method Get -ContentType 'application/json' -Credential $credentials
$id = $response.result.sys_id
$updateObject = @{'work_notes'=$comment}
$body = $updateObject | ConvertTo-Json
$addComment = "$url/api/now/table/incident/$id"
$response = Invoke-RestMethod $addComment -Method Put -ContentType 'application/json' -Credential $credentials -Body $body
```

## Adding Comments to a General Audit Log

In addition to adding comments to specific tickets, you may want general audit entries made in your ticket system. The arguments are passed in the following order.

```
$comment = $args[1]
$user = $args[2]
$password = $args[3]
```

```
## custom script here
```

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

## Introduction

Secret Server can integrate with ServiceNow's Incident and Change Management service. This integration includes validating ticket numbers, their status, and adding Work Detail items to the request. The integration with ServiceNow leverages the out-of-the-box REST-based Web services.

## Requirements

- ServiceNow instance running the Eureka version or later with REST services enabled.
- A username and password that has access to execute the REST services, specifically GET and MODIFY on the following tables: Change Request and Incident.
- The Secret Server environment needs to be able to connect to the ServiceNow Web services via port 80 or 443. SSL is highly recommended because the REST messages authenticate with a username and password.

## Configurable Settings

### View Ticket URL Template

The format of the URL to be used for viewing the ticket. This appears in the audit log so you can easily view the corresponding ticket from Secret Server.

Incident management: `https://<instance name>.service-now.com/nav_to.do?uri=incident.do?sysparm_query=number=$TICKETID`

Change management: `https://<instance name>.service-now.com/nav_to.do?uri=change_request.do?sysparm_query=number=$TICKETID`

This field specifies the URL that will be used when displaying a link to a ticket in the audit log. In this field, the \$TICKETID parameter will be replaced by the ticket number that is entered by the user.

For example, if you specify the **View Ticket URL Template** as `http://myticketingsystem/ticket.aspx?ticketid=$TICKETID`, and Bob enters 5125-242 as the ticket number, a link will appear in the audit log to `http://myticketingsystem/ticket.aspx?ticketid=5125-242`.

### Ticket Number Format Pattern (Regex)

Before even making a call to the ServiceNow Web service you can have Secret Server validate the number matches a pattern. For example, your incident numbers might all be prefixed with "INC" and you want to ensure they enter this prefix. Some sample expressions to validate the ticket number are listed below:

Incident management: `^INC[d](7)$`

Change management: `^CHG[d](7)$`

### Ticket Number Validation Error Message

The error message to display to the user when their entered ticket number fails the validation pattern regex.

### Domain Name

This is the domain name of your instance in the format `<instance name>.service-now.com`, for example `dev5859.service-now.com`.

## System Credentials

Select or create a secret that contains the username and password for a user that has access to execute the REST Web services. Secret Server uses these credentials to authenticate to ServiceNow.

## Add Comments to Ticket

Check this box if you want the comment that a user enters to be added to the request in ServiceNow. This adds information such as the Secret to which access is requested, who requested access, and their comments. The comment is added as a work note in the activity section of the request.

## Testing your Integration Setup

After configuring the ticket system, use the **Test Validation** button to verify Secret Server can successfully access ServiceNow. This button opens a dialog in which you can enter a ticket number from ServiceNow. This validation process either succeeds or shows an error code.



## Troubleshooting and Notices

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

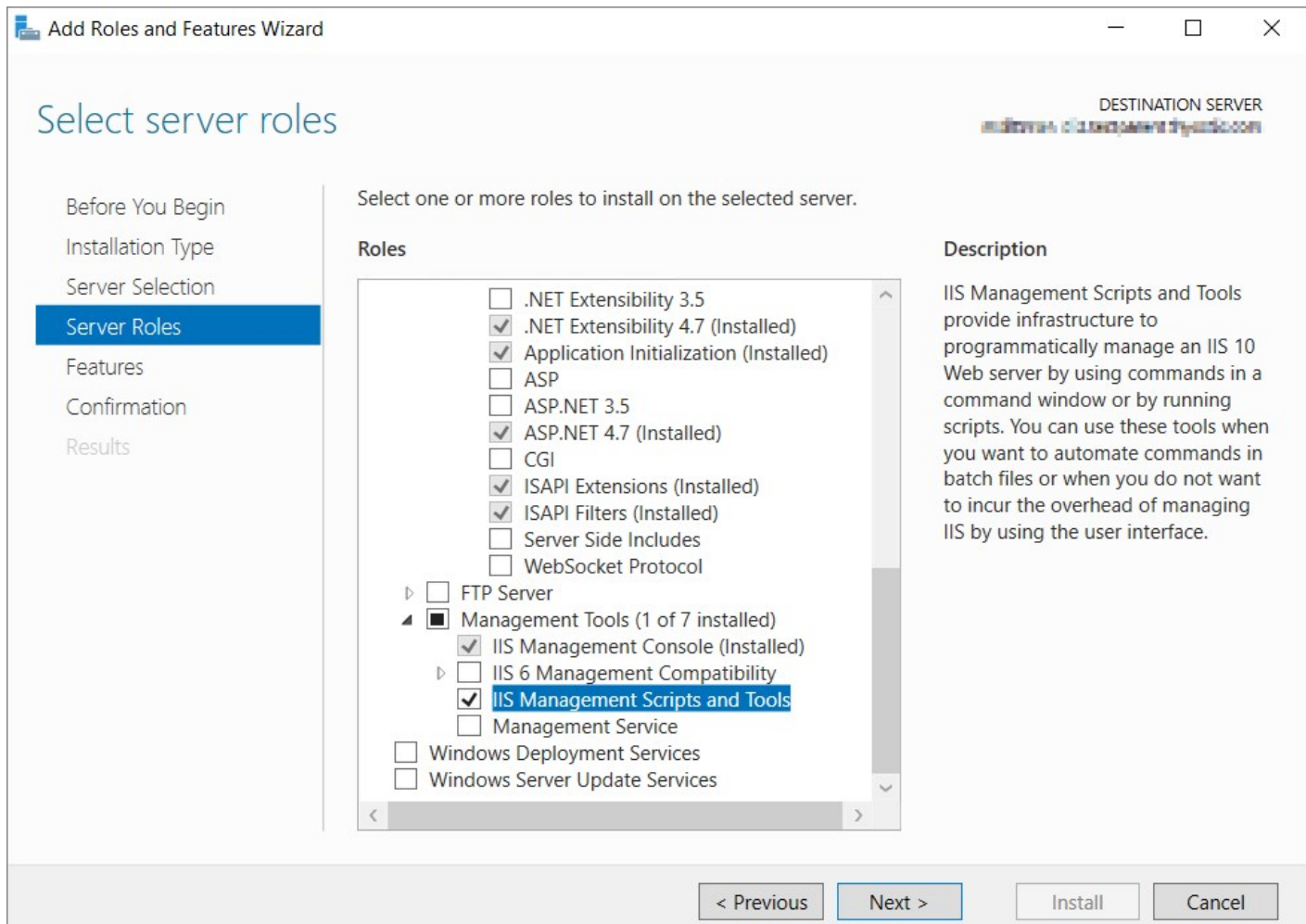
This section contains common troubleshooting issues, workarounds, and technical notices.

**Note:** This section is a work in progress. It does **not** contain a complete set of Secret Server troubleshooting and workaround articles.

You can perform discovery over distributed engines. However, application pool scanning cannot use the discovery source's identity for impersonation.

**Important:** The distributed engine service must be run as an account with sufficient privileges to scan the application pools on its own.

For discovery to work on application pool service accounts on IIS 7+, the "IIS Management Scripts and Tools" feature must be installed on the DE or Web server running the code:



Check that the following privileges are set:

- Enable the account to log on as a service.
- Grant the account read, write, and execute privileges to the entire distributed engine installation directory and sub-folders.
- Add the account to the administrators group on each computer that will be scanned.

## 80070005 Error

An 80070005 error similar to the one below indicates that the distributed engine service account does not have sufficient privileges on the

machine being scanned.

Exception: Retrieving the COM class factory for remote component with CLSID {2B72133B-3F5B-4602-8952-803546CE3344} from machine <MACHINE> failed due to the following error: 80070005

To resolve the error, add the account to the administrators group on that machine. When changing the user of the distributed engine service, Secret Server will interpret the service as a new engine. You will need to delete the old engine and activate the new engine in Secret Server, if applicable.

The typical workflow for changing the account logon for the distributed engine service is as follows:

1. Go to **Admin > Distributed Engine > Manage Sites** and deactivate distributed engine in **Site**.
2. Delete the engine by selecting the trash can icon next to the engine.
3. Go to the distributed engine server and stop the distributed engine service, or end the process from the Task Manager.
4. Change the Log On option – this must be the same account used for your discovery.
5. Start the distributed engine service.
6. In the Secret Server application, go to **Admin > Distributed Engine > Manage Sites** and select your site (or /SiteView.aspx?SiteId=X page) then refresh the page.
7. Activate distributed engine by clicking the check mark icon next to it (or from the /ManageEngines.aspx page).
8. Wait 3-5 minutes and click Validate Connection. You should see a successful connection.

Secret Server requires the application pool to have the "load user profile" setting enabled. Secret Server will report a critical alert to notify admins if this setting is not enabled.

**Note:** The site will load to give access to secrets but many internal operations will not function correctly so we recommend fixing the issue as soon as possible.

**Note:** This applies to version 10.2 and later.

Steps to enable the "load user profile" setting:

1. On each Web server that is running Secret Server, open IIS Manager.
2. Under the **Application Pool** node on the left, select **Secret Server**.
3. On the right-hand panel, select **Advanced Settings** to get to the full properties.
4. Scroll to the **Load User Profile** setting in the **Process Model** section.
5. Set **Load User Profile** to **True**.
6. Click the **OK** button.
7. Perform an iisreset on the server:
  1. Open a Windows command prompt as an administrator.
  2. Type iisreset.
  3. Press the **<Enter>** key.

## Overview

When using IIS version 7.0 and above, by default, the worker process terminates after a period of inactivity. If Secret Server is in its own application pool, the application pool will stop after a period of no requests. To make sure that the application pool associated with Secret Server does not stop when idle:

- Set the idle time-out to 0 minutes.
- Set the regular time interval to 0.
- Ensure there are no specific times scheduled for recycling.

Additionally, by default, IIS launches a worker process when the first request for the Web application is received. So if the Secret Server application takes a long time to start, we recommend launching the worker process as soon as IIS is started by setting the start mode to AlwaysRunning to launch the worker process for the Secret Server application pool as soon as IIS is started.

## Procedure

To change IIS advanced settings:

1. Open **Internet Information Server (IIS) Manager**: On the taskbar, click **Server Manager**, click **Tools**, and then click **Internet Information Services (IIS) Manager**.
2. In the **Connections** pane, expand the server name.
3. Click **Application Pools**.
4. Locate the application pool Secret Server is running as. To determine this:
  1. Expand **Sites** at the left, then find the website Secret Server is running on.
  2. Click on the Secret Server website or virtual directory (if it is running on one).
  3. Click **Basic Settings** on the right panel. This indicates Secret Server's application pool.
5. Right-click the application pool, and select **Advanced Settings**. The Advanced Settings panel appears.
6. Go to the **(General)** section.
7. Set **Start Mode** to **AlwaysRunning**.
8. Set **Maximum Worker Processes** to **1**.
9. Go to the **Process Model** section.
10. Set **Idle Time-out (minutes)** to **0**.
11. Go to the **Recycling** section.
12. Set the **Regular Time Interval (minutes)** to **0**.
13. Select **Specific Times**.
14. **Either** click the > expander arrow to see if there is time specified below. **Or** click the ... to see if there are any values in the **TimeSpan Collection Editor** dialog box. If so, clear it out.
15. Click the **OK** button. The dialog closes.

16. Click the **OK** button.

There are several ways to find the version number of your Secret Server release. The procedures in this section apply to the Professional and Platinum editions of the Secret Server on-premises application.

## Through Secret Server

You can find the version number of your Secret Server release from any Secret Server page. Just click your user icon in the top right corner, and a box opens displaying information including the full version number.

## Through Windows File Explorer

1. Log into the web server where the Secret Server application is installed.
2. Open Windows File Explorer.
3. Navigate to `C:/inetpub/wwwroot/SecretServer/bin`
4. Right-click the `Thycotic.ihawu.Business.dll` file and select **Properties**.
5. In the Properties dialog, click the **Details** tab, which displays information including your product version.

## Through SQL

1. Log into your Secret Server database server.
2. Open and log into your Microsoft SQL Server Management Studio application.
3. Click **Connect**.
4. At the top level of the **Object Explorer** pane, click the **+** symbol next to `servername\instance`.
5. Click the **+** symbol next to **Databases**.
6. Right-click your Secret Server database and select **New Query** from the dialog.
7. In the SQL Query pane that opens, paste the following query:  

```
`SELECT * from tbVersion`  
`ORDER BY CAST(REPLACE(VersionNumber, '.', '' ) AS INT) DESC;`
```
8. Click **Execute**.
9. On the **Results** tab below the SQL Query pane, confirm that your query executed successfully and find the version number of your current Secret Server release in the top row.

## Through the API

You can also use the REST API to check the version of Secret Server using the endpoint `GET /v1/version`.

An HTTP 404.2 error code is received when ISAPI/CGI Restrictions are preventing the .NET Framework 4.5.1 from running.

## Resolution

1. Open Internet Information Services.
2. Select the Server in the left tree view.
3. In the **IIS** section, open ISAPI and CGI Restrictions.
4. For all items beginning with **ASP.NET v4.0**, right-click the item and select **Allow**.



## Error

After upgrading Secret Server and changing the CLR version, when attempting to load Secret Server, you receive the following error in Internet Explorer:

HTTP Error 404.17 - Not Found The requested content appears to be script and will not be served by the static file handler

## Resolution

This error can be caused by ASP.NET 4.5 not being correctly registered on the server. To correct this:

### Windows Server 2012 or 2012 R2

Use the Server Manager to install ASP.NET 4.5.

1. Open the Server Manager.
2. Select **Manage > Add Roles and Features**. The Add Roles and Features wizard appears.
3. Click the **Next** button. The Select Installation Type page appears.
4. Click to select the **Role-based or feature-based installation for your server** selection button.
5. Click the **Next** button twice. The Select Server Roles page appears.
6. Click to select the **Web Server (IIS)** check box in the **Roles** list.
7. Click the **Next** button until you arrive at **Role Services** under **Web Server (IIS)**.
8. Drill down to **Web Server > Application Development** in the **Role Services** list.
9. Click to select the **ASP.NET 4.5** check box.
10. Click the Next button until you arrive at the final page.
11. Click the **Install** button.
12. Once installed, follow the resolution instructions in [HTTP Error 404.2 - ISAPI and CGI Restrictions](#) (KBA) to ensure ASP.NET 4.0 is allowed to execute in IIS.

## Error

### Error Text

Oracle error: Invalid length for connection option 'Data Source', maximum length is 128.

### Scenario

You run an SQL script that attempts to connect to an Oracle DB using the `System.Data.OracleClient.OracleConnectionStringBuilder.set_DataSource(String value)` call. The script runs from the local site as a database account, and an error occurs.

The error stack trace from the logs looks similar to this:

```
2020-05-20 11:24:16,149 [CID:] [C:] [TID:PriorityScheduler Thread @ Normal] ERROR Delinea.PasswordChangers.DependencyChangers.Sql.SqlScriptRunner - Invalid length for connection option 'Data Source', maximum length is 128.
```

```
System.ArgumentException: Invalid length for connection option 'Data Source', maximum length is 128.
```

```
at System.Data.OracleClient.OracleConnectionStringBuilder.set_DataSource(String value)
```

```
at System.Data.OracleClient.OracleConnectionStringBuilder.set_Item(String keyword, Object value)
```

```
at System.Data.Common.DbConnectionStringBuilder.set_ConnectionString(String value)
```

```
at Delinea.PasswordChangers.DependencyChangers.Sql.SqlScriptRunner.BuildConnection(DbProviderFactory dbProviderFactory, String connectionString, IDictionary`2 additionalConnectionItems)
```

```
at Delinea.PasswordChangers.DependencyChangers.Sql.SqlScriptRunner.ExecuteScript(String providerName, String connectionString, IDictionary`2 additionalConnectionItems, String commandText, IEnumerable`1 parameters)
```

## Resolution

This error is an Oracle issue. Oracle has built-in string length restrictions on data source strings. One possible workaround is to use IP addresses for the Oracle server instead of FQDNs. Failing that, search the Internet for "Invalid length for connection option 'Data Source', maximum length is 128" to discover the latest information and workarounds.

## Relevance

This Delinea **technical issue** knowledge base article is relevant to:

- Product(s): Secret Server using jQuery 3.2.1
- Version(s): 10.7
- Edition(s): All

## Technical Issue

Secret Server 10.7 uses jQuery 3.2.1, which is listed as vulnerable to the jQuery CVE-2019-11358 security issue on the [Common Vulnerabilities and Exposures \(CVE\) list](#).

## Resolution

Delinea removed the jQuery vulnerability from Secret Server's copy of jQuery v3.2.1 by applying a patch (see [Related Articles and Resources](#)).

To verify the fix:

1. Navigate to `https://<your_secret_server_URL>/assets/libs/jquery-3.2.1.js`
2. Open the file in a text editor.
3. Search for the string `proto` in the code: ...

```
// Prevent Object.prototype pollution
// Prevent never-ending loop
if ( name === "__proto__" || target === copy ) {
  continue;
}
```

4. If the string appears, the patch has been applied.

## Related Articles and Resources

- [NIST website for CVE-2019-11358](#)
- [GitHub commits on the fix](#)

**Note:** The commit shows two files, the top file is the security fix, and the bottom file is a unit test for the fix. Secret Server does not ship with any jQuery unit tests as found in that second file.

- [Common Vulnerabilities and Exposures \(CVE\) list](#)

## Relevance

This Delinea **technical issue** knowledge base article is relevant to:

- Product(s): Secret Server using jQuery 3.2.1
- Version(s): 10.8.000004
- Edition(s): All

## Technical Issue

Secret Server 10.8.000004 uses jQuery 3.2.1, which is listed as vulnerable to the jQuery CVE-2020-11022 security issue on the [Common Vulnerabilities and Exposures \(CVE\) list](#).

## Resolution

Delinea removed the jQuery vulnerability from Secret Server's copy of jQuery v3.2.1 by applying a patch (see [Related Articles and Resources](#)).

To verify the fix:

1. Navigate to `https://<your_secret_server_URL>/assets/libs/jquery-3.2.1.js`
2. Open the file in a text editor.
3. Search for the string `htmlPrefilter` in the code (line 5919):

```
jQuery.extend( {  
  htmlPrefilter: function(html) {  
    return html;  
  }  
}
```

4. If the string appears, the patch has been applied.

## Related Articles and Resources

- [NIST website for CVE-2020-11022](#)
- [GitHub commits on the fix](#)

**Note:** The commit shows multiple files, the top file is the security fix, and the bottom files are unit tests for the fix. Secret Server does not ship with any jQuery unit tests.

- [Common Vulnerabilities and Exposures \(CVE\) list](#)

## Detection

During a security review of Secret Server on June 4, 2019, an internal security team found the security issue described below. The issue was also detected later by an internal team in Password Reset Server.

## The Security Issue

An attacker with administrator permissions could modify the input field data in one specific location to execute a SQL injection attack against Secret Server or Password Reset Server. This means that the attacker could append, modify or delete data in the Secret Server or Password Reset Server SQL databases, and upgrade their access to code execution on the SQL server.

## Common Vulnerability Scoring System Version 3.0

The CVSS score for this issue is 9.1. The CVSS vector string is CVSS:3.0/AV:N/AC:L/PR:H/UI:N/S:C/C:H/I:H/A:H

## Products Affected

- Secret Server On-Premises version 10.6.000026 and earlier.
- Secret Server Cloud, which was updated June 15, 2019 to permanently remove this issue for all customers.
- Password Reset Server earlier than version 5.1.000005.

## Recommended Actions

- All Secret Server On-Premises customers should upgrade to version 10.6.000027 or later.
- All Password Reset Server customers should upgrade to version 5.1.000005 or later.
- Secret Server Cloud users do not need to take any action.

Google Authenticator relies on time to create tokens. If Secret Server's clock is inaccurate or is not synchronized with devices running Google Authenticator, user token validation may fail when enrolling or logging in.

## **Solution A (preferred)**

Ensure that Secret Server's clock is accurate and synchronized with the device running Google Authenticator. Set the web servers to synchronize their clocks with an accurate domain controller clock or with an NTP server.

## **Solution B**

By default the leniency value for token time accuracy is zero, which means the token supplied must be accurate. Follow the steps below to configure Secret Server with higher leniency to accept tokens with times that are slightly behind or slightly ahead.

1. Open the web-appSettings.config file and add the following key between the appSettings tags.

```
<add key="TOTPLeniency" value="0 or greater value here" />
```

2. Change the leniency value. We recommend setting this value to no higher than 2.
3. Recycle your IIS application pool. You must recycle your IIS application pool for the setting to take effect.

When using Secret Server for SSH password rotation, you may encounter errors when changing a secret. This article helps the reader troubleshoot the configuration of Remote Password Changing (RPC) in Secret Server to avoid errors.

**Note:** See [Troubleshooting SSH Issues](#) for other SSH issues.

## Step 1: Verifying Ports and Connectivity

To determine if the heartbeat issue is outside of Secret Server:

1. Open the secret which is failing Remote Password Changing in Secret Server.

The screenshot shows the Secret Server interface for a secret named 'centos6.testlab.com\testuser'. The breadcrumb path is 'rootfolder > centos6.testlab.com\testuser'. The 'General' tab is selected, and a 'Heartbeat' button is visible in the top right corner.

**Launchers**

Provides a launcher to easily access an account using your secret's credentials.

- PuTTY Launcher
- ProxyTest

**Expiration and Heartbeat**

Sets when a secret's credentials are confirmed to work (heartbeat) and must be changed (expiration). Secret Server administrators use these settings to enforce your organization's security policy. Expiration is set in the secret template.

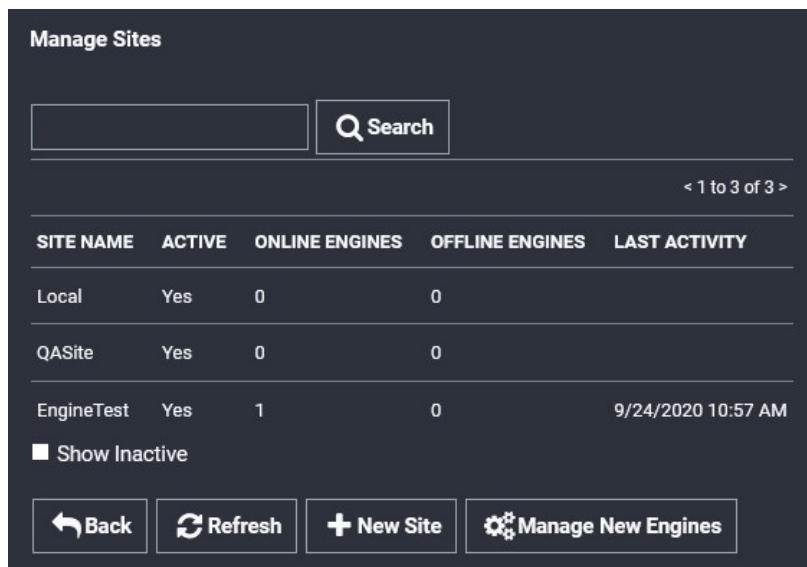
<b>Last Heartbeat Status</b>	Failed	ClientPollingTimeout
<b>Heartbeat Enabled</b>	Yes	<a href="#">Edit</a>

**Advanced Information**

Varies with the system environment and the secret template. Examples include secret policies, parent folders, and network information.

<b>Folder</b>	rootfolder	<a href="#">Edit</a>
<b>Secret Policy</b>	Inherits from Folder	<a href="#">Edit</a>
<b>Site</b>	Local	<a href="#">Edit</a>

2. Scroll down to the **Advanced Information** section. You may have to click the **Advanced** link.
3. Note the **Site** parameter.
4. Go to **Admin > Distributed Engine**.
5. Click the **Manage Sites** button. The Manage Sites page appears:



6. Click the **Site Name** link for the site. The Site View page appears.
7. Note the **Processing Location** parameter for the site.
8. If the processing location is **Local** and website processing is enabled, do your testing on the Secret Server application server. If it is **Distributed Engine**, do your testing on the distributed engine machine.
9. In PowerShell run one of the following command for the machine you are trying to connect to from the secret:
 

```
Test-NetConnection -ComputerName <computer_name> -Port 22
```

**Note:** If you chose a custom port, note it—that port will need to be changed on the RPC too.
10. If the test was successful, proceed to the next step. If it was not successful, contact your networking team to open the port and test the connectivity. They can refer to [Ports Used by Secret Server](#).

## Step 2: Testing Heartbeat and RPC in Secret Server

Procedure:

1. Return to the secret on Secret Server.
2. Click the **Remote Password Changing** tab of the secret (not shown).
3. Check the **Associated Secret** section to see if there is an associated account set on the secret for use with RPC:



4. Return to the **General** tab for the secret:



		<a href="#">Edit All</a>
<b>Secret Name *</b>	centos6.testlab.com\testuser	<a href="#">Edit</a>
<b>Secret Template</b>	Unix Account (SSH)	<a href="#">Edit</a>
<b>Machine *</b>	centos6.testlab.com	<a href="#">Edit</a>
<b>Username *</b>	testuser	<a href="#">Edit</a>
<b>Password *</b>	***** <a href="#">Show</a>	<a href="#">Edit</a>
<b>Notes</b>		<a href="#">Edit</a>
<b>Private Key</b>		<a href="#">Edit</a>
<b>Private Key Passphrase</b>	***** <a href="#">Show</a>	<a href="#">Edit</a>

5. Note the **Secret Template** type.
6. Determine the password type for the template:
  1. Go to **Admin > Secret Templates**.
  2. Click to select the desired template in the dropdown list.
  3. Click the **Edit** button. The Secret Template Designer page appears (not shown).
  4. Click the **Configure Password Changing** button at the bottom of the page. The Secret Template Edit Password Changing page appears:

### Secret Template Edit Password Changing

Enable Remote Password Changing	Yes
Retry Interval	1 hour
Maximum Attempts	10000
Enable Heartbeat	Yes
Heartbeat Check Interval	8 hours

Password Type to use Unix Account Custom (SSH)

PASSWORD TYPE	SECRET FIELD	SCRIPT VARIABLE
Machine Name	Machine	\$machine
Password	Password	\$password
User Name	Username	\$username

[← Back](#)
[✎ Edit](#)

- Note the password types used, the applicable secret field, and the equivalent script variable. These indicate reserved variables that reference fields in the secret, in this case, \$USERNAME, \$MACHINE and \$PASSWORD. You will need to test your script using known-good values for these.
- Go to **Admin > Remote Password Changing**. The Remote Password Changing Configuration page appears (not shown).
- Click the **Configure Password Changers** button. The Password Changes Configuration page appears:

### Password Changers Configuration

PASSWORD TYPE NAME	SCAN TEMPLATE	ACTIVE
Active Directory Account	Active Directory Account	Yes
Amazon IAM Console Password Privileged Account	AWS User Account	Yes
Amazon IAM Key	AWS Access Key	Yes
Blue Coat Account Custom (SSH)	SSH Local Account	Yes
Blue Coat Enable Password Custom (SSH)	SSH Local Account	Yes
Cisco Account Custom (SSH)	SSH Local Account	Yes
Cisco Account Custom (Telnet)	SSH Local Account	Yes
Cisco Enable Secret Custom (SSH)	SSH Local Account	Yes
Cisco Enable Secret Custom (Telnet)	SSH Local Account	Yes

9. Click the name link for the same password changer. The password changer page for that changer appears:

Unix Root Account Custom (SSH)

Verify Password Changed Commands

Test Action

AUTHENTICATE AS

Username \${1}\$USERNAME  
Password \${1}\$PASSWORD  
Key < None >  
Passphrase < None >

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	su \$USERNAME	Turn on privileged commands	2000
2	\$CURRENTPASSWORD	Privileged password	2000
3	whoami	Get name of account	2000
4	\$\$CHECKFOR \$USERNAME	Check the privileged login worked	2000

Password Change Commands

Test Action

AUTHENTICATE AS

Username \${1}\$USERNAME  
Password \${1}\$PASSWORD  
Key < None >  
Passphrase < None >

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	su \$USERNAME	Turn on privileged commands	2000
2	\$CURRENTPASSWORD	Privileged password	2000
3	passwd	Change password	2000
4	\$NEWPASSWORD	New password	2000
5	\$NEWPASSWORD	New password	2000

The **Verify Password Changed Commands** section defines the secret fields and commands to use to confirm that a password has rotated (changed) successfully on the target machine. The **Password Change Commands** section defines the secret fields and commands to use to change the password on the target machine.

10. Click the **Edit** button at the bottom of the page. The Edit Password Changer page appears:

Edit Password Changer

Name

\* Unix Account Custom (SSH)

Line Ending

New Line (\n) ▾

Custom Port

(e.g. override the default value of 22 for SSH or 23 for Telnet with another value)

Runner Type

Standard ▾

Request Terminal

☒ (If checked, the standard out and standard error data streams combine for \$\$CHECK\* commands, else \$\$CHECK\* will only check standard out and standard error will cause an error)

Exit Command

(A custom command can be used to exit or logout of the session if only one connection per user is allowed on the device. Or if the SSH connections are not closing.)

Use SSH Password Authentication


☒


Active

☒

Valid for Discovery Import

☐

 Save

 Cancel

11. If a port for the RPC is listed in the **Custom Port** text box, it must match the port that Secret Server connects to when running the commands seen on the previous page.
12. Click the **Cancel** button to return to the previous page:

**Unix Root Account Custom (SSH)**

**Verify Password Changed Commands**

Test Action

**AUTHENTICATE AS**  
Username `${1}$USERNAME`  
Password `${1}$PASSWORD`  
Key `< None >`  
Passphrase `< None >`

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	<code>su \$USERNAME</code>	Turn on privileged commands	2000
2	<code>\$CURRENTPASSWORD</code>	Privileged password	2000
3	<code>whoami</code>	Get name of account	2000
4	<code>\$CHECKFOR \$USERNAME</code>	Check the privileged login worked	2000

**Password Change Commands**

Test Action

**AUTHENTICATE AS**  
Username `${1}$USERNAME`  
Password `${1}$PASSWORD`  
Key `< None >`  
Passphrase `< None >`

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	<code>su \$USERNAME</code>	Turn on privileged commands	2000
2	<code>\$CURRENTPASSWORD</code>	Privileged password	2000
3	<code>passwd</code>	Change password	2000
4	<code>\$NEWPASSWORD</code>	New password	2000
5	<code>\$NEWPASSWORD</code>	New password	2000

13. The **Verify Password Changed Commands Test Action** button tests the defined password-changed verification listed under it. When clicked, it uses the "Authenticate As" parameters to connect to the accounts and run the commands to test for a heartbeat and check that the account and password is valid.

**Note:** This authenticates with a non-privileged associated secret and then uses that account to connect to the Linux machine. This is needed because root accounts are often unable to directly authenticate. Thus, several commands are run to test if the active account can be set to root. If that fails, heartbeat fails.

14. In the example command set for the section, when the heartbeat runs, the associated account (`${1}$USERNAME`) authenticates, logs into the remote SSH device, and runs:

1. `su $USERNAME` (The username from the secret)
2. `$CURRENTPASSWORD` (The password which the password should have been changed to)
3. `whoami` (Returns the name of the active user, which indicates the `su` command and the provided parameters worked). This test checks that the returned username is the same as the username field in the secret. If it is not, the heartbeat fails.
4. `CHECKFOR $USERNAME` (Checks if the 'whoami' returns the username field from the secret. If it does not, an error is thrown and the heartbeat fails)

**Note:** Some of the command sets run by the "Verify Passwords Changed Test Action" button are empty. In that case, the test authenticates with the provided username and password, and if that is successful, so is the heartbeat. That is, the heartbeat uses the secret's own account (`$USERNAME`) and value to connect, rather than those of an associated secret.

**Note:** If the RPC is set up to use an associated secret but the secret does not have one, the secret fails to rotate and throws

an error.

**Note:** For more on how Secret Server interprets what values to supply your custom script from the secrets involved, see [Editing Custom Commands](#) and [Remote Password Changing](#).

**Note:** The heartbeat above is designed to authenticate with a non-privileged associated secret and use that account to connect to the Unix machine because root accounts are often unable to authenticate directly. Then, several commands are run to check if root can be successfully switched to. If this fails, the heartbeat fails.

15. When you click the Verify Password Changed Commands **Test Action** button, the commands cannot read the fields from a secret or associated secret because when setting up the password changer no specific secret is calling it. Instead, for the test only, you manually provide the input parameters from the secret and associated secrets involved with the RPC. For example, the \$USERNAME field refers to the user on the secret that you are trying to change. Whereas [1][1]USERNAME refers to the first associated secret linked to that secret.
16. When you click the button a popup appears for you to do just that:

Test Action

i

Please enter the information to test the action. Note this test may take a while to complete since it will run against the actual host.

Authenticate As

Username

root

Password

....

Key

Choose File No file chosen

Passphrase

Fields

MACHINE

earth

Site

Local

✓ OK

✗ Cancel

17. Type or select your parameters.
18. Click the **OK** button. The password-changed command set is tested with a simulated heartbeat, using what you entered. If any errors occur, record them for troubleshooting later. The console outputs something similar to this:

```
su root
Password:

[root@CentOS user1]#
whoami
root
[root@CentOS user1]#
$$CHECKFOR passed.
```

You then return to the previous page:

Unix Root Account Custom (SSH)

Verify Password Changed Commands

Test Action

AUTHENTICATE AS

Username \${1}\$USERNAME  
Password \${1}\$PASSWORD  
Key < None >  
Passphrase < None >

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	su \$USERNAME	Turn on privileged commands	2000
2	\$CURRENTPASSWORD	Privileged password	2000
3	whoami	Get name of account	2000
4	\$\$CHECKFOR \$USERNAME	Check the privileged login worked	2000

Password Change Commands

Test Action

AUTHENTICATE AS

Username \${1}\$USERNAME  
Password \${1}\$PASSWORD  
Key < None >  
Passphrase < None >

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	su \$USERNAME	Turn on privileged commands	2000
2	\$CURRENTPASSWORD	Privileged password	2000
3	passwd	Change password	2000
4	\$NEWPASSWORD	New password	2000
5	\$NEWPASSWORD	New password	2000

- 19. The **Password Change Commands** section defines the secret fields and commands to use to rotate (change) a password on the target machine. We now run a similar test on it.
- 20. Click the Password Change Commands **Test Action** button. Another Test Action popup page appears:

**Test Action**

Please enter the information to test the action. Note this test may take a while to complete since it will run against the actual host.

**Warning:** This will change the password and/or rotate the SSH Keys on the target account if successful.

**Authenticate As**

Username

Password

Key  No file chosen

Passphrase

**Fields**

MACHINE

\$CURRENTPASSWORD

\$NEWPASSWORD

Site

**Important:** Clicking the OK button in the following instructions **really changes the password or rotates the SSH keys on the target account** (the \$NEWPASSWORD parameter gets changed), so record what you change it to, and update the secret with the new password (assuming the RPC is successful).

21. Similar to the last test, manually provide the input parameters. See [Step 2: Testing Heartbeat and RPC in Secret Server](#) for a description of how to fill in the parameters.
22. Click the **OK** button. The test connects with the "Authenticate As" accounts and runs the commands to change the password. A password rotation occurs, and more console output appears. Record any errors and output.
23. If the rotation did not occur, check the information that was presented to the changer from your secret. It is possible that the secret's data is involved in the issue.

### Step 3: Troubleshooting Heartbeat or RPC Outside of Secret Server

This section troubleshoots the commands used by Secret Server to heartbeat and RPC outside of Secret Server. The intent is to confirm a successful authentication and password change on the endpoint when the same commands are issued outside of Secret Server. If they do not, the commands must be revised to work within Secret Server.



1. Use the procedure from [Step 1](#) to determine which machine (Secret Server application or DE) to perform this step on.
2. If you did not already, [Download PuTTY](#) on the application or any of the DE servers.
3. Open a browser tab on the secret which is failing to Heartbeat or RPC.
4. Do the same for each associated secret of that secret.

**Note:** Instead of the following three steps, you can instead go to ...\\SecretServer\\CustomCommandsEdit.aspx.

5. Go to **Admin > Remote Password Changing**. The Remote Password Changing Configuration page appears (not shown).
6. Click the **Configure Password Changers** button. The Password Changers Configuration page appears:

Password Changers Configuration		
PASSWORD TYPE NAME	SCAN TEMPLATE	ACTIVE
Active Directory Account	Active Directory Account	Yes
Amazon IAM Console Password Privileged Account	AWS User Account	Yes
Amazon IAM Key	AWS Access Key	Yes
Blue Coat Account Custom (SSH)	SSH Local Account	Yes
Blue Coat Enable Password Custom (SSH)	SSH Local Account	Yes
Cisco Account Custom (SSH)	SSH Local Account	Yes
Cisco Account Custom (Telnet)	SSH Local Account	Yes
Cisco Enable Secret Custom (SSH)	SSH Local Account	Yes
Cisco Enable Secret Custom (Telnet)	SSH Local Account	Yes

7. Click the name link for the subject password changer. The password changer configuration page for that changer appears:



### Unix Root Account Custom (SSH)

**Verify Password Changed Commands**

[Test Action](#)

**AUTHENTICATE AS**  
  
 Username    \${1}\$USERNAME  
 Password    \${1}\$PASSWORD  
 Key          < None >  
 Passphrase < None >

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	su \$USERNAME	Turn on privileged commands	2000
2	\$CURRENTPASSWORD	Privileged password	2000
3	whoami	Get name of account	2000
4	\$\${CHECKFOR} \$USERNAME	Check the privileged login worked	2000

**Password Change Commands**

[Test Action](#)

**AUTHENTICATE AS**  
  
 Username    \${1}\$USERNAME  
 Password    \${1}\$PASSWORD  
 Key          < None >  
 Passphrase < None >

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	su \$USERNAME	Turn on privileged commands	2000
2	\$CURRENTPASSWORD	Privileged password	2000
3	passwd	Change password	2000
4	\$NEWPASSWORD	New password	2000
5	\$NEWPASSWORD	New password	2000

- Determine if you are troubleshooting heartbeat or RPC: The **Verify Password Change Commands** section applies to heartbeat, and the **Password Change Commands** section applies to RPC. Which you use (or both) depends on what failed in Step 9.
- Return the Secret Server or DE server you are testing.
- Launch PuTTY.
- Type the host name or IP address of the subject Linux machine (generally, the Machine field in the secret).
- Log on with the username and password for the main or associated secret.

**Note:** If you are successful with connecting with PuTTY but not Secret Server, launch PuTTY in in debug mode and collect a log file. Determine what cipher was used to connect. If you have a machine that works with Secret Server, compare the ciphers. Also check if the endpoint handles interactive logins differently. Secret Server's logins for RPC are non-interactive. See [Troubleshooting SSH Issues](#) for more information about troubleshooting connection issues in Putty.
- Use the commands listed in the "Authenticate As" section you are troubleshooting directly in PuTTY to determine if they work outside of Secret Server. For example, given these heartbeat (Verify Password Changed) commands:

Unix Root Account Custom (SSH)

Verify Password Changed Commands

Test Action

AUTHENTICATE AS

Username \${1}\$USERNAME  
Password \${1}\$PASSWORD  
Key < None >  
Passphrase < None >

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	su \$USERNAME	Turn on privileged commands	2000
2	\$CURRENTPASSWORD	Privileged password	2000
3	whoami	Get name of account	2000
4	\$CHECKFOR \$USERNAME	Check the privileged login worked	2000

Password Change Commands

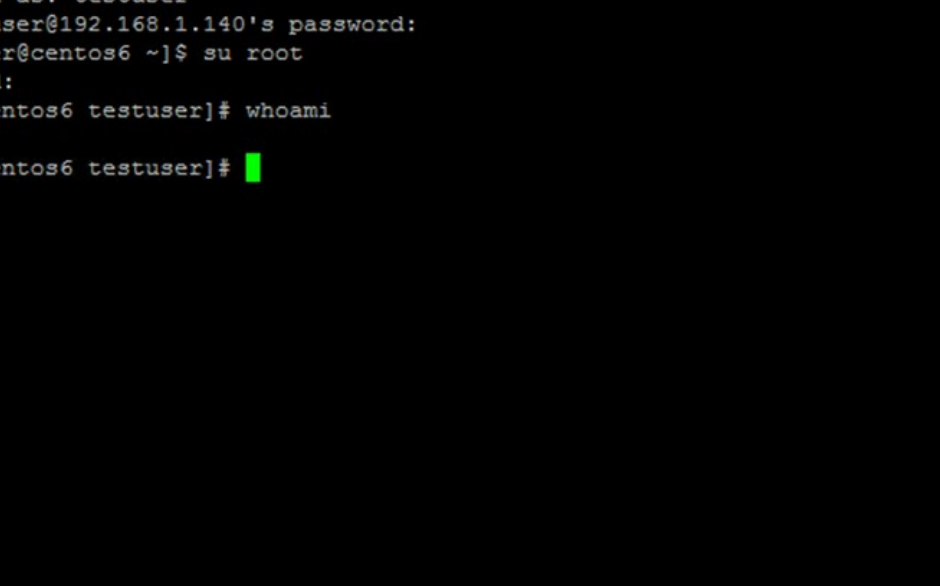
Test Action

AUTHENTICATE AS

Username \${1}\$USERNAME  
Password \${1}\$PASSWORD  
Key < None >  
Passphrase < None >

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	su \$USERNAME	Turn on privileged commands	2000
2	\$CURRENTPASSWORD	Privileged password	2000
3	passwd	Change password	2000
4	\$NEWPASSWORD	New password	2000
5	\$NEWPASSWORD	New password	2000

Your console would look like this:



The screenshot shows a terminal window with a blue title bar. The title bar contains the text "testuser@centos6:/home/testuser" and standard window control buttons (minimize, maximize, close). The terminal content is as follows:

```
login as: testuser
testuser@192.168.1.140's password:
[testuser@centos6 ~]$ su root
Password:
[root@centos6 testuser]# whoami
root
[root@centos6 testuser]#
```

The prompt changes from "testuser@centos6 ~" to "root@centos6 testuser" after the "su root" command is executed. The "whoami" command confirms the user is now "root".

In this example, we assumed the secret contained a value of "root" for the Username field, and the associated account in the first position was "testuser." This example was successful because the `$$CHECKFOR $USERNAME` found "root" on the previous line.

If the `su root` command were to fail above and reports the message "Username is not in the sudo users file. This incident will be reported." then the `$$CHECKFOR` would fail and the heartbeat would fail to verify. This type of issue needs to be remediated on the endpoint.

14. If the issue is clearly an endpoint issue, remediate it and repeat the commands in PuTTY.
15. Once the commands work properly in PuTTY, if the RPC or heartbeat command set needs adjustment to match the working PuTTY equivalent, return to Secret Server and make the changes to the command set (see the next step).

**Important:** Before you change the RPC commands, ensure that the device that you are working on belongs to the secret template you are using. Secret templates dynamically update all the secrets based on them, so **all secrets with this template are affected by your changes**. We strongly recommend that if this device is unique or you are storing an independent root account in the associated secret template, you should:

1. Copy the template you are using, giving the copy a descriptive name.
2. Create a new password changer based on the current one that you are using.
3. Assign it the the secret template you just created.

This ensures that you do not change how ALL devices related to a secret template when you only intend to change a single devices. Accounts that are the same type on the same device should share the same template.


16. Click the **Edit Commands** button at the bottom of the subject password changer page. The commands for RPC and heartbeat appear:
-

## Unix Account Custom (SSH)

## Verify Password Changed Commands

## AUTHENTICATE AS

Username	<input type="text" value="\$Username"/>
Password	<input type="text" value="\$CURRENTPASSWORD"/>
Key	<input type="text"/>
Passphrase	<input type="text"/>


 Save

ORDER	COMMAND	COMMENT	PAUSE(MS)
	<input type="text"/>	<input type="text"/>	<div>2000</div>

## Password Change Commands

## AUTHENTICATE AS

Username	<input type="text" value="\$Username"/>
Password	<input type="text" value="\$CURRENTPASSWORD"/>
Key	<input type="text"/>
Passphrase	<input type="text"/>

 Save

17. Scroll down to the command list in the **Password Change Commands** section:

## Password Change Commands

### AUTHENTICATE AS

Username

Password

Key

Passphrase

Save

ORDER	COMMAND	COMMENT	PAUSE(MS)	
1	passwd	Password Command	2000	
2	\$CURRENTPASSWORD	Current Password	2000	
3	\$NEWPASSWORD	New Password	2000	
4	\$NEWPASSWORD	Confirmed Password	2000	
	<input type="text"/>	<input type="text"/>	<input type="text" value="2000"/>	

- Click the blue edit icon to the right of any commands you want to change. The command becomes editable.
- Edit the command to make it match your known-good revision.
- Click the blue save icon next to the amended command.
- Click the **Back** button to return to the password changer page:

### Unix Account Custom (SSH)

Verify Password Changed Commands

Test Action

Authenticate As

Username

\$Username

Password

\$CURRENTPASSWORD

Key

< None >

Passphrase

< None >

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	passwd	Password Command	2000
2	\$CURRENTPASSWORD	Current Password	2000
3	\$NEWPASSWORD	New Password	2000
4	\$NEWPASSWORD	Confirmed Password	2000

Password Change Commands

Test Action

Authenticate As

Username

\$Username

Password

\$CURRENTPASSWORD

Key

< None >

Passphrase

< None >

ORDER	COMMAND	COMMENT	PAUSE(MS)
1	passwd	Password Command	2000
2	\$CURRENTPASSWORD	Current Password	2000
3	\$NEWPASSWORD	New Password	2000
4	\$NEWPASSWORD	Confirmed Password	2000

22. One of the Test Action popups appears.
23. Type the known-good values from the secret in the text boxes.
24. Click the **OK** button to test heartbeat or RPC. The result should look something like this:

```

su root
Password:

[root@CentOS user1]#
whoami
root
[root@CentOS user1]#
$$CHECKFOR passed.
  
```

This topic discusses resolving the "The specified domain is not a valid domain" error.

## Troubleshooting Procedure

1. Verify that you are entering the fully qualified domain name in the domain field and that the domain username and password fields are correct.
2. Ensure that the ports used for LDAP (389) or LDAPS (389 and 636) are open. For more information about the ports used by Secret Server, see [Ports Used by Secret Server](#).
3. Ensure that your server is connecting to the correct DNS server:
  1. Open the command console as an administrator (**Start > Run > cmd**).
  2. Type `ipconfig /all`.
  3. Press **<Enter>**.
  4. Find your primary ethernet adapter and look in the **DNS Servers** section. Verify that the DNS server is correct.
4. If the DNS server is incorrect, then follow these steps to configure the DNS server:
  1. Open up your control panel (**Start > Control Panel**).
  2. Click on **Network and Sharing Center**.
  3. Click **Manage Network Connections** on the left.
  4. Right click on your primary network adapter and select **Properties**.
  5. Click **Internet Protocol Version 4 (TCP/IPv4)**.
  6. Click **Properties**.
  7. Click to select the **Use the following DNS server addresses selection** button.
  8. Type your primary DNS server in the first row.
  9. If you have a secondary DNS server, put it in the second row.

**Important:** Both DNS servers must contain the SRV record for your domain controller.
5. Check that your server is retrieving domain controller DC records correctly:
  1. Open up your control panel (**Start > Control Panel**).
  2. Type `nslookup`.
  3. Press **<Enter>**.
  4. Type `set q=srv`
  5. Press **<Enter>**.
  6. Type `_ldap._tcp.dc._msdcs.<Fully_Qualified_Active_Directory_Domain_Name>`.
  7. Press **<Enter>**.

8. If you get a result that looks like:

```
_ldap._tcp.dc._msdcs.<Fully_Qualified_Active_Directory_Domain_Name> SRV service location: priority = 0 weight = 100 port = 389 svr hostname =  
*Domain_Controller_Host_Name*
```

Then you are retrieving the DNS record correctly. Otherwise, your DNS records are not correctly configured.

## Configuring the DNS Record on Your Server

1. If you are **not** using a Windows DNS server, contact your vendor to ask how to add SRV records. You will need to add a SRV record pointing `_ldap._tcp.dc._msdcs.<Fully_Qualified_Active_Directory_Domain_Name>` to your primary DNS server.
2. Connect to your Windows DNS server.
3. Open the DNS control panel (**Start > Administrative Tools > DNS**).
4. Expand the node corresponding to your server.
5. Expand the **Forward Lookup Zones** node.
6. Expand the node corresponding to your domain.
7. Delete the **\_msdcs** node if it exists.
8. Right click on the domain node and select **New Domain...**
9. Type `_msdcs` as the name.
10. Right click on the new **\_msdcs** node, and select **New Domain...**
11. Type `dc` as the name.
12. Right click on the new **dc** node and select **Other New Records...**
13. Select **Service Location (SRV)** as the record type.
14. Click the **Create Record** button.
15. Select **\_ldap** as the service.
16. Select **\_tcp** as the protocol.
17. Type 389 as the port.
18. Type the fully qualified host name of your DC or the IP address in the **Host offering this service:** text box.
19. Click the **OK** button.
20. Click the **Done** button.
21. Open up the services console (**Start > Run > services.msc**)
22. Right click on the **DNS Server** service and select **Restart**. Your domain DNS record should now be set up.

## Resolving Other DNS Issues

Secret Server requires that the DNS is correctly configured to add a domain. For additional tips on tracking down DNS Issues, see this [Troubleshooting Active Directory Installation Wizard Problems](#).



Also ensure the domain controller is using the appropriate DNS. The `ipconfig /registerdns` command (as per the link above) is frequently helpful for entering the correct DNS entries in for a given domain.

In Secret Server 10.7 and newer, all background operations have moved to Quartz. All scheduled background operations have become jobs registered in tables inside the Secret Server database.

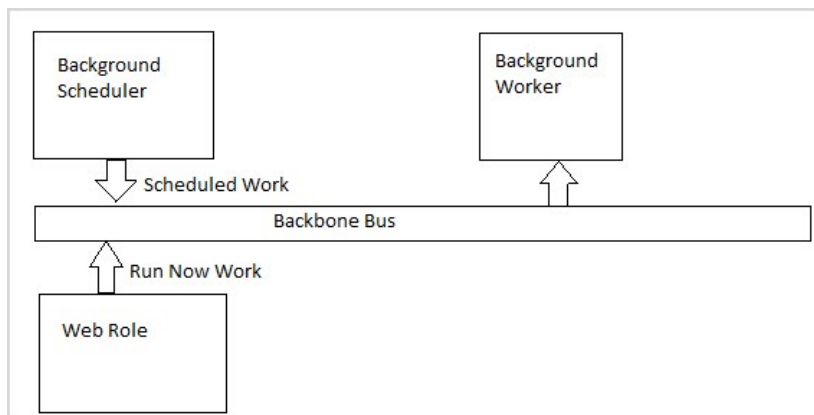
## Quartz-Related Tables

All Quartz-related table names start with "QRTZ\_ "

+	dbo.QRTZ_BLOB_TRIGGERS
+	dbo.QRTZ_CALENDARS
+	dbo.QRTZ_CRON_TRIGGERS
+	dbo.QRTZ_FIRED_TRIGGERS
+	dbo.QRTZ_JOB_DETAILS
+	dbo.QRTZ_LOCKS
+	dbo.QRTZ_PAUSED_TRIGGER_GRP
+	dbo.QRTZ_SCHEDULER_STATE
+	dbo.QRTZ_SIMPLE_TRIGGERS
+	dbo.QRTZ_SIMPROP_TRIGGERS
+	dbo.QRTZ_TRIGGERS

## Trigger Job Components

Each background job runs as a consumer, similar to how a distributed engine (DE) works, in the background worker. Each job has a corresponding trigger job registered in Quartz. Quartz executes the trigger job at the configured time and interval. The trigger job puts a message on the backbone bus, which is picked up and executed by the background worker:



## Simple Trigger Job

There are two kinds of registered trigger jobs, *simple triggers* and *cron triggers*. A simple trigger fires on an interval. For example, on premises the heartbeat job runs every 30 seconds:

```
1 select * from QRTZ_SIMPLE_TRIGGERS where trigger_name like '%heartbeat%'
```

	SCHED_NAME	TRIGGER_NAME	TRIGGER_GROUP	REPEAT_COUNT	REPEAT_INTERVAL	TIMES_TRIGGERED
1	BackgroundScheduler	ProcessHeartbeat TriggerJob-trigger	group1	-1	30000	3
2	BackgroundScheduler	ProcessLocalHeartbeat TriggerJob-trigger	group1	-1	30000	3

In this case, you can ignore the TRIGGER\_GROUP and REPEAT\_COUNT columns. The latter column limits the number repetitions, which we do not do. The REPEAT\_INTERVAL is in milliseconds, so 30000 is 30 seconds. TIMES\_TRIGGERED is a counter of trigger firings. There are two trigger jobs for heartbeat. The local job handles secrets that do not run through a distributed engine while the other heartbeat handles secrets that do run through a distributed engine.

## Cron Trigger Job

Cron jobs run at a specific time using a variation of the well-known cron syntax. For example:

```
1 select * from QRTZ_CRON_TRIGGERS where trigger_name like '%license%'
```

	SCHED_NAME	TRIGGER_NAME	TRIGGER_GROUP	CRON_EXPRESSION	TIME_ZONE_ID
	BackgroundScheduler	ExpiringLicenseTask TriggerJob-trigger	group1	0 0 12 * * ?	UTC

In this example, the trigger ExpiringLicenseTaskTriggerJob runs every day at 12:00 PM UTC.

The Quartz jobs are run within the background scheduler role, which runs on every node that has the background-worker-enabled bit set to true. Quartz coordinates trigger-job execution through the database to ensure that the same trigger-job is run just once, even if the Quartz scheduler is running on multiple nodes simultaneously.

## Procedures

### Viewing Trigger Job State (QRTZ\_TRIGGERS Table)

The current state of each trigger-job can be seen in the QRTZ\_TRIGGERS table:

```
1 select Trigger name,NEXT FIRE TIME,prev fire time,trigger state from QRTZ TRIGGERS
```

	Trigger name	NEXT_FIRE_TIME	prev_fire_time	trigger_state
1	BackgroundWorkerTask TriggerJob-trigger	637019930838743141	637019930738743141	WAITING
2	Backup TriggerJob-trigger	637019930838863056	637019930238863056	WAITING
3	CheckinExpiredCheckedoutSecret TriggerJob-trigger	637019930838143479	637019930238143479	WAITING
4	ComputerScan TriggerJob-trigger	637019932036884199	637019928436884199	WAITING

### Viewing Trigger Firing Times

In the previous figure, the NEXT\_FIRE\_TIME and PREV\_FIRE\_TIME columns are not human readable. To convert them to something you can read, run the following SQL query:

```
SELECT TOP 1000
[TRIGGER_NAME]
,[TRIGGER_STATE]
```

```

,[TRIGGER_TYPE]
,NEXT_FIRE_IN = DATEDIFF(second, GETUTCDATE(), CAST(NEXT_FIRE_TIME/864000000000.0 - 693595.0 AS DATETIME))
,UTCNOW = GETUTCDATE()
,NEXT_FIRE_TIME2 = CAST(NEXT_FIRE_TIME/864000000000.0 - 693595.0 AS DATETIME)
,[PREV_FIRE_TIME2] = CAST(PREV_FIRE_TIME/864000000000.0 - 693595.0 AS DATETIME)
,[START_TIME2] = CAST(START_TIME/864000000000.0 - 693595.0 AS DATETIME)
,[END_TIME2] = CAST(END_TIME/864000000000.0 - 693595.0 AS DATETIME)
,[PRIORITY]
FROM [dbo].[QRTZ_TRIGGERS]

```

This query shows the NEXT\_FIRE\_TIME in seconds and the other fields as DateTimes, along with the current UTC date to make it easier to compare to the current time.

The TRIGGER\_STATE is normally WAITING. If the trigger job is currently running, the state will be ACQUIRED. If there was an error running the trigger job, the state will be ERROR. Once a trigger job enters an ERROR state it will not run again. To address this, Secret Server automatically looks for any trigger jobs in the ERROR state every 10 minutes and changes their state to WAITING. If the NEXT\_FIRE\_TIME is a large negative number, it indicates that the scheduler role is not running—take a look at the Secret Server-BSSR.log file to see its status.

## Adjusting Trigger Job Frequency

Secret Server populates the Quartz schedules when it starts up and creates them if they do not exist. Secret Server does not update pre-existing schedules, so it is possible to change the frequency of a job in the table and have the system run with that frequency from that point on.

**Important:** Do not change the job frequency unless it is absolutely necessary.

Delinea controls those schedules and in future releases may not recognize changes you have made to those schedules. Furthermore, we do not test with a variety of schedules and have no plans to do so. Therefore, adjusting the schedules is a risky undertaking that may cause issues within Secret Server. If you must change the tables, you must bounce IIS on all the nodes where the scheduler runs, after you change the table values.

To trigger an infrequent task just once, without altering its schedule, follow these steps:

1. Update the NEXT\_RUN\_TIME value in the QRTZ\_TRIGGERS table to match the NEXT\_RUN\_TIME value from a trigger that fires frequently, such as one of the heartbeat triggers.
2. Recycle the scheduler role by running Recycle Background Processes on the Diagnostics page,
3. Reset the background worker (inside the application pool) in one of the following ways:
  - Click Recycle Background Processes on the Diagnostics page. This shuts down and restarts the scheduler.
  - Recycle the the application pool. This restarts Secret Server in its entirety.
  - Reset IIS. From SS's perspective this is nearly the same as the second option.

**Note:** The PDF version of this online document is automatically generated and thus may have minor formatting anomalies.

**Note:** This document is not updated with every release—many releases do not affect the guide's contents and thus do not warrant a document update.

**Note:** This topic is for upgrades of Secret Server from a version earlier than 10.2.

## Initial Troubleshooting

Changes to the `saml.config` were introduced in Secret Server 10.2. Secret Server should automatically convert the existing `saml.config` to the latest format. If it does not:

1. Ensure that the application pool has write access to the `saml.config` file.
2. Restart the application pool in IIS and try to log in again.
3. If Secret Server is running in a clustered environment:
  1. Copy the `saml.config` from the Web node that was upgraded to the remaining web nodes.
  2. Restart their application pools in IIS.

If that does not resolve the issue or Secret Server is not running in a clustered environment, there may be some other issue that prevented the `saml.config` from converting successfully during the upgrade. Please contact [Technical Support](#) for assistance.

**Note:** See the [Configuring SAML in Secret Server](#) article for more information on configuring your `saml.config` in 10.2

## Additional Troubleshooting

If the `saml.config` is not loading properly, there are a few possibilities:

- The `saml.config` file is invalid. Ensure that it contains valid XML. Element and attribute names are case sensitive. Ensure that the elements and attributes names and value are valid for SAML configuration.

**Note:** See the `saml.config.template` file in Secret Server's root folder for guidance on which elements and attributes can be used.

- Secret Server is running in a clustered environment and some nodes are not yet configured. Copy the `saml.config` from the functioning Web node to all of the remaining Web nodes and restart their Application Pools in IIS.

Restart the Application Pool in IIS any time changes are applied to the `saml.config` file. If issues remain after following these steps, please contact [Technical Support](#) for assistance.

When troubleshooting performance or connectivity issues with SSH with or without proxy it is useful to enable SSH debug logging on your remote host. There are several things that could go wrong during the connection process and the SSH debug log tells you how far the connection gets before failing. To enable debug logging on a host the SSH service should be started with the debug flag.

**Important:** A UNIX administrator should be tasked with these operations because if the box is a remote host with no local access then an incorrect action could leave you locked out of the machine if SSH is the only remote connection possible.

## Local Servers with Direct Access

The following example works best with a local connection. You can start the SSH service in verbose debug mode where the debug output is sent to a file on the local system and the service terminates after the remote connection ends with the following:

```
/usr/sbin/sshd -ddd 2> sshd-debug.log
```

## Remote Servers

Another way to configure SSH to log debugging information is to have syslog set up. You will need to add a syslog entry for the SSH service in `/etc/syslog.conf`:

```
*.* /var/log/sshd/sshd.log
```

And then configure the SSH service to have a log level of `DEBUG3`, which can be modified in `/etc/ssh/sshd_conf`:

```
LogLevel DEBUG3
```

Then restart the SSH service:

```
service sshd restart
```

**Note:** On some systems, the log may already be configured to output to `/var/log/auth.log`.

## Logging from the Client Perspective

You can also do logging from the perspective of the client connection to the remote host. This sort of logging helps you to understand what a normal successful connection should look like. To obtain logging from the client connection, you can run SSH in verbose mode.

```
ssh -vvv user@host
```

The debug information will be sent to the console. Or if you are using PuTTY, then you can right click the PuTTY window title after connecting to the remote host and selecting "Event Log".

## Understanding SSH Logging

### Example

The following is an example of standard debug output from PuTTY looks like the following:

1. The client begins by lookup up the hostname and see if the host is valid:

```
2016-01-07 12:23:57 Looking up host "192.168.1.60"
```

2. The client proceeds to make a TCP connection to the host:

```
2016-01-07 12:23:57 Connecting to 192.168.1.60 port 22
```

3. The client sends a message to the server saying what version of SSH we are using. In this example we are using SSH 2 over PuTTY v0.65:

2016-01-07 12:23:57 We claim version: SSH-2.0-PuTTY\_Release\_0.65

4. The server sends back a message saying what version of SSH they are using. In this example we are connecting to an Ubuntu Server running an SSH 2 over OpenSSH v6.6.1p1:

2016-01-07 12:23:57 Server version: SSH-2.0-OpenSSH\_6.6.1p1 Ubuntu-2ubuntu2

2016-01-07 12:23:57 We believe remote version has SSH-2 channel request bug

5. The client confirms the type of connection that can be used with the server. In this example the communications will be done using SSH 2:

2016-01-07 12:23:57 Using SSH protocol version 2

6. The client begins the key exchange process and agrees on using Diffie-Hellman Group Exchange 256:

2016-01-07 12:23:57 Doing Diffie-Hellman group exchange

2016-01-07 12:23:57 Doing Diffie-Hellman key exchange with hash SHA-256

7. The server replies with their host key fingerprint information to identify its identity and aide in the prevention of Man in the Middle attacks. In this example the server is presenting an RSA 2048-bit key:

2016-01-07 12:23:57 Host key fingerprint is:

2016-01-07 12:26:53 ssh-rsa 2048 e0:d4:94:36:e9:20:fd:e3:58:ad:8d:4c:4a:1f:27:e8

8. The client initializes the transport layer encryption using AES-256 with SDCTR enabled and uses SHA-256 for message authentication:

2016-01-07 12:26:53 Initialized AES-256 SDCTR client->server encryption

2016-01-07 12:26:53 Initialized HMAC-SHA-256 client->server MAC algorithm

9. The server initializes the transport layer encryption using AES-256 with SDCTR enabled and uses SHA-256 for message authentication:

2016-01-07 12:26:53 Initialized AES-256 SDCTR server->client encryption

2016-01-07 12:26:53 Initialized HMAC-SHA-256 server->client MAC algorithm

10. The client sends a password.

2016-01-07 12:27:12 Sent password

11. The server validates the password and granted access to the user:

2016-01-07 12:27:12 Access granted

12. The session opens a shell for user interaction:

2016-01-07 12:27:12 Opening session as main channel

2016-01-07 12:27:12 Opened main channel

2016-01-07 12:27:12 Allocated pty (ospeed 38400bps, ispeed 38400bps)

2016-01-07 12:27:12 Started a shell/command

## Confirming Proper Operation

Things to look for in an SSH log:

- Verifies the host IP address that you are connecting to.
- Verifies the port is correct for the address that you are connecting to.
- Verifies that you are not using an outdated SSH client.

- Verifies the SSH protocol you are using.
- Verifies what group exchange algorithm is being used.
- Verifies the server identity using the presented fingerprint. If the fingerprint is not expected then there may be malicious server between you and the remote host you want to connect to. Alert the administrator to verify if the host key has changed or if there is another issue.
- Verifies the transport layer and HMAC ciphers being used.
- Verifies that the password or key being sent is accepted by the server.
- If a connection does not open, it notes what the last successful step was and then what the next failed step is to find what the issue is.
- If using Secret Server proxy, it is useful to collect the client-to-proxy SSH log and then the proxy-to-remote-host log from the remote server.



Secret Server supports operating systems in a VMware virtual machine environment in an identical manner as it runs on any other major x86-based systems without initially requiring reproduction of issues on native hardware. Should Delinea Support suspect that the virtualization layer is the root cause of an incident, you must contact VMware support provider to resolve the VMware issue. While Delinea products are expected to function properly in a VMware virtual environment, there may be performance implications that can invalidate Secret Server sizing and recommendations.

**Note:** Migrating between CPU families or versions will require re-activation.

## Overview

Beginning with Windows 10 version 1607 (Creator's Update) and Windows Server 2016, the default GPO security descriptor denies users [remote access to Security Account Manager \(SAM\)](#) with non-domain credentials, and therefore prevents remote heartbeat and password changes made by otherwise-authenticated local user accounts. Affected Windows local account secrets return "Access Denied" on a heartbeat or remote password change.

This article provides a script and instructions to address these "access denied" errors. The script modifies the default local group policy remote SAM access security descriptor to allow all local users on a specified machine remote SAM access after authentication. This script requires elevated PowerShell permissions.

**Note:** Adding an account to the local computer's Administrators group does not solve the problem.

On most systems, the Administrators group on the local machine is part of the "Network Access: Restrict clients allowed to make remote calls to SAM" security policy setting. Through testing, we determined that Windows currently treats this group as only the built-in administrator account for this configuration. Therefore, if you add another user to the Administrators group on the machine, that user will be unable to heartbeat since it is not the built-in administrator account. In addition, the built-in object, "Local account and a member of Administrators" does not allow a local account that is a member of Administrators to heartbeat for any account other than the built-in administrator account.

## Additional Requirements

For heartbeat to work correctly, make sure that the local or authenticated users are:

- *Not* in the "Deny access to this computer from the network" security policy
- *In* the "Access this computer from the network" security policy

## Remediation Options

**Option 1:** Creating a custom group and adding users to it (this is what the script does for users on the endpoint) then adding that group to the security setting to allow the user to heartbeat successfully. New local users need to be added to the custom group if they are created in the future.

**Option 2:** Adding a user individually to the security setting to allow the user to heartbeat successfully.

**Option 3:** Modifying the Default GPO: Adding "allow authenticated or local users" to the security setting. This allows all local users or all users who are authenticated to the machine to bypass this setting. This does require the PowerShell Script below. The drawback is that this allows all users to remotely access SAM, so long as they are authenticated.

**Option 4:** Create a heartbeat workaround for GPO "Network Access: Restrict Clients Allowed to Make Remote Calls to SAM." This is addressed in the last section. This is for situations where the GPO needs to be completely bypassed.

## Option 3: Modifying the Default GPO

### PowerShell Script Description

This script adds a local non-privileged user group to the machine (a custom group name can be specified with the `-GroupName` parameter), adds all local users to the group, and then adds this group to the "Network Access: Restrict clients allowed to make remote calls to SAM" local group policy. This allows all local users within the group remote access to SAM after authentication, which is required for Secret Server heartbeat and password changing.

## Download

Extract the .ps1 script found here: [https://updates.thycotic.net/secretserver/support/PowerShell\\_Win10-HB-RPC-Fix/Win10-HbFix.zip](https://updates.thycotic.net/secretserver/support/PowerShell_Win10-HB-RPC-Fix/Win10-HbFix.zip) Run in an elevated PowerShell ISE session.

## Script Argument Help

### Command Prompt Help

For full help text, run:

```
> Get-Help C:\Script\Win10-HbFix.ps1 -Examples
```

### Parameters

#### -ComputerNames (string)

Specifies the computers on which the script runs (comma separated). If unspecified, the default is the local computer.

#### -Username (string)

Specifies a username of an account that has administrative permissions on the computer to add a local user group and modify the local group policy. You will be prompted for a password. Examples: Administrator Or TestDomain\AdminUser.

#### -GroupName (string)

Specifies a name for the SAM access local user group. If unspecified, the default group name is "Secret Server Remote SAM Access"

#### -ForceGPUUpdate

Specifies whether a group policy update should be forced for immediate effect following the script. (Otherwise Group Policy changes may take up to 120 minutes to take effect by default).

### Examples

```
> C:\Script\Win10-HbFix.ps1
```

 This example gives remote SAM access to all local users on the current machine. The current PowerShell credentials would be used for authentication.

```
> C:\Script\Win10-HbFix.ps1 -LogDir "D:\Win10-HbFix\log"
```

 This example changes the default output log path to D:\Win10-HbFix\log (default is [user temp directory]\log).

```
> C:\Script\Win10-HbFix.ps1 -ComputerNames "WINSERVER","TestDomain\SOMEMACHINE" -Username "TestDomain\Administrator"
```

 This example gives remote SAM access to all local users on the WINSERVER and TestDomain\SOMEMACHINE remote computers. The domain user "TestDomain\Administrator" credentials will be used. You would be prompted for a password.

```
> C:\Script\Win10-HbFix.ps1 -ComputerNames "D:\Win10MachineList.txt" -Username "TestDomain\Administrator"
```

This example gives remote SAM access to all local users on the remote computers listed in D:\Win10MachineList.txt (one machine per line). The domain user "TestDomain\Administrator" credentials will be used. You would be prompted for a password.

```
> C:\Script\Win10-HbFix.ps1 -ComputerNames "WINSERVER" -GroupName "Secret Server Group"
```

This example gives remote SAM access to all local users on the WINSERVER remote computer. The local group created will be named "Secret Server Group". Current PowerShell credentials would be used for authentication.

```
> C:\Script\Win10-HbFix.ps1 -ComputerNames "WINSERVER" -ForceGPUUpdate -Verbose
```

 This example gives remote SAM access to all local users on the WINSERVER remote computer, with verbose output. The current PowerShell credentials will be used for authentication. Group policy update

will be forced on WINSERVER for immediate effect.

## Related Articles and Resources

[Network access: Restrict clients allowed to make remote calls to SAM](#)

## Option 4: Creating a Heartbeat GPO Workaround

1. Make sure that **Admin > Scripts** is functional. Once you have it working, download, unzip, and run this script [HBWorkAroundScripts.zip](#).
2. Go to **Admin > Scripts**.
3. Add the HBWorkAroundScript and the HBWorkAroundPasswordChange scripts.
4. Test the first script. Add the appropriate `args[]` as needed. Add arguments 0-4 with no quotes or commas. Spaces are the argument separator and are required.
5. You should get a return of "True," such as this:



```
{ "PSComputerName": "WIN-33CNECA5VSJ.solar.local", "RunspaceId": "4b3d3fe8-5877-4500-825f-7b6f4062e014", "PSShowComputerName": "True" }
```

6. Navigate to **Admin > Remote Password Changing**.
7. Click the **Configure Password Changers** button. The Password Changers Configuration page appears.
8. Click the **New** button at the bottom.
9. Click the **Base Password Changer** dropdown list to select **PowerShell Script** as your password changer.
10. Type a name in the **Name** text box.
11. Click the **Save** button. The password change command page appears:

Test PC

Verify Password Changed Commands

Testing of PowerShell Scripts can be performed at Admin -> Scripts.

PowerShell Script

<select>

Script Args

Save

Hide Advanced Settings

SETTING	VALUE
Heartbeat Unknown Error to Unable to Connect Translation (regex)	
Attempt Password Change with new password when error contains (regex)	

Back

Configure Scan Template

View Audit

Password Change Commands

Testing of PowerShell Scripts can be performed at Admin -> Scripts.

PowerShell Script

<select>

Script Args

Save

12. Click the **PowerShell Script** dropdown list in the **Password Change Commands** section to select the script you ran earlier.

13. Add the appropriate tokens in the **Script Args** text box.

**Note:** See [Dependency Tokens](#) for a complete list.

12. Click the **Save** button. Your configuration should look like this:

HBWorkAroundChangerSAM

Verify Password Changed Commands

Testing of PowerShell Scripts can be performed at Admin -> Scripts.

PowerShell Script

HBWorkAroundScript

Script Args

`\${1}\$Username \${1}\$Password \$Machine \$Username \$Password

Password Change Commands

Testing of PowerShell Scripts can be performed at Admin -> Scripts.

PowerShell Script

HBWorkAroundPasswordChange

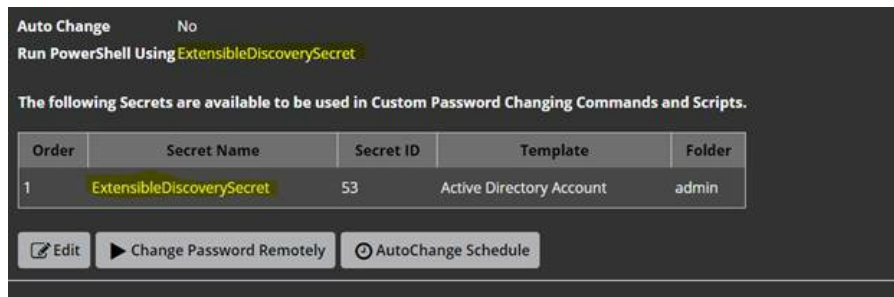
Script Args

`\${1}\$Username \${1}\$Password \$Machine \$Username \$NewPassword

13. Go to **Admin > Secret Templates**.

14. Select **Windows Account**.

15. Click the **Edit** button.
16. Click the **Copy Secret Template** button.
17. Click the **Configure Password Changing** button.
18. Click the **Edit** button.
19. Click the **Password Type to Use** dropdown list to select the password change you created earlier.
20. Create your windows secret using the custom template.
21. Once it is created, add your privileged and associated secret to the RPC tab as seen below. In that example we use the same one for the privileged and associated secret.



22. Run a heartbeat to confirm it works as desired.

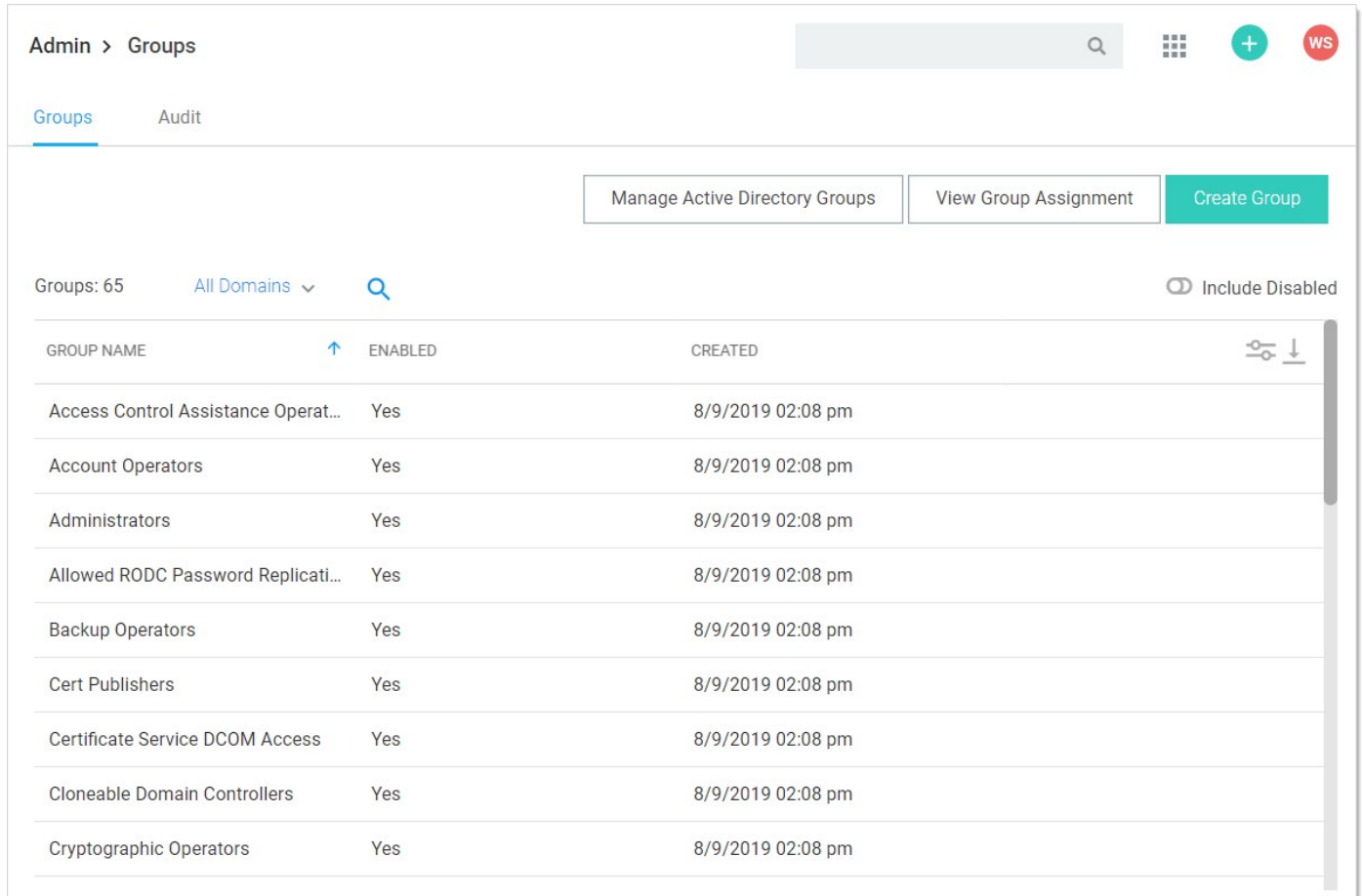
## User Groups

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server allows administrators to manage users through *user groups*. Users can belong to different groups and receive the sharing permissions, as well as roles, attributed to those groups. This setup simplifies the management of the permissions and roles that can be assigned to a user. Additionally, groups can be synchronized with Active Directory to further simplify management.

Group Administrators can also set another group or user as the group owners for a Secret Server local group. Group owners can manage membership just for that group. To assign the group owner:

1. Navigate to the **Groups** page:



The screenshot shows the 'Admin > Groups' page in the Delinea interface. The 'Groups' tab is active, and the 'Audit' tab is also visible. The page displays a list of groups with the following columns: GROUP NAME, ENABLED, and CREATED. The 'Groups' count is 65, and the 'All Domains' dropdown is set to 'All Domains'. The 'Include Disabled' checkbox is checked. The list of groups includes:

GROUP NAME	ENABLED	CREATED
Access Control Assistance Operat...	Yes	8/9/2019 02:08 pm
Account Operators	Yes	8/9/2019 02:08 pm
Administrators	Yes	8/9/2019 02:08 pm
Allowed RODC Password Replicati...	Yes	8/9/2019 02:08 pm
Backup Operators	Yes	8/9/2019 02:08 pm
Cert Publishers	Yes	8/9/2019 02:08 pm
Certificate Service DCOM Access	Yes	8/9/2019 02:08 pm
Cloneable Domain Controllers	Yes	8/9/2019 02:08 pm
Cryptographic Operators	Yes	8/9/2019 02:08 pm

2. Click the desired group in the list. The Group's page appears:



Group

Group Name

Test Group

Enabled

Yes

Created

8/12/2019

IP Address Restrictions

None

Group Owners

NAME

gamma.thycotic.com\Developers

admin

gamma.thycotic.com\Jonathan Thompson

gamma.thycotic.com\Roberto Hernandez

gamma.thycotic.com\Jonathan Lohoff

Jon Thompson

Mark

Nguyen

Will Spivey

David Lohoff

Members

There are no members.

Back

Edit

Change IP Restrictions

Configure Secret Template Permissions

View Audit

View Group Assignment Audit

View IP Address Audit

3. Click the **Edit** button. The Group Edit page appears:

## Group Edit

Group Name

Enabled
☒

Managed By

### Members

### All Users

admin  
appaccount1  
gamma.thycotic.con  
gamma.thycotic.con  
gamma.thycotic.con  
gamma.thycotic.con  
gamma.thycotic.con  
gamma.thycotic.con  
gamma.thycotic.con  
gamma.thycotic.con  
gamma.thycotic.con

<<  
<  
>  
>>

Save

Cancel

4. Click the **Managed By** dropdown list to select the owner.

5. Click the **Save** button.

**Note:** Very commonly, the group owner is managed by Active Directory, not Secret Server:

Q


Group


Group Name	gamma.thycotic.com\Administrators
Enabled	Yes
Created	8/9/2019
IP Address Restrictions	None
Group Owners	Managed by Active Directory


Members


| Show All < 1 to 15 of 17 >

NAME
gamma.thycotic.com\David Lindberg
gamma.thycotic.com\Thomas Thomsen
gamma.thycotic.com\Christopher Taylor
gamma.thycotic.com\Robert Nichols
gamma.thycotic.com\David Hoffmann


 Back

 Change IP Restrictions

 Configure Secret Template Permissions

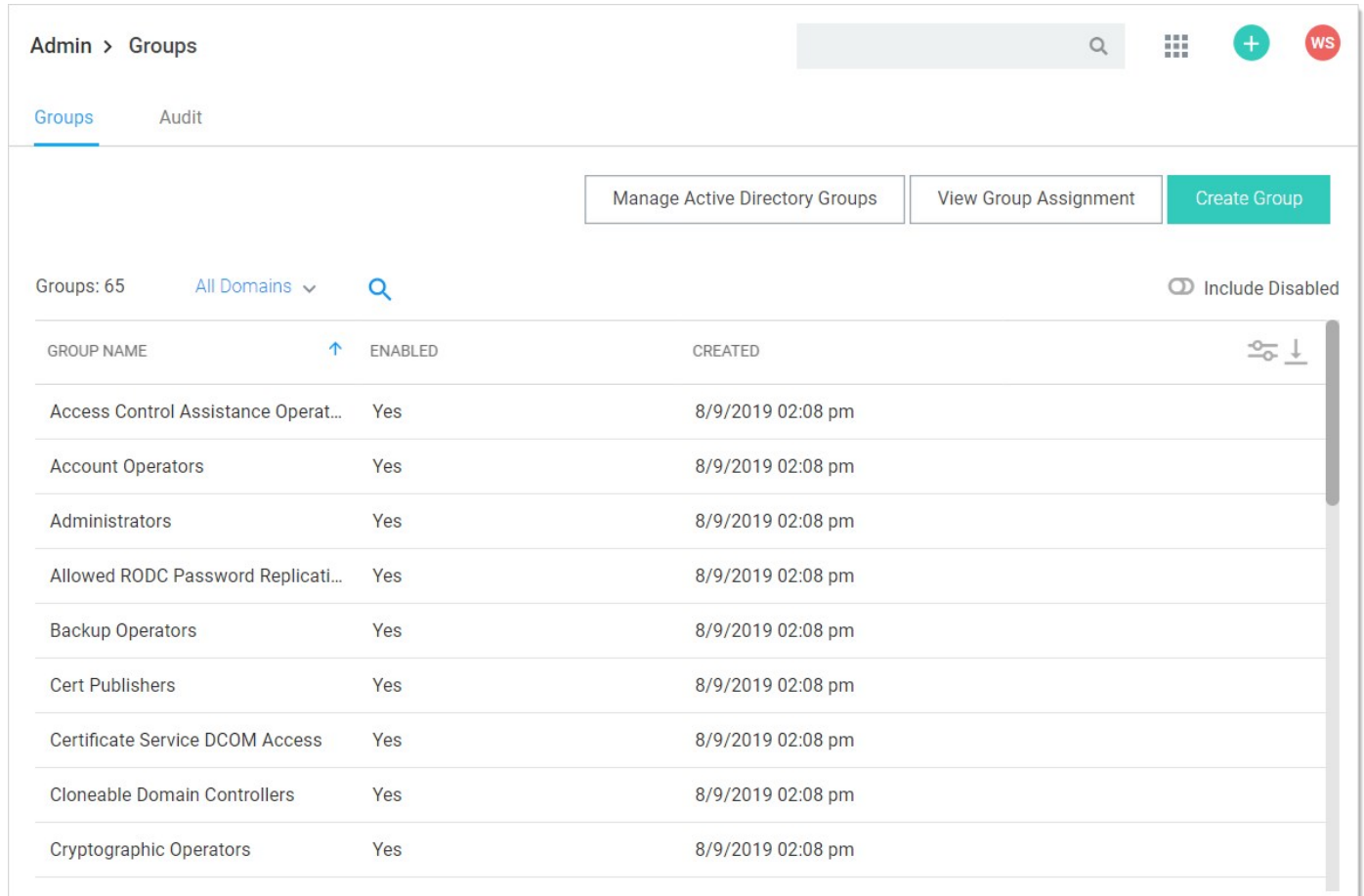
 View Audit

 View Group Assignment Audit

 View IP Address Audit

On the Group Assignment page, users can be added and removed from the group.

1. Navigate to the **Groups** page:



Admin > Groups

Groups Audit

Manage Active Directory Groups View Group Assignment Create Group

Groups: 65 All Domains  Include Disabled

GROUP NAME	ENABLED	CREATED
Access Control Assistance Operat...	Yes	8/9/2019 02:08 pm
Account Operators	Yes	8/9/2019 02:08 pm
Administrators	Yes	8/9/2019 02:08 pm
Allowed RODC Password Replicati...	Yes	8/9/2019 02:08 pm
Backup Operators	Yes	8/9/2019 02:08 pm
Cert Publishers	Yes	8/9/2019 02:08 pm
Certificate Service DCOM Access	Yes	8/9/2019 02:08 pm
Cloneable Domain Controllers	Yes	8/9/2019 02:08 pm
Cryptographic Operators	Yes	8/9/2019 02:08 pm

2. Click the **View Group Assignment** button. The Group Assignment page appears:

## Group Assignment

[By Group](#)
[By User](#)

Group
Duo Approvers

Assigned

Unassigned

<<

<

>

>>

← Back

- Use the arrow buttons to move users into and out of the current group. When you have finished with your changes, click the **Save Changes** button and your new group members are added.

Alternatively, you can click the By User tab and manage the groups for a single user:

## Group Assignment

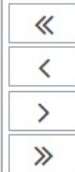
By Group By User

User

### Assigned

### Unassigned

Duo Approvers  
Test Group  
TJWForWorkflow



 Back

**Note:** If the group was created using Active Directory synchronization, this group is not be editable. See [Active Directory Synchronization](#).

You can create and edit groups from the Groups page. You can get to the Groups page by navigating to **Admin > Groups**

Admin > Groups

+

WS

Groups

Audit

Manage Active Directory Groups

View Group Assignment

Create Group

Groups: 65

All Domains

Q

☐ Include Disabled

GROUP NAME	↑	ENABLED	CREATED	
Access Control Assistance Operat...		Yes	8/9/2019 02:08 pm	
Account Operators		Yes	8/9/2019 02:08 pm	
Administrators		Yes	8/9/2019 02:08 pm	
Allowed RODC Password Replicati...		Yes	8/9/2019 02:08 pm	
Backup Operators		Yes	8/9/2019 02:08 pm	
Cert Publishers		Yes	8/9/2019 02:08 pm	
Certificate Service DCOM Access		Yes	8/9/2019 02:08 pm	
Cloneable Domain Controllers		Yes	8/9/2019 02:08 pm	
Cryptographic Operators		Yes	8/9/2019 02:08 pm	

By either selecting an already existing group from the list, or clicking **Create Group**, you can modify or add the group.

**Note:** To add groups and the users inside them from your Active Directory setup, you can use Active Directory synchronization (see [Active Directory Synchronization](#)).

## User Teams

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

With Secret Server teams, administrators can create special groups called *teams* to restrict what users can see. A team bundles users and groups to assign them the same rules as to what other users and sites are visible to them. For example, a managed service provider could isolate their customers from seeing other customer's user accounts or a large company could "firewall" their users by department. Site visibility can also be restricted by teams.

**Note:** Teams are designed for shared secrets and do not apply to Secret Server administration as a whole.

**Note:** Users *without* any team-related permissions are subject to team restrictions. The Unrestricted by Teams permission must be present to remove them. That is why the User role comes with that permission by default. See [Team-Related Permissions](#).

**Note:** Team restrictions are designed for regular users so granting additional administrative permissions can override the restriction. This applies to group owners, so if a user is assigned as a group owner, that user will be able to see all users when assigning members.

Team visibility and management are controlled by user roles. Those roles, and by extension users, are governed by the following team-related role permissions:

- **Administer Teams:** Users can create, edit, and view all teams.
- **No Teams-related Permissions:** Users can only view other users within their team.
- **Unrestricted by Teams:** Users can view all users, groups, and sites, regardless of Team affiliation. Essentially, teams do not exist for the users with this permission, and the Teams page is not available to them. The default user role has this permission.
- **View Teams:** Users can view all teams. This is essentially a read-only Administer Teams.

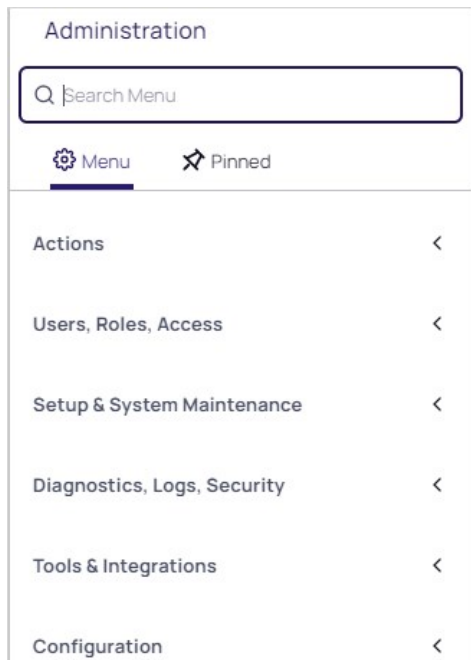


To set up Secret Server to use the team management feature:

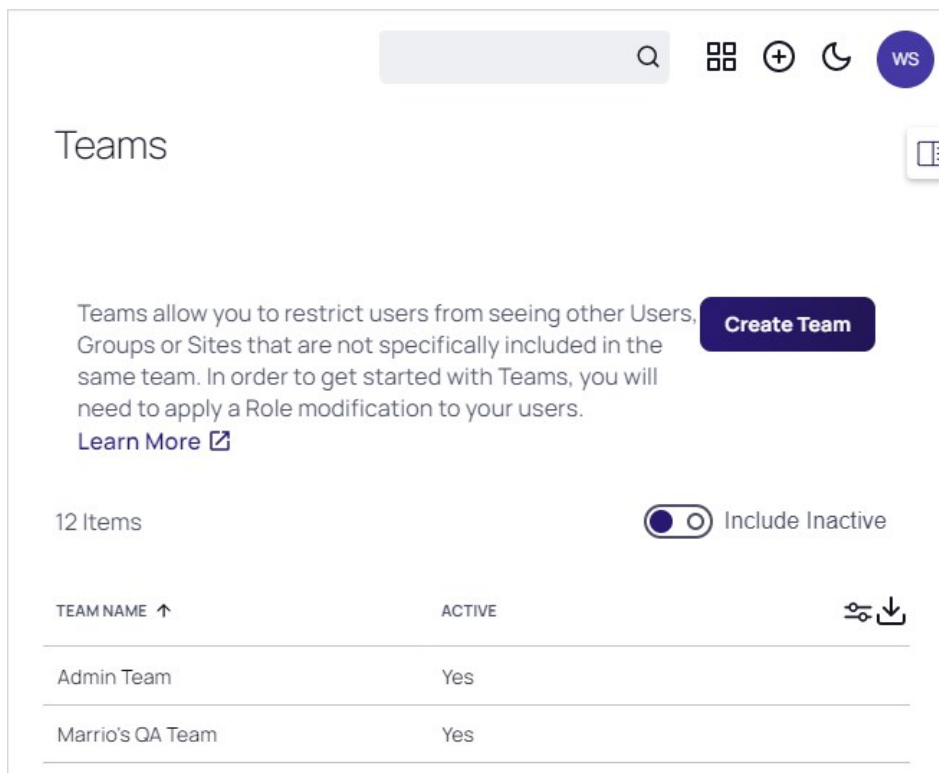
1. Create a new role called *Team Limited User*.
2. Assign all permissions of the standard user role except *Unrestricted by Teams*.
3. Assign users you want restricted by teams to this role.
4. Remove the User role from their account.

**Note:** If you want all new users restricted by team, you can configure Secret Server to assign the Team Limited User role as the default upon creation of a new user.

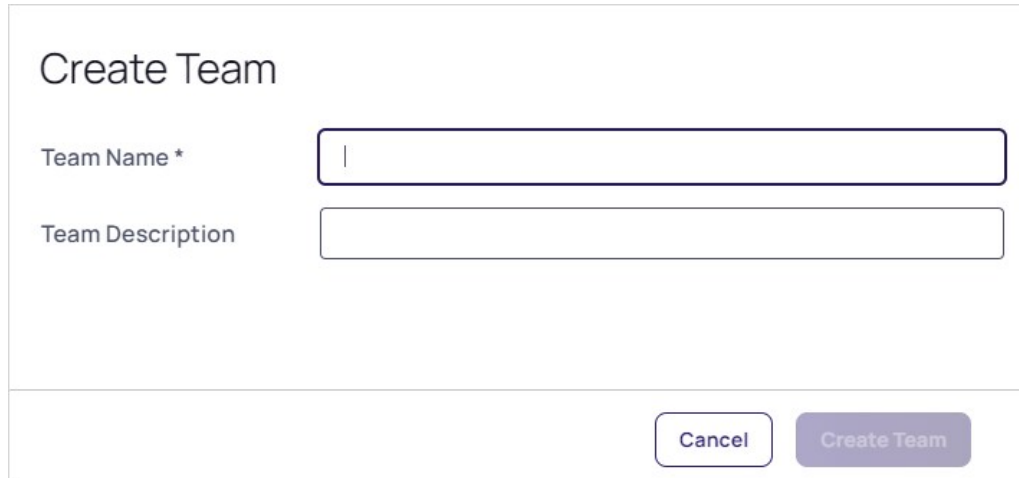
1. Navigate to **Administration**. The Admin Side Panel appears:



2. Click **Users, Roles, Access** and select **Teams** in the list. The Teams page appears:



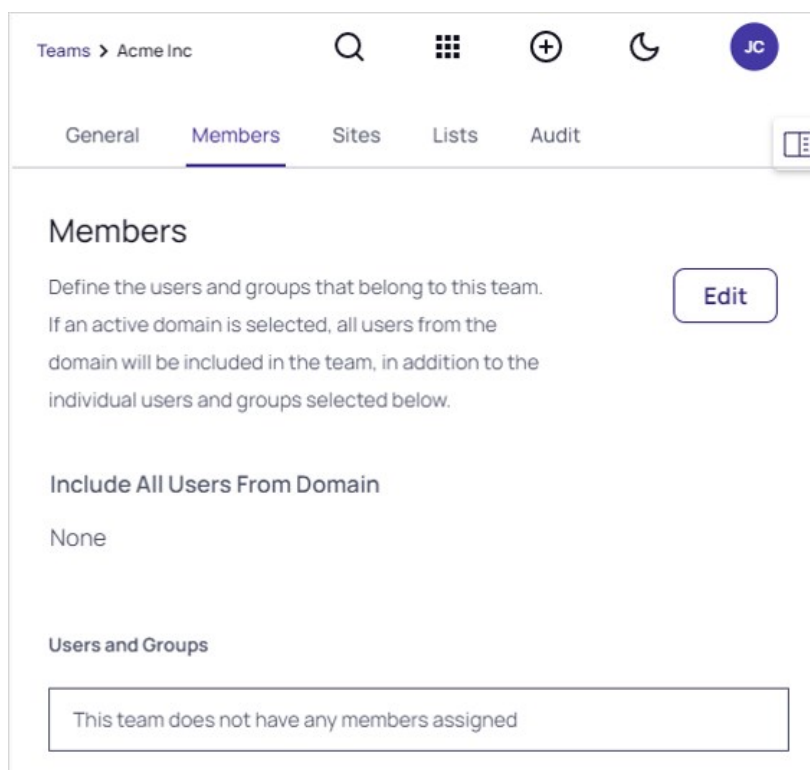
- Click the **Create Team** button. The Create Team popup page appears:



The 'Create Team' popup form contains the following elements:

- Create Team**: Main title of the form.
- Team Name \***: A text input field with a cursor inside.
- Team Description**: A larger text input field.
- Buttons**: 'Cancel' and 'Create Team' buttons at the bottom right.

- Type the name for the new team in the **Team Name** text box.
- (Optional) Type a description in the **Team Description** text box.
- Click the **Create Team** button. The new team's Members tab appears:



The 'Members' page for a team (Acme Inc) displays the following components:

- Navigation**: Breadcrumbs 'Teams > Acme Inc', search icon, grid icon, add icon, moon icon, and user profile 'JC'.
- Tabs**: 'General', 'Members' (active), 'Sites', 'Lists', 'Audit'.
- Members Section**:
  - Members**: Section header.
  - Instructions**: 'Define the users and groups that belong to this team. If an active domain is selected, all users from the domain will be included in the team, in addition to the individual users and groups selected below.'
  - Edit**: Button to edit members.
  - Include All Users From Domain**: Section header.
  - None**: Selection option.
  - Users and Groups**: Section header.
  - Message**: 'This team does not have any members assigned' in a box.

- Click the **Edit** button. An Add Groups / Users section appears:

## Members

Define the users and groups that belong to this team. If an active domain is selected, all users from the domain will be included in the team, in addition to the individual users and groups selected below.

Include All Users From Domain

Search or pick one

Users and Groups

Add

This team does not have any members assigned

Cancel

Save

8. **Either** to include all users in a domain, click the first **Include All Users from Domain** dropdown list to select a domain. This only appears if you have domains available.

**Or** to add individual users:

1. Click the **Add** button. The Users and Groups popup appears:

## Users & Groups

Search...

All Domains Users & Groups

0 selected

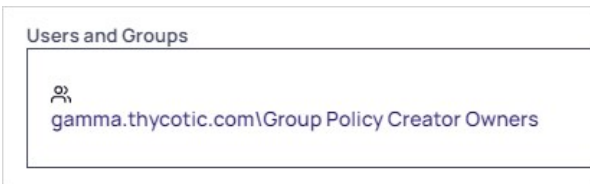
☐ #symbolgroup (testparent.thycotic.com)  
☐ (lol) (testparent.thycotic.com)  
☐ /groups  
☐ \ leading spaces (testparent.thycotic.com)  
☐ \_test  
☐ a1  
☐ a10  
☐ a11

Cancel

Add

2. If needed, type the name of desired users or groups in the search box.
3. Click to select the check boxes for the desired users or groups.

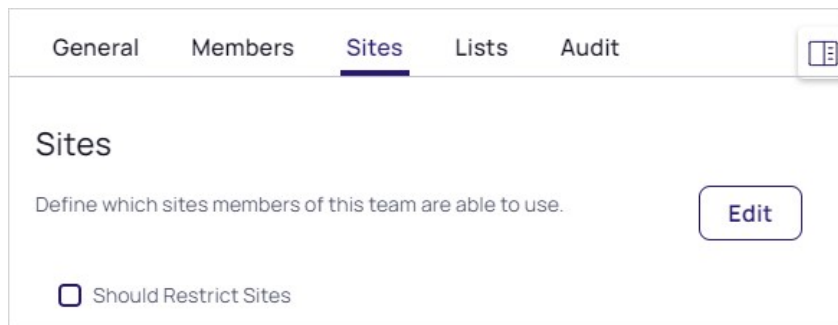
4. Click the **Add** button. The popup disappears, and your choices appear in the Users and Groups box:



The screenshot shows a box titled "Users and Groups". Inside the box, there is a user icon and the text "gamma.thycotic.com\Group Policy Creator Owners".

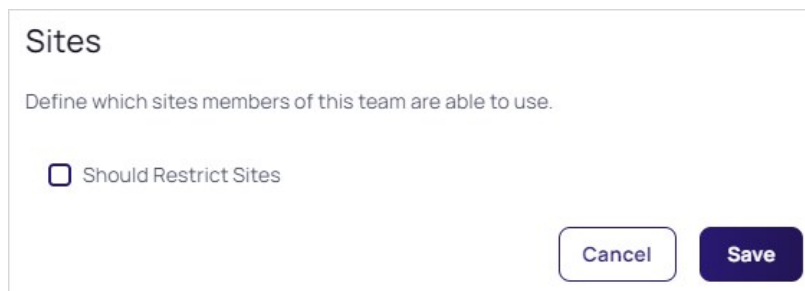
9. Click the **Save** button.

10. Click the **Sites** tab:



The screenshot shows the "Sites" tab selected in a configuration interface. The tabs are "General", "Members", "Sites", "Lists", and "Audit". The "Sites" tab is active. Below the tabs, the title "Sites" is displayed. Underneath, it says "Define which sites members of this team are able to use." and there is an "Edit" button. At the bottom, there is a checkbox labeled "Should Restrict Sites" which is currently unchecked.

11. Click the **Edit** button. The page becomes editable:



The screenshot shows the "Sites" tab in the configuration interface, now in an editable state. The title "Sites" is at the top. Below it, the text "Define which sites members of this team are able to use." is present. There is a checkbox labeled "Should Restrict Sites" which is unchecked. At the bottom right, there are two buttons: "Cancel" and "Save".

12. Click to select the **Should Restrict Sites** check box. A Site dropdown list appears:

## Sites

Define which sites members of this team are able to use.

☒ Should Restrict Sites

Allowed Sites

Add Site \*

Search or pick one

Cancel

Save

- Click the **Add Site** list to select a site to restrict the team to. The selected site appears in the Allowed Sites box:

## Sites

Define which sites members of this team are able to use.

☒ Should Restrict Sites

Allowed Sites

Gamma-Engines
Remove

Add Site \*

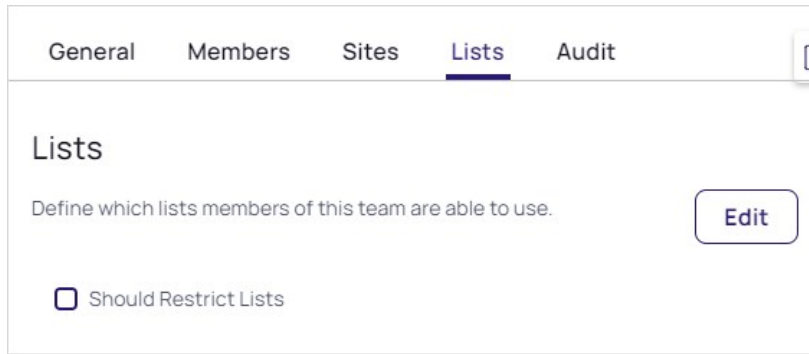
Search or pick one

Cancel

Save

- Click the **Save** button.

- Click the **Lists** tab:



General Members Sites **Lists** Audit

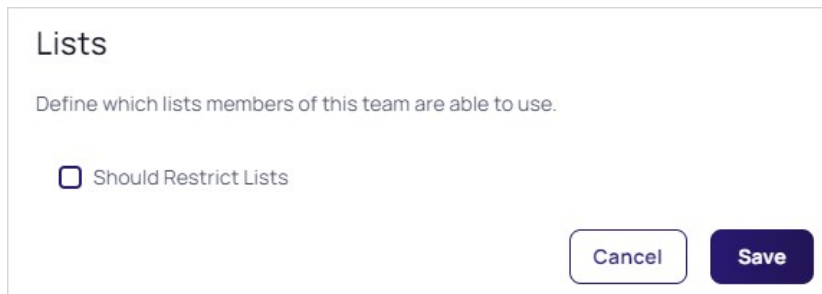
## Lists

Define which lists members of this team are able to use.

☐ Should Restrict Lists

[Edit](#)

16. Click the **Edit** link. The page becomes editable:



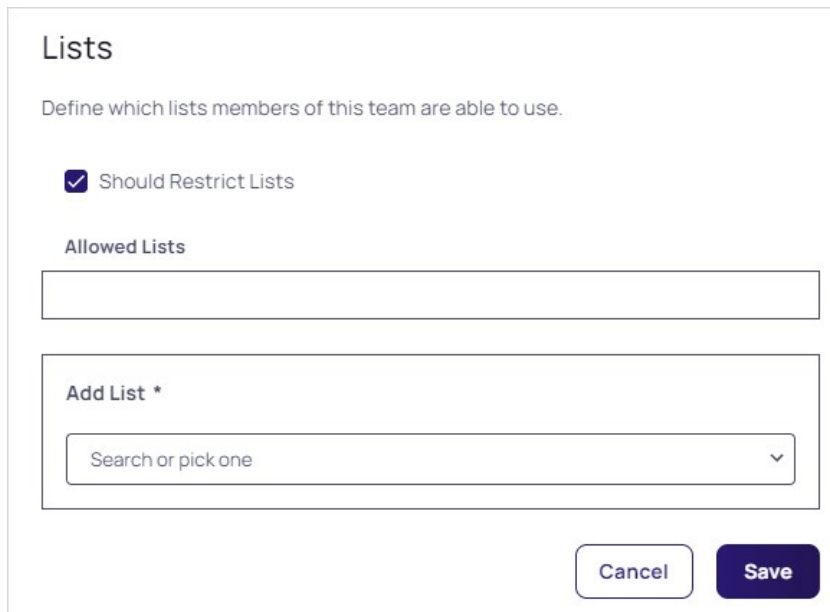
## Lists

Define which lists members of this team are able to use.

☐ Should Restrict Lists

[Cancel](#) [Save](#)

17. Click the **Should Restrict Lists** check box.



## Lists

Define which lists members of this team are able to use.

☒ Should Restrict Lists

Allowed Lists

Add List \*

[Cancel](#) [Save](#)

18. Click the **Add List** dropdown list to select what lists the team members have access to. The chosen list appears in the Allowed Lists box:

General

Members

Sites

Lists

Audit

## Lists

Define which lists members of this team are able to use.

☒ Should Restrict Lists

Allowed Lists

Test

Remove

Add List \*

Search or pick one

Cancel

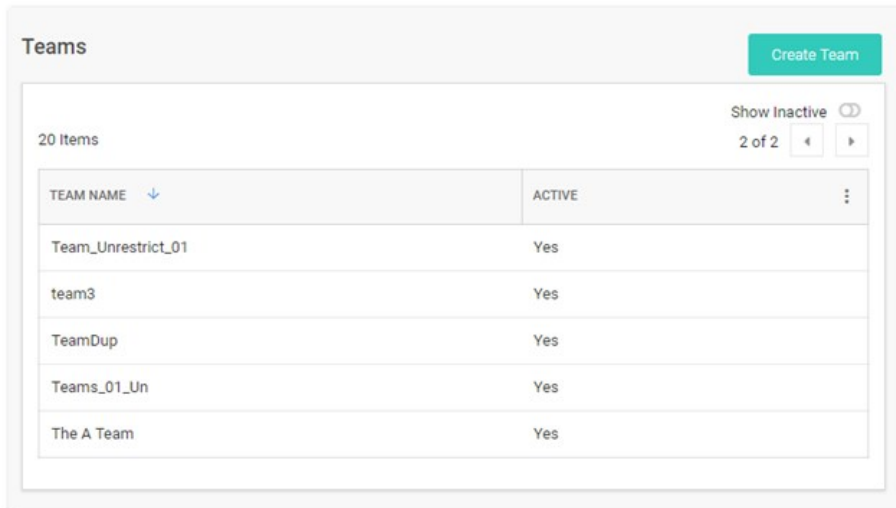
Save

19. Repeat the process for any additional lists.
20. Click the **Save** button.



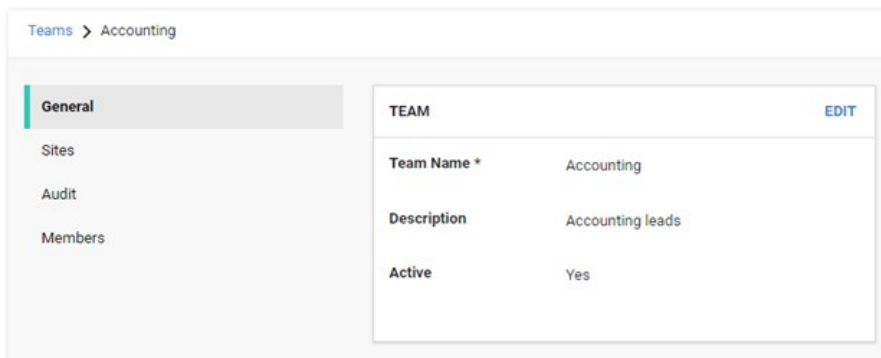
**Note:** You cannot delete teams because of auditing restrictions.

1. In Secret Server, click the **Admin** menu item. The Administration page appears.
2. Click the **Teams** button in the list. The Teams page appears:



TEAM NAME	ACTIVE
Team_Unrestrict_01	Yes
team3	Yes
TeamDup	Yes
Teams_01_Un	Yes
The A Team	Yes

3. Click the table row for the desired team. That team's page appears:



Teams > Accounting

General

Sites

Audit

Members

TEAM

EDIT

Team Name \*

Accounting

Description

Accounting leads

Active

Yes

4. On the **General** page, click the **Edit** button. The tab becomes editable:

**TEAM**

Team Name \*

Accounting

Description

Accounting leads

Active

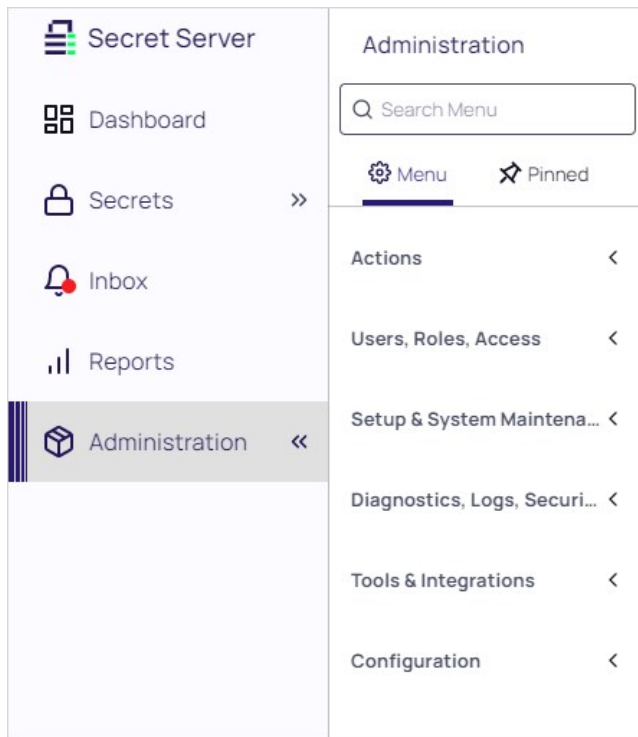
☒

Cancel

Save

5. Click the **Active** check box to deselect it.
6. Click the **Save** button. The team is deactivated.

1. Navigate to **Administration**. The Admin Side Panel appears:



2. Click **Users, Roles, Access** and select **Teams** in the list. The Teams page appears:

WS

Teams

Teams allow you to restrict users from seeing other Users, Groups or Sites that are not specifically included in the same team. In order to get started with Teams, you will need to apply a Role modification to your users.

Learn More

Create Team

12 Items

☒ Include Inactive

TEAM NAME ↑	ACTIVE	
Admin Team	Yes	
Marrio's QA Team	Yes	

3. Click the table row for the desired team. That team's page appears on the General tab:

General Members Sites Lists Audit

Team

Teams allow you to restrict users from seeing other Users, Groups or Sites that are not specifically included in the same team. In order to get started with Teams, you will need to apply a Role modification to your users.

Learn More

Team Name \*

Winners

Description

Folks That Win

Active \*

Yes

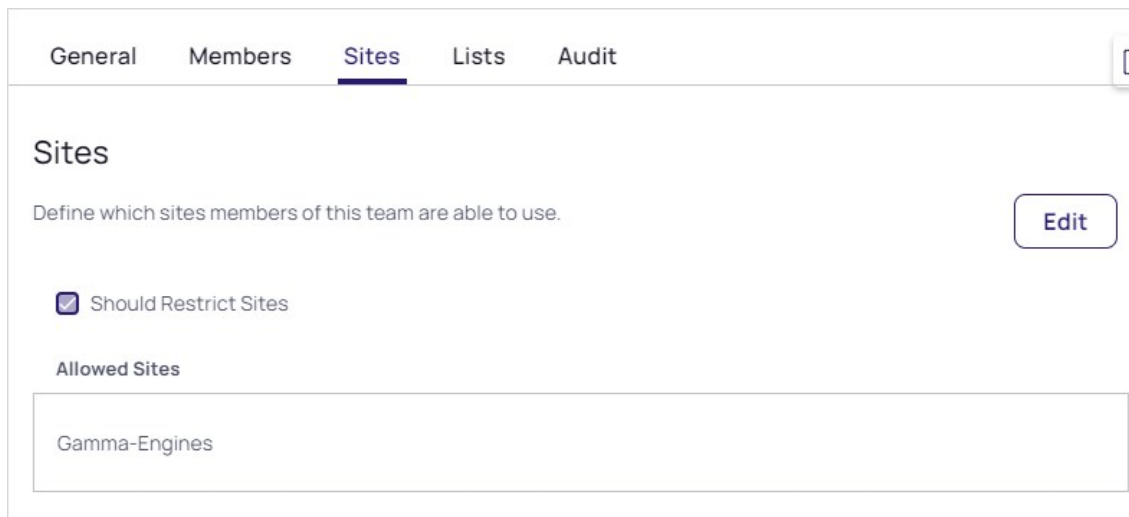
Edit

4. Click the **Edit** button to change:

- The team name
- The team's description
- The team's status

5. To restrict the visible sites:

1. Click the **Sites** tab:



General Members **Sites** Lists Audit

## Sites

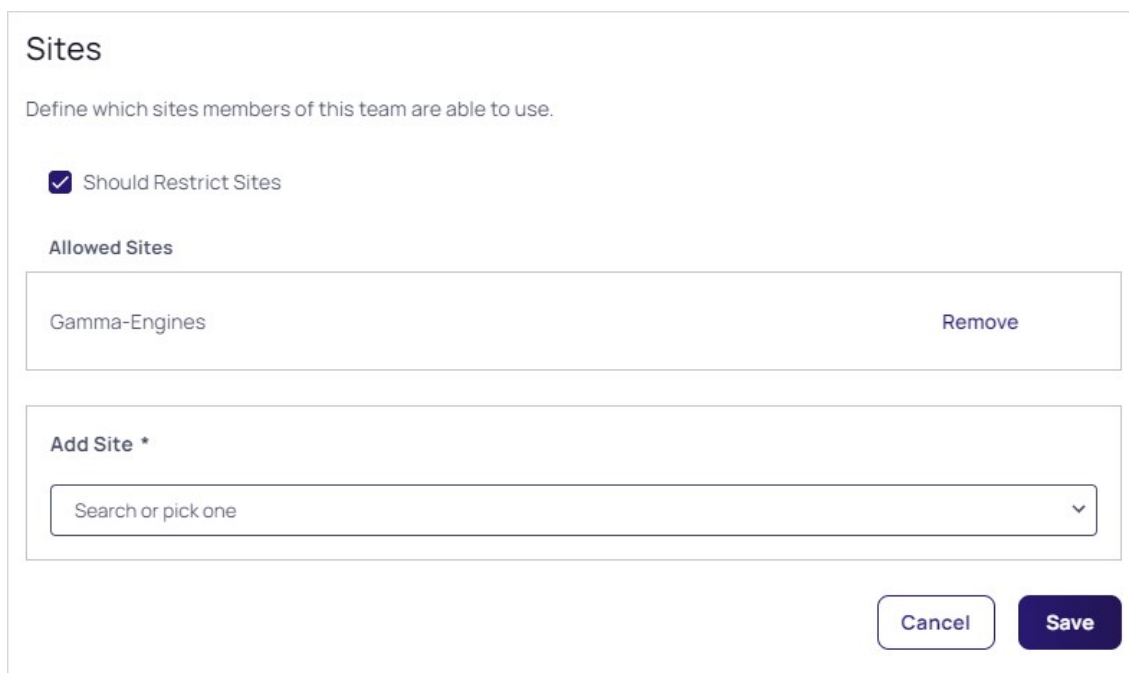
Define which sites members of this team are able to use. [Edit](#)

☒ Should Restrict Sites

**Allowed Sites**

Gamma-Engines
---------------

2. Click the **Edit** button. The page becomes editable:



## Sites

Define which sites members of this team are able to use.

☒ Should Restrict Sites

**Allowed Sites**

Gamma-Engines	<a href="#">Remove</a>
---------------	------------------------

**Add Site \***

Search or pick one ▼

[Cancel](#) [Save](#)

3. If necessary, click to select the **Should Restrict Sites** check box.
4. Click the **Remove** button next to any sites you want to remove.
5. Click the **Add Site** dropdown list to select sites you desire to add. The selected site appears in the Allowed Sites table:

Allowed Sites

Gamma-Engines	Remove
Omega-Engines	Remove

6. Click the **Save** button.

6. To edit the team's member users or groups:

1. Click the **Members** tab:

General **Members** Sites Lists Audit

## Members

Define the users and groups that belong to this team. If an active domain is selected, all users from the domain will be included in the team, in addition to the individual users and groups selected below.

Include All Users From Domain None

### Users and Groups

gamma.thycotic.com\Group Policy Creator Owners

2. Click the **Edit** button. The page becomes editable:

## Members

Define the users and groups that belong to this team. If an active domain is selected, all users from the domain will be included in the team, in addition to the individual users and groups selected below.

Include All Users From Domain Search or pick one

### Users and Groups

gamma.thycotic.com\Group Policy Creator Owners

Remove

Cancel

Save

3. **Either** to include all users in a domain, click the first **Include All Users from Domain** dropdown list to select a domain. This

only appears if you have domains available.

**Or** to add individual users:

1. Click the **Add** button. The Users and Groups popup appears:

**Users & Groups**

Search...

All Domains ▾ Users & Groups ▾

0 selected

- ☐ #symbolgroup (testparent.thycotic.com)
- ☐ (lol) (testparent.thycotic.com)
- ☐ /groups
- ☐ \ leading spaces (testparent.thycotic.com)
- ☐ \_test
- ☐ a1
- ☐ a10
- ☐ a11

Cancel Add

2. Click the unlabeled domains dropdown list to select the desired domain.
3. If needed, type the name of desired users or groups in the search box.
4. Click to select the check boxes for the desired users or groups.
5. Click the **Add** button. The popup disappears, and your choices appear in the Users and Groups box:

**Users and Groups**

Add

- gamma.thycotic.com\Group Policy Creator Owners Remove
- gamma.thycotic.com\Backup Operators Remove

Cancel Save

6. Click the **Save** button.
7. Repeat the process for additional users and groups to add.

8. Click the **Remove** button next to a user or group to delete it.
  9. Click the **Save** button.
7. View events for the team using its audit trail:

1. Click the **Audit** tab:



General

Members

Sites

Lists

Audit

DATE ↓	NAME	ACTION	DETAILS	 
8/10/2022 12:44 PM	gamma.thycotic.com\...	Update Site Map		
8/10/2022 12:29 PM	gamma.thycotic.com\...	Edit	ShouldRestrictLists: f...	
8/10/2022 12:29 PM	gamma.thycotic.com\...	UPDATE CATEGORIZE...	+ Test	
8/10/2022 12:26 PM	gamma.thycotic.com\...	Update Site Map	+ Gamma-Engines	
8/10/2022 12:26 PM	gamma.thycotic.com\...	Edit	ShouldRestrictSites: f...	
8/10/2022 12:23 PM	gamma.thycotic.com\...	Update Membership		
8/10/2022 12:22 PM	gamma.thycotic.com\...	Update Membership	+ gamma.thycotic.co...	
8/10/2022 12:17 PM	gamma.thycotic.com\...	Update Membership		
8/10/2022 12:11 PM	gamma.thycotic.com\...	Create	TeamName: Winners; ...	

2. Audit events occur when:

- The team is created
- General tab: name, description, or active status is changed
- Sites tab: restrictions are added, removed, or changed
- Members: users or groups are added or removed



Users can view other users not in their teams if that user already had a connection, such as a shared secret, with the other user prior to setting up the team restrictions.

The API does not restrict who can be assigned if they use the known group ID of a user or group not in their team. This is designed so secret permissions can be saved across teams without removing the permissions of another team.

1. Navigate to **Admin** > **See All**. The Administration page appears:

What are you looking for?

Search for an admin option



[Simplified View](#) ▾



## Actions

Secret Server features that perform important jobs



## Setup & System Maintenance

Setup your Secret Server system and keep it running with Licensing, Backups, Imports, Networking options, and more



## Users, Roles, Access

These features help you organize users & permission settings within Secret Server



## Diagnostics, Logs, Security

Reference options for diagnostics, logs, and security features



## Tools & Integrations

Find Secret Server tools and other product integrations here

2. Type and then click **Users** in the search text box. The View User page appears:

## View User

User Name	[REDACTED]
Display Name	[REDACTED]
Email Address	[REDACTED]@thycotic.com
Domain	Local
Two Factor	< None >
Enabled	Yes
Locked Out	No
Application Account	No

### IP Address Restrictions

None

Restricted By Team	No
--------------------	----

You can see if the user belongs to a team, and if so, what teams the user belongs to. If the Restricted by Team line says *No*, it means the user has been granted the Unrestricted by Teams permission, which means the user can view all users, groups, and sites.

## Users

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Bulk operations on users can also be performed from the **Users** page. Select one or more users using the check boxes beside the **User Name** column, or select all or none by toggling the check box in the header row. Once the appropriate users have been selected, use the Bulk Operation list at the bottom of the grid to select an action. Bulk operations on users currently include enabling or disabling user access, as well as configuring users for email or RADIUS two-factor authentication.

User settings can be modified by clicking the username in the **User Name** column on the **Users** page. Search for users using the search bar at the top of the grid. To show users that are marked inactive, check the **Show Inactive Users** box below the grid.

To manually create a single user, navigate to **Administration > Users** and click the **Create New** button. On the subsequent page, you can enter the relevant information for a user.

**Note:** To add many users from your Active Directory setup, you can use Active Directory synchronization (see [Active Directory Synchronization](#)).



You cannot delete users per se because of auditing requirements; however, deactivating the user from the [User Settings page](#) accomplishes the same thing. See [Removing Deactivated User PII](#) for eliminating all traces of a deactivated user.

The following settings are found in the **Administration > Configuration** page, inside the **Local User Passwords** tab. These settings apply to users that were created manually, not users brought into Secret Server through Active Directory synchronization:

- **Allow Users to Reset Forgotten Passwords:** If enabled, the "Forgot your password?" link appears on all users' login screens. Clicking on this link prompts the user to enter the email address that is associated with the user's Secret Server account. If the email address is found, then an email containing a link for password reset is sent. Note that this only works for local user accounts and not for Active Directory accounts. Secret Server
- **Enable Local User Password Expiration:** When enabled, Secret Server forces a password change for a user after a set interval. After the interval time has elapsed, the next time the user attempts to log in, they are prompted for the old password, a new password, and a confirmation of the new password. The new password is validated against all the password requirements. Newly created local users are also be prompted to change their password upon logging into Secret Server for the first time when this setting is enabled.
- **Enable Local User Password History:** If enabled, this prevents a user from reusing a password. For example, if set to "20 Passwords", this would prevent the user from using a password they have used the previous 20 times. This in conjunction with "Enable Minimum Local Password Age" helps ensure that users are using a new and unique password frequently rather than recycling old passwords.
- **Enable Minimum Local User Password Age:** If enabled, the value for this setting reflects the minimum amount of time that needs to elapse before a password can be changed. This prevents a user from changing their password too frequently, which allows them to quickly re-use old passwords.
- **Local User Password is valid for:** If enabled, this is the interval that a local user password is valid before it must be changed (see "Enable Local User Password Expiration" setting for details). If this setting is disabled, the entered value displays as "Unlimited".
- **Lowercase Letters Required for Passwords:** Force all user Secret Server login passwords to contain at least one lowercase letter.
- **Minimum Password Length:** Force all user Secret Server login passwords to contain a set minimum number of characters.  
  
**Note:** The maximum number of characters is 1024.
- **Numbers Required for Passwords:** Force all user Secret Server login passwords to contain at least one number.
- **Symbols Required for Passwords:** Force all user Secret Server login passwords to contain at least one symbol, such as !@#%&\*.
- **Uppercase Letters Required for Passwords:** Force all user Secret Server login passwords to contain at least one uppercase letter.

## Overview

General Data Protection Regulation (GDPR) adherence raises the possibility that Secret Server users may make a data removal claim against a Secret Server administrator. This requires removing any personally identifiable information (PII) in Secret Server for that individual.

To address this, Secret Server has a button that automatically removes most PII for any deactivated user.

## Removing the PII

1. Remove the user from Active Directory (AD). See [Active Directory Considerations](#) below.
2. In Secret Server, go to **Admin > Users**. The Users page appears.
3. Click the user name link for the desired user. The View User Page appears.
4. Click the **Remove Personally Identifiable Information** button. A confirmation dialog box appears.

**Important:** Once you confirm, the user cannot log on to Secret Server. Click the Cancel button if you are not positive this is what you want to do.

Clicking the **OK** button will change these to random values or set them to null:

- Username
- Display name
- Password
- Personal folder name
- Personal group name
- RADIUS username

In addition:

- The user's AD GUID is cleared
- The user's email address is removed from their record
- The user's name is replaced with "<redacted>" in event audits where it can be clearly identified.
- The PII removal is recorded in the user's audit

5. Click the **OK** button. The removal begins. Once complete, the Remove PII button disappears for that user.
6. (Optional) Run a query that scans the entire Secret Server database for the removed strings. You may want to do this because the process cannot find *all* potential instances of USER PII throughout Secret Server, such as that in secret names or notes.

**Note:** You can create an Event Subscription to "remove user PII" events.

## Active Directory Considerations

We recommend removing the user from AD before removing the PII. If you remove the PII without first removing the user from AD, the user is reintroduced into Secret Server on subsequent AD synchs. This creates a new user account in Secret Server, which might require you to disable this new user account and remove its PII too (after removing the AD user).

If a user fails their login too many times (specified in the **Local User Passwords** section of the configuration page), their account is locked out and they are not be able to log in.

To unlock the account:

1. Log on as an administrator.
2. Click on **Admin > Users**.
3. Click on the user who is locked out.
4. Click **Edit**.
5. Click to deselect the **Locked out** check box.
6. Click **Save**.

Secret Server users can be set up with many different login requirements. For example, you can force strong Login passwords by requiring a minimum length and the use of various character sets.

The following settings are available under the **Administration > Configuration** page, inside the **Login** tab:

**Note:** "Allow Autocomplete" is now permanently on.

- **Allow Remember Me:** This option enables the Remember Me checkbox on the Login screen. When a user chooses to use remember me, an encrypted cookie is set in their browser. This enables the user to revisit Secret Server without the need to log in. This cookie is no longer be valid when the remember me period has expired. They then have to enter their login information again. This option allows users to remain logged in for up to a specific period (specified in the "Remember Me Is Valid for" setting mentioned below). This option can be a security concern as it does not require re-entry of credentials to gain access to Secret Server.

**Note:** "Remember me" is only visible if the "Allow Remember Me" setting is enabled. This is the period that the remember me cookie mentioned above is valid. For example: if set to one day, then users taking advantage of "remember me" have to log in at least once a day. To set a time value (minutes, hours, or days), uncheck the Unlimited checkbox.

- **Enable RADIUS Integration:** Allow for RADIUS server integration with your user login authentication. Other RADIUS settings appear upon enabling this option. These settings are discussed in [RADIUS Authentication](#).
- **Maximum Concurrent Logins Per User:** This setting allows a user to log into Secret Server from multiple locations at once without logging out their sessions at other locations.
- **Maximum Login Failures:** Set the number of login attempts allowed before a user is locked out of their account. Once locked out, they need a Secret Server administrator to reset their password and enable their account. For details on how to reset a locked account, see [Creating Users](#).
- **Require Two Factor for these Login Types:** This setting specifies which types of login require two-factor authentication:
  - Website and Web service Log on
  - Website log on only
  - Web service log on only
- **Visual Encrypted Keyboard Enabled:** This setting enables a visual keyboard for logins.
- **Visual Encrypted Keyboard Required:** This setting requires a visual keyboard for logins.

User Administrators can also set another group or user as the *user owner* for a Secret Server local user. User owners can manage and edit just that user. For example, a developer might need to unlock or reset the password for an application account but should not have access to all users. Set **Managed by to User Owners** on a user and then select **Groups** or **Users**. Note that Unlimited Administrator mode can still be used to manage groups with user owners assigned.

**Note:** Users can set their preferences by hovering on their profile icon in the top right and selecting preferences.

## General Tab

The following configuration settings are available for users under the General tab:

- **Date Format and Time Format:** Date and time format displayed for a user in Secret Server.
- **Language and My Theme:** Customize the look of Secret Server on a per user basis. For details, see [Themes](#).
- **Mask passwords when viewing Secrets:** When enabled, this masks the Password text box for a secret. There is a configuration setting that forces this to be enabled for all users. For details on password masking, see [Setting Up Password Masking](#).
- **Send email alerts when dependencies fail to update:** Enables emails to be sent when dependencies fail to update.
- **Send email alerts when Heartbeat fails for Secrets:** When enabled, the user is emailed when a heartbeat fails for any secret the user has view permission to.
- **Send email alerts when Secrets are changed:** Enables emails to be sent on all changes of any secret that the user has view permission. There is a limit of one mail per five minutes per edit of the same user. For example, if user "User1" edits the secret twice within this grace period, only one email is sent.
- **Send email alerts when Secrets are viewed:** Enables emails to be sent on all views of any secret that the user has view permission. There is a limit of one email per five minutes per view of the same user. For example, if user "User1" views the secret twice within this grace period, only one email is sent.
- **Show the full folder path on search results:** Enables the full path to be displayed in the Folder column on the Home page.
- **Use the TreeView control for search on the home screen:** Enables the TreeView control for the Search tab on the Legacy Home screen. This option does not apply to the Dashboard.

## Launcher Tab

The following configuration settings are available to users on the Launcher tab:

- **Allow Access to Printers, Allow Access to Drives, Allow Access to Clipboard:** Allow access to various items when using the launcher.
- **Connect to Console:** Allows you to connect to remote machines using the Remote Desktop launcher and connects as an administrator. This is the equivalent of using the `/admin` or `/console` switch when launching Remote Desktop.
- **Use Custom Window Size:** Checking this box displays Width and Height text boxes for the user to specify a custom window size for an RDP launcher.

The following restriction settings are available:

- **Enable Login Policy:** If enabled, this simply displays the policy. To force the acceptance of the policy.
- **Force Inactivity Timeout:** This setting is the time limit on idle Secret Server sessions. Once a session expires, the user must login again with their username and password.
- **Force Login Policy:** This setting forces the checking of the "I accept these terms" checkbox before allowing the user to login to SS.
- **IP Restrictions:** This setting can be entered by going to **Administration > IP Addresses**. In there, you can enter the IP ranges you wish your users to use. To configure a user to use the ranges, navigate to the **User View** page and click the **Change IP Restrictions** button. In the subsequent page, you can add all the ranges you want your user to use.
- **Login Policy Agreement:** The Login Policy Agreement is displayed on the login screen. You can change the contents of the Login Policy Statement by editing the file `policy.txt`. By default, this is not enabled. The settings to enable this are accessed by first navigating to **Administration > Configuration** and going into the **Login** tab. Then click the **Login Policy Agreement** button.



Below is a brief explanation of each text-entry field or control:

- **Display Name:** Text that is used throughout the user interface, such as in audits.
- **Domain:** If a drop-down list is visible, selecting a domain from the list is one way to set the expected domain of the user. However, a more dynamic way to have this text-entry field (and all the other text-entry fields) set is through Active Directory synchronization.
- **Email Address:** Email address used for Request Access, email two-factor authentication, and the like.
- **Email Two-Factor Authentication:** On a login attempt, the user has an email sent to the email address entered above. This email contains a pin code that the user needs to log into the account. See [Email Two-Factor Authentication](#) for details.
- **Enabled:** Disabling this control removes the user from the system. Effectively, this is the way to delete a user. Secret Server does not allow complete deletion of users due to auditing requirements. To re-enable a user, navigate to the **Administration > Users page**, check the **Show Inactive Users** checkbox just under the **Users** grid, and edit the user to mark them enabled (see [Configuring Users](#)).
- **Locked Out:** If checked, then this user has been locked out of the system due to too many login failures. To remove the lock, uncheck the check box. For more details on locking out users, see Maximum Login Failures setting described in the Login Settings section.
- **Password:** Login password for the user. For the various login settings, see Login Settings section.
- **RADIUS Two-Factor Authentication:** This text-entry field only appears if RADIUS authentication is enabled in the configuration. On a login attempt, the user must enter the RADIUS token sent from the RADIUS server. See [RADIUS Authentication](#).
- **RADIUS User Name:** This text-entry field only appears if the above RADIUS Two Factor Authentication setting is enabled. This is the username the RADIUS server is expecting. See [RADIUS Authentication](#).
- **User Name:** Login name for the user.

**Note:** A new user is assigned the User role by default. For more information on roles, see "Roles."

## Webservices

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Secret Server provides a suite of webservices which can be used to retrieve and update secrets, and folders. The webservices allow Secret Server to be accessed using the mobile apps as well as custom built integrations. The webservices are secure and require authentication in the same manner as regular access to Secret Server. All actions that involve data are also logged, such as secret views, updates, and adds.

Webservices can be enabled at the **Administration > Configuration** general tab. Enabling webservices simply makes the ASP.NET webservices built into Secret Server available. They are found under `/webservices/sswebservice.asmx` in your Secret Server directory. They run on the same port as the Web application. You can view them with a browser to see the functionality that is offered. Specific webservice functionality is documented in the Secret Server Webservice API guide.

Secret Server also provides a webservice that uses integrated Windows authentication instead of a username and password. This webservice can be used in an application or script to access Secret Server and retrieve secrets without storing the login credentials in the application or configuration file.

**Note:** See [Configuring Integrated Windows Authentication](#) for more advanced technical information on using this webservice.

## Workflows

**Note:** Please click the table of contents on the left to see any sub-pages to this one. Click the table of contents on the right to see headings on this page.

Starting in 10.6, Secret Server introduced *access-request workflows*. These allow users to build more complex interactions based on events within Secret Server than currently possible. The first release of workflows offers access requests. Workflow templates define the series of steps and reviewers required for an access request. You can assign workflows to secrets or secret policies.

With Access-Request Workflow Templates, you can:

- Require that multiple people approve a request before access is granted
- Require multiple workflow steps, each with different reviewers and number of required approvers, if desired.
- Select "Owners" as a review group

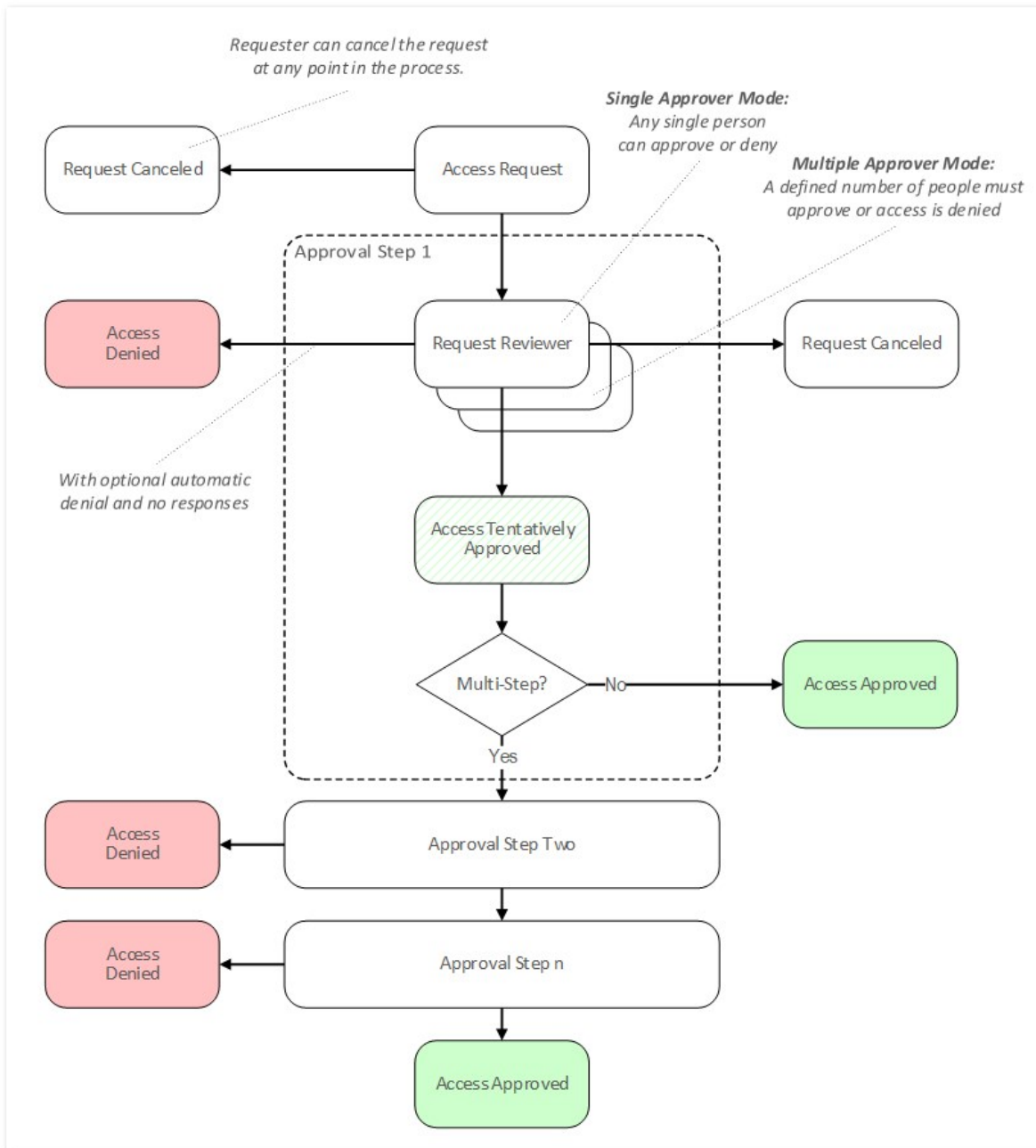
**Note:** Access Requests already existed in Secret Server, but with 10.6 they become much more powerful. Previously, if access requests enabled on a secret, requests were granted after a single reviewer approved the request. Now, approval workflows can require multiple approvers, and multiple approval levels.

The original access requests are one level or step—anyone approving approves the request—no other input is required. Workflows allow up to 15 approval steps where approval by reviews in step 1 moves the request to step 2, approval at step 2 moves it to step 3 and so forth. Denial at any step denies the request.

The new workflow feature can be configured where one approver at a given step is not enough. In effect, approvers in each step can "vote" for approval—you stipulate how many approvers at a step must approve for the approval to move on to the next step.

The following diagram is the entire process summarized:

**Figure:** The Approval Process Workflow



In general, "simple access requests," the only type available to older versions of Secret Server, are the same as a one-step stepped approval. The major exception is that with stepped requests, once a workflow access request has been approved, denied, or canceled, its status cannot be changed. In contrast, simple, non-workflow, access requests retain the original behavior of allowing a request to be approved after it has been denied or denied after it has been approved.

## Release notes

You can configure workflow steps to time out after a specified number of minutes. Workflow administrators can define approval workflows that notify a different set of users if a step in the workflow is not responded to within a specified time period.

Applications include:

- Improving responsiveness to access requests on time-sensitive secrets by moving the request to another step if not responded to quickly.
- Overflowing to a different region so a secret can be accessed by users in different time zones with different sets of support personnel responding.

Timed out access requests automatically advance to the next step in the workflow. The last step of the workflow cannot time out and must be approved to access the secret.

You can apply multiple timeouts to create workflows that can cascade through multiple steps if the previous steps do not receive the required approvals.

Denying or canceling a request in any step stops the workflow and stops any time out to the next step.

**Important:** Once a workflow step times out, only the reviewers in the next step can approve the request. If you want reviewers from the initial step to respond after the initial request has timed out, add them to the reviewers of the next step.

To access workflows:

1. Go to **Admin > Workflows**. The Workflows page appears:

**Workflows**

"Workflows" allow you to setup multi-tier Secret access approvals for users across your organization in order to responsibly share your most important Secrets. [KB Link](#)

[Create Workflow](#)

14 Items ☐ Show Inactive

WORKFLOW NAME	TYPE	ACTIVE
5 steps	Access Request	Yes

The page lists all active workflows.

2. (Optional) Click to enable the **Show Inactive** toggle button, under the **Create Workflow** button, to show both active and inactive templates. When the toggle button is disabled, it only shows active workflows.
3. Click any workflow in the list to go to the designer page for that workflow:

**Workflows > 5 steps**

[Designer](#) [Audit](#) [Duplicate](#) [Delete](#)

**Workflow Designer** [Edit](#)

**Name \***

5 steps

**Description**

has 5 steps



1. Click **Admin > Secret Policy**. The Secret Policy page appears:

## Secret Policy

[Explain](#)

Use Secret Policies to establish consistent sets of security requirements assigned at the folder or Secret level.

< 1 to 5 of 5 >

SECRET POLICY NAME	DESCRIPTION	ACTIVE
Disabling_policy	test	Yes
EPP Testing		Yes
tjwSEcretPolicy2	make Thomas approver	Yes
tjwSecretPolicyForcedApproval	Forces Legacy Approval	Yes
Web Password Policy	rpc auto, rpc priv account, rpc daily	Yes

☐ Show Inactive

← Back
+ Create New

2. For this instruction, we are going to create a new policy.
3. Click the **+ Create New** button. Another Secret Policy page appears:

## Secret Policy

[Explain](#)

- Any items selected as 'Default' will be applied on the creation of any Secret that has this Secret Policy applied to it.
- Any items selected as 'Enforced' will be applied to all Secrets that have this Secret Policy applied to it.
- 'Enforced' settings cannot be changed on the Secret.
- Certain settings will only be applied to a Secret if they are valid settings for the Secret.

Secret Policy Name

Description

Active

☒

SECTION	SECRET POLICY ITEM NAME	SETTING	VALUE
General	Site		< Not Set > ▼
Remote Password Changing	Auto Change		< Not Set > ▼

- Type the new policy name in the **Secret Policy Name** text box.
- Scroll down the page to the **Security Settings** section of the unlabeled table.
- Click the **Enable Requires Approval for Access** list and select **Enforced**.
- Click to select the check box next to the list. The Assign Approvers popup page appears:

### Assign Approvers

Select the users or groups to be approvers.

NAME

User/Group

< Select > ▼

✓ OK

✗ Cancel

- Click the **Cancel** button. The Request Access Approvers setting become enabled:

**Note:** You cannot set approvers and use a workflow at the same time. The intent of the next few instructions is avoid attempting to do so, which causes an error.

Security Settings	Request Access Approvers <i>(Dependent on: Enable Requires Approval for Access)</i>	Enforced ▼	< None >
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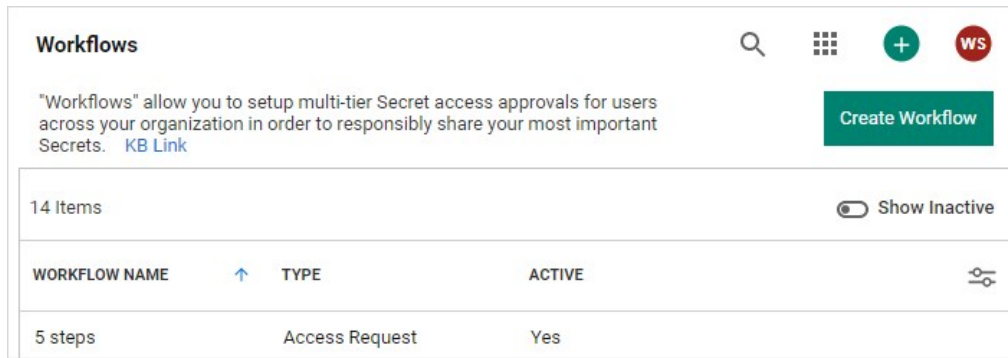
- Click the **Request Access Approvers** list and select **Not Set**.
- Click the **Request Access Workflow** list and select **Enforced**. A new list appears alongside:

Security Settings	Request Access Workflow <i>(Dependent on: Enable Requires Approval for Access)</i>	Enforced ▼	< None > ▼
-------------------	---------------------------------------------------------------------------------------	------------	------------

- Click the new unlabeled list and select the access template workflow to associate with the policy.
- Click the **Save** button at the bottom of the page. The policy is now available for assignment to secrets and folders, just like any other policy.

## Markdig.Syntax.Inlines.EmphasisInline

1. Go to **Admin > Workflows**. The Workflows page appears:



2. Click the **Create Workflow** button. The Create Workflow popup appears:

The screenshot shows the 'Create Workflow' popup form. It has a title 'Create Workflow' and two input fields: 'Workflow Name' and 'Description'. The 'Workflow Name' field is currently selected with a blue border. At the bottom right, there are two buttons: 'Cancel' and 'Create Workflow'.

3. Type the workflow's name and description (optional) in their text boxes. Once you type the name, the Create Workflow button becomes enabled.
4. Click the **Create Workflow** button. The Edit page for the new workflow appears on the Designer tab.

A new workflow has only one empty step by default.

## Markdig.Syntax.Inlines.EmphasisInline

1. Click the **Edit** link next to the **Workflow Designer** heading. The page becomes editable.
2. (Optional) Type a name for the first step in the **Step 1 Name** text box, such as "Line Managers."
3. Click the **Add Groups / Users** dropdown list to select the domain where you want to get your approvers from.
4. Type the name of the user or group you desire as an approver in the unlabeled search box to the right. Options appear in the dropdown.
5. Click the desired user or group. It appears in the Approvers table:

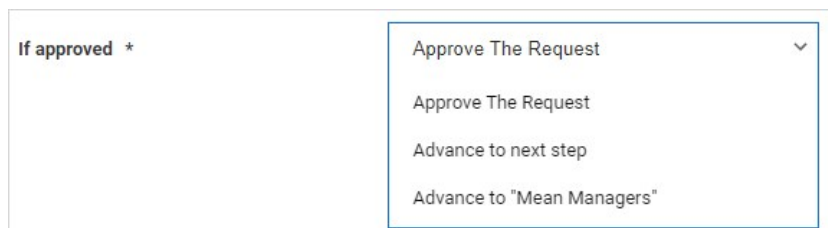
6. Repeat as desired.
7. (Optional) To automatically include the owner of the secret the template is assigned to, click to select the **Include owners as reviewers** check box.
8. If you wish to have multiple approvers required on the step, type the minimum required in the **Number of approvers required** text box. Otherwise, leave it set to 1.
9. If you want the step to time out, click to select the **Step Times out** check box. Another text box appears:

**Important:** This feature is part of the early release of Secret Server 10.11. The general release is not till April 13, 2021 for the on-premises version and between April 3rd and May 15th 2021, depending on region, for the cloud version.

## Note:

- Timeout minutes must be a positive integer set to 1 or greater.
- If a step is set to time out and then all following steps are deleted, the step will no longer time out because the last step in a workflow is not allowed to time out.
- Multiple steps can time out, so cascading timeouts are possible. That is, step one times out to step two and step two times out to step three.

1. Replace the 0 in the **Skip step if not approved...** text box with the number of minutes for the desired timeout.
2. Click the **If approved** dropdown list to select what to do next:



The screenshot shows a dropdown menu for the 'If approved' condition. The menu is open, displaying four options: 'Approve The Request' (selected), 'Approve The Request', 'Advance to next step', and 'Advance to "Mean Managers"'. The first option is highlighted with a blue border and a downward arrow.

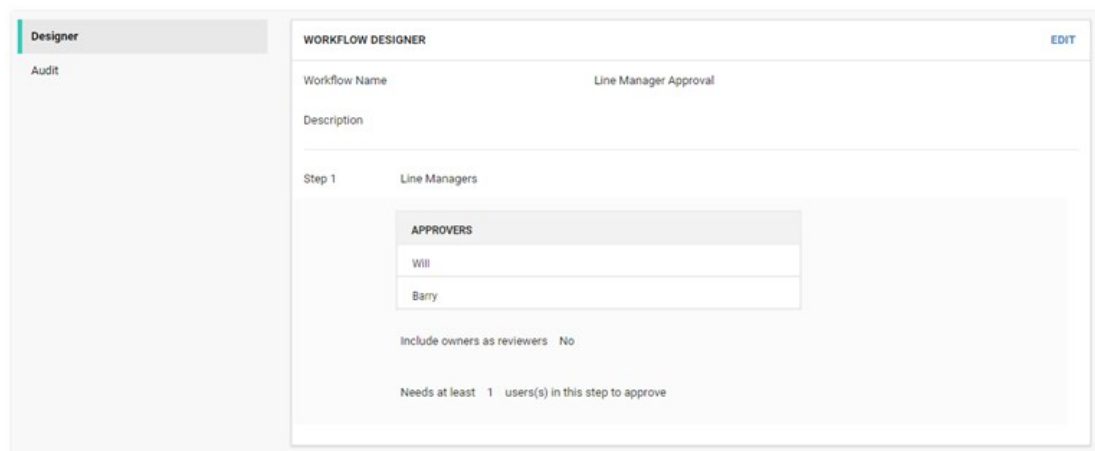
You can:

- Approve the request
- Advance to the next step in a linear fashion
- Jump to another already defined step that is presented as an option in the list box.

## Markdig.Syntax.Inlines.EmphasisInline

**Note:** There are situations where you might want to have only one workflow step, seemingly doing the same thing as a simple access request. Workflows provide options to require multiple approvers or have owners as approvers, which are not available to simple access requests.

1. Click the **Insert a Step** button. A new step appears below the first two.
2. Repeat the process as for earlier steps. Keep adding steps as needed.
3. Click the **Save** button to create the access-request workflow. The template exits editable mode:



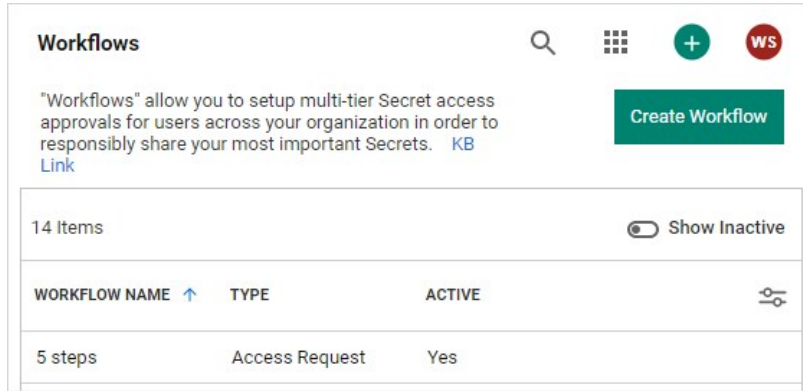
The screenshot shows the 'Workflow Designer' interface. On the left is a sidebar with 'Designer' and 'Audit' tabs. The main area is titled 'WORKFLOW DESIGNER' and contains a form for creating a workflow. The 'Workflow Name' is 'Line Manager Approval'. Below it is a 'Description' field. The 'Step 1' is 'Line Managers'. Under 'Line Managers', there is a section for 'APPROVERS' with a list containing 'Will' and 'Barry'. Below the list, there is a checkbox for 'Include owners as reviewers' which is currently unchecked. At the bottom, it says 'Needs at least 1 users(s) in this step to approve'. An 'EDIT' button is visible in the top right corner.

4. Click the **Workflows** bread crumb link on the top of the page to return to the table.



To delete a workflow:

1. Go to **Admin > Workflows**. The Workflows page appears:



The page lists all active workflows.

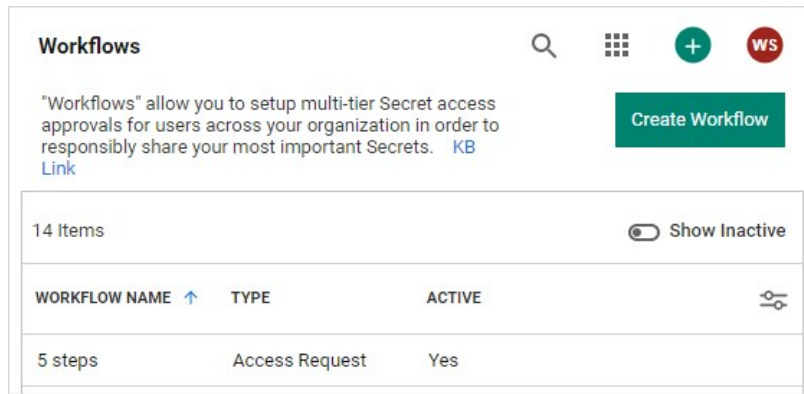
2. (Optional) Click to enable the **Show Inactive** toggle button, under the **Create Workflow** button, to show both active and inactive templates. When the toggle button is disabled, it only shows active workflows.
3. Click the workflow to delete in the list to go to the designer page for that workflow (not shown).
4. Click the **Delete** button. A confirmation popup page appears.
5. Click the **Yes, Delete** button.

**Note:** Because workflows based on the template may still be in play, the template is not completely deleted. Instead, it is inactivated. You can reactivate the template later. See [Accessing the Workflow Designer](#).



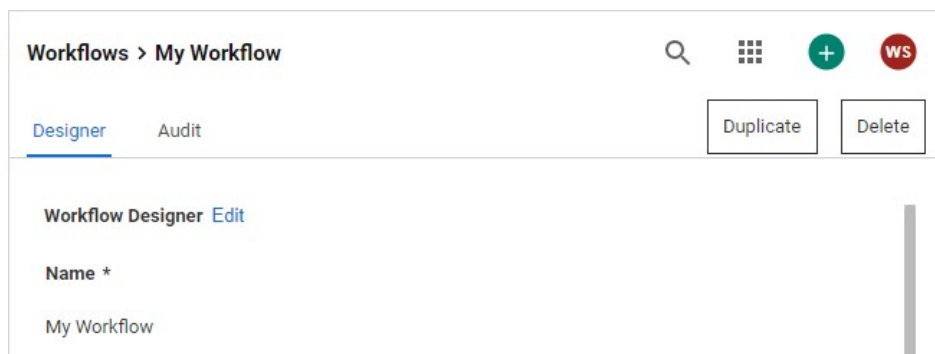
If you need to create a new workflow that is like one you already have, you can save time by copying the similar template and then making the any changes:

1. Go to **Admin > Workflows**. The Workflows page appears:

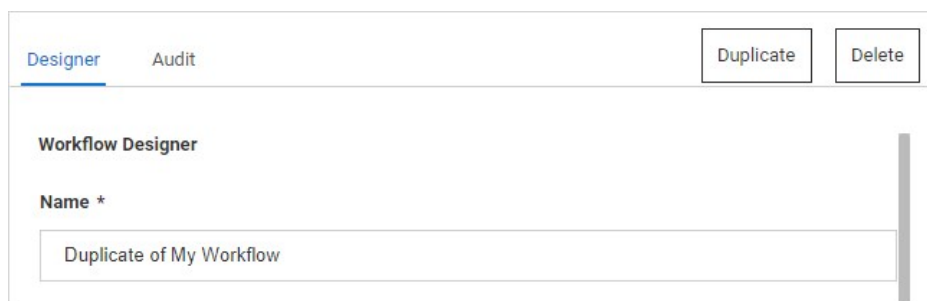


The page lists all active workflows.

2. (Optional) Click to enable the **Show Inactive** toggle button, under the **Create Workflow** button, to show both active and inactive templates. When the toggle button is disabled, it only shows active workflows.
3. Click the workflow you want to copy in the **Workflow Templates** table. That template appears:



4. Click the **Duplicate** button. The new template appears, filled in the same as the original but with a "Duplicate of" name:

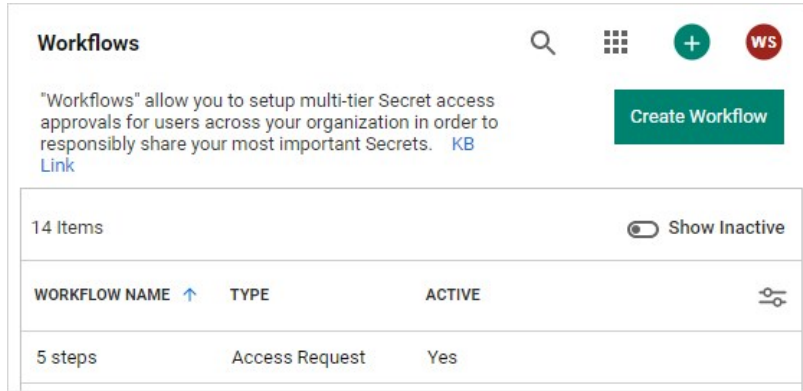


5. Change the name and edit as desired.

6. Click the **Save** button when finished.

To edit the template:

1. Go to **Admin > Workflows**. The Workflows page appears:



The page lists all active workflows.

2. (Optional) Click to enable the **Show Inactive** toggle button, under the **Create Workflow** button, to show both active and inactive templates. When the toggle button is disabled, it only shows active workflows.
3. Click the workflow to edit in the list to go to the designer page for that workflow (not shown).
4. At this stage the process is nearly identical to creating a new workflow. The only difference is many of the parameters and additional steps are already completed. Change them as desired. If you want to eliminate an entire step, click the **Delete This Step** link for that step.

**Note:** You cannot make any changes to the behavior of a workflow if there are active requests using that template without cancelling those requests. An active request is any unexpired request that has not been approved, denied, or canceled by the user. If you do make an alteration, any requests are canceled and those affected are notified by email so they can resubmit their requests. Any user editing the template is notified when he or she tries to save changes on the canceled request.

Consider the following when setting up an access-request workflow:

- Use multiple-step approval workflows when you need to have different people (such as different departments) sign off on an approval request.
- We do not recommend assigning equally important approvers or groups to multiple steps. Having a single step with multiple approvers works better. Remember, steps are best used for hierarchical approval--an approval chain.
- A reviewer can only respond to a request once. If you have the same user as a reviewer in multiple steps, that approver cannot respond if he or she already responded on an earlier step. In addition, the reviewer's earlier approval does **not** count towards the number of approvals required in later steps. Thus, if you want to assign the same user as a reviewer in multiple steps, make sure that you have enough reviewers in each step to approve without that user.
- A well-crafted workflow design ensures there are enough approvers in a group to satisfy the multiple approver (x of n reviewers must approve) requirement, but group membership can change after the workflow is created. Thus, if you remove members from groups used by workflows, ensure there are still enough members in those groups to approve requests.
- Once a workflow step times out, only the reviewers in the next step can approve the request. If you want reviewers from the initial step to respond after the initial request has timed out, add them to the reviewers of the next step.

## Secret Server Release Notes

**Note:** Cloud only: As of 8/29/2022, only advanced session-recording agent version 7.89.1.0 or later can register with Secret Server. To install a new agent, please see [Installing the Advanced Session-Recording Agent](#). Previously registered agents will continue to function normally.

### Secret Server Cloud

[June 3, 2023](#)

[Secret Server Cloud Change Log](#)

### Secret Server On-Premises

[Secret Server 11.5.000000](#) (June 9, 2023)

**Note:** The system requirements last changed with version 10.7.000000. See [that version's release notes](#) for details.

### Secret Server Cloud

- [May 6, 2023](#)
- [March 31, 2023](#)
- [February 11, 2023](#)
- [December 3, 2022](#)

### Secret Server On-Premises

- [Secret Server 11.4.000031](#)
- [Secret Server 11.4.000030](#)
- [Secret Server 11.4.000002](#)
- [Secret Server 11.4.000000 \(EA\)](#)
- [Secret Server 11.3.000003](#)
- [Secret Server 11.3.000002](#)
- [Secret Server 11.3.000001 \(GA\)](#)
- [Secret Server 11.3.000000 \(EA\)](#)
- [Secret Server 11.2.000003](#)
- [Secret Server 11.2.000002](#)
- [Secret Server 11.2.000000](#)
- [Secret Server 11.1.000012](#)
- [Secret Server 11.1.000007](#)
- [Secret Server 11.1.000006](#)
- [Secret Server 11.0.000008](#)
- [Secret Server 11.0.000007](#)
- [Secret Server 11.0.000006](#)
- [Secret Server 11.0.000005](#)
- [Secret Server 10.9.000064](#)
- [Secret Server 10.9.000033](#)
- [Secret Server 10.9.000032](#)

- [Secret Server 10.9.000002](#)
- [Secret Server 10.9.000000](#)
- [Secret Server 10.8.000004](#)
- [Secret Server 10.8.000000](#)
- [Secret Server 10.7.000059](#)
- [Secret Server 10.7.000002](#)
- [Secret Server 10.7.000000](#)
- [Secret Server 10.6.000027](#)
- [Secret Server 10.6.000026](#)
- [Secret Server 10.6.000001](#)
- [Secret Server 10.6.000000](#)
- [Secret Server 10.5.000003](#)
- [Secret Server 10.5.000001](#)
- [Secret Server 10.5.000000](#)
- [Secret Server 10.4.000000](#)
- [Secret Server 10.3.x](#)
- [Secret Server 10.2.x](#)
- [Secret Server 10.1.x](#)
- [Secret Server 10.0.x](#)
- [Secret Server 9.x](#)
- [Secret Server 8.x](#)
- [Secret Server 7.x](#)
- [Secret Server 6.x](#)
- [Secret Server 5.x](#)
- [Secret Server 4.x](#)

- [Cloud Release December 21, 2019](#)
- [Cloud Release September 21, 2019](#)
- [Cloud Releases prior to September 21, 2019](#)