appviewx



Platform Guides

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Preface

Revision History

Revision	Description	Date
1.0	Initial draft of document for release 2025.0.0.0 Platform.	November 2025

About the Documentation

This section includes the following guides that will give you an overview of Platform and Reporting module:

- Platform User Guide
- Platform API Guide
- Reporting User Guide

Audience

This guide is intended for CISO, PKI Security, and Application Teams.

Third-Party Software Acknowledgements

This section serves as a placeholder to document the third-party components referenced in this guide, along with their associated trademark information.

For example,

- This document includes software details developed by VMware, Inc. (www.vmware.com).

Text Conventions

The following text conventions are used in this document:

Convention	Description
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in the text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.

Convention	Description
`codeblock`	Indicates commands with a paragraph, URLs, codes in examples, text that appears on the screen, or text that you enter.
	Indicates a feature available only in the On-premise deployments of AppViewX.
	Indicates a feature available only in the SaaS deployments of AppViewX.

Chapter 1: Platform User Guide

The AppViewX Platform is a module that lets you enable general configuration settings such as authentication, authorization, and integration of external services like log forwarding, HSM integration, SMTP configuration, and so on. These general configuration settings are applicable to all AppViewX subsystems such as ADC, CERT+, Security+, Visual Workflow, and so on.

- Overview
- Account Ownership
- User Profile Settings
- Configuring Policies (Notifications)
- Access Management: Configuring Authentication Settings
- Identity: Configuring Role and Resource-Based Access Control
- Vault and Security (PAM and HSM)
- Observe and Explore (Alerts, Logs, Log Forwarding)
- System Administration
- Glossary

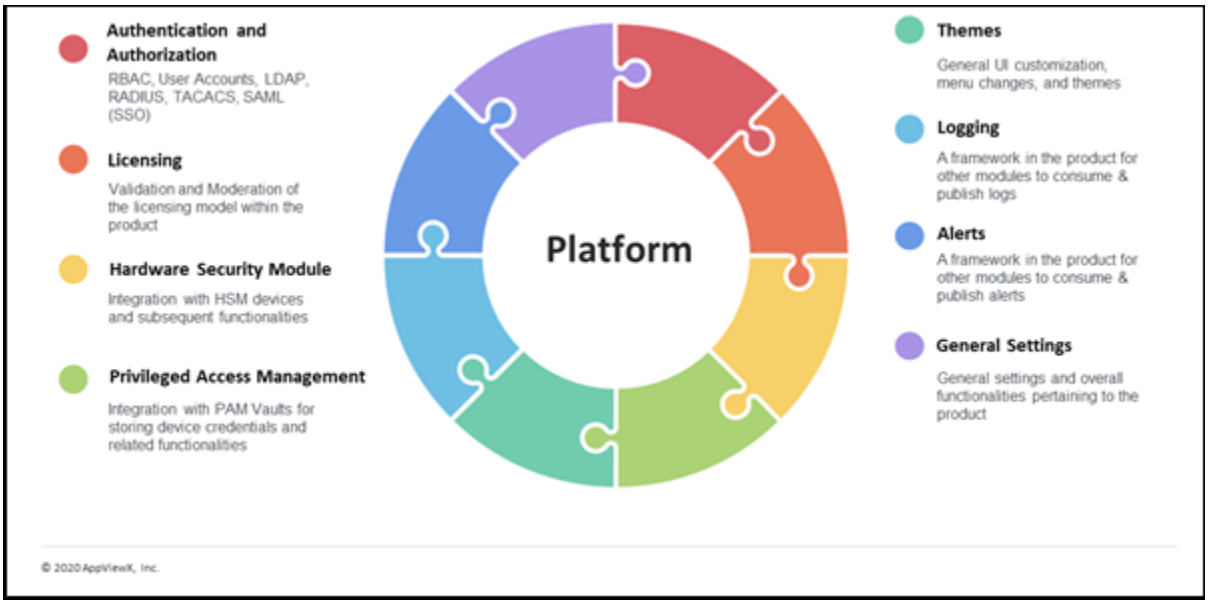
Overview

The AppViewX Platform is a module that lets you enable general configuration settings such as authentication, authorization, and integration of external services like log forwarding, HSM integration, SMTP configuration, and so on. These general configuration settings are applicable to all AppViewX subsystems such as ADC, CERT+, Security+, Visual Workflow, and so on.

The Platform User Guide documents these general configuration settings.

Platform components common to all subsystems are shown in the image below:

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Account Ownership

In AppViewX, the account used during sign-up becomes the designated Account Owner for that specific account. The ownership can be transferred to another user with Admin privileges at any time in the future. The Account Owner is possesses the following permissions, along with any other assigned permissions:

These permissions include:

- MFA: Enabling/Disabling Multi-Factor Authentication for all users
- Enabling master key encryption
- Access to analytics and tracking
- Plan and account information.

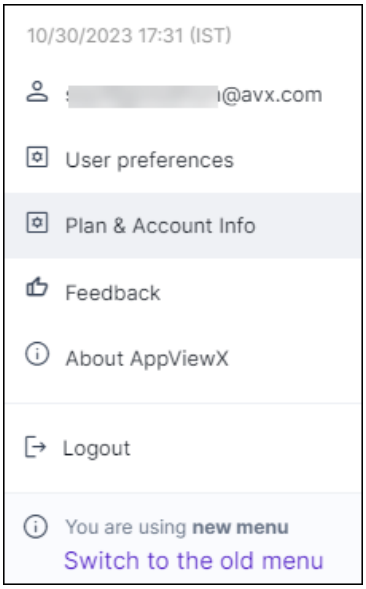
Transfer of Account Ownership

The ownership can be transferred to another user with admin privileges at any point in the future, but only by the current account owner. Upon transfer, all active sessions of the current account owner will be automatically logged out, and the new account owner will get account ownership permissions upon their next login. Both the existing and new account owners will receive email notifications regarding the ownership change. This action is exclusive to the account owner.

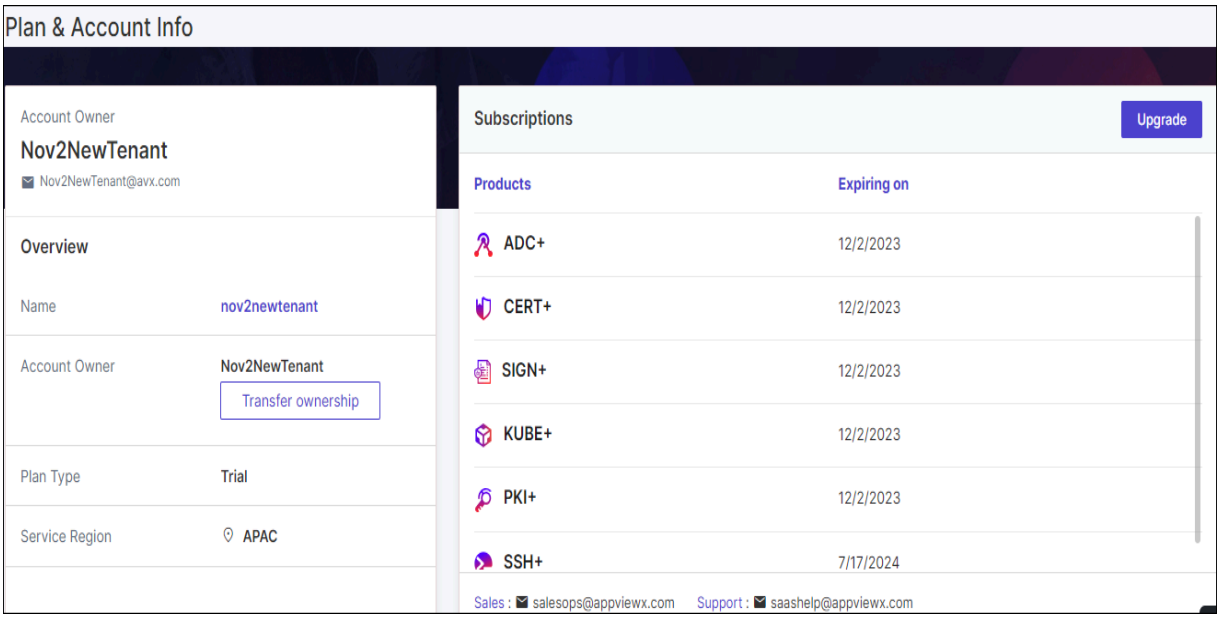
To initiate the transfer of ownership to another user, follow the steps below:

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1. Login to AppViewX.
2. From the top right corner of your screen, click **(Profile)** icon.
   The drop down displays a list of menus.

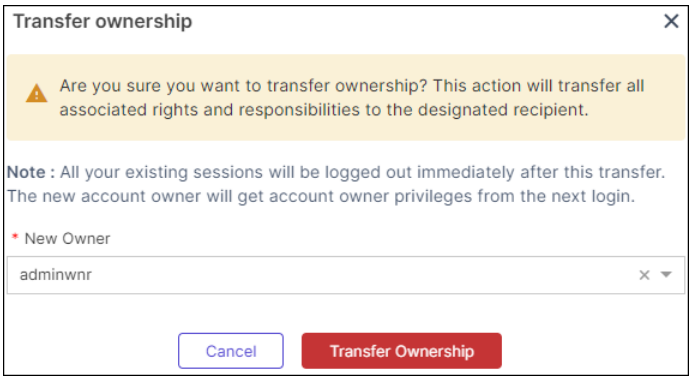


3. Click **Plan & Account Info**.
   The **Plan & Account Info** page is displayed, featuring account details and a list of subscribed products.



4. In the **Account Owner** section, click **Transfer ownership**.
   The **Transfer ownership** dialog box appears.

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CAUTION: Are you sure you want to transfer ownership? This action will transfer all associated rights and responsibilities to the designated recipient.

Note: All your existing sessions will be logged out immediately after this transfer. The new account owner will get account owner privileges from the next login.

5. Select the **New Owner** from the dropdown list, then proceed to click **Transfer Ownership** to confirm the change of ownership.
   AppViewX assigns the owner role to the selected new owner.

Note:
- The account owner will be logged out of all sessions of the previous account owner immediately, ensuring the prompt application of permission changes.
- AppViewX will send email notifications to both the previous and new account owners to confirm the successful transfer of account ownership.

User Profile Settings

User Preferences

The **User Preference** option on a webpage allows individual users to customize their interface and behavior settings based on their personal needs and usage patterns.

1. Login to AppViewX with valid credentials.
2. From the top right corner of your screen, click **(Profile)** icon.
3. Click **User Preferences**.

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The User Preferences page is displayed.

4. To set the UI preferences for the user, refer to the table below for the fields.

Fields	Description
Language	Select the language for the text to be displayed across the UI from the dropdown options.
Font display	Select the font size for the text to be displayed across the UI from the size options provided.
Font type	Select the font type for the text to be displayed across the UI from the options provided. • OpenSans • Ubuntu • Inter
Date display format	Select the date display format to be displayed across the UI from the options provided. • MM/DD/YYYY • DD/MM/YYYY • YYYY/MM/DD **Note:** The date format selected here will be used in all the inventory pages, audit logs, and the form (date) fields across the application.
Landing page	Select the preference for the landing page to be displayed upon login from the **Preference** dropdown.

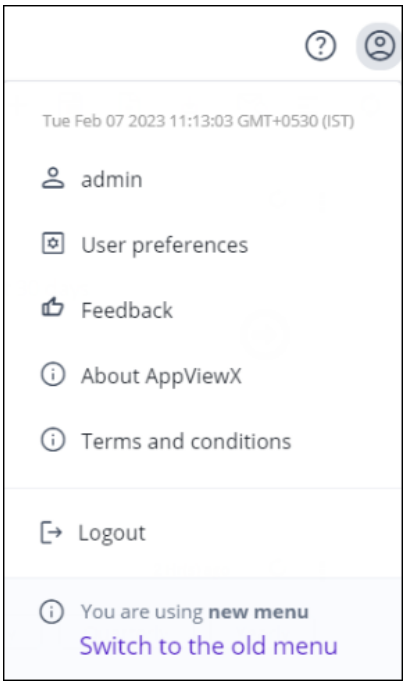
5. Click **Save**.

Switching between Menus

This section explains how to identify which menu you are currently using and how to switch between the old and new menus. Follow these steps to seamlessly transition to your preferred menu.

1. From the top right corner of your screen, click **(Profile)** icon.
   The dropdown displays which menu is in use.

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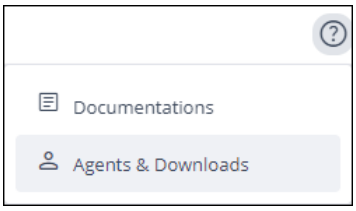
2. Click **Switch to the old menu** to change the menu.

Platform Agents & Download Service

Follow these steps to seamlessly download the agents.

1. From the top right corner of your screen, click **(Profile)** icon.

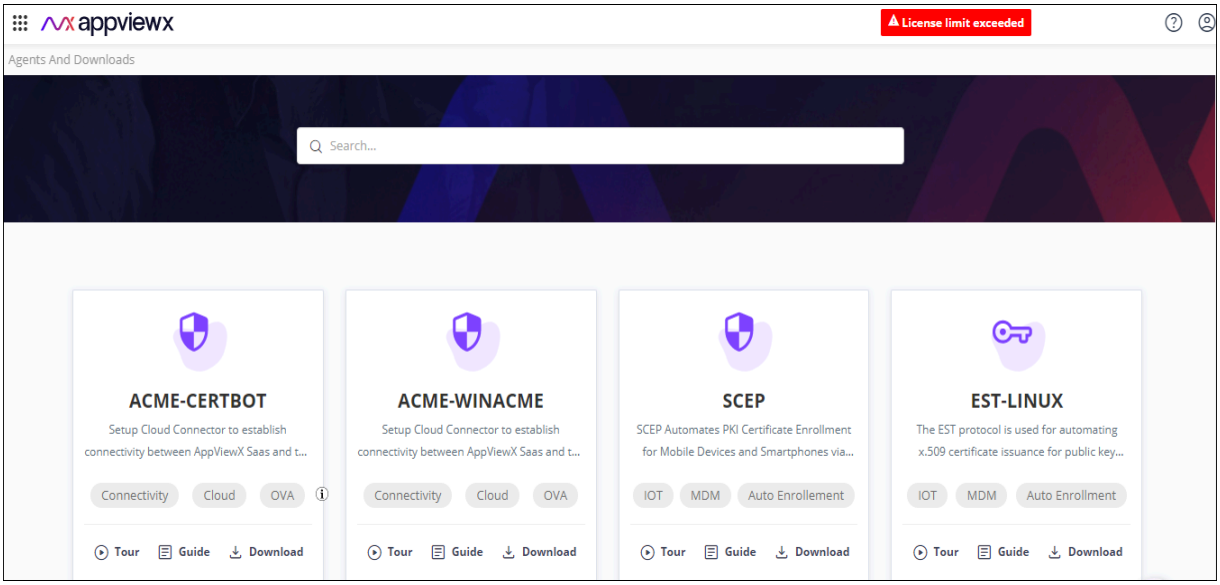
   The dropdown displays **Documentation** and **Agents & Downloads**.



2. Click **Documentation** to view the helpcenter of AppViewX.
3. Click **Agents & Downloads** for the service to download agents.

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The **Agents & Downloads** page is displayed.



4. Click **(Download)** icon on the corresponding agents to download.

API Reference

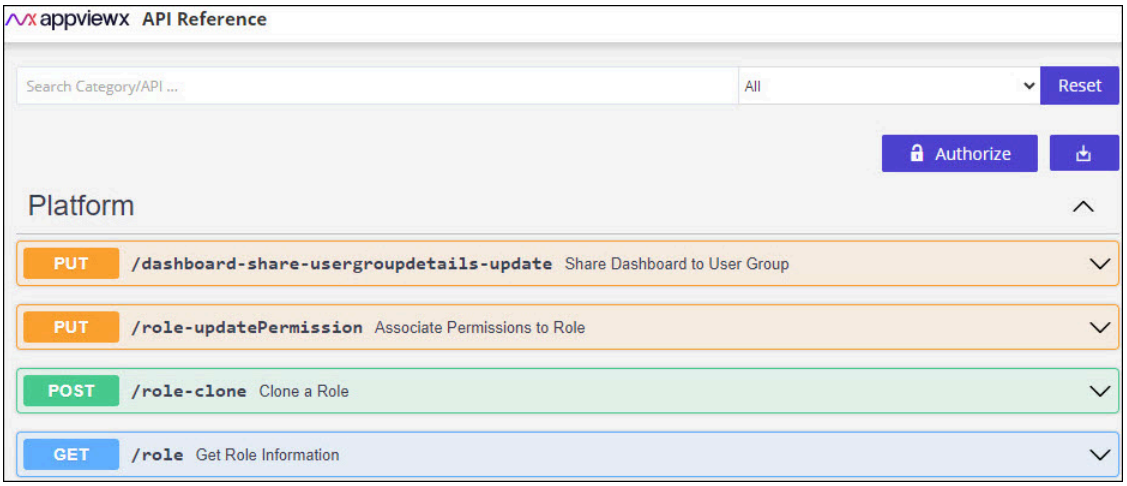
Follow these steps to try the AppViewX exposed APIs on Swagger:

1. From the top right corner of your screen, click **(API Reference)** icon.

> **Note:** The **API Reference** icon is displayed for the Admin user and users with ACF permission enabled for API Reference.

You will be redirected to **AppViewX API Reference** page.

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2. Click any API to **Try it out**.

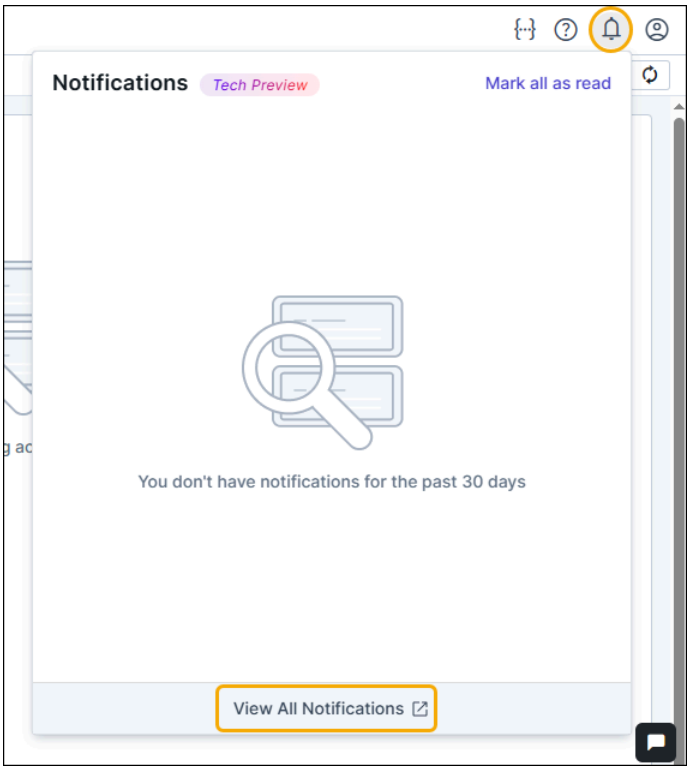
Configuring Policies (Notifications)

Configuring Policies for Notifications refers to setting up rules and triggers that determine when, how, and to whom notifications are sent based on specific events or system activities. It is mainly used to:

- Alert users/admins about important system activities, such as workflow completions, errors, certificate expirations, license issues, or secret rotations.
- Ensure timely responses to critical events in both operational and security contexts.

1. Login to AppViewX with valid credentials.
2. From the top right corner of your screen, click **Notification Center** (Bell) icon.
   The Notifications window is displayed.
3. At the bottom of the Notifications window, click **View All Notifications**.
   The notification details screen is displayed.

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4. Click the 

(**Configure Policies**) button on the top right, below the bell icon. The **Notification Policies** screen is displayed.
5. Enter/Select the field values in the **Notification Policies** screen as described in the table below.

Field Descriptions for Notification Policies screen

Fields	Description
Event	Select any of the following event that will generate notification alerts: • *License Notification* • *Kube cluster service account expiry Notification* • *Kube cluster status unhealthy Notification* • *Password policy Notifications* • *Policy Central Notifications* • *Super admin login Notifications* • *Certificate Auto Enrollment Protocol Requests Notifications* • *User Profile Update* • *PKI Custodian Approval*

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Fields	Description
	• *Missed CronJob Notifications* • *DCV Action*
Channels	Select the channels to receive the notifications: • *Push Notifications* - These are in-product notifications, displayed on the notifications window upon clicking the bell icon. • *Emails* - Notifications will be received by email in the designated user(s)/user group(s) inbox.
Recipient Category	Select who should receive the notifications: • *User* • *User group* • *Email / Distro*
User / User Group / Email	Select one or more user(s) or user group(s) from the dropdown if the Recipient category is *User* or *User group*. Enter one or more email ids in the field provided if the Recipient category is *Email*. (Input multiple email ids separated by comma).

6. Click **Update**.

   The created notification policy is displayed in the table with columns as described below.

Column	Description
Event	The event that will generate notification alerts.
Status	Displays whether the event is enabled or disabled.
Channels	The selected channels.
Recipient Category	Displays the category opted (user(s)/user groups(s)/email ids)
Notification Recipients	The user(s)/user groups(s)/email ids of the recipient(s).

   The following buttons are available above the table:

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- **More actions** - dropdown with options to **Enable** or **Disable** an event from the table.
- **Refresh** - to refresh the table based on updates made.

7. To enable or disable an event, select the checkbox(s) next to **Event** column. After the More actions button is displayed, select **Enable** or **Disable**.

Viewing Notifications

To view the push (in-product) notifications:

1. Login to AppViewX with valid credentials.
2. From the top right corner of your screen, click  **Notification Center** (Bell) icon. (*The Notifications window is displayed with the notifications.*)
3. To expand or view product based notifications, from the bottom of the Notifications window, click **View All Notifications**. (*All product notifications are displayed.*)
   - To view product specific notifications, click the specific product on the left.

To view the email notifications:

- As soon as the event is triggered, check the inbox. (if your email was assigned or you belong to the specific user group or email distro.)

Access Management: Configuring Authentication Settings

In addition to configuring authentication settings, AppViewX also lets you enable birthright provisioning for new users, configure the order in which user credentials are authenticated, enable/disable an authentication check, and other user and node settings.

To configure the authentication settings:

1. On the **Settings :: Authentication** page, under the **Authentication settings** tab, to enable **Birthright provisioning** for new users who log into the system with a predefined set of permissions (associated with the user group), turn on the **Enable Birthright** toggle.
   To do this, the admin should select the user group (Assigned with the defined permissions), which will act as a default user group for all the users logging in to AppViewX. Fore more details, refer to the content on creating a role and associating it with a user group.
2. To define the order in which the authentication settings will be checked, in the **Order** section, drag and drop the authentication labels to the required corresponding levels.

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If the level 1 check is set to Local and the level 2 check is set to LDAP, user credentials will be authenticated locally first and then on the LDAP server.

Note: You can also disable, and then enable a level of authentication. To do this, click the green tick 

next to the server name.

3. In the **User settings** section, enter the required field information.

Field descriptions for User settings

Field	Description
Create User with an unique E-mail ID	To ensure that every AppViewX user has a unique email ID, turn on this toggle.
Create User on Authorization Failure	To create a user even if authorization fails (but the user is authenticated successfully), turn on this toggle.
Exclude domain name from User name	To exclude the domain name from the username during SSO or LDAP logins, turn on this toggle.
Idle Session Timeout	Users can enter the idle web session timeout limit in minutes. AppViewX lets you set a session timeout limit between 2 and 480 minutes.
Enable Max Session Timeout	Enable the toggle to enter the max session timeout duration, which will force the session to expire even if idle time never expires.
Max Session Timeout	**Note:** This field appears only when the **Enable Max Session Timeout** toggle is turned on. AppViewX lets you set **Max Session Timeout** limit between 100 and 7200 minutes. To set a max session timeout limit, enter the value in minutes. **Note:** The session timeout expiration notification appears 4 minutes and 1 minute prior to the session's expiration.

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4. If the AppViewX node password is updated, in the **Node Settings** section, enter the updated Node Password.

> **Note:** The value entered in the Node Password field should be the same as the node password. To apply the changes, restart the avx-config-server pod in every datacenter.

5. Click **Save**.

• LDAP Authentication
• TACAS Authentication
• RADIUS Configuration
• Single Sign On (SSO) Configuration
• SCIM Configuration
• MFA Settings Configuration
• Authentication Settings Configuration
• OAuth Settings
• IP Restriction Configuration

LDAP Authentication

LDAP Authentication is a method used by systems to authenticate user identities against a centralized LDAP (Lightweight Directory Access Protocol) directory service. It validates user credentials, such as username and password, stored in the LDAP server to grant access to various applications and services within an organization's network.

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Accessing LDAP Authentication Settings

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **ACCESS MANAGEMENT**, select **LDAP**. The **Settings :: Authentication** page is displayed with the **LDAP** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Authentication**. The **Settings :: Authentication** page is displayed with the **LDAP** tab open by default.
Note: For more information on how to switch between menus, click here.	

Configuring the LDAP Authentication

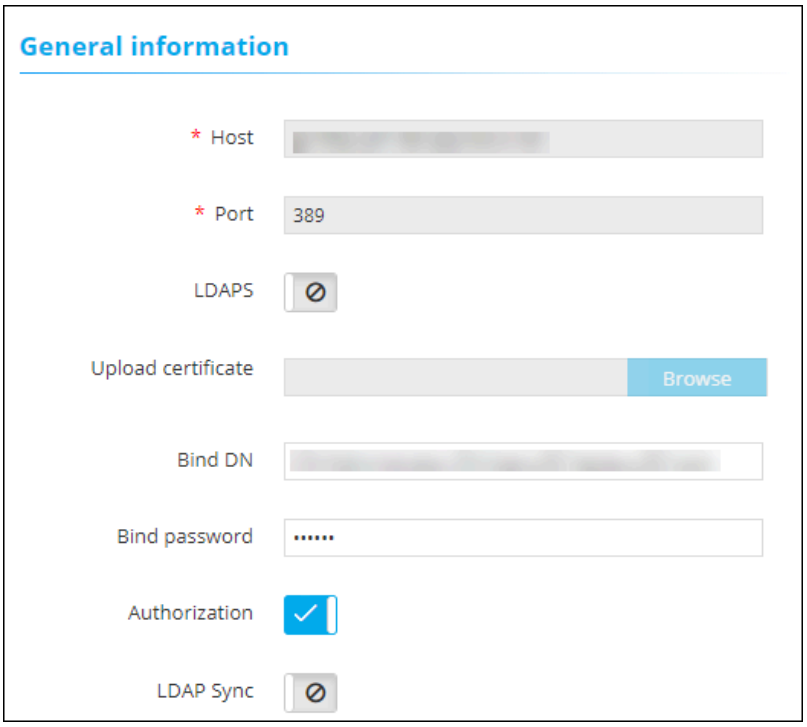
The Lightweight Directory Access Protocol (LDAP) is an authentication protocol to validate a user's credentials entered in an application, against the credentials stored in the Active Directory database.

AppViewX integrates with the Active Directory and Open LDAP for authentication of external users. It also enables configuring multiple servers in the event that users belong to multiple domains.

To configure the LDAP authentication:

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1. On the **Settings :: Authentication** page, under the **LDAP** tab, in the **General Information** section, enter the following details (sample values are shown in the image):



Field descriptions for General Information

Field	Description
***Host**	Host name (domain name) of the LDAP server.
***Port**	Port number of the LDAP server. **Note:** This value is entered based on the port number used in your deployment. By default, port number **389** is used for a LDAP configuration and port number 636 is used for a LDAPS configuration.
LDAPS	The LDAPS protocol is used for secure communication between AppViewX and Active Directory/Open LDAP. To enable use of the LDAPS protocol, enable this toggle.
Upload Certificate	This field is enabled only when the **LDAPS** is enabled.

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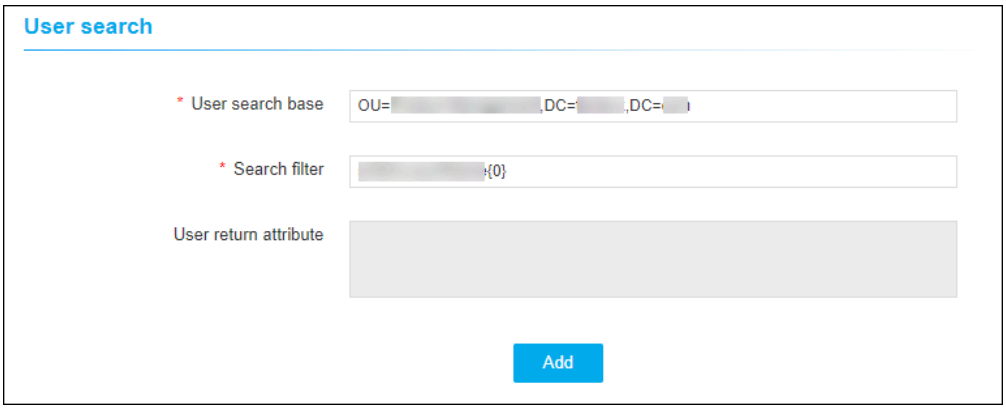
Field	Description
	To upload a LDAP server certificate: a. Click **Browse Certificate**. b. Navigate to the location of the **.pem** certificate file. **Note:** If the LDAP servers are load balanced with VIP, upload the root certificate of the LDAP server instead of the server certificate. c. Select the certificate to be uploaded and click **Open**. The selected certificate is uploaded. **Note:** Only a single certificate can be uploaded for each server.
Bind DN	Username of the base authentication endpoint that will be used to connect to LDAP.
Bind password	Password of the base authentication endpoint that will be used to connect to LDAP.
Authentication	In addition to authentication, AppViewX also lets you perform user authorization against the LDAP server. To enable authorization along with authentication, turn on the toggle. **Note:** If **Authorization** is not enabled, AppViewX will only carry out LDAP authentication for the given user.
LDAP Sync	To enable the use of the SSH module in AppViewX for SSH key discovery use case, turn on the toggle.
** : Mandatory fields*	

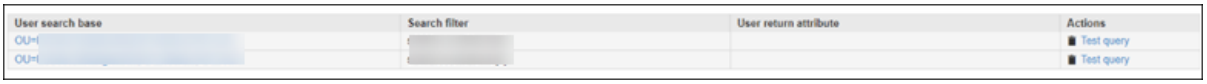
2. After entering the above connection details, to test if the host is reachable and the port is valid for establishing a LDAP/LDAPS connection, click **Test Connection**.

Note: You can test the connection of LDAPS only when you save all of the configuration details. Bind DN and Bind password details cannot be validated through a test connection.

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3. The **User Search** section collects information to validate a user's presence in the Active Directory. In the **User Search** section, enter the following details (sample values are shown in the image):





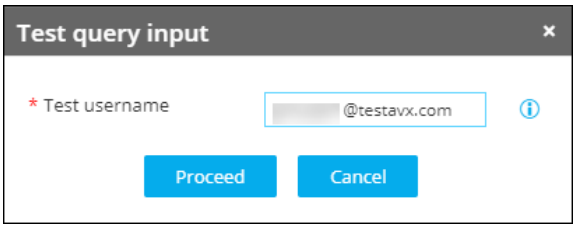
> **Note:** You can now add multiple OUs in User search so that it checks multiple OUs to validate a user's presence in the Active Directory.

Field descriptions for User Search

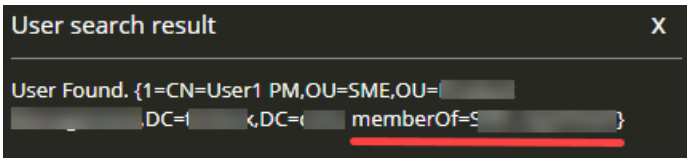
Field	Description
***User search base**	Base directory where the user is present.
***Search filter**	Criteria for searching for the user from the search base.
User return attribute	This field is enabled only when the **Authorization** toggle (in the **General Information** section) is turned on. User information to be retrieved from the search base. **Note:** You can specify only **User return attribute**.
** : Mandatory fields*	

4. For the given configuration, to check the user's presence, click **Test query**.
5. In the **Test query input** dialog box, enter the **Test username**.

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The output is displayed as shown in the image below:



6. To test which user group the user belongs to, in the **Group search** section, enter the following details:

> **Note:** This section is enabled only when the **Authorization** toggle (in the **General Information** section) is turned on.

Field descriptions for Group search

Field	Description
***Group search base**	Base directory where the user group is present.
***Search filter**	Criteria to search the user group from the search base.
Group return attribute	User group information to be retrieved from the search base.
** : Mandatory fields*	

> **Note:** You are allowed to check the query response for User search and Group search only when the connection is valid.

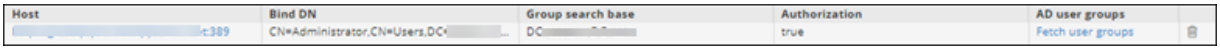
> **Note:** Group search can be performed only if the customer's LDAP is of type Open LDAP. Microsoft Active Directory does not need group search configuration. For Open LDAP, group search needs to be configured mandatorily. The User return attribute in the User search section does not return the group membership details.

7. After entering the above details, to test if the group search query thus configured works, click **Test Query**. For Open LDAP, when the user runs the test query for group search, the user search base

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details are passed to the group search test query and the group membership details for that user are returned.

8. To save the LDAP settings, click **Save**.
   The LDAP authentication settings thus configured are saved and displayed in the table shown at the end of this screen:



> **Note:** In the case of multiple LDAP servers, to define/update the order in which the servers will be authenticated, drag and drop the entries in this table.

9. To reconfigure the settings, click **Reset**.

TACAS Authentication

TACACS (Terminal Access Controller Access-Control System) is a remote authentication protocol commonly used to manage access to network devices. It ensures secure user authentication, authorization, and accounting (AAA) services in network security by validating users attempting to gain access to a network.

Accessing TACAS Authentication Settings

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **ACCESS MANAGEMENT**, select **TACAS**. The **Settings :: Authentication** page is displayed with the **TACAS** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Authentication**. The **Settings :: Authentication** page is displayed with the **LDAP** tab open by default. 3. Click the **TACAS** tab.
For more information on how to switch between menus, click here.	

Configuring the TACACS Authentication

The Terminal Access Controller Access Control System (TACACS) authentication is used to validate users requesting remote access. AppViewX integrates with TACACS for authentication of external users.

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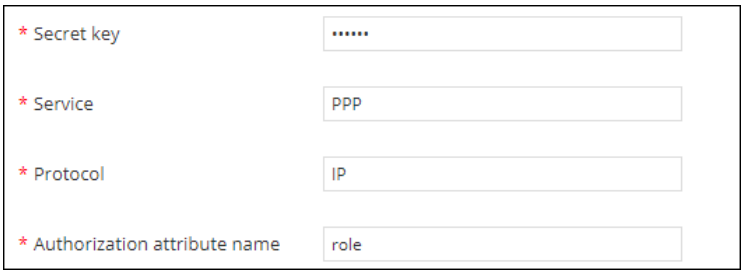
To configure the TACACS authentication:

1. On the **Settings :: Authentication** page, under the **TACAS** tab, enter the following details:

Field descriptions for TACAS Test connection

Field	Description
***Server name**	Name of the TACACS server.
***IP address**	IP address of the TACACS server.
***Port**	Port number of the TACACS server.
** : Mandatory fields*	

2. To test the connectivity between AppViewX and the IP address mentioned above, click **Test connection**.
3. Enter the following details (sample values are shown in the image):



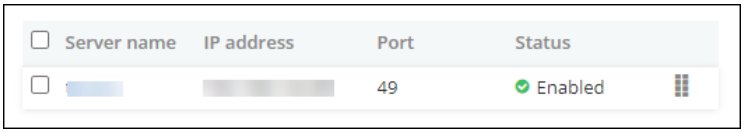
Field descriptions for TACAS

Field	Description
***Secret key**	A unique key for authentication between the AppViewX server and the TACACS server.
***Service**	Name of the service used by the user requested to be authorized. Specifying the service name is mandatory because it enables the TACACS+ server to behave according to the type of each authorization request. Commonly, the Point-to-Point Protocol (PPP) is used for authorization checks.
***Protocol**	The protocol associated with the value specified in Service Name, which is a subset of the associated service being used for client authorization or system accounting

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Field	Description
	Commonly, the Internet Protocol (IP) is used as the modifier with PPP to indicate the protocol layer for authorization check.
***Authorization Attribute Name**	Attribute that will be returned from the TACACS server to authenticate and authorize the connection between the AppViewX server and the TACACS server.
** : Mandatory fields*	

4. To save the TACACS authentication settings, click **Add**.
   The TACACS authentication settings thus configured are saved and displayed in the table shown in the left half of the screen:



> **Note:** In the case of multiple TACACS servers, to define/update the order in which the servers will be authenticated, drag and drop the entries in this table.

5. To reconfigure the settings, click **Reset**.

Enabling a TACACS Server for Authentication

To enable a TACAS server for authentication:

1. On the **Settings :: Authentication** page, under the TACAS tab, from the table displayed in the left half of the page, for the server you want to enable, select the check box corresponding to the server name.
2. From the top-right corner of the page, click **(Enable)** icon.
3. In the **Confirmation message** dialog box, click **Proceed**.

Disabling a TACACS Server for Authentication

To disable a TACAS server for authentication:

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1. On the **Settings :: Authentication** page, under the TACAS tab, from the table displayed in the left half of the page, for the server you want to disable, select the check box corresponding to the server name.
2. From the top-right corner of the page, click **(Disable)** icon.
3. In the **Confirmation message** dialog box, click **Proceed**.

Deleting a TACACS Server

To delete a TACAS server :

1. On the **Settings :: Authentication** page, under the TACAS tab, from the table displayed in the left half of the page, for the server you want to delete, select the check box corresponding to the server name.
2. From the top-right corner of the page, click **(Delete)** icon.
3. In the **Confirmation message** dialog box, click **Proceed**.

RADIUS Configuration

RADIUS (Remote Authentication Dial-In User Service) Configuration involves setting up a networking protocol that provides centralized authentication, authorization, and accounting management for users connecting to a network. It establishes a secure method for users to access resources via a client-server protocol.

Accessing the RADIUS Configuration Settings

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **ACCESS MANAGEMENT**, select **RADIUS**. The **Settings :: Authentication** page is displayed with the **RADIUS** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Authentication**. The **Settings :: Authentication** page is displayed with the **LDAP** tab open by default. 3. Click the **RADIUS** tab.
For more information on how to switch between menus, click here.	

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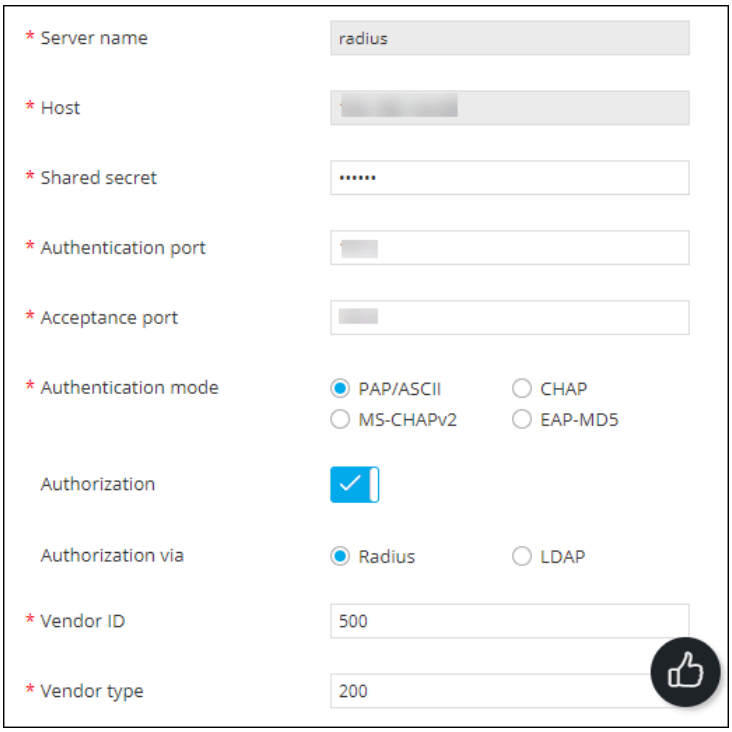
Configuring the RADIUS Configuration

The Remote Authentication Dial-In User Service (RADIUS) protocol is a networking protocol that provides centralized authentication, authorization, and accounting management.

AppViewX integrates with RADIUS for authentication of external users.

To configure the RADIUS authentication:

1. On the **Settings :: Authentication** page, under the **RADIUS** tab, enter the following details (sample values are shown in the image):



Field descriptions for RADIUS

Field	Description
***Server name**	Name of the RADIUS server.
***Host**	The IP address of the RADIUS server.
***Shared secret**	A unique key for authentication between the AppViewX server and the RADIUS server.
***Authentication port**	Port number that AppViewX will use for authentication.

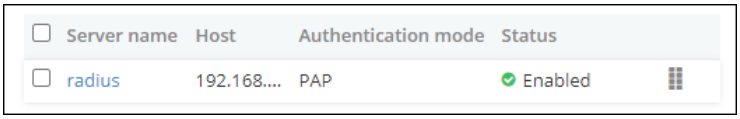
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Field	Description
	The default authentication port number is 1812. Please check with your sysadmin if your organization uses a different port number.
***Acceptance port**	Port number that AppViewX will use to accept a response from the RADIUS server. The default acceptance port number is 1813. Please check with your sysadmin if your organization uses a different port number.
***Authentication mode**	Select one of the following authentication modes: • PAP/ASCII • CHAP • MS-CHAPv2 • EAP-MD5 **Note:** Ensure that the selected authentication mode is also confirmed in the RADIUS server settings.
***Authorization**	In addition to authentication, AppViewX also lets you perform user authorization against the RADIUS server. To enable authorization along with authentication, turn on the toggle. **Note:** If Authorization is not enabled, AppViewX will only carry out RADIUS authentication for the given user.
***Authorization via**	Select from one of the following authorization modes: • RADIUS: To perform both, authentication and authorization, via the RADIUS server • LDAP: To perform authentication via the RADIUS server and authorization via the LDAP server This field is enabled only when the **Authentication** toggle is turned on.
***Vendor ID**	Enter the vendor ID.

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Field	Description
	Note: AppViewX does not have a unique vendor ID. We use a free vendor ID: **500**. Ensure that this is configured as part of the RADIUS server settings. This field is enabled only when the **Authentication** toggle is turned on and authorization is done via the RADIUS server.
***Vendor type**	Enter the vendor type. **Note:** AppViewX does not have a unique vendor type. We use a free vendor ID: **200**. Ensure that this is configured as part of the RADIUS server settings. This field is enabled only when the **Authentication** toggle is turned on and authorization is done via the RADIUS server.
***LDAP**	From the drop-down menu, select the LDAP server to be used for the authorization. This field is enabled only when the **Authentication** toggle is turned on and authorization is done via the LDAP server.
** : Mandatory fields*	

2. To save the RADIUS authentication settings entered above, click **Add**.
   The RADIUS authentication settings thus configured are saved and displayed in the table shown in the left half of the screen:



Note: In the case of multiple RADIUS servers, to define/update the order in which the servers will be authenticated, drag and drop the entries in this table.

3. To reconfigure the settings, click **Reset**.

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Enabling a RADIUS Server for Authentication

To enable a RADIUS server for authentication:

1. On the **Settings :: Authentication** page, under the **RADIUS** tab, from the table displayed in the left half of the page, for the server you want to enable, select the check box corresponding to the server name.
2. From the top-right corner of the page, click **(Enable)** icon.
3. In the **Confirmation message** dialog box, click **Proceed**.

Disabling a RADIUS Server for Authentication

To disable a RADIUS server for authentication:

1. On the **Settings :: Authentication** page, under the **RADIUS** tab, from the table displayed in the left half of the page, for the server you want to disable, select the check box corresponding to the server name.
2. From the top-right corner of the page, click **(Disable)** icon.
3. In the **Confirmation message** dialog box, click **Proceed**.

Deleting a RADIUS Server

To delete a RADIUS server:

1. On the **Settings :: Authentication** page, under the **RADIUS** tab, from the table displayed in the left half of the page, for the server you want to delete, select the check box corresponding to the server name.
2. From the top-right corner of the page, click **(Delete)** icon.
3. In the **Confirmation message** dialog box, click **Proceed**.

Single Sign On (SSO) Configuration

Single Sign-On Configuration involves setting up systems to enable users to access multiple applications with a single set of credentials, simplifying authentication processes and enhancing user experience across different platforms or services.

- Security Assertion Markup Language (SAML)
- OpenID Connect (OIDC)

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Accessing the SSO Configuration Settings

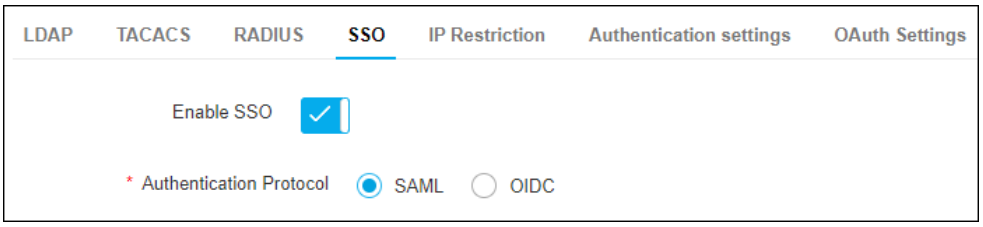
New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **ACCESS MANAGEMENT**, select **SSO**. The **Settings :: Authentication** page is displayed with the **SSO** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Authentication**. The **Settings :: Authentication** page is displayed with the **LDAP** tab open by default. 3. Click the **SSO** tab.
For more information on how to switch between menus, click here.	

Configuring Single Sign On Settings with AppViewX

Single sign-on (SSO) is an authentication method that enables users to securely authenticate with multiple applications and websites by using just one set of credentials.

To configure single sign on settings with AppViewX:

On the **Settings :: Authentication** page, under the **SSO** tab, turn on the **Enable SSO** toggle.



The **Authentication protocol** field is displayed with the following options:

- **SAML** (selected by default)
- **OIDC**

Security Assertion Markup Language (SAML)

- Configuration of SAML Parameters in AppViewX (Service Provider)
- Mapping User Groups for Local Authorization

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• SAML Vendor-Side Configuration
• Troubleshooting

SAML Overview

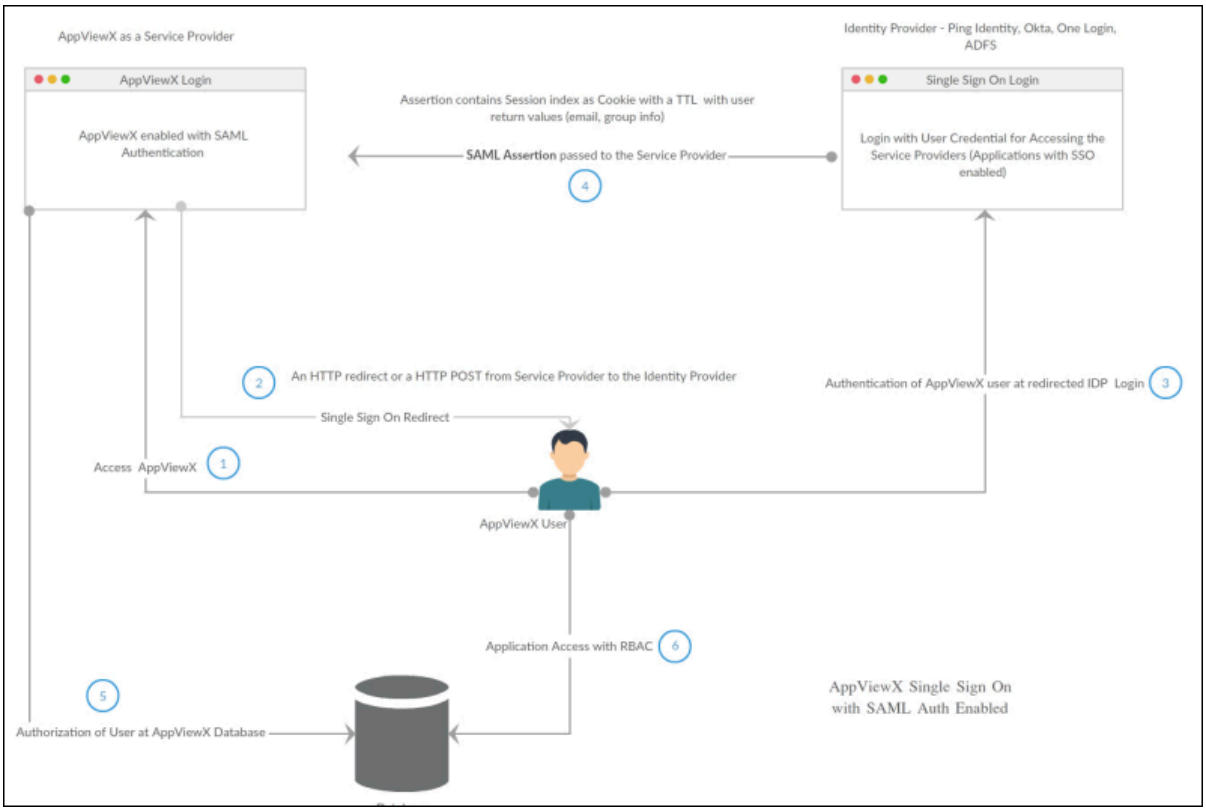
Security Assertion Markup Language (SAML) is a mechanism used for communicating identities between two web applications. It enables a web-based Single sign-on (SSO) and hence, it eliminates the need for maintaining credentials for various applications and reduces identity theft.

SAML integration requires the following parameters:

• IDP – Identity Provider (Okta, OneLogin, PingIdentity, and OpenSSO)
• SP – Service Provider (any application which supports SAML 2.0), AppViewX in this case
• User – Access the application.

Basic SAML Flow

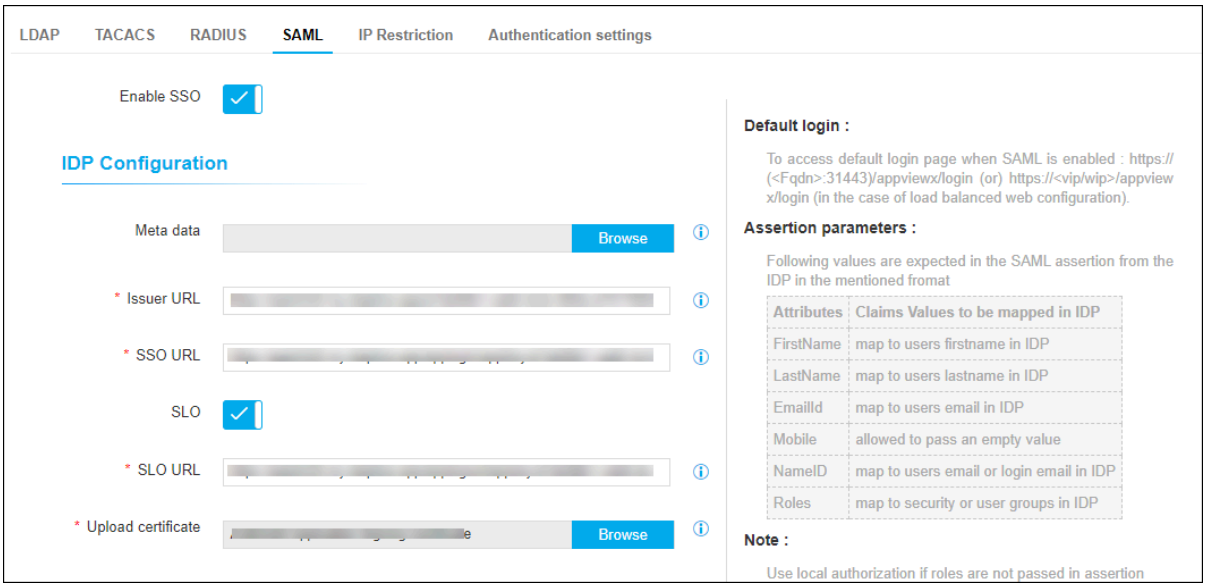
A user requests a SAML SSO to access a resource protected by a service provider. The service provider requests the identity provider to authenticate and authorize the user. The identity provider checks the existence of the user and sends back an assertion to the service provider that may or may not include the user information. The communication passes through the HTTP/HTTPS.



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Configuration of SAML Parameters in AppViewX (Service Provider)

1. On the **Settings :: Authentication** page, under the **SSO** tab, turn on the **Enable SSO** toggle.
2. In the **Authentication Protocol** field, select the **SAML** option.
3. Enable the **Enable SSO** toggle. This action will populate the service provider contents for the integration.
4. Under the **IDP Configuration** section, enter the required field information.



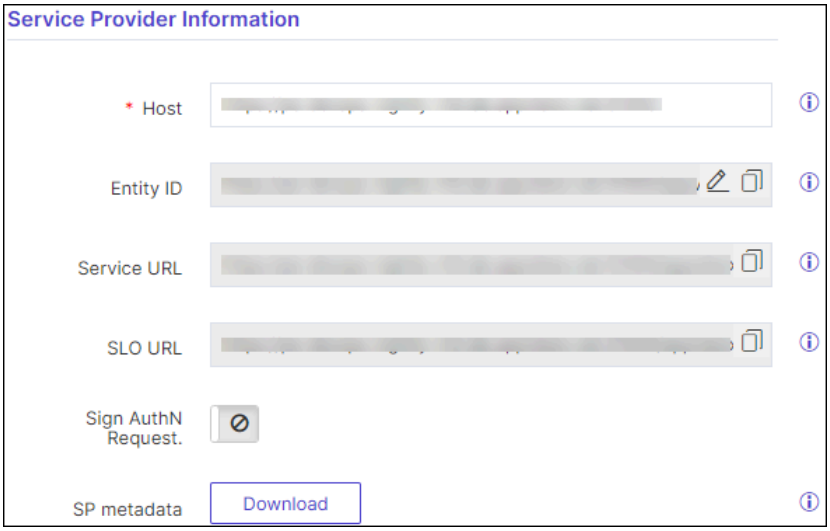
Field descriptions for IDP Configuration

Field	Description
Meta data	Upload the Metadata which is downloaded from your Identity Provider. **Note:** Upload of metadata automatically parses the fields SSO, SLO, and so on.
***Issuer URL**	This field is auto-populated upon uploading of the **Meta data**. In case the **Meta data** is unavailable, enter the ID of the Identity Provider.
***SSO URL**	This field is auto-populated upon uploading of the **Meta data**. In case the **Meta data** is unavailable, enter the SSO URL which is a single sign-on URL for the service provider to authenticate the users.
SLO	Enable/Disable SLO as per requirement.

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Field	Description
***SLO URL**	This field is auto-populated upon uploading of the **Meta data**. In case the **Meta data** is unavailable, enter the SLO URL which is the SAML logout URL to send logout responses.
***Upload certificate**	Upload the IdP certificate in **.pem** format if it is not available as a part of your IdP metadata.
** : Mandatory fields*	

5. Under the **Service Provider Information** section, enter the required field information.



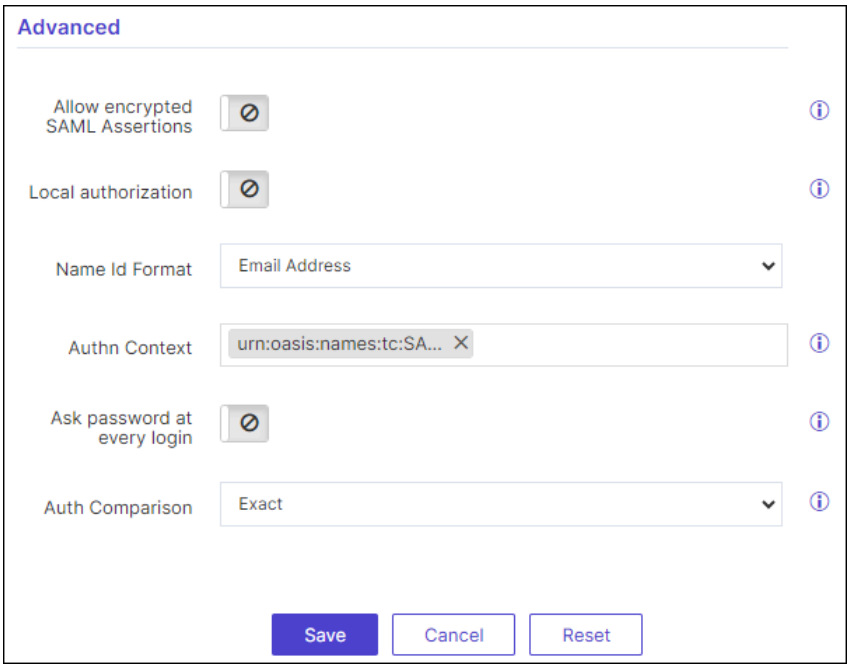
Field descriptions for Service Provider Information

Field	Description
***Host**	Enter the host information for AppViewX in the Host field. The host information can be the Hostname/URL used to access the application. **Note:** The **Entity ID**, **SSO URL** and the **SLO URL** fields will be auto-populated based on the Host information provided.
Entity ID	This field is auto-populated based on the **Host** information provided. Its a Unique identifier of the Service Provider AppViewX. Click **(Edit)** icon to modify the Entity ID.

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Field	Description
Service URL	This field is auto-populated based on the **Host** information provided.
SLO URL	This field is auto-populated based on the **Host** information provided.
Sign AuthN Request	Enable/Disable the Sign AuthN Request toggle to send signed AuthN requests from AppViewX to your Identity Provider. **Note:** This is to be enabled only when your IdP requires a sign authN request from service provider. Once the Sign AuthN Request is enabled, Upload a Service Provider certificate and private key in a p12 format and provide the p12 Password. Choose the Signing Algorithm (Recommended Algorithm: SHA-256) from the drop-down list. The Service provider certificate should be shared with the IDP to validate the Service Provider SAML assertion signature.
SP metadata	Download the Service Provider information (Entity Id, SSO/Service URL, SLO URL)to be consumed at IdP.

6. Under the **Advanced** section, enter the required field information.



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Field descriptions for Advanced

Field	Description
Allow encrypted SAML Assertions	Enable/Disable the Allow encrypted SAML Assertions to encrypt SAML assertion using decryption certificate and decryption certificate password. If SAML Assertions are encrypted in the IDP, enable this field to decrypt the SAML assertions before using them in AppViewX. Once Allow Encrypted SAML Assertions is enabled, upload the Assertions decryption certificate and private key in a p12 format, and the password of the Assertions decryption certificate provide the p12 password to decrypt the private key in the certificate. The service provider certificate should be shared with the IDP to validate the service provider SAML assertion.
Upload Assertions decryption certificate	Upload the Assertions decryption certificate. Private key in this certificate will be used to decrypt the SAML assertions. This field is visible only when 'Allow encrypted SAML Assertions' is enabled.
Password of Assertions decryption certificate	Enter the password to decrypt the private key in the certificate. This field is visible only when 'Allow encrypted SAML Assertions' is enabled.
Local authorization	Enable/Disable the Local authorization to authenticate in IdP and authorize in AppViewX. If the IDP is unable to pass the roles/usergroup as a part of the SAML assertion and requires AppViewX to perform the Authorization then the above feature can be used. **Note:** This feature is available from 20.1 version of AppViewX.
Name Id Format	Choose the Name id Format from the drop-down list.
Authn Context	Enter the Authn Context in the text field. Use any one of the below values for a customized type of auth request needed by your IDP. Other RFC SAML2.0 standard auth request can also be used. (Copy and paste the below values or add values in the same format from RFC to the AuthNcontext field). • urn:oasis:names:tc:SAML:2.0:ac:classes:X509. • urn:oasis:names:tc:SAML:2.0:ac:classes:TLSClient.

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Field	Description
	• urn:oasis:names:tc:SAML:2.0:ac:classes:PasswordProtectedTransport • urn:oasis:names:tc:SAML:2.0:ac:classes:Password • urn:oasis:names:tc:SAML:2.0:ac:classes:Kerberos • urn:oasis:names:tc:SAML:2.0:ac:classes:InternetProtocol
Ask password at every login	If this option is enabled, the user will be required to enter their password during each login, even if a single sign-on (SSO) session is currently active.
Auth Comparison	Choose the Auth Comparison from the drop-down field. This indicates how the authentication context URI in the AuthnRequest message compares to the context defined at the asserting party. It is preferred to be exact.

7. Click **Save**.
8. If the configuration provided needs to be removed, click **Reset**.

Mapping User Groups for Local Authorization

Administrators can map user groups manually for external users login through SSO by using either Manual mapping or Birthright.

Manual Mapping

Once the user logins to AppViewX using SSO if no proper Roles are passed in the Assertion the user will end on a No Usergroup found page. Now the administrator can log in with the default login URL **https://ip:port/appviewx/login** and navigate to Account > Users. The user who has not logged in will have the user-created tag and will be in an inactive state. Administrators can modify the user and map the user to a user group that is available and this will enable the user to login successfully on the next attempt.

Birthright Role

The administrator can enable a birthright role and map a user group by default for all the SSO users to log in initially when they do not have a role/user group passed in the SAML assertion. This would enable the user to login successfully and access the application with the access given in the specific user group. If required now the administrator can create different sets of user groups and assign manually to the respective users who do not need the birthright user group which will be reflected in the subsequent login.

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SAML Vendor-Side Configuration

- ADFS Integration
- Azure ADFS IDP Configuration
- Forgerock Integration
- Idaptive Integration
- OneLogin Integration
- Okta Integration
- PingOne SSO

ADFS Integration

The below steps are performed at the IdP end. The navigation and screenshots might differ based on the version of the IdP. (This is just an example configuration)

Prerequisite

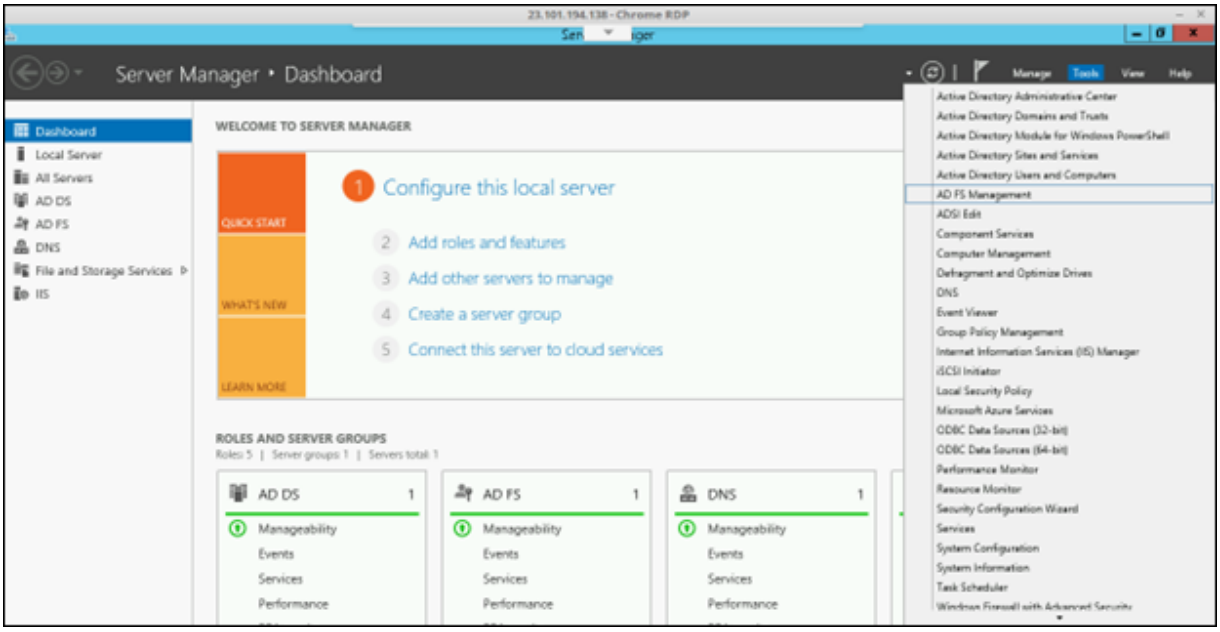
To enable ADFS based single sign-on, the ADFS service should be installed and configured with the respective Active Directory Domain.



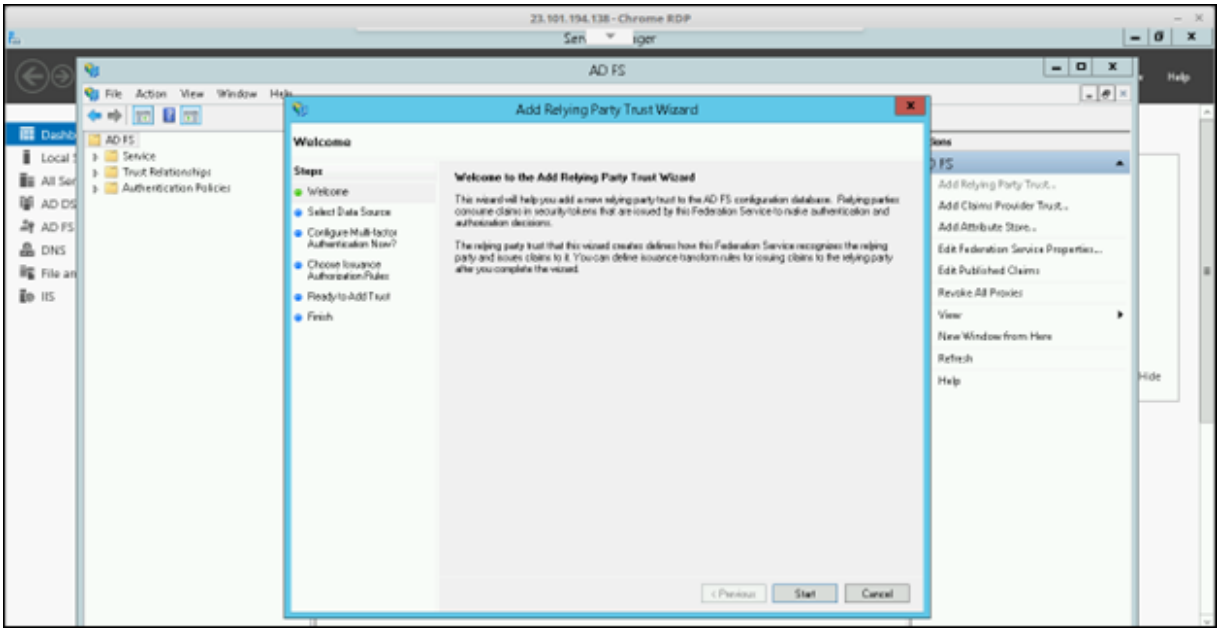
Note: The steps are performed on the Windows 2012 R2 server with AD enabled in the same domain.

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1. Navigate to **Server Manager** > **Tools** > **AD FS Management**.

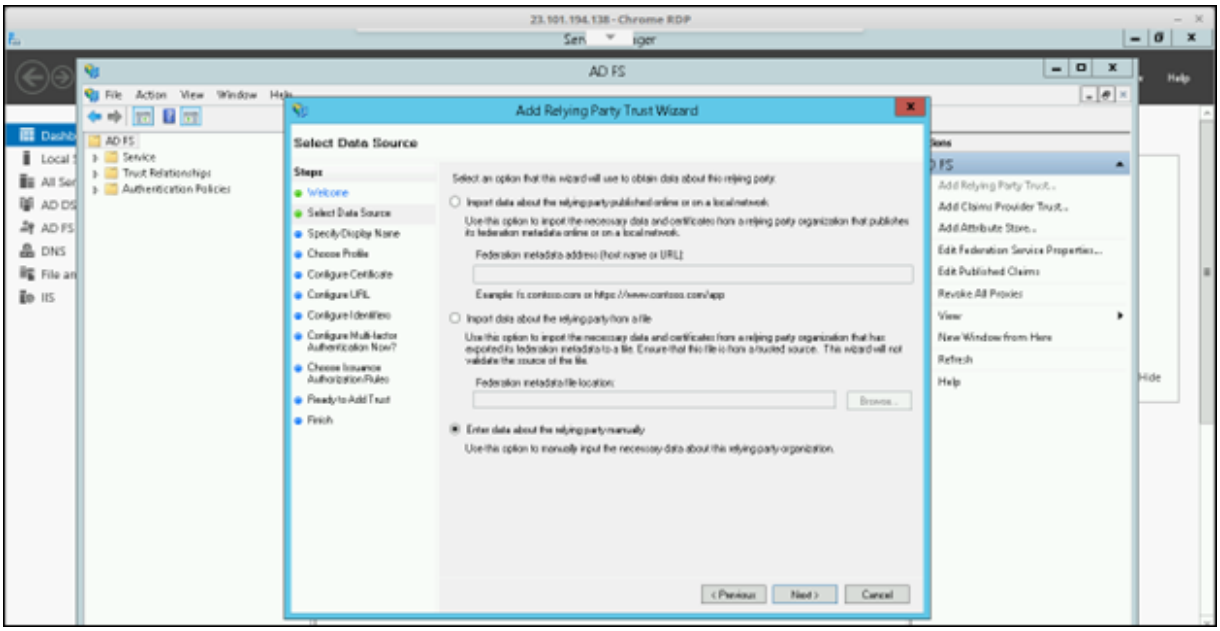


2. In the **AD FS** window, under **Actions** select **Add Relying Party Trust**.

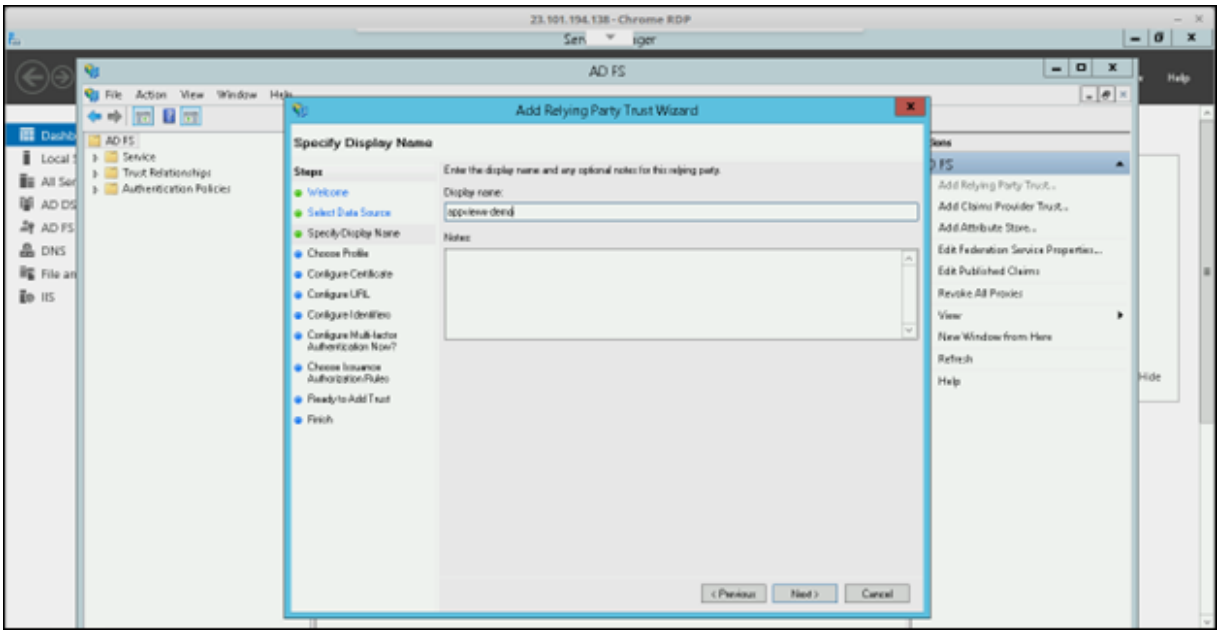


3. Click **Start** to **Add Relying Party Trust wizard**.
4. Under the **Select Data Source** section, select the **Enter data about the relying party manually** option, and then click **Next**.

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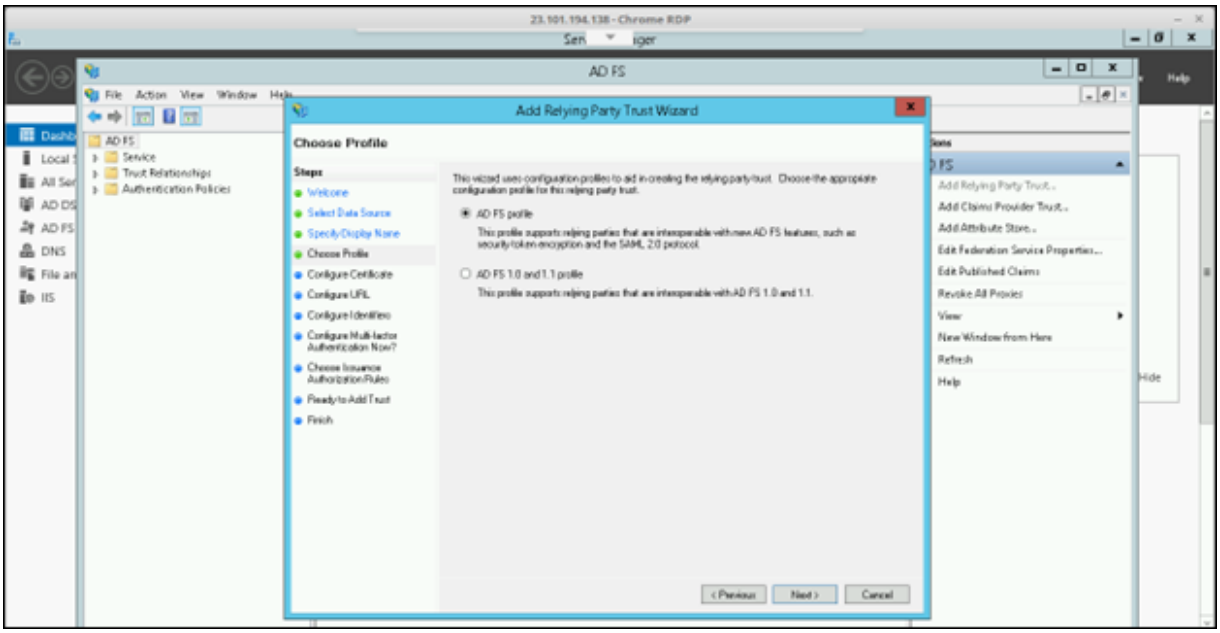


5. Enter a **Display Name** and click **Next**.

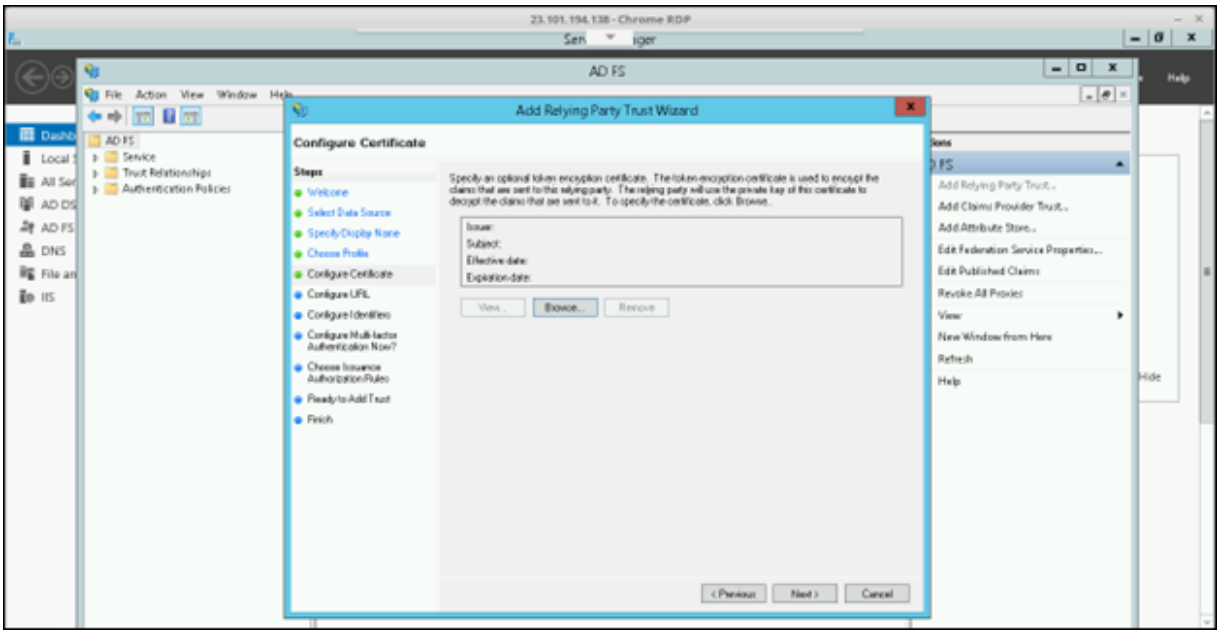


6. Under the **Choose Profile** section, select the **AD FS profile**option and click **Next**.

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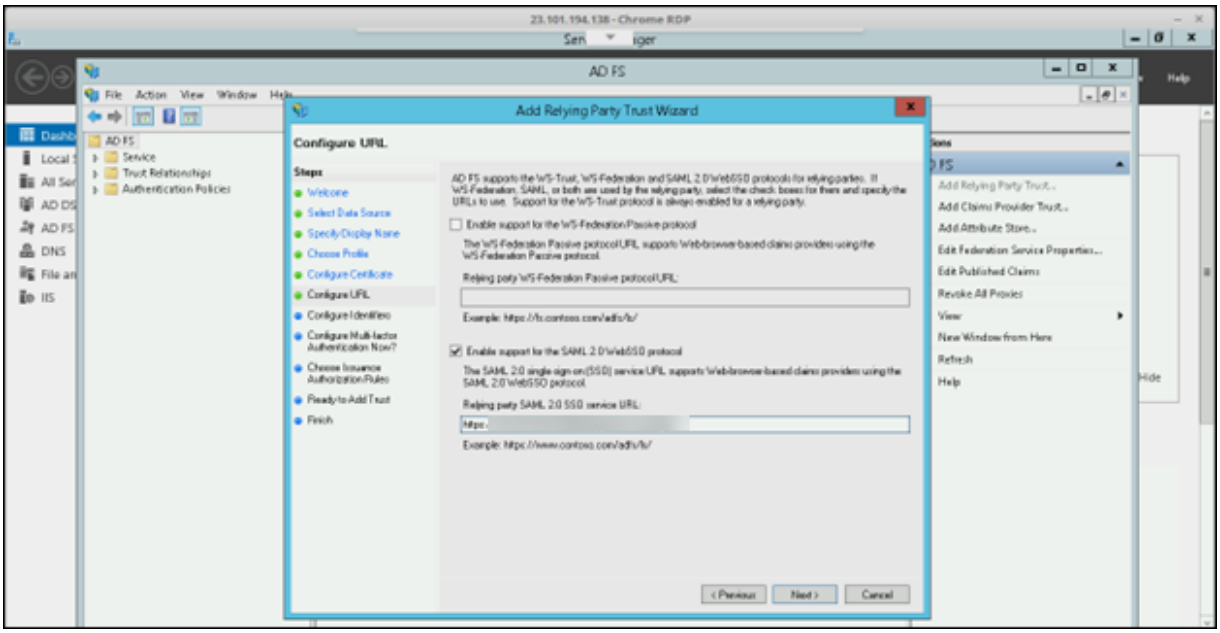


7. Add a new token encryption certificate if needed or leave it with the default setting and click **Next**.

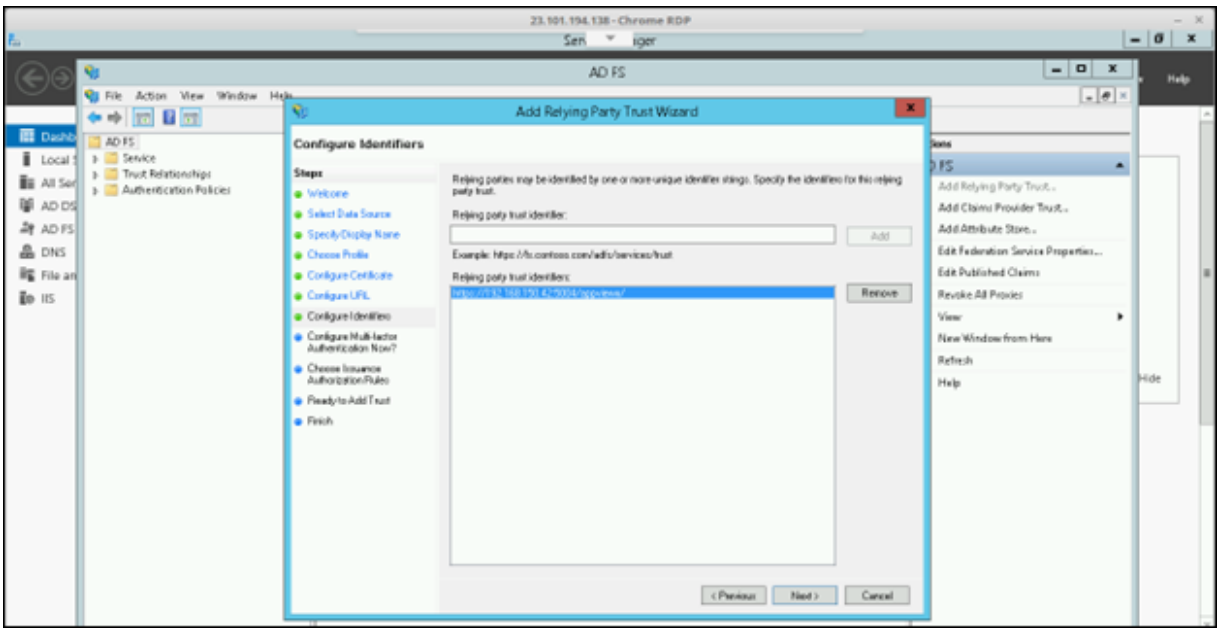


8. Under the **Configure URL** section, select the **Enable support for SAML 2.0 WebSSO protocol** option.
9. Enter the AppViewX Service URL which was copied in the previous step of Enabling SSO in AppViewX and click **Next**.

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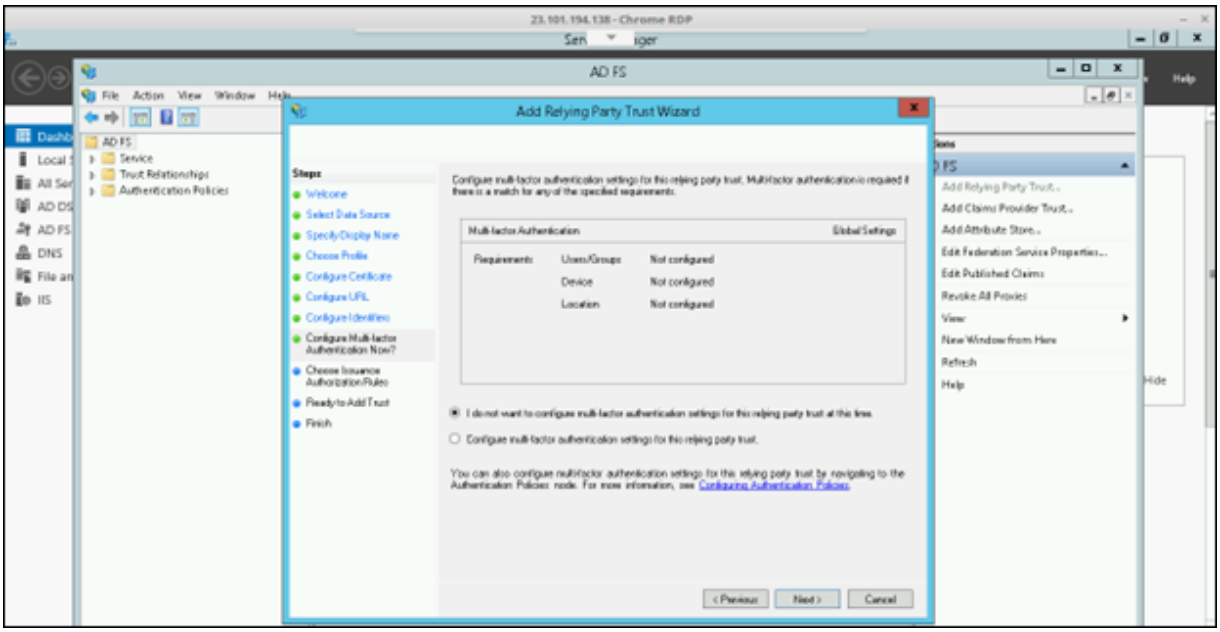


10. Under the **Configure Identifiers** section, enter the **AppViewX Entity ID** which was copied in the previous step of Enabling SSO in AppViewX and click **Add**.

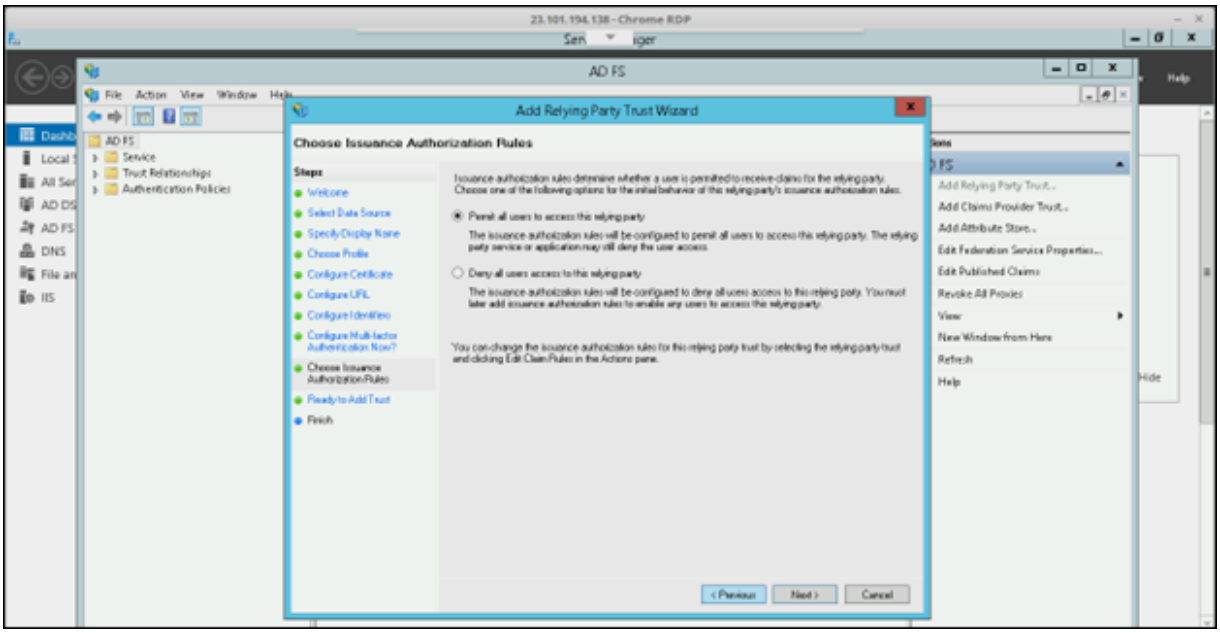


11. Click **Next**.
12. Under the **Choose Multi-factor Authentication** section, select the **I do not want to configure multi-factor authentication settings at this time** option. If the organization has a multi-factor authentication setting, enable it and click **Next**.

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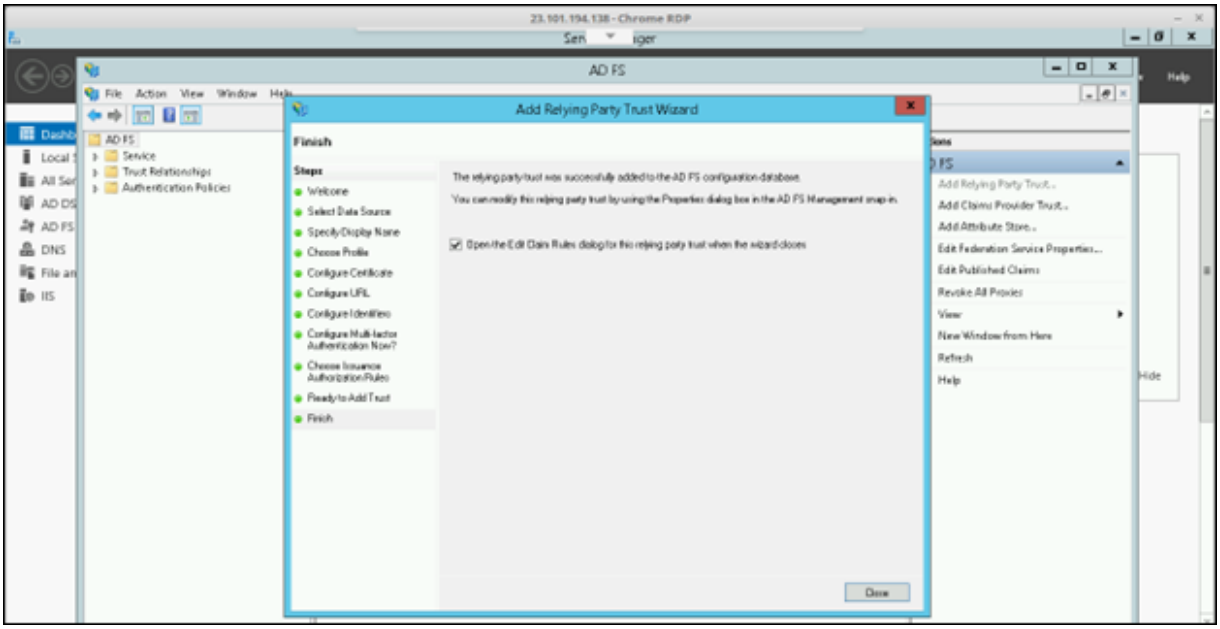
13. Under the **Choose Issuance Authorization Rules** section, select **Permit All Users to access this relying party** and then, click **Next**.



14. Under the **Ready to Add Trust** section, review the configuration done in the wizard and click **Next**.

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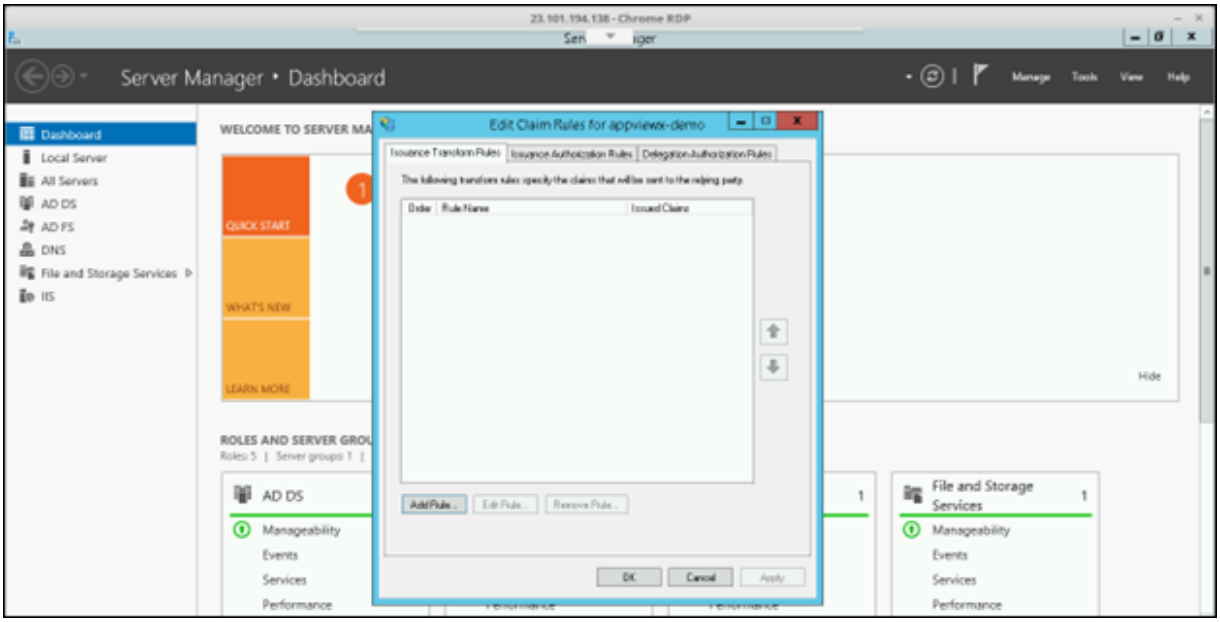
15. Under the **Finish** section, select the **Open the Edit Claims** checkbox and click **Close**.



Add Claim Rules

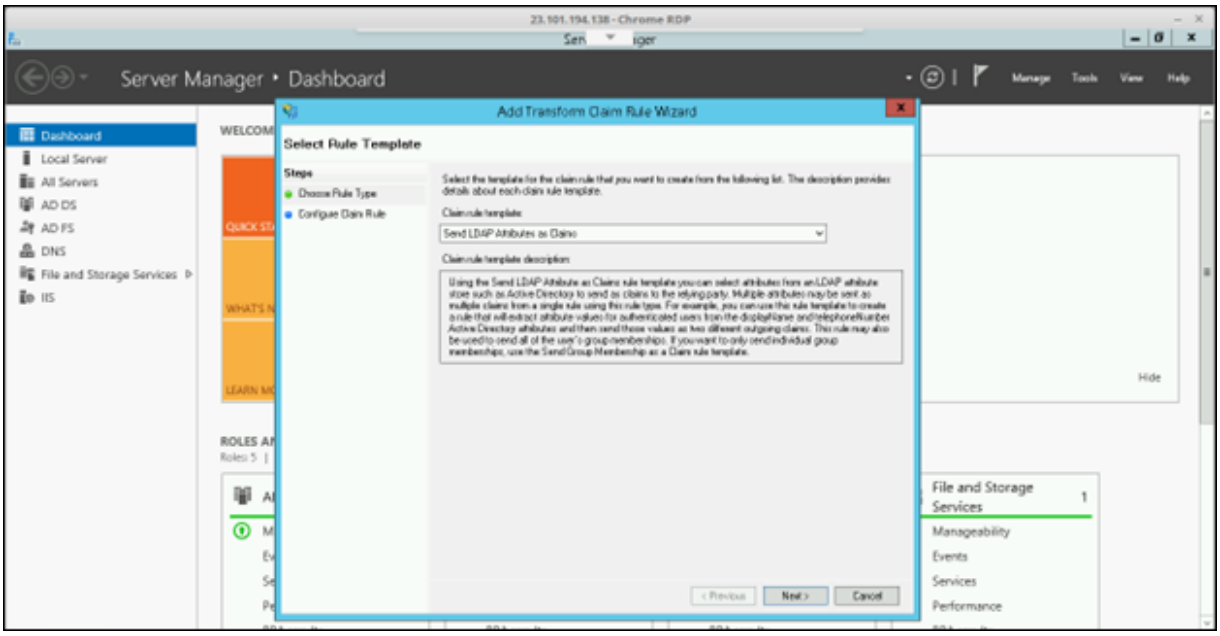
To configure attributes or claims to be passed as an assertion Claim Rules should be created in ADFS.

1. In the **Edit Claim Rules** pane, click **Add Rule**.



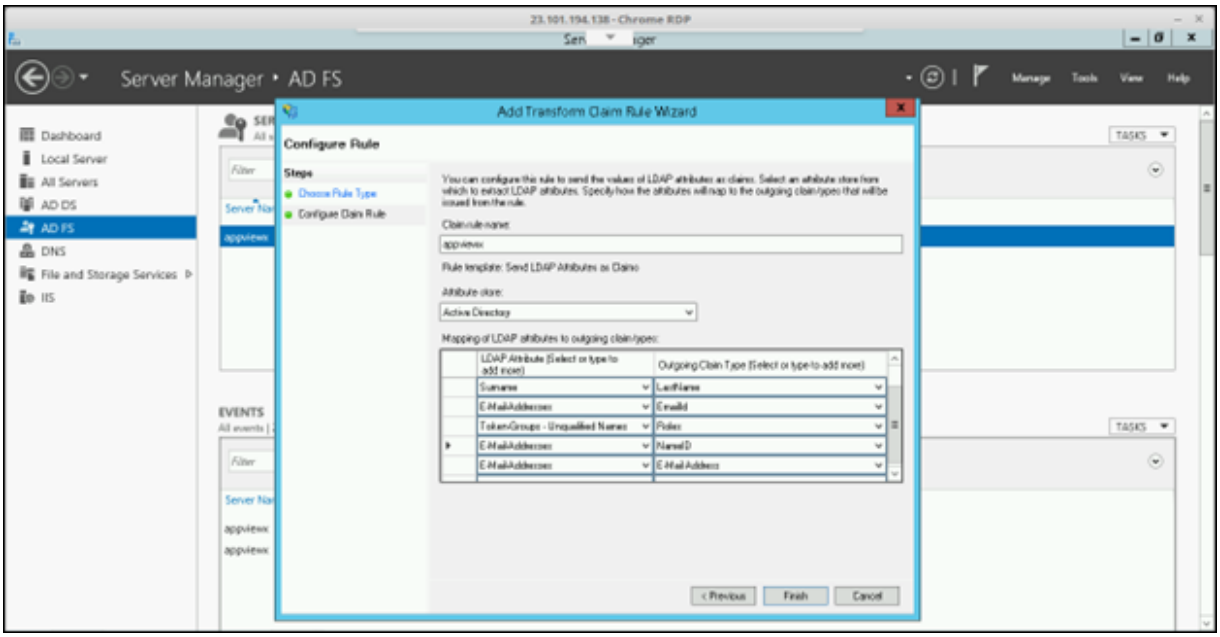
2. Under the **Select Rule Template** section, select **Rule Type** as **Send LDAP attributes as Claims** and click **Next**.

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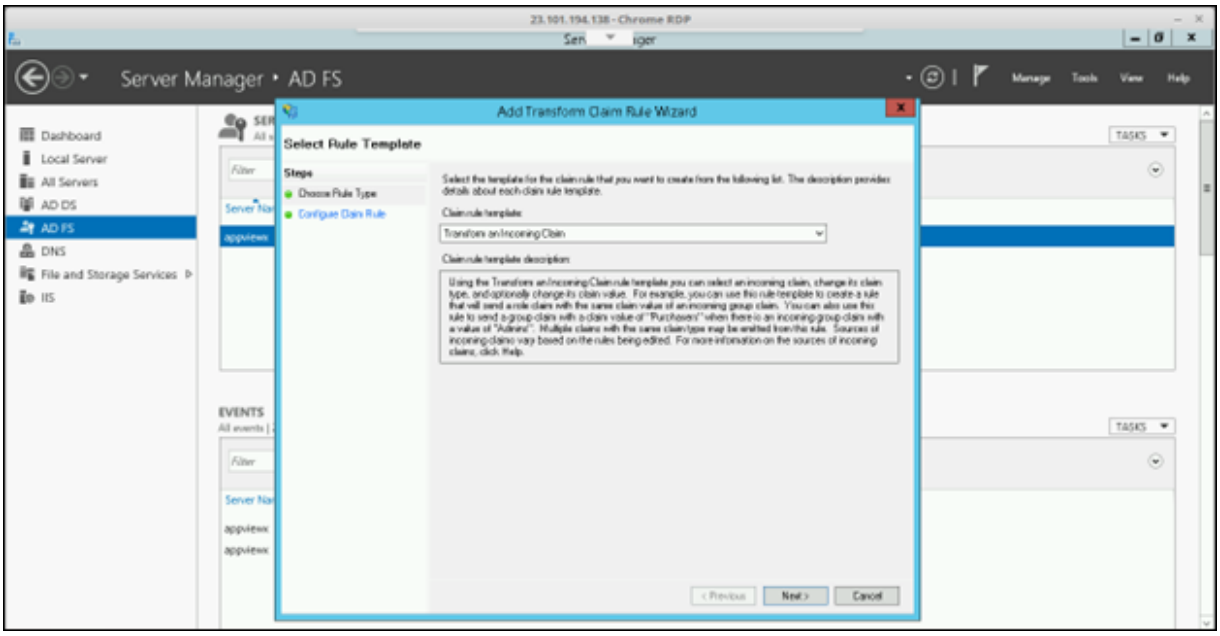
3. Enter a **Rule name** and select the **Attribute store** as **Active Directory**.
4. Enter the claim types as below, and then click **Finish**.

   Display-Name > FirstName, Surname > LastName, E-Mail-address > EmailId, Token-Groups-Unqualified Names > Roles, E-Mail-address > NameID, E-Mail-address > E-Mail-address.
5. Create another rule to transform the incoming claim by clicking **Add Rule** > **Rule Template** (Transform an Incoming Claim), and then click **Next**.

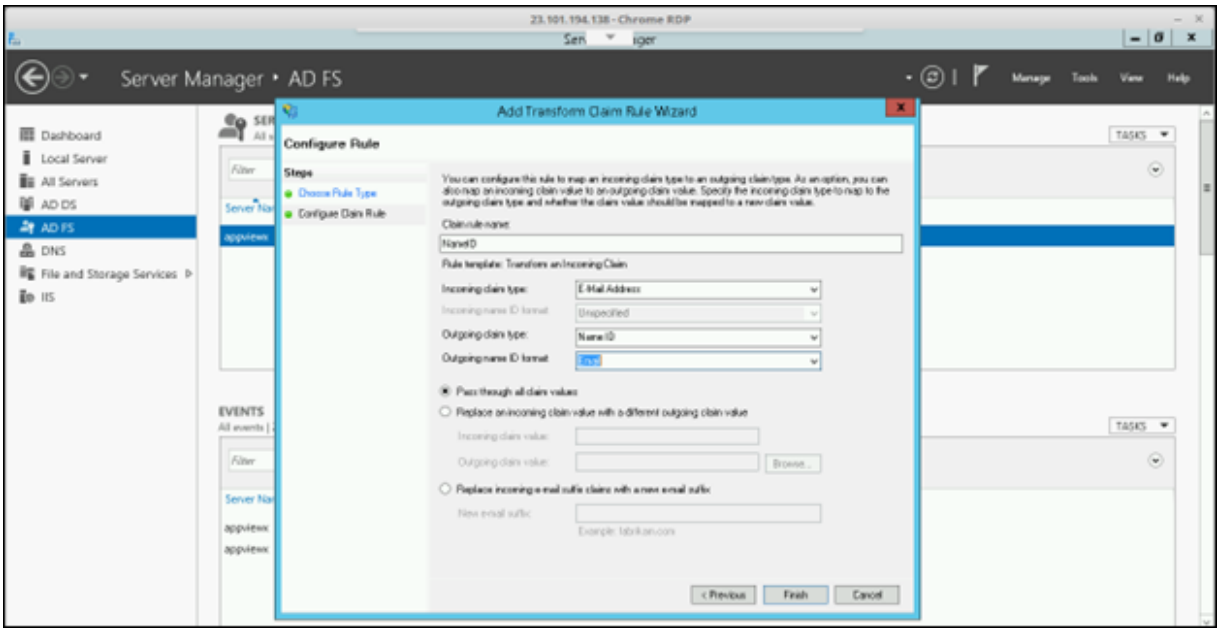


6. Enter a **Rule Name** and select the **Incoming Claim Type** as **E-Mail-Address**, **Outgoing Claim Type** as **Name ID**, and **Outgoing Name ID Format** as **Email**, and then click **Finish**.

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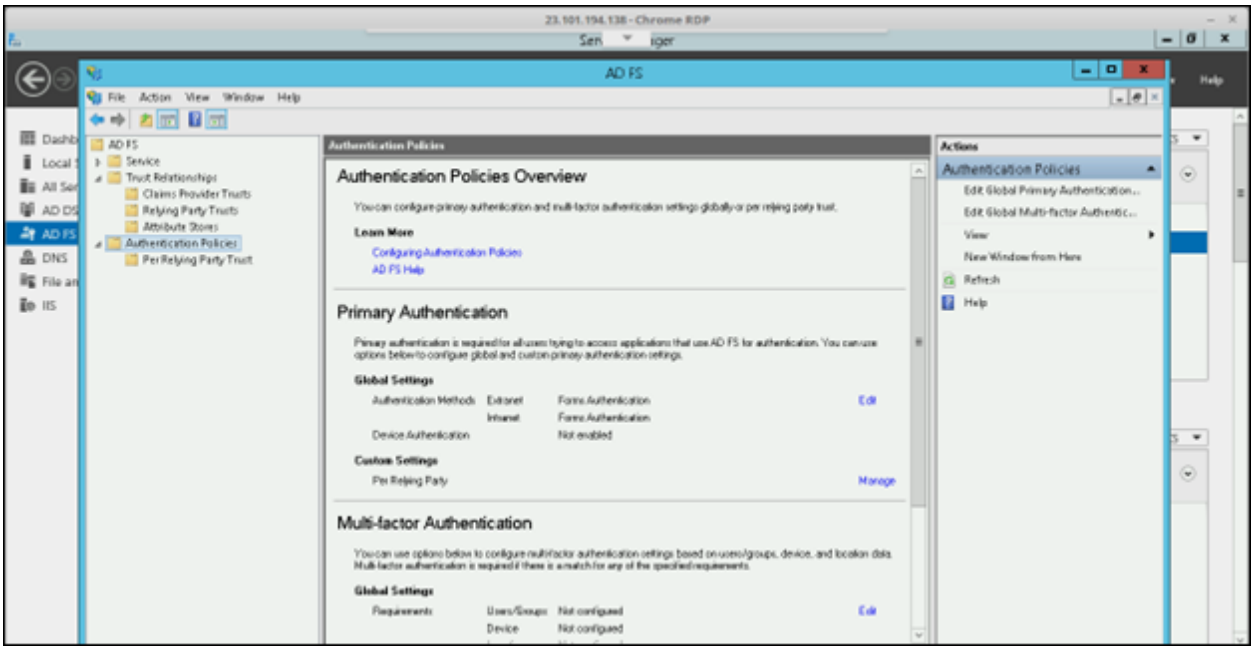
7. In the **Edit Claims** pane, click **Apply**, and then **OK**.



Enable Form-Based Authentication

For users to redirect from AppViewX to AD FS for authentication enable Form-based authentication as mentioned below. Under the AD FS menu > Authentication Policies the Primary Authentication should be Forms Authentication for Extranet and Intranet. If not select Edit and configure it as Forms Authentication.

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Now AD FS is configured with all necessary details for SSO based authentication. To Export AD FS IDP metadata and upload in AppViewX SSO settings, export the metadata using the IDP URL and save it as an XML file.

Sample URL:

https://appviewx.westus.cloudapp.azure.com/federationmetadata/2007-06/federationmetadata.xml

Note: Role name passed in as a part of the SAML assertion should be configured in AppViewX on the Accounts > UserGroup and assign a role for accessing the application. For an IDP initiated SSO the following structure like URL should be used.

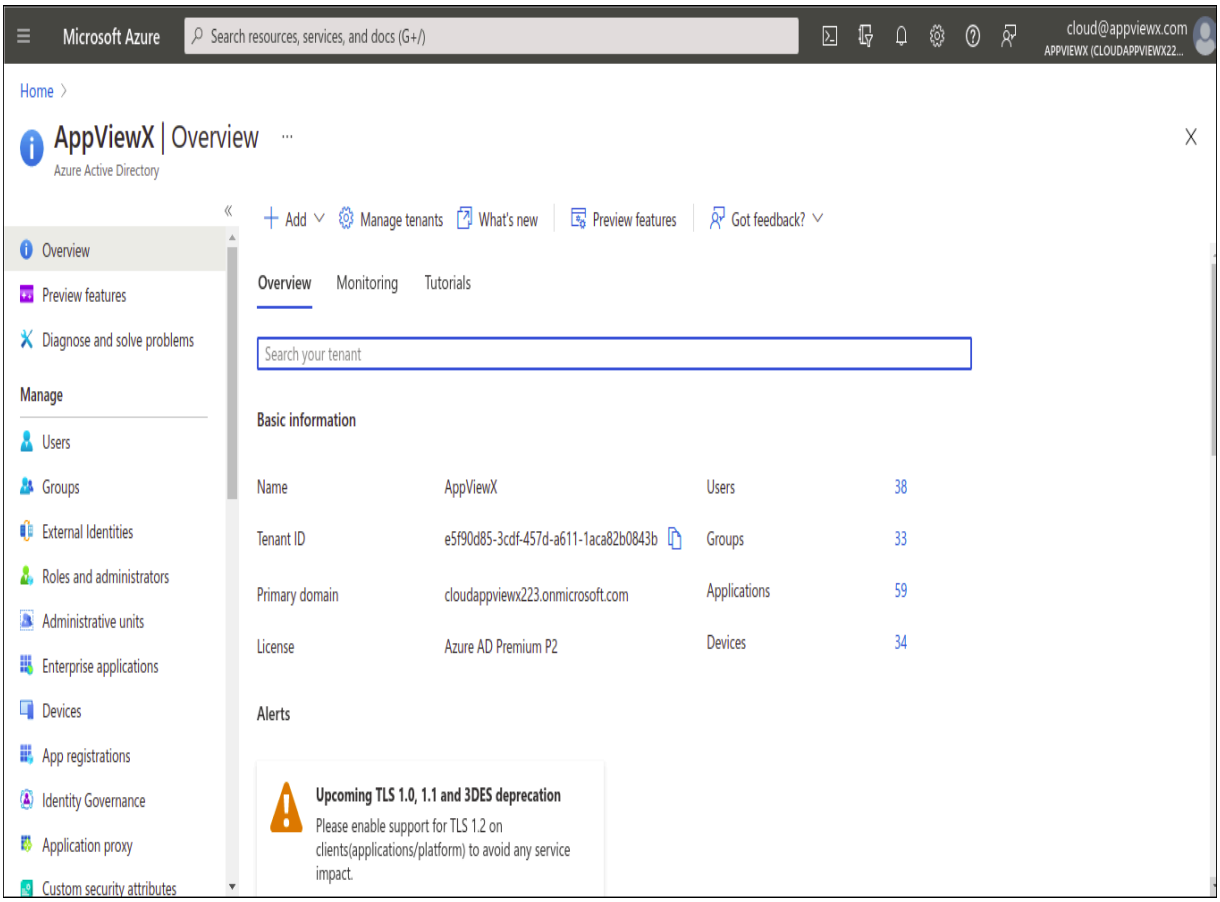
Sample IDP initiated URL: https://appviewx.westus.cloudapp.azure.com/adfs/ls/idpinitiatedsignon

Azure ADFS IDP Configuration

The steps mentioned below are performed at the IdP end. The navigation and screenshots might differ based on the version of the IdP. (This is just an example configuration). The following are the steps to configure AppViewX SAML attributes in Azure ADFS.

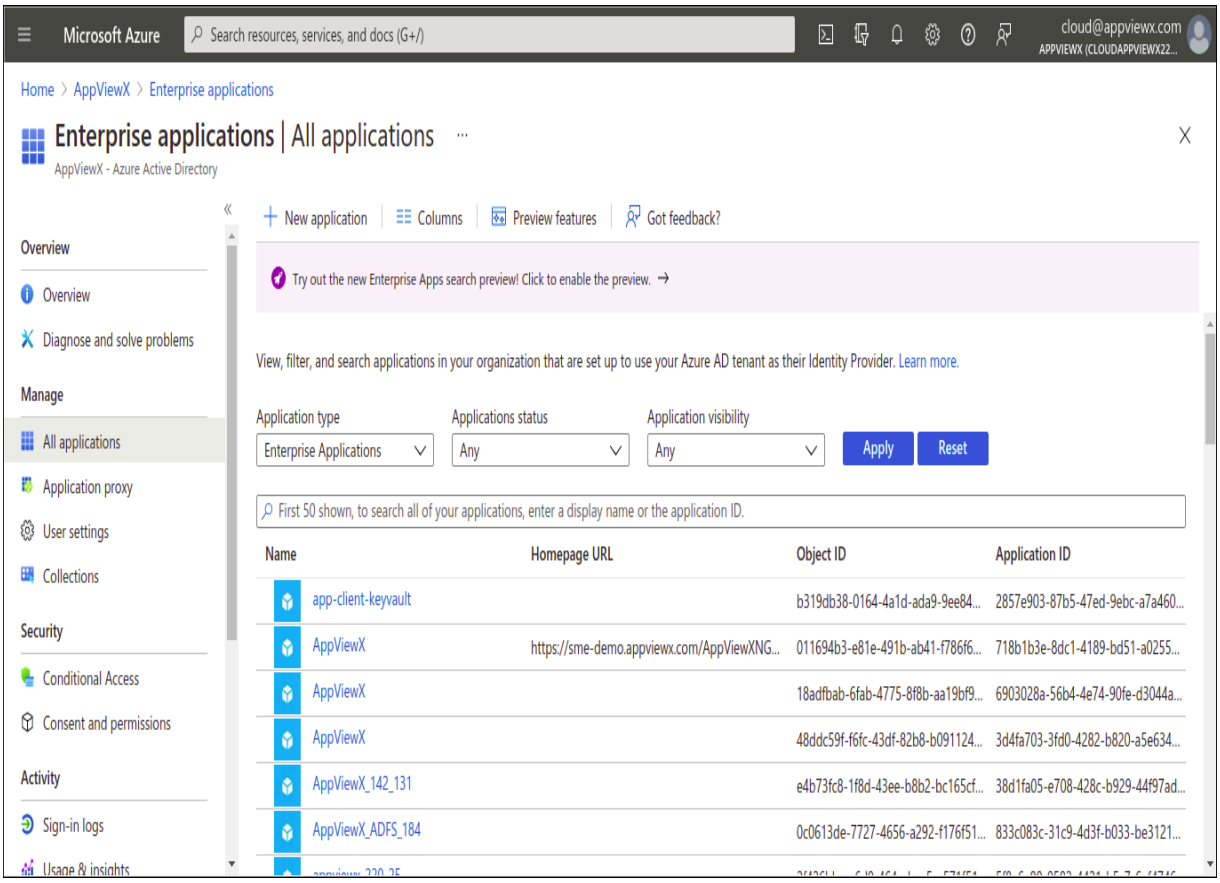
1. Log into the Azure portal https://portal.azure.com.
2. Select **Azure Active Directory**.
3. From the left menu of the Azure Active Directory (AD), select the **“Enterprise Applications”**.

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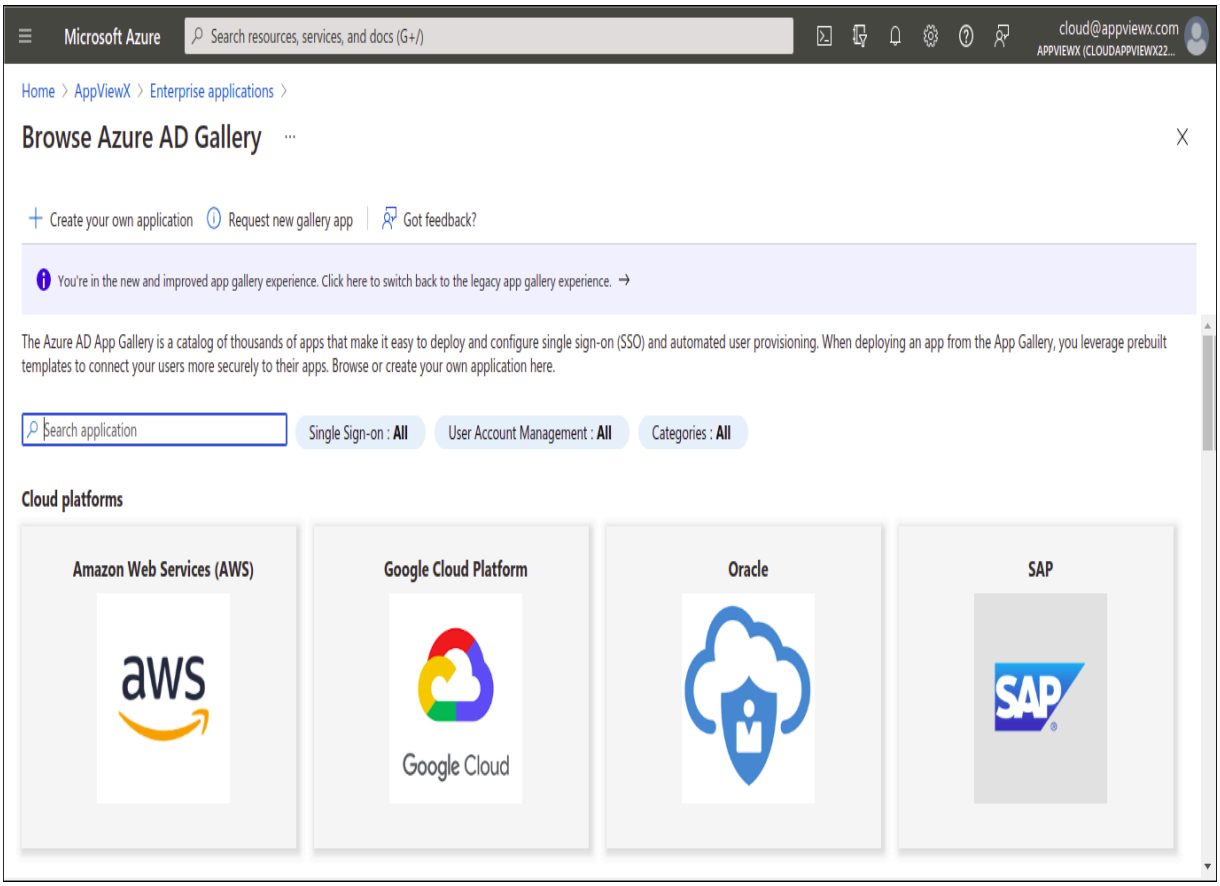
4. To create a SAML application with Azure AD, select the **“New Application”** option.

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5. To add AppViewX, select **“Create your own application”** option.

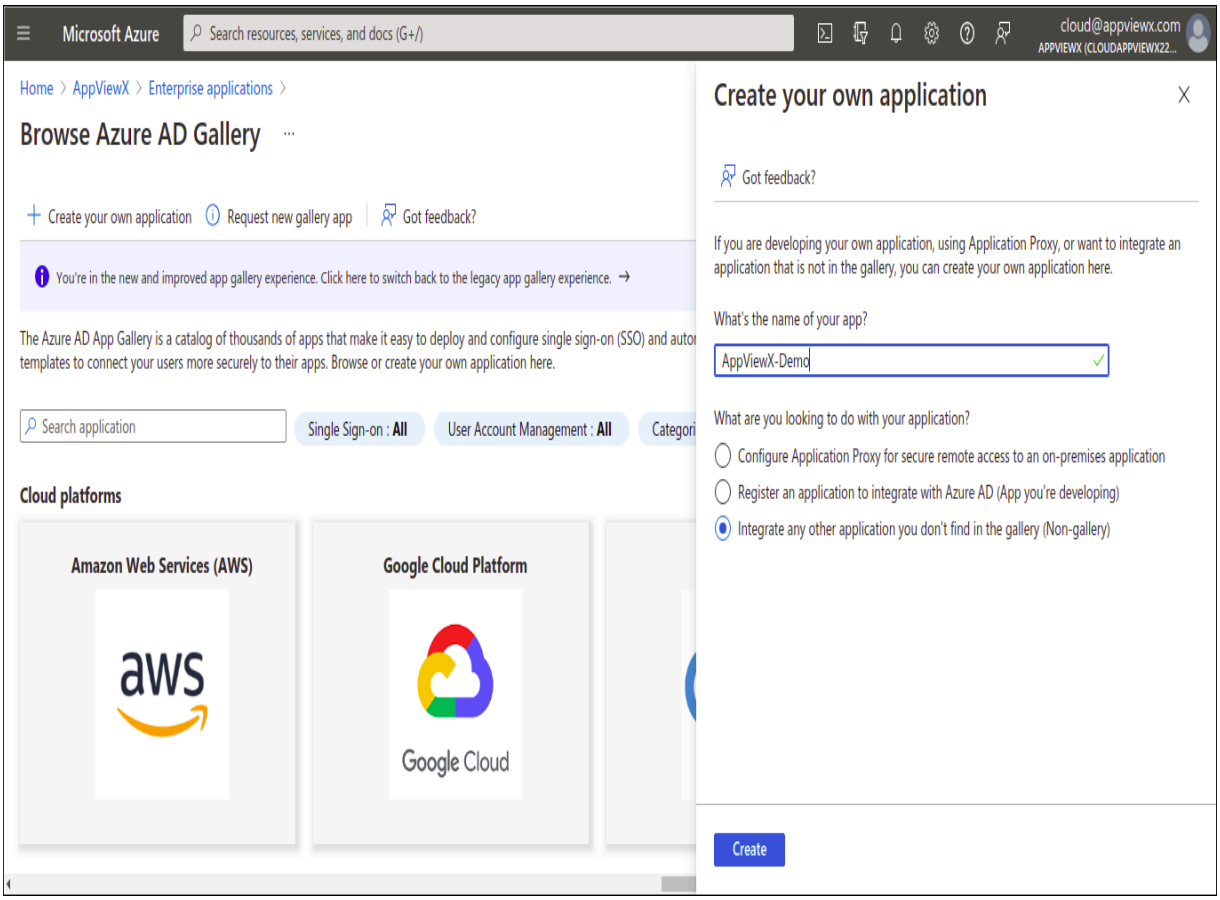
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Note: This is done since AppViewX is a non gallery application.

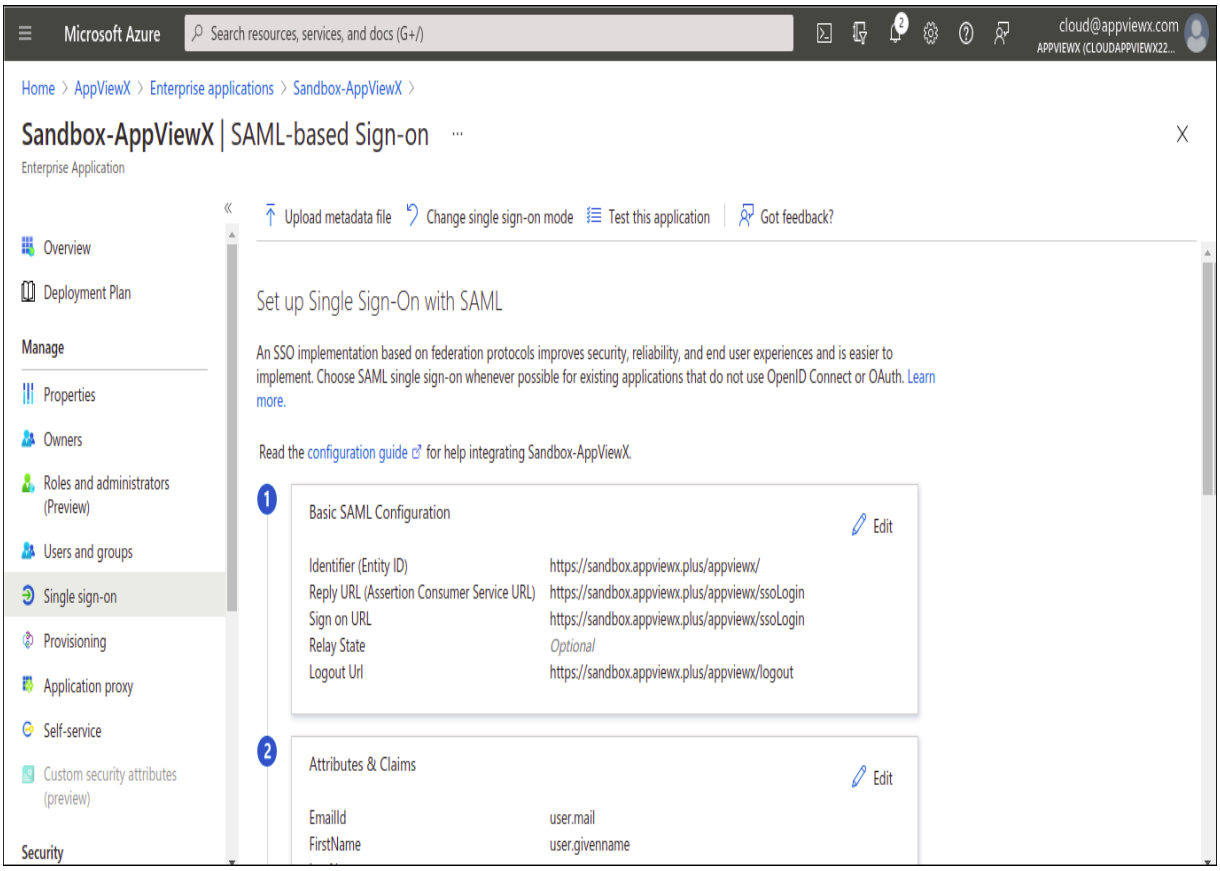
6. Provide the Name for the application and point the selection to the 3 option which is *"Integrate any other application you don't find in the gallery (Non-gallery)"*.

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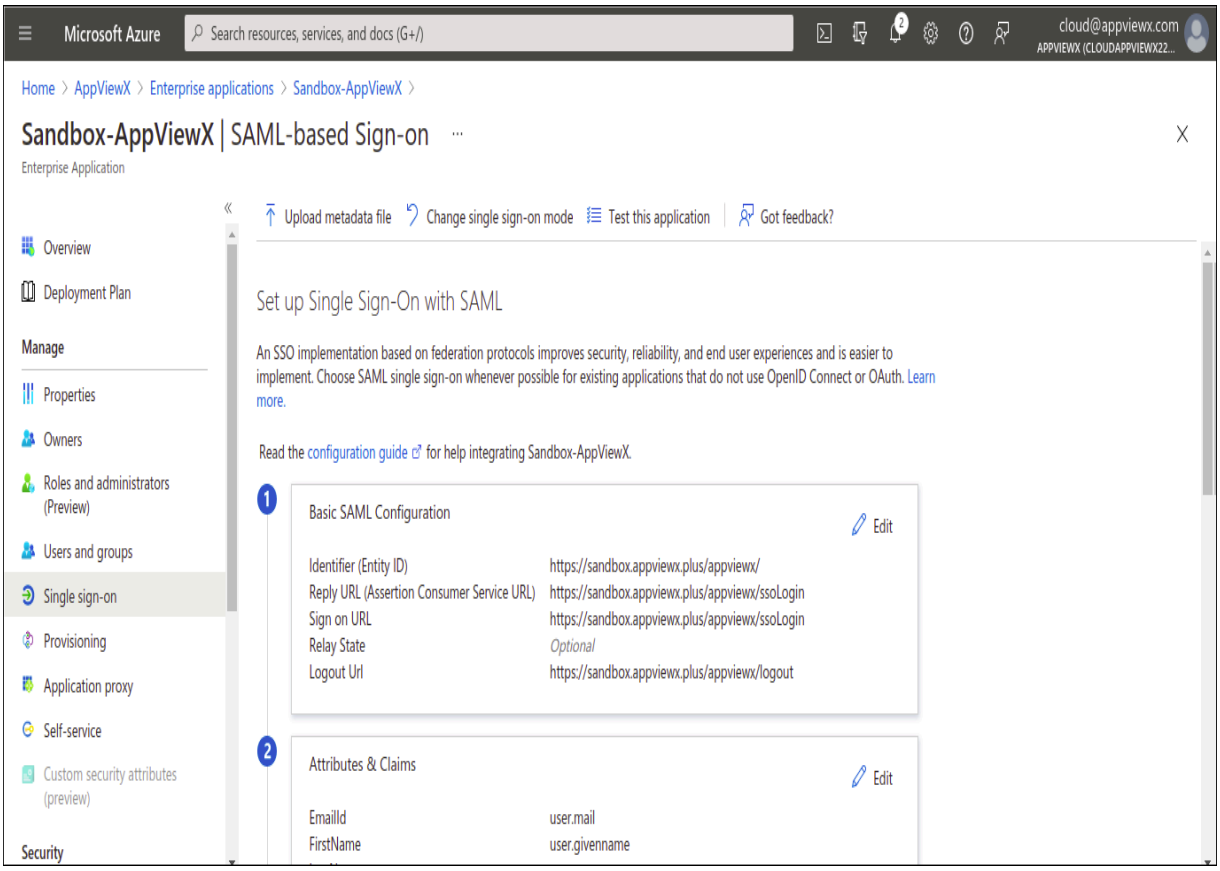
7. To configure single sign-on for the newly created application, from the left of the menu of the newly created application, select **“Single sign-on”** option.

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8. To add the AppViewX Service Provider Information , edit the **“Basic SAML Configuration”**.

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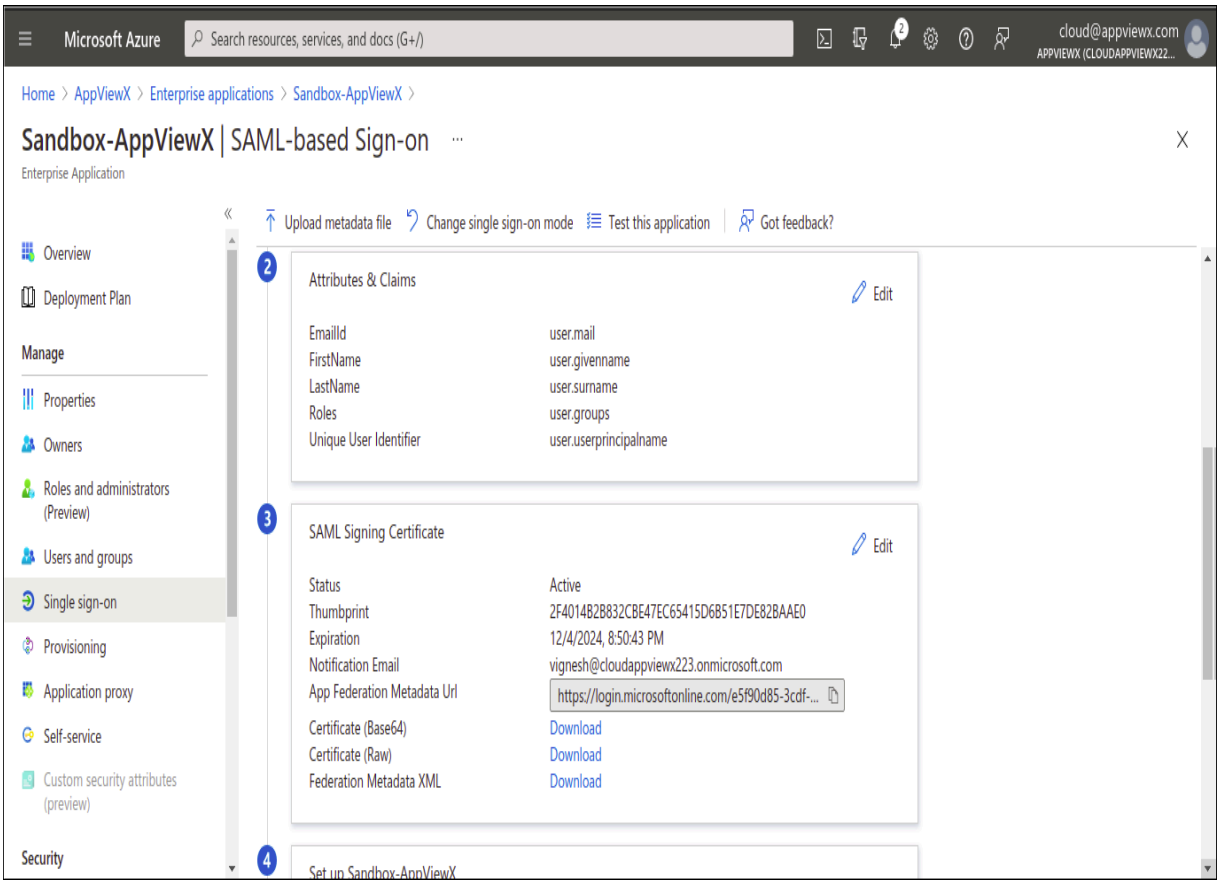


9. In **AppViewX system**, copy the **Entity ID**, **ACS URL (Sign on URL)** and **Logout URL** from **AppViewX Menu** > **Settings** > **General** > **Authentication** > **SAML**.
10. Enable SSO and copy the URLS's.

> **Note:** The value for Reply URL (Assertion Consumer URL), Sign on URLis the value of the SSO URL defined in AppViewX. The value for Logout URL is the value of the SLO URL defined in AppViewX. Please ignore the Relay State configuration.

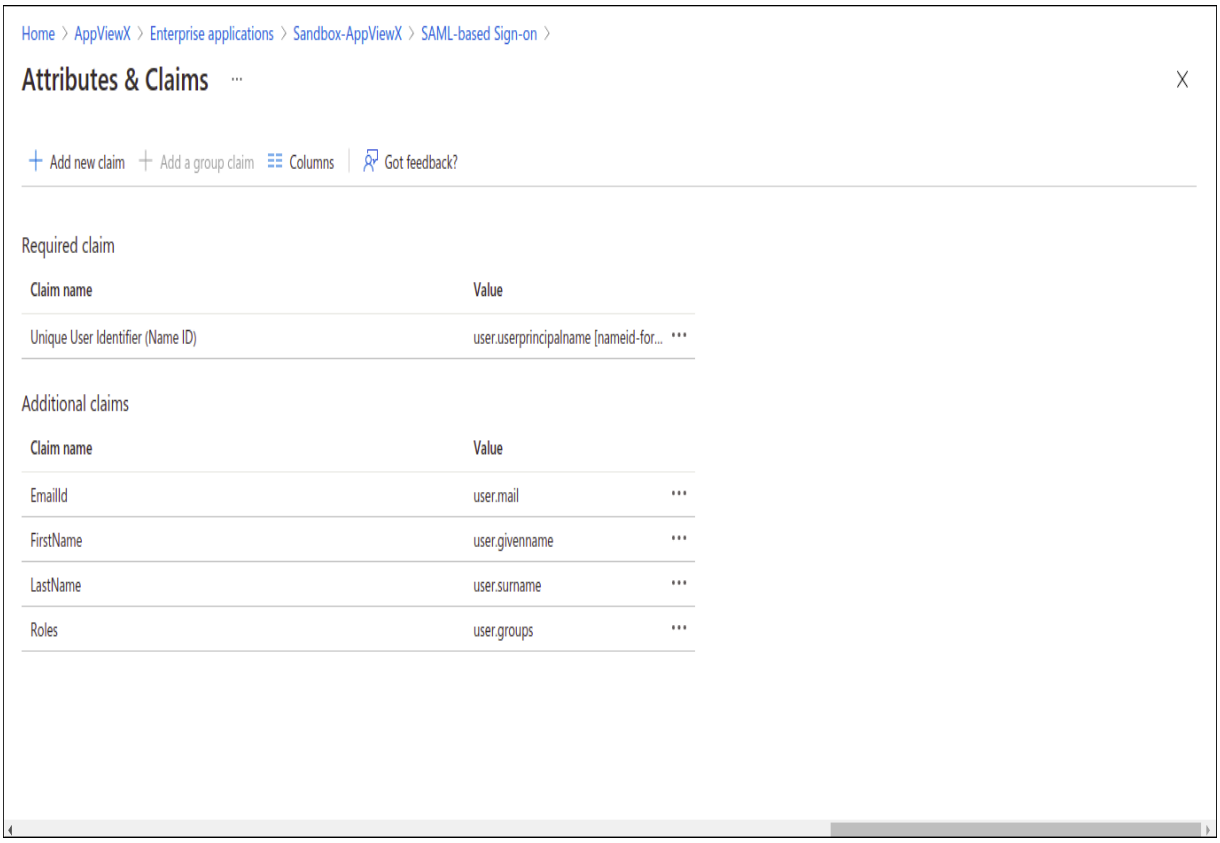
11. Save the settings.
12. To configure the Assertion parameters required by AppViewX during the Single Sign on process, edit the **"Attributes and Claims"** option.

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13. The required claims and the values that should be passed during the assertion are mentioned below:

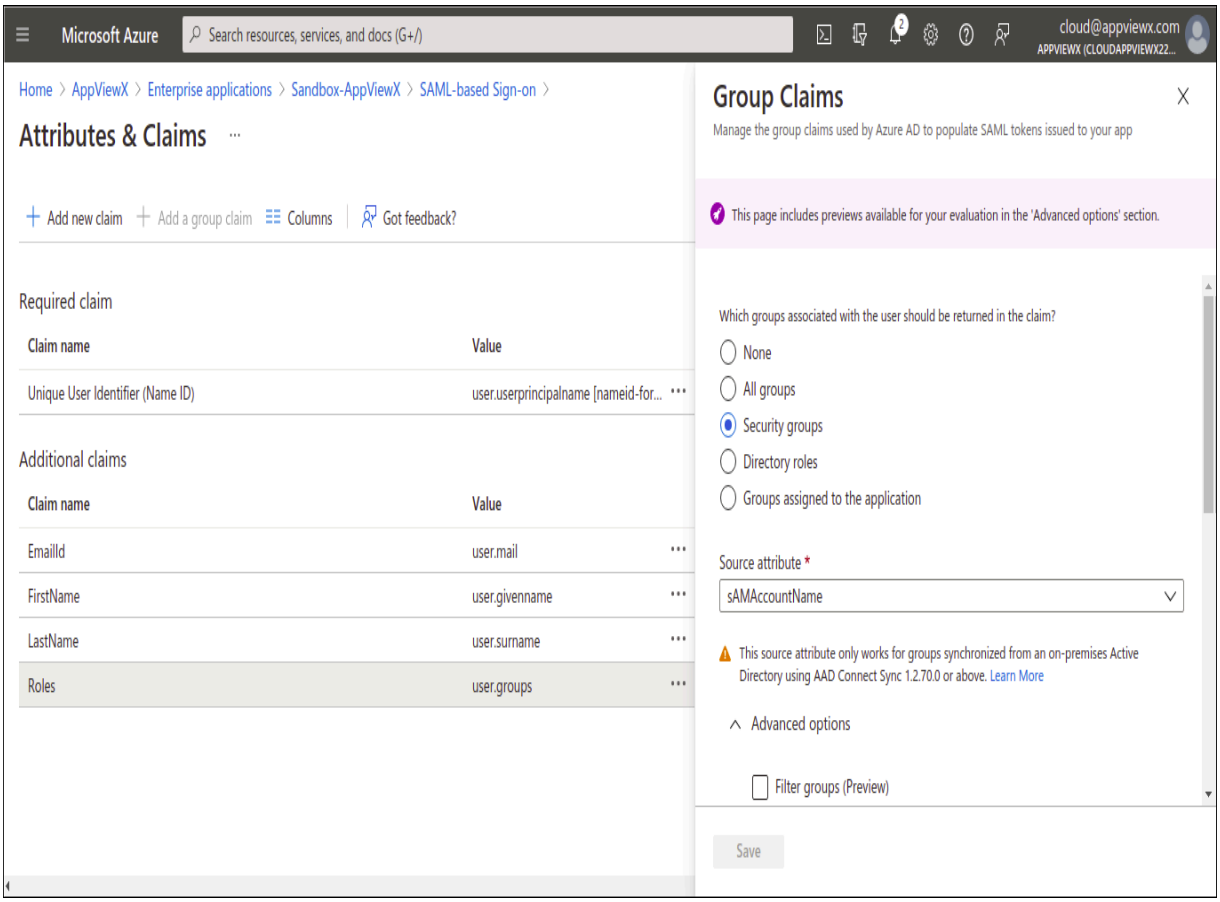
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- EmailId→ user.mail
- FirstName→ user.givenname
- LastName→ user.surname

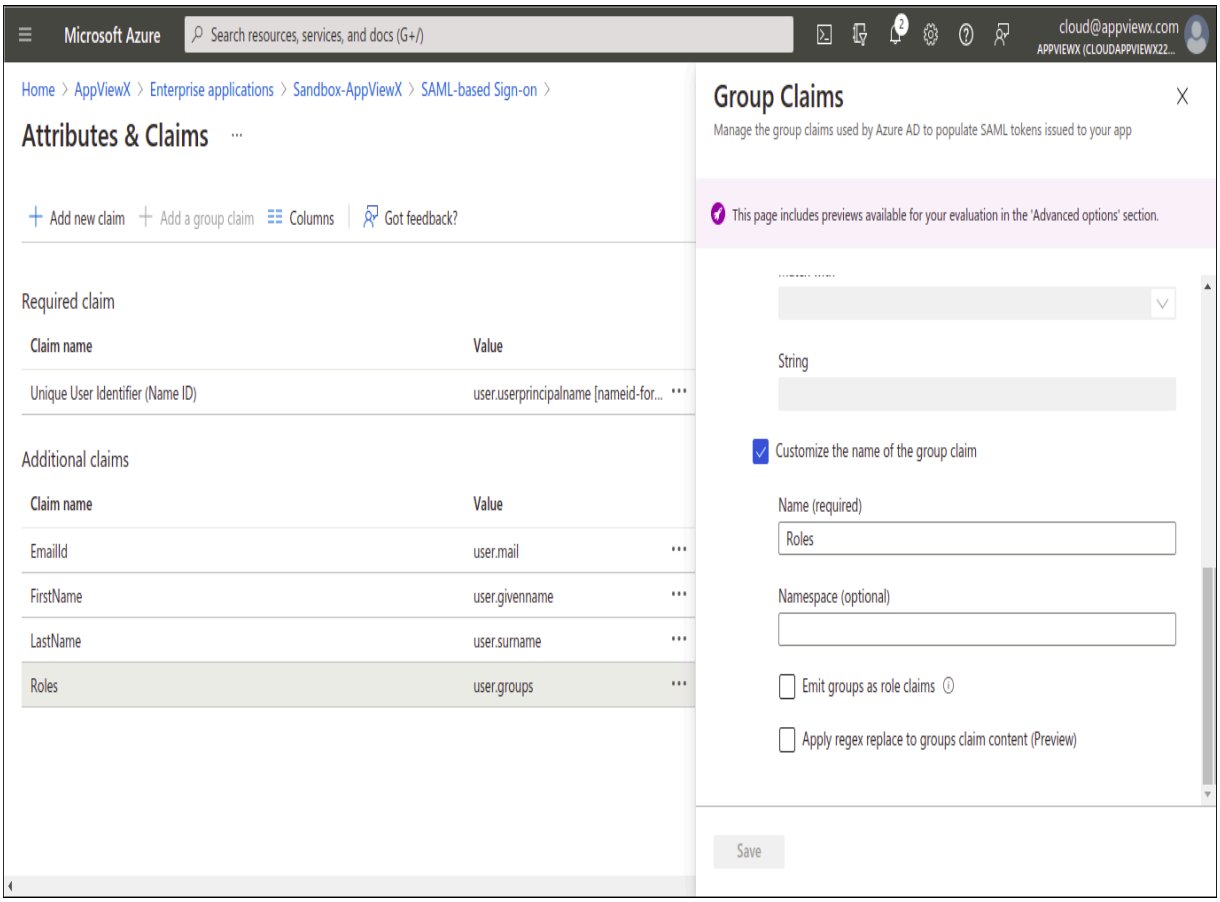
14. If the **UserGroup** of the user has to be included in the assertion, configure a Group claim with the **Security Groups** associated and the source attribute as **sAMAccountName**.

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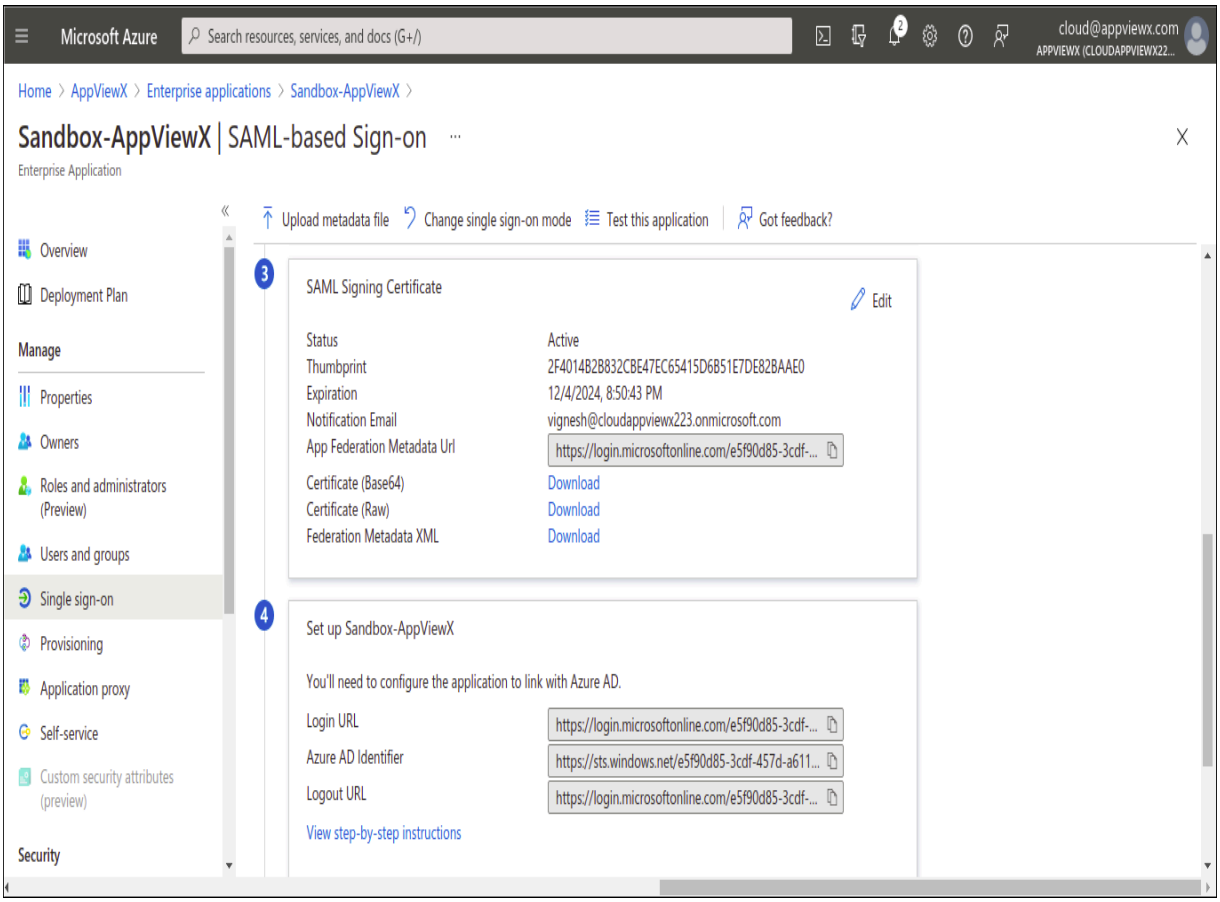
Along with the above customize the **Name** of the group claim which is sent to AppViewX, since AppViewX would need the **Group**claim to be sent with the key called **“Roles”.**

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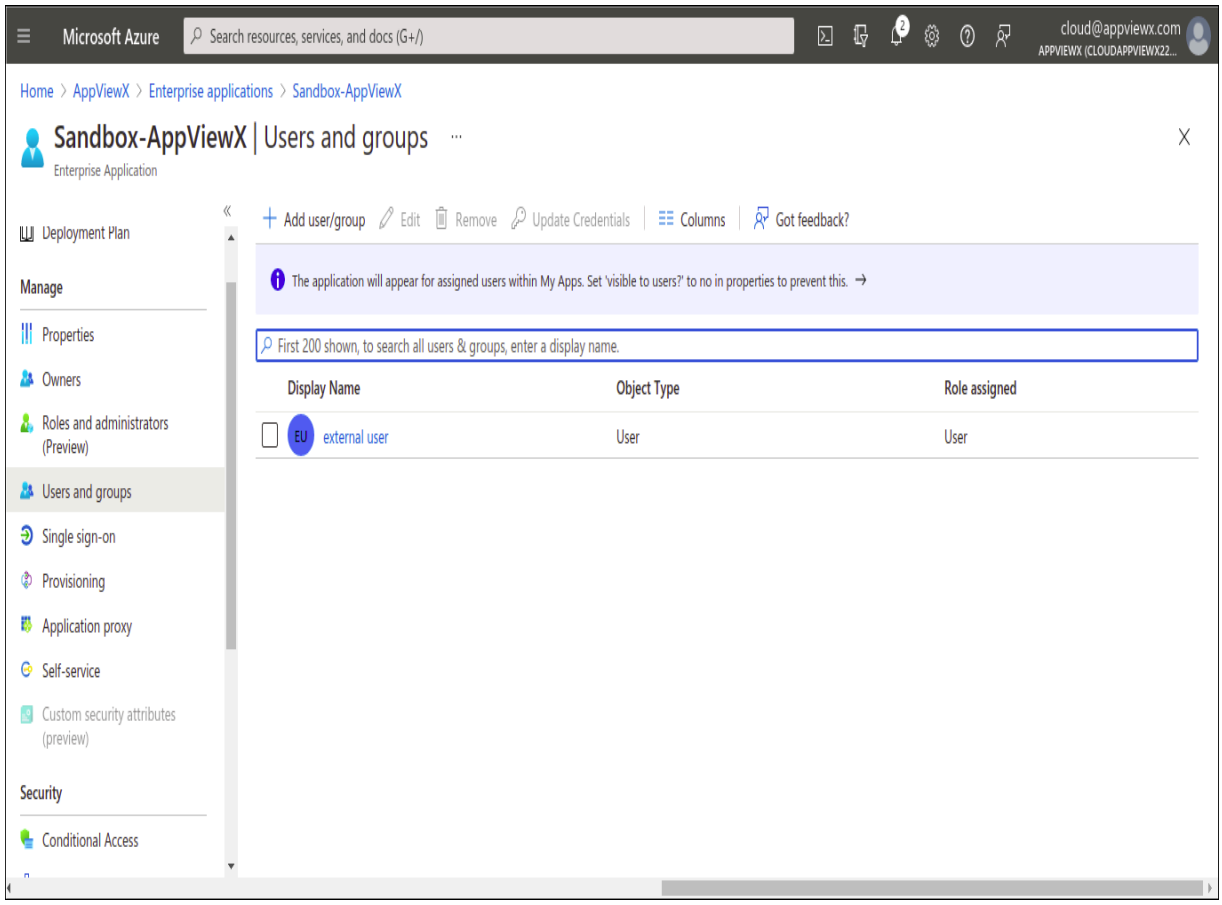
15. The group claim value can be the **“security group”** from the azure directory or the **“security group”** from the **on prem active directory** as well.
16. Save the settings once done.
17. Download the Federated Metadata XML from the SAML Signing Certificate option.

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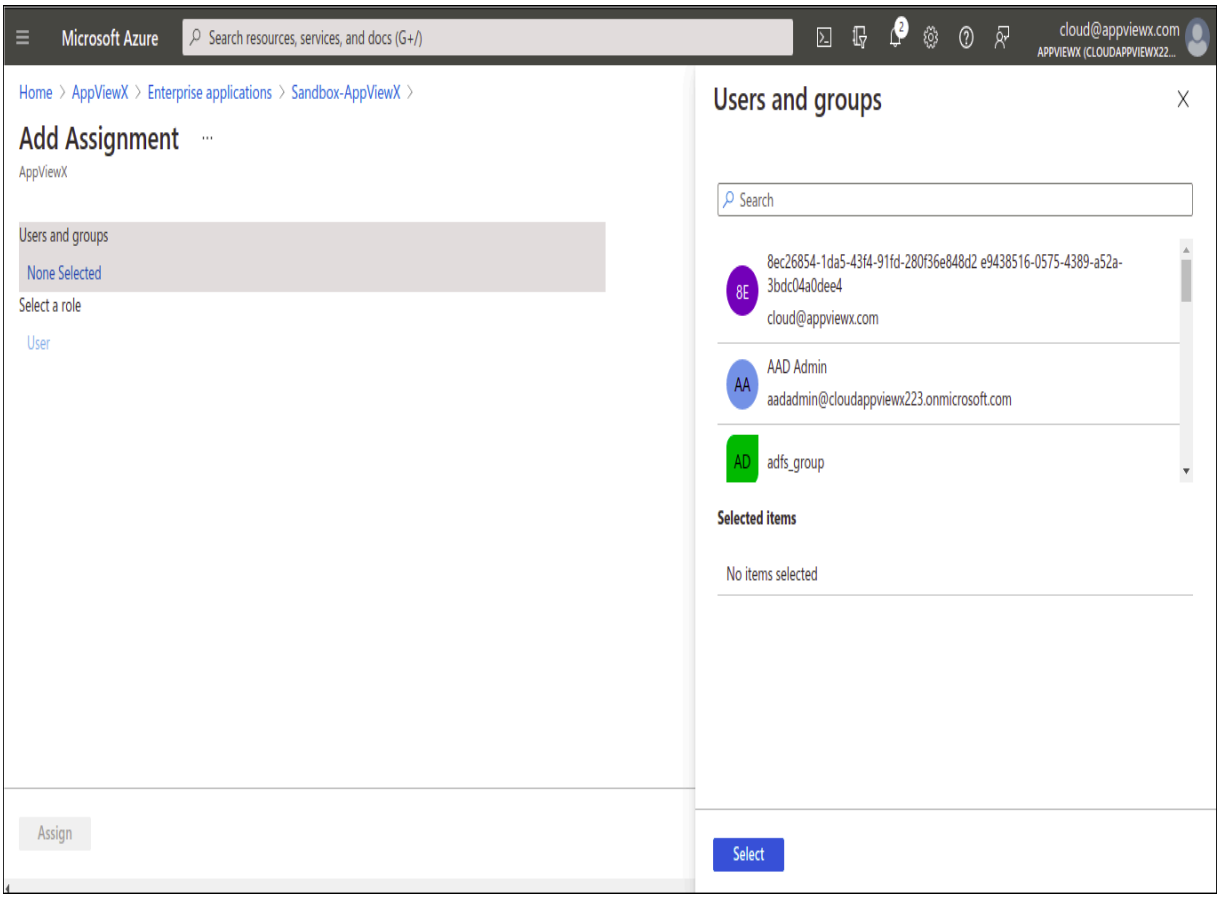


18. To assign the application to the respective users in the active directory, from the left hand side menu, select the **“Users and Groups”** option.

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Verification of the Configuration

1. To check the IDP initiated flow from Azure to AppViewX, login to the portal https://login.microsoftonline.com/ with the **SSO credential** of the organization.
2. From the **Menu of the Office 365** portal select **All Apps** and select the **AppViewX Application** to login.

SAML Only Authentication

If the IDP is unable to pass the roles/usergroup as a part of the SAML assertion and requires AppViewX to perform the Authorization then the following feature can be used.

Mapping User Groups for Local Authorization

Administrators can map user groups manually for external users login through SSO by using either Manual mapping or Birthright.

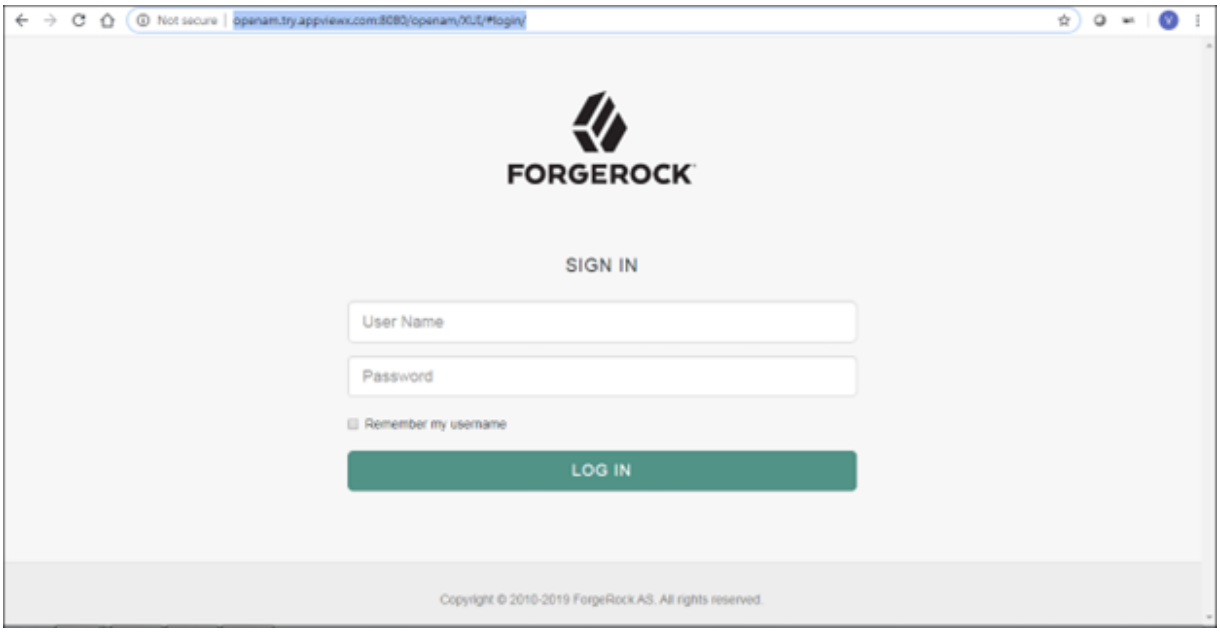
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Manual Mapping: Oncethe user logins to AppViewX using SSO if no proper Roles are passed in the Assertion the user will end on a No Usergroup found page. Nowthe administrator can log in with the default login URL *https://ip:port/appviewx/login* and navigate to **Account** > **Users**. The user who has not logged in will have the user-created tag and will be in an inactive state. Administrators can modify the user and map the user to a user group that is available and this will enable the user to login successfully on the next attempt.

Birthright Role: The administrator can enable a birthright role and map a user group by default for all the sso users to log in initially when they do not have a role/user group passed in the SAML assertion. This would enable the user to login successfully and access the application with the access given in the specific user group. If required now the administrator can create different sets of user groups and assign manually to the respective users who do not need the birthright user group which will be reflected in the subsequent login.

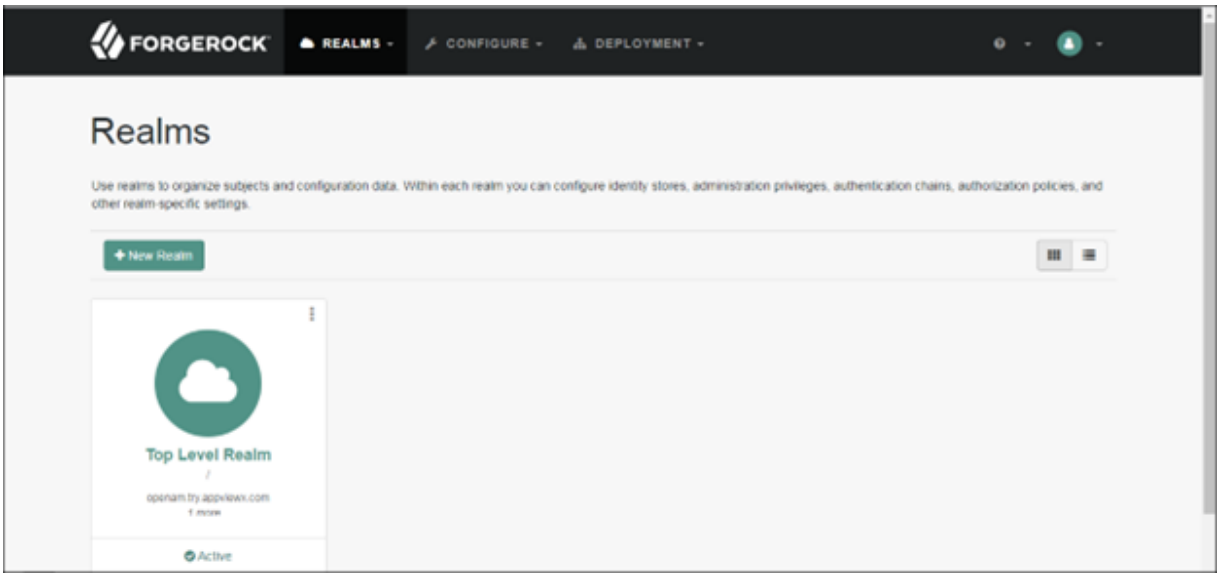
Forgerock Integration

1. Login to the Forgerock IDP Intense or Console.

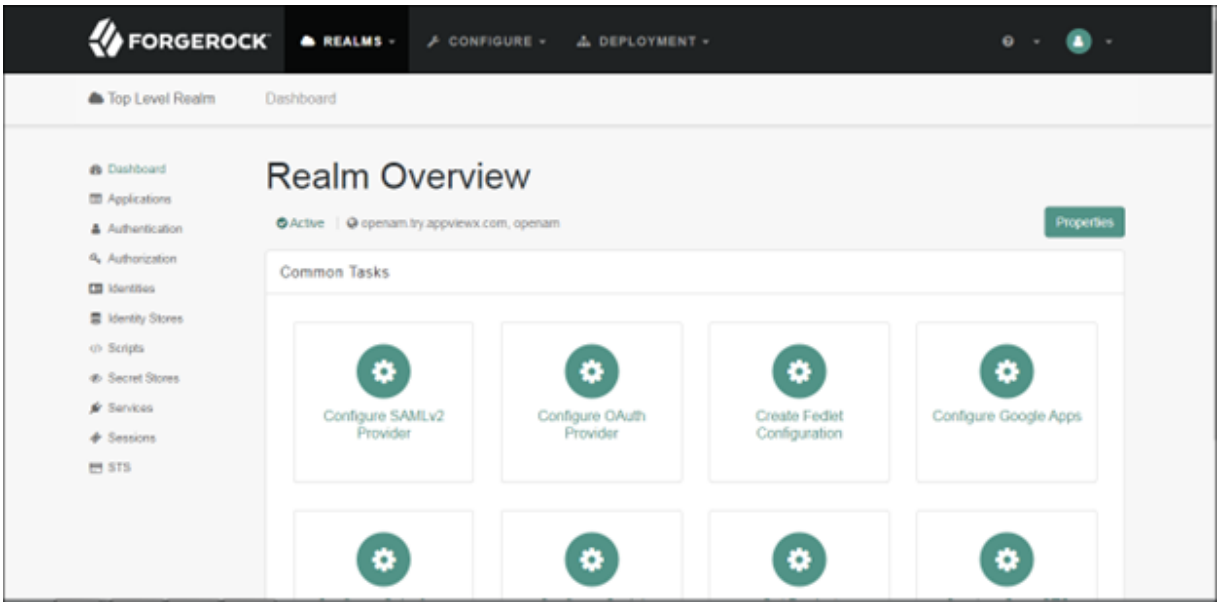


2. Select the respective Realm.

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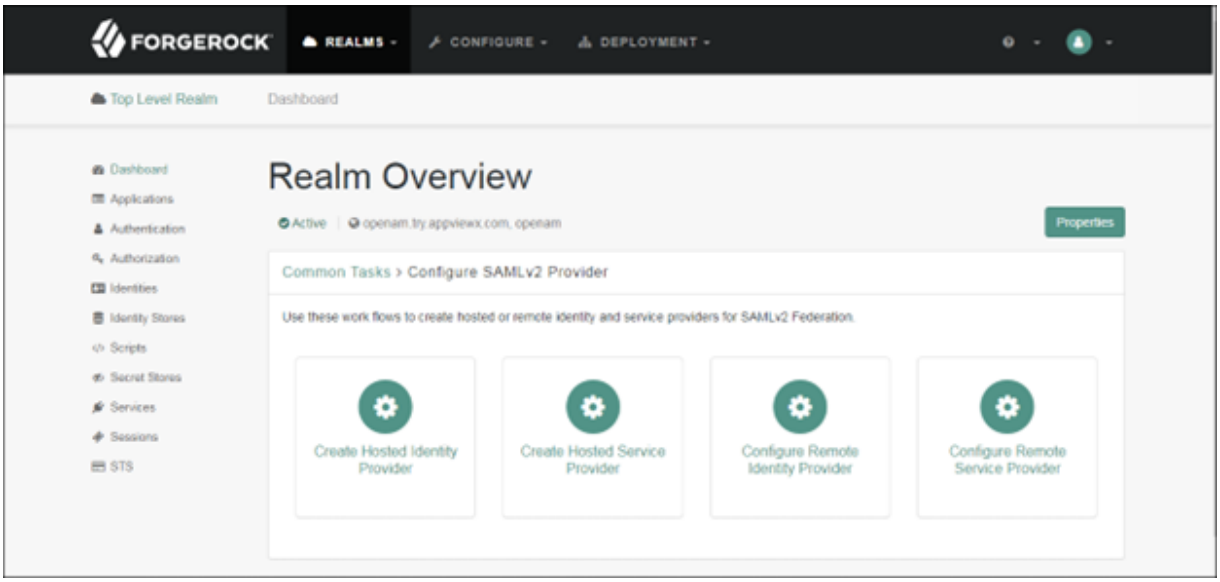


3. Under **Common Tasks**, select **Configure SAML v2 provider**.

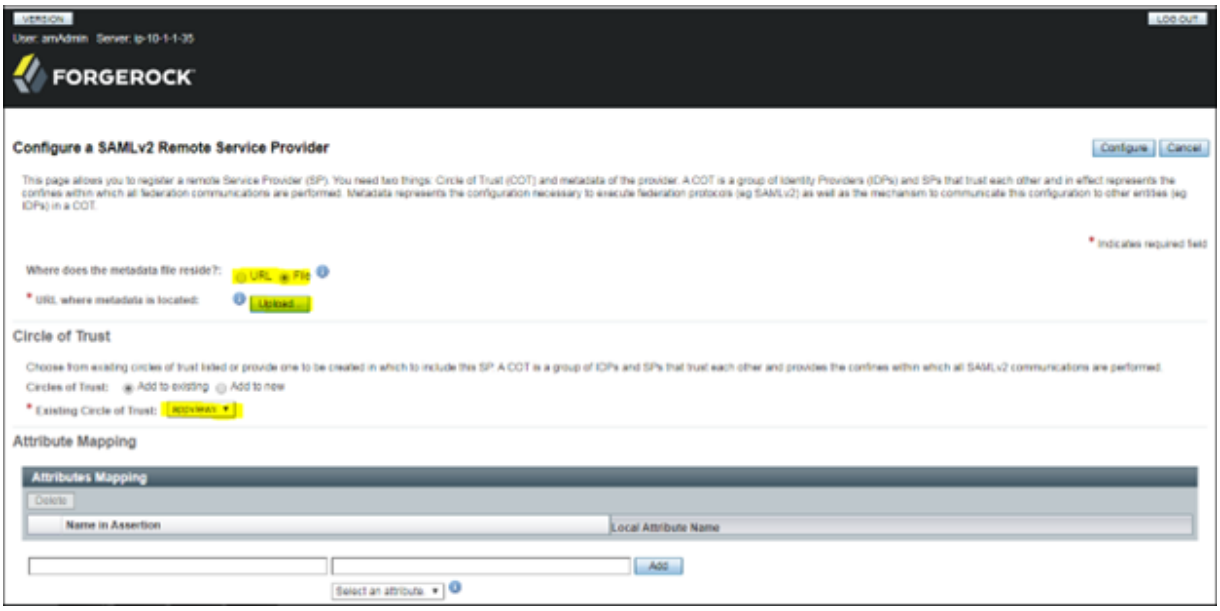


4. For Configuring AppViewX configuration, select **Configure Remote Service Provider**.

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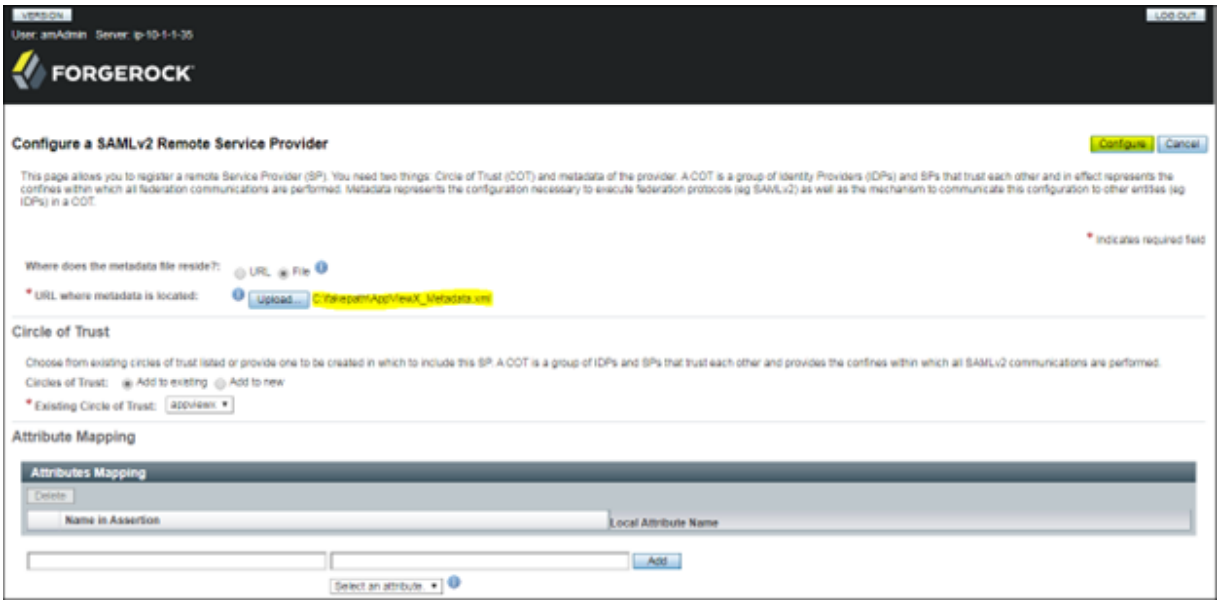


5. For metadata upload, select the **File** option.
6. Select or Create the circle of trust for mapping AppViewX to the IDP and then click **Upload**.



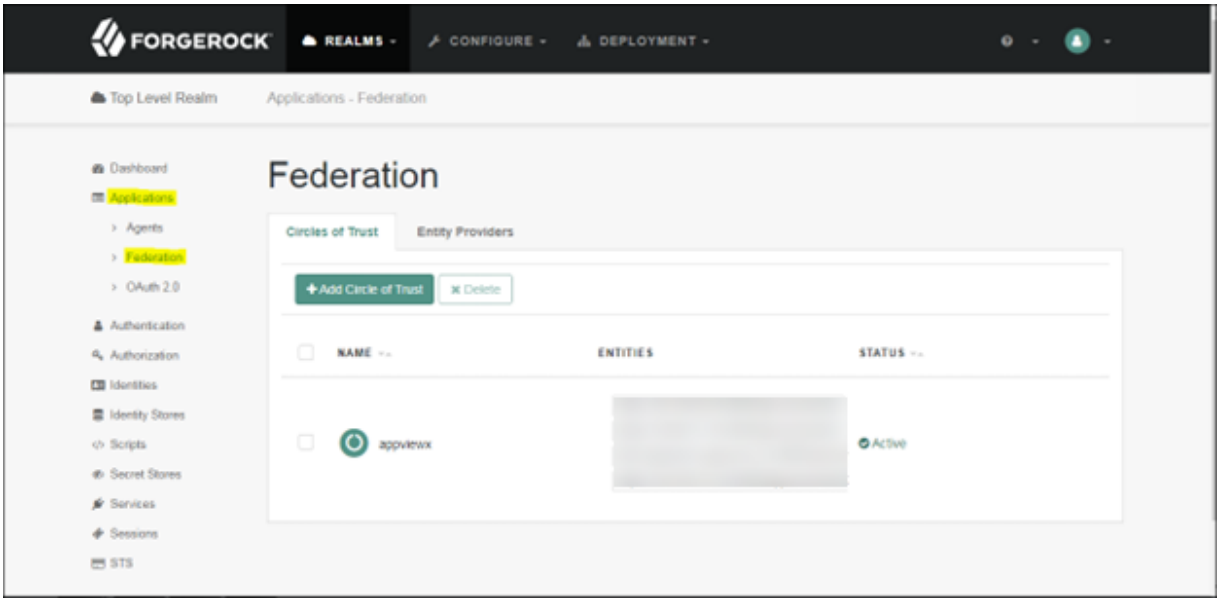
7. Upload the AppViewX metadata, which was downloaded earlier and click **Configure** to save the settings.

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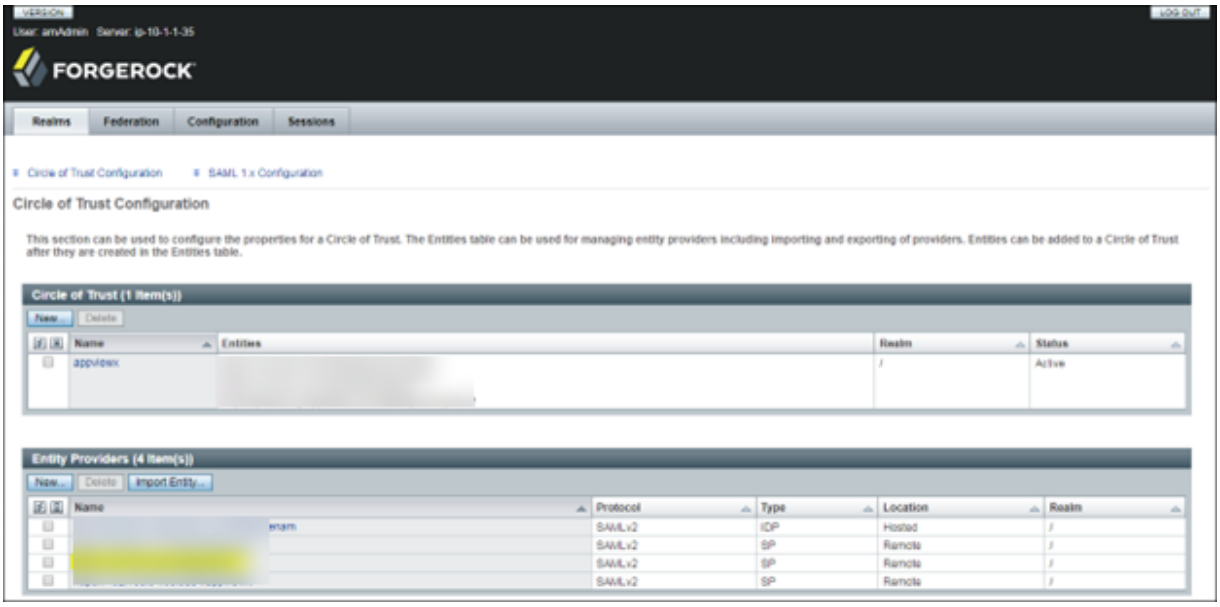
The page will redirect to the common tasks under the specific realm.

8. Access **Applications** > **Federation** from the left navigation pane.



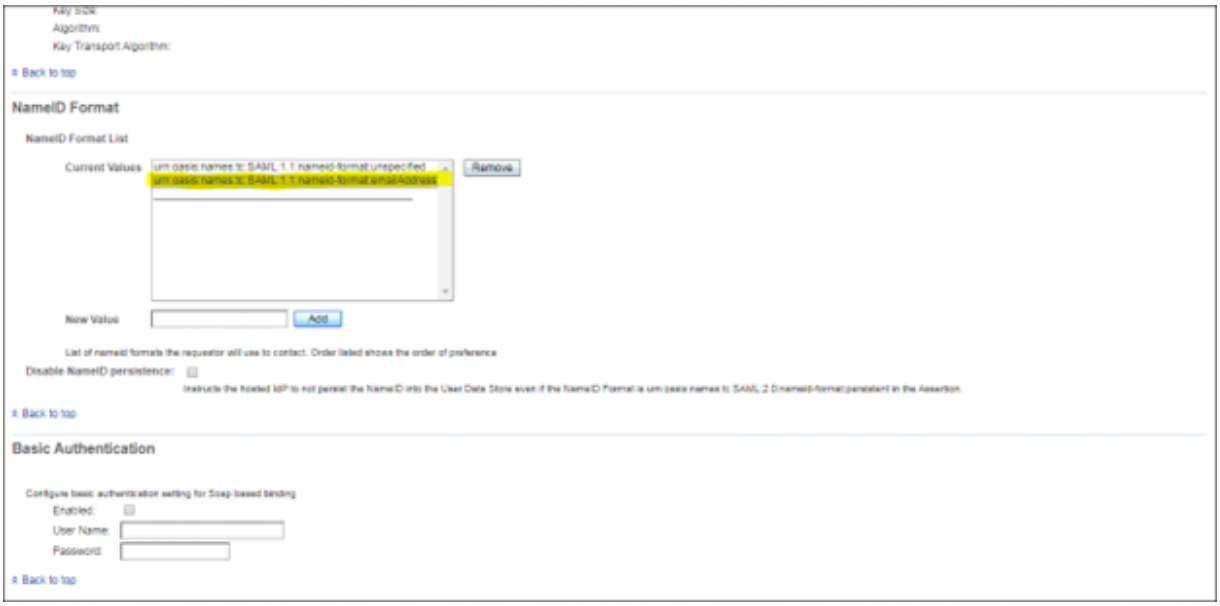
9. Select the entity providers tab.

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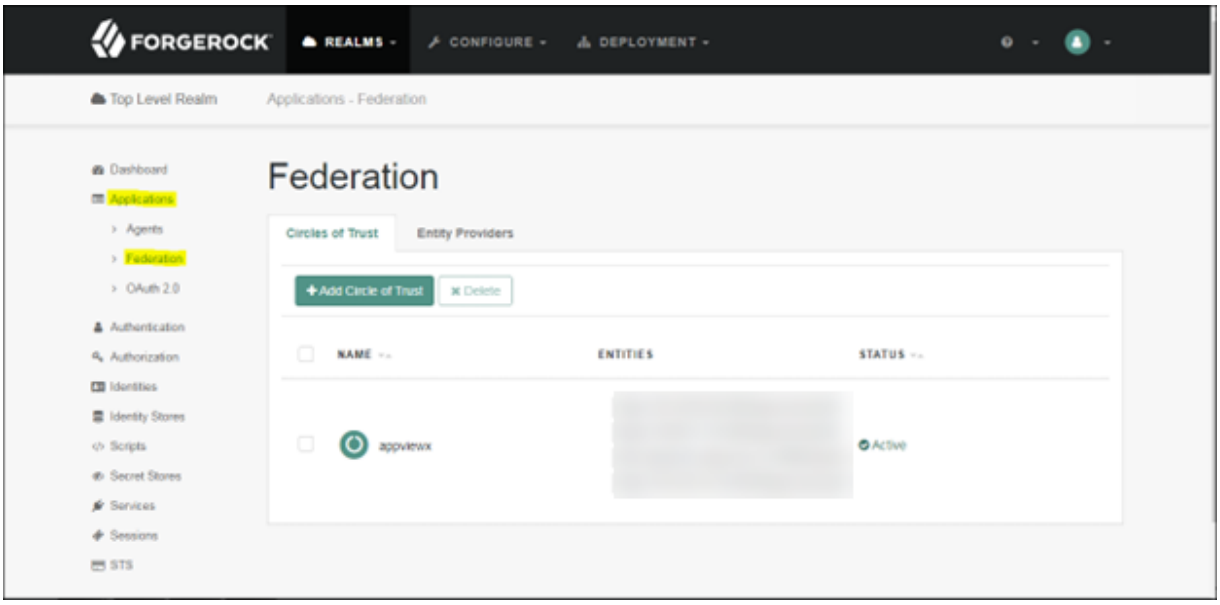
This action redirects to the **Federation** tab, displaying the service providers list and IDP configuration.

10. Select the respective Entity ID to navigate to the settings of the respective entity configuration.
11. On the **Assertion Content** tab, add the following in the **NameID Format** and then click **Save**.
    urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress

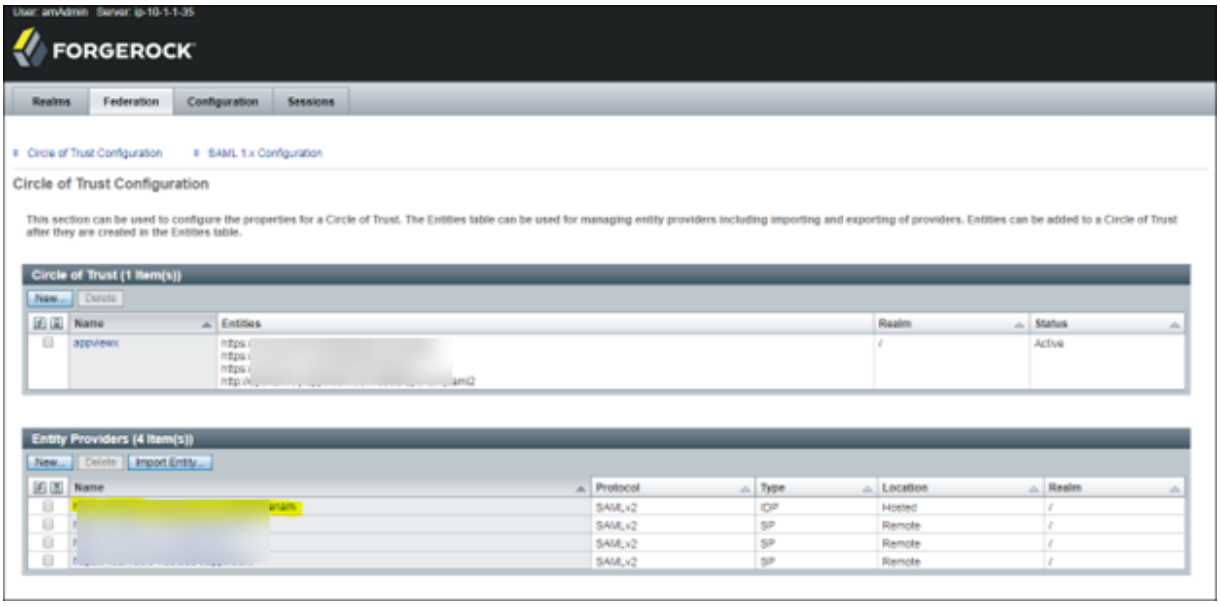


12. On the **Assertion Processing** tab, add the below assertion parameter that has to be passed as part of the SAML assertion and then click **Save**.
    EmailId=mail ; FirstName=cn ; LastName=sn ; NameID=mail ; Roles=isMemberOfAuthentication.
13. Modify IDP configuration to accept a password-based Authentication Context.
14. Navigate to **Applications** > **Federation**, and then select **Entity Providers** tab.

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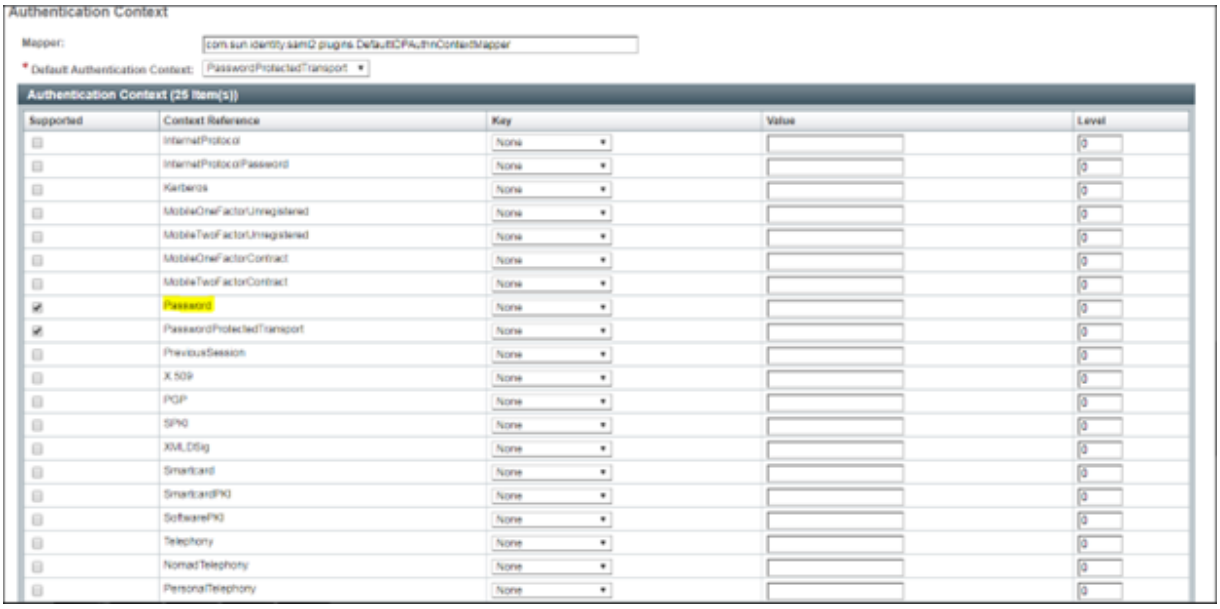


15. Under the **Federation** tab, select the IDP config under **Entity Providers**.

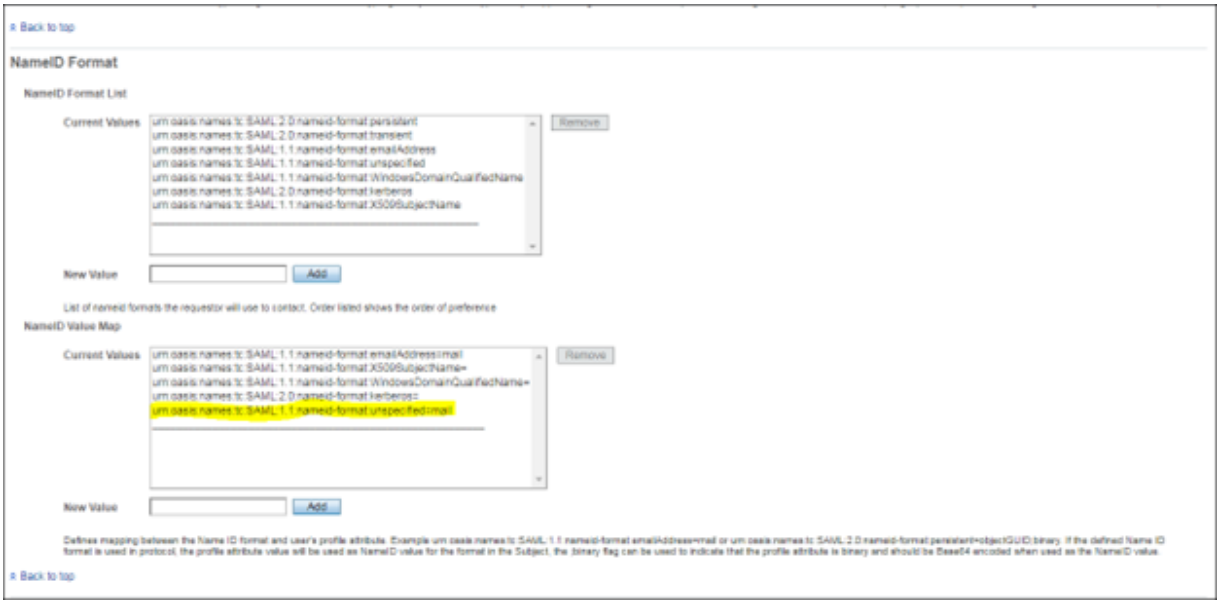


16. Under the **Authentication Context** section, check the password based context.

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17. Above the Context, add the **NameID Value Map** and **Save** the settings.
    urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified=mail.



18. Access AppViewX with the SSO authentication and forgerock.
19. Export IDP metadata and upload it in AppViewX SSO settings.
20. To export metadata using the IDP URL and save it as an XML file. **Sample URL:**http://openam.try.appviewx.com:8080/openam/saml2/jsp/exportmetadata.jsp?entityid=http://openam.try.appviewx.com:8080/openam

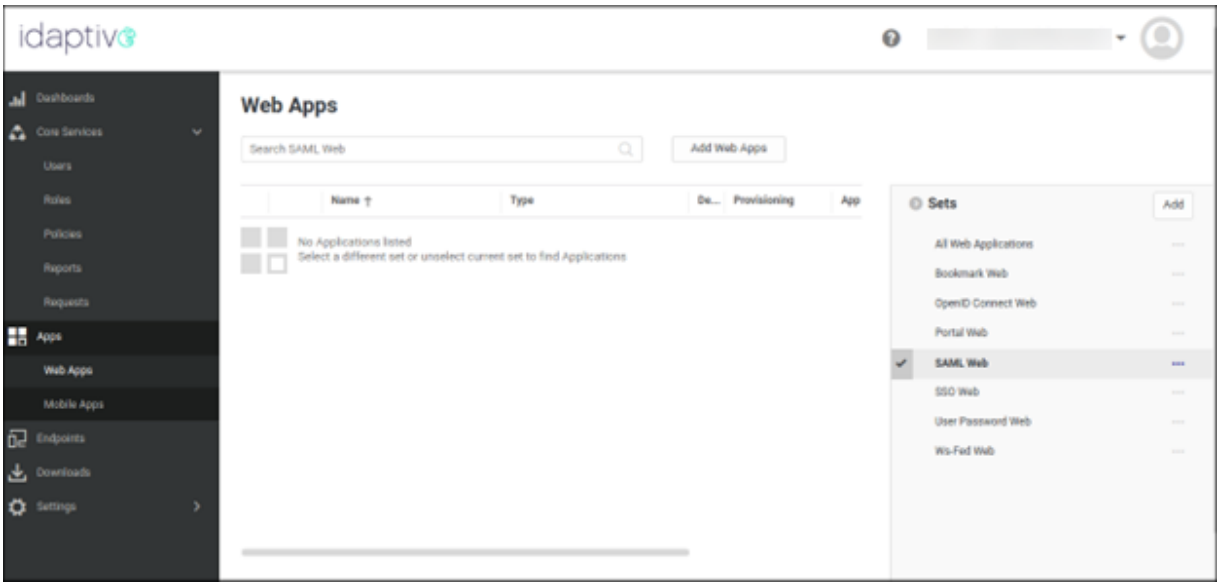
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21. Role name passed in as a part of the SAML assertion should be configured in appviewx on the **Accounts > UserGroup** and assign a role for accessing the application.

> **Note:** For an IDP initiated SSO the following structure like URL should be used. **Sample IDP initiated URL:** http://openam.try.appviewx.com:8080/openam/idpssoinit?metaAlias=/idp&spEntityID=https://192.168.x.x:31443/appviewx/

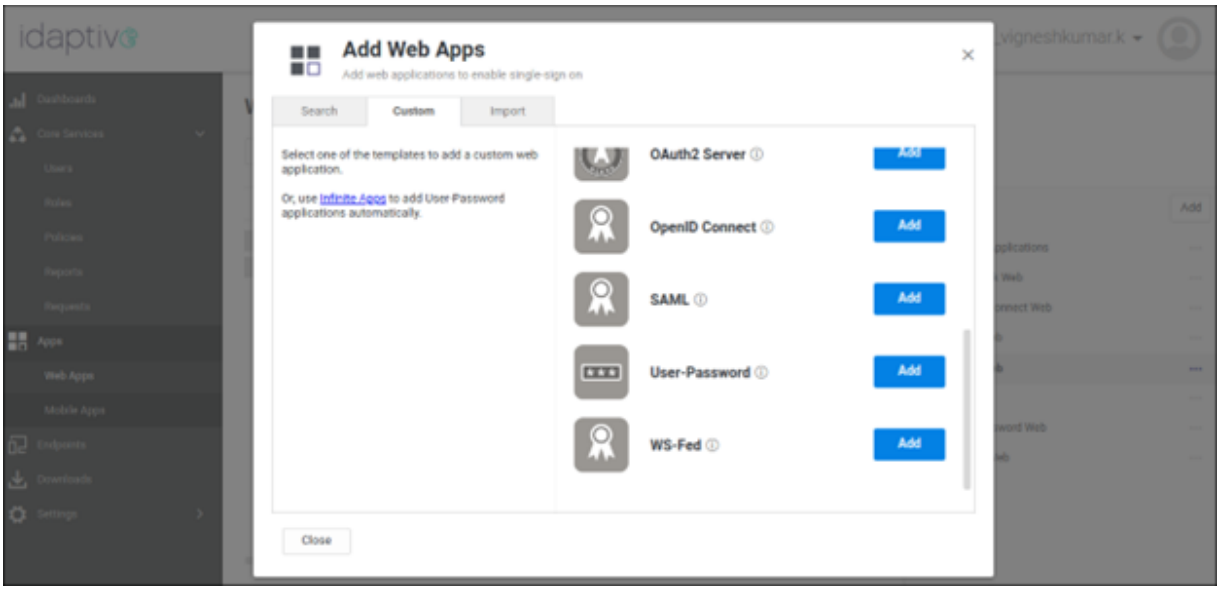
Idaptive Integration

1. Login to the Idaptive SSO platform.
2. Navigate to **Apps** > **WebApps** > **Select SAML Web**.
3. Select **SAML Web**.



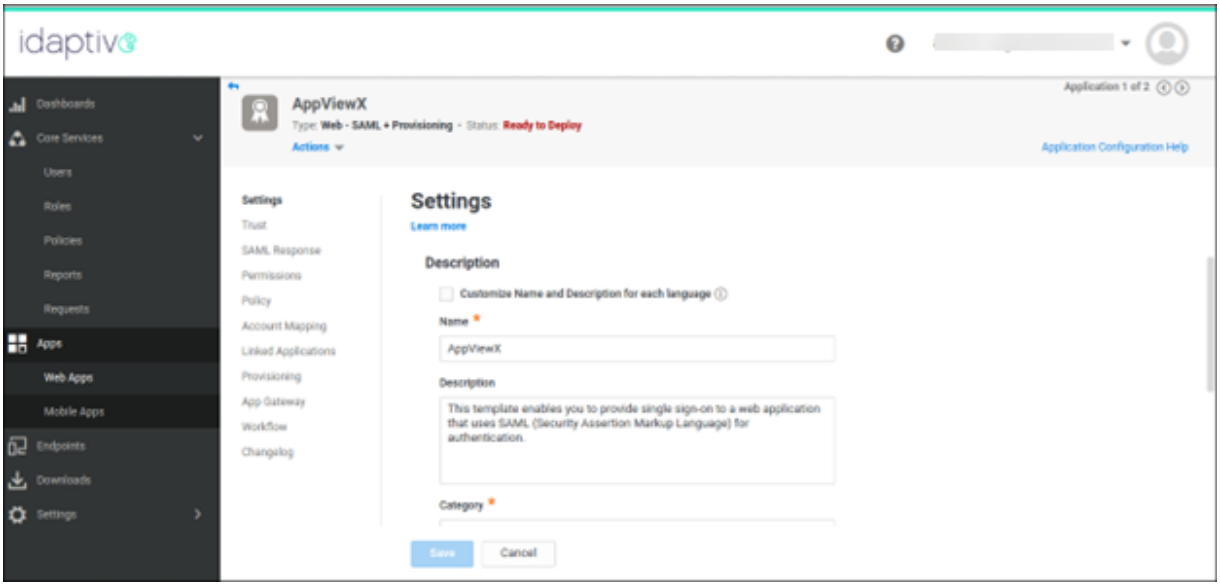
4. Click **Add Web Apps**.
5. In the **Add Web Apps** window, under the **Custom** tab, click **Add** for **SAML**.

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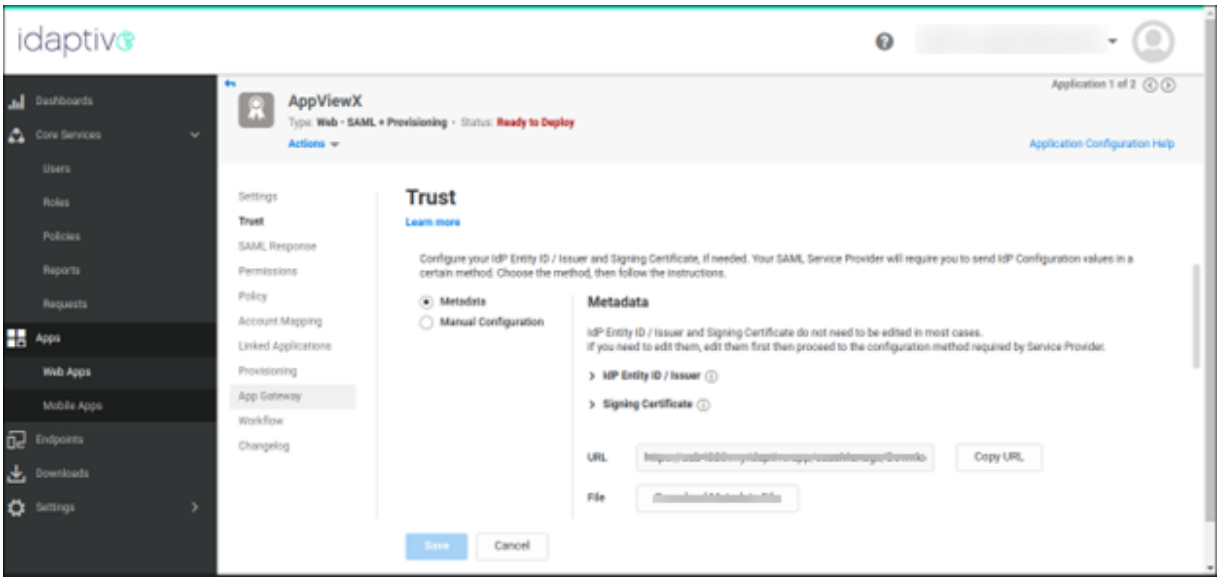
SAML app is added to the Web Apps Inventory.

6. Select the SAML app in the Web Apps Inventory and proceed with the configuration.
7. In the **Settings** tab, enter **AppViewX** as the app name and save the configuration.

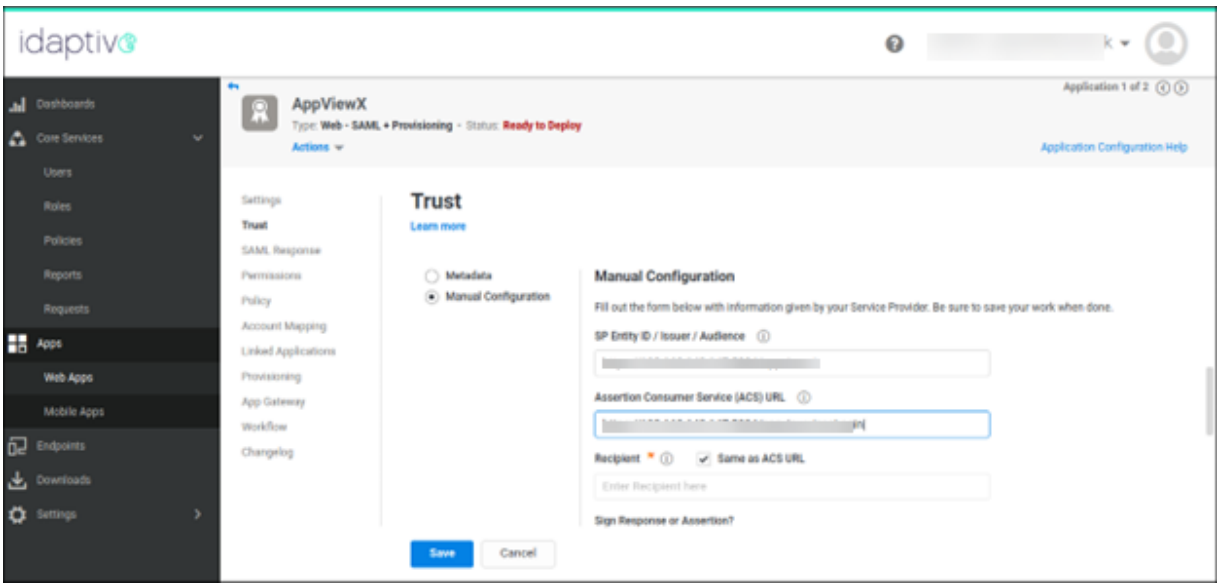


8. In the **Trust** tab, click **Download Metadata File**.

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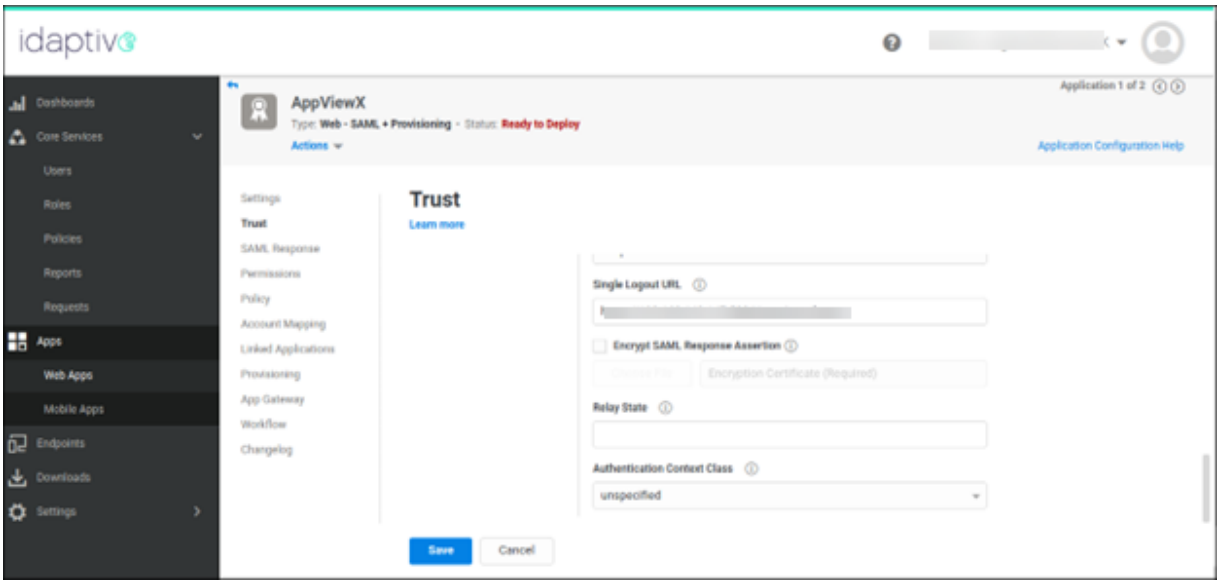


9. Select the **Manual Configuration** option.
10. Copy the **Entity ID URL** from AppViewX and paste it into the **SP Entity ID** field within the Idaptive portal. Similarly, copy the **Service URL** from AppViewX and paste it into the **ACS URL** field in the Idaptive portal.

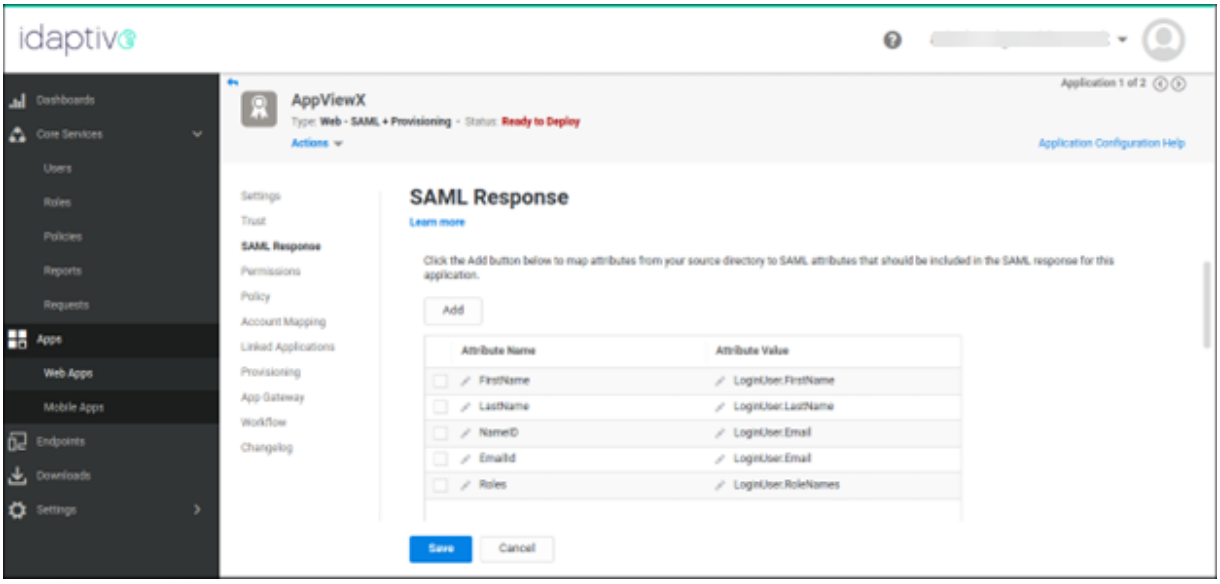


11. Verify whether the Recipient checkbox matches the ACS URL. Retain the default settings for the remaining fields. Configure the Single Logout URL field with the copied value from the SLO URL in AppViewX. Finally, **Save** the configuration.

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12. In the **SAML response** tab, add the below assertion attributes with the same format. FirstName > LoginUser.FirstName, LastName > LoginUser.LastName, NameID > LoginUser.Email, EmailId > LoginUser.Email, Roles > LoginUser.RoleNames (This should be the user associated User Groups or Security Groups).



13. Click **Save**.
14. Assign the application to the respective Role and the Role to the respective Users.
15. After configuration of role is done, proceed to set up the same role within AppViewX under the **Account > User Group** module. Assign the respective AppViewX role permissions to the User Group.
16. Access AppViewX with the help of External login using SAML.

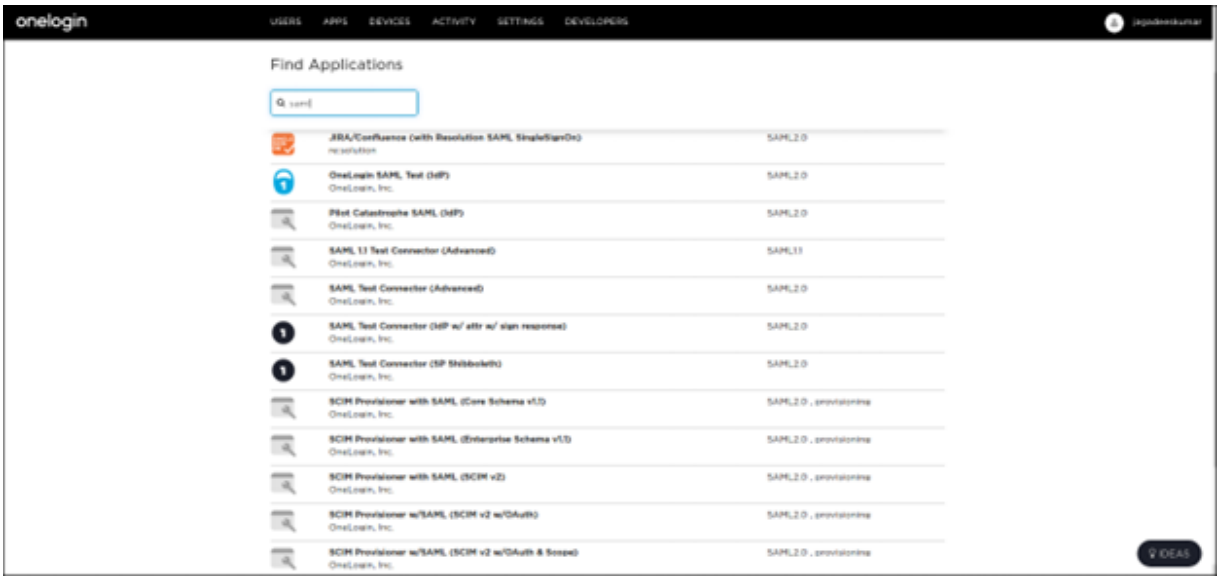
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OneLogin Integration

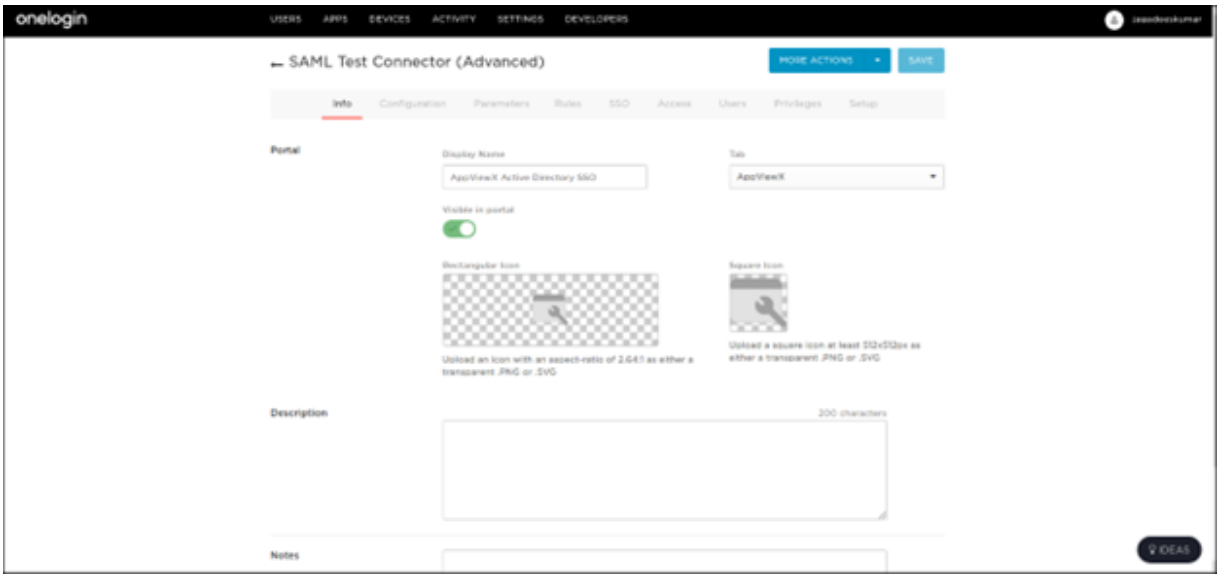
The below steps are performed at the IdP end. The navigation and screenshots might differ based on the version of the IdP.

The following are the steps to configure AppViewX SAML attributes in OneLogin.

1. Create a new application.
2. Click Add application and search for SAML Test Connector.

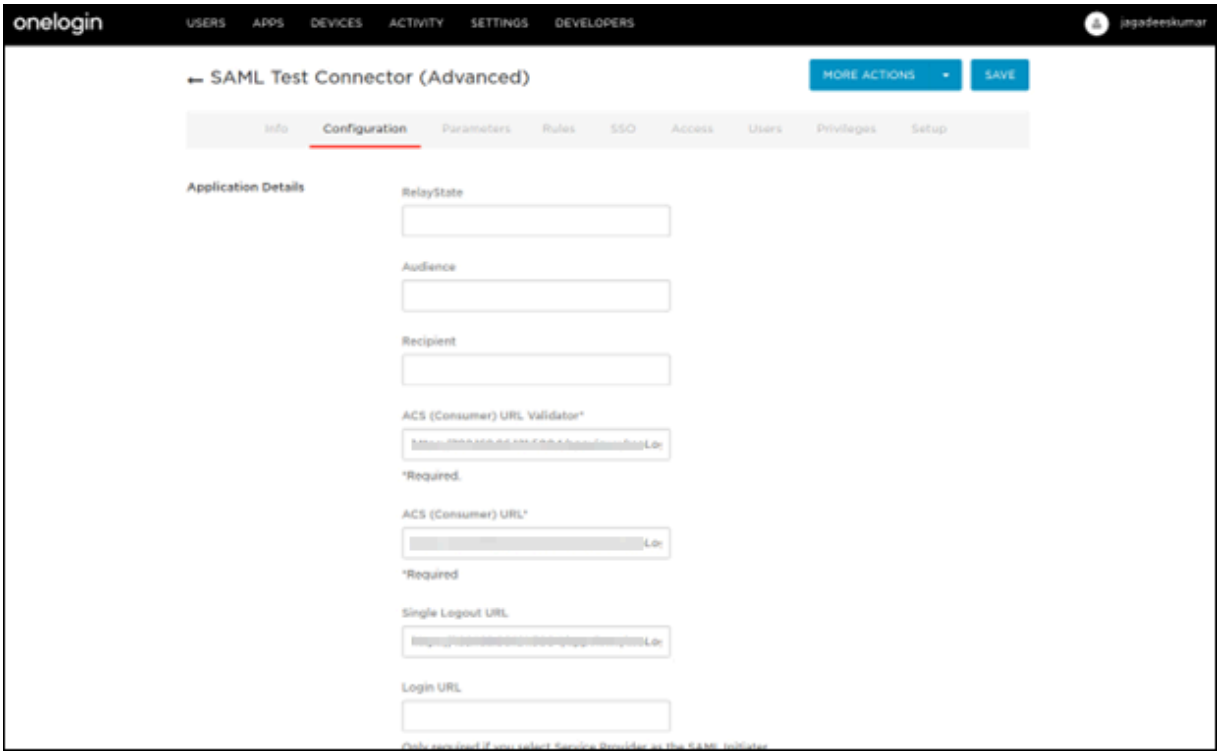


3. Provide the application name and application details of AppViewX on the information page.



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4. **AppViewX SAML attributes:**On the Configuration tab, provide the ACS consumer URL, single login URL, and single logout URL. This can be fetched by navigating to **AppViewX > Settings > General > Authentication > SAML > Enable SSO > Service URL** from the configuration found at the end of the page and specify the remaining settings to default.



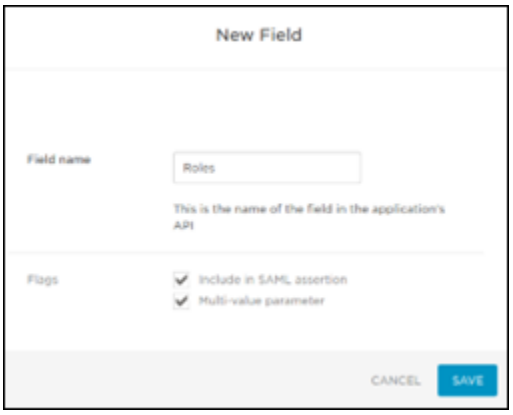
5. **Parameters to be sent to AppViewX:** The following parameters are samples that have been sent to AppViewX.
6. Create a parameter called FirstName which sends the user's first name to AppViewX in the SAML Assertion.



Include the flag in SAML Assertion for all the added parameters.

7. **Sending User Groups to AppViewX:** To send User Groups to AppViewX from OneLogin via SAML Assertion, perform the following configuration:

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a. Integrate OneLogin with Active Directory.

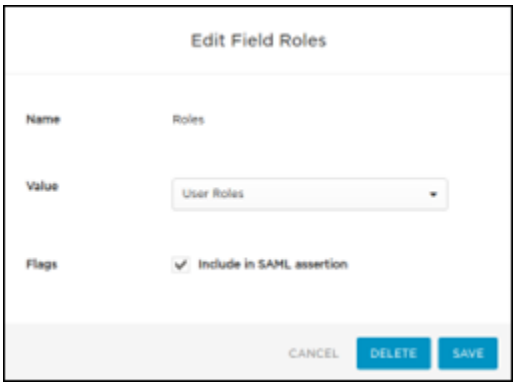
b. Set the field name as **Roles**.

c. Enable the Flags for SAML assertion along with the multi-value parameter.

8. To utilize the user's **MemberOf** attribute as a role, enter the field name as **MemberOf** and select the **AD/LDAP CN Extraction**.

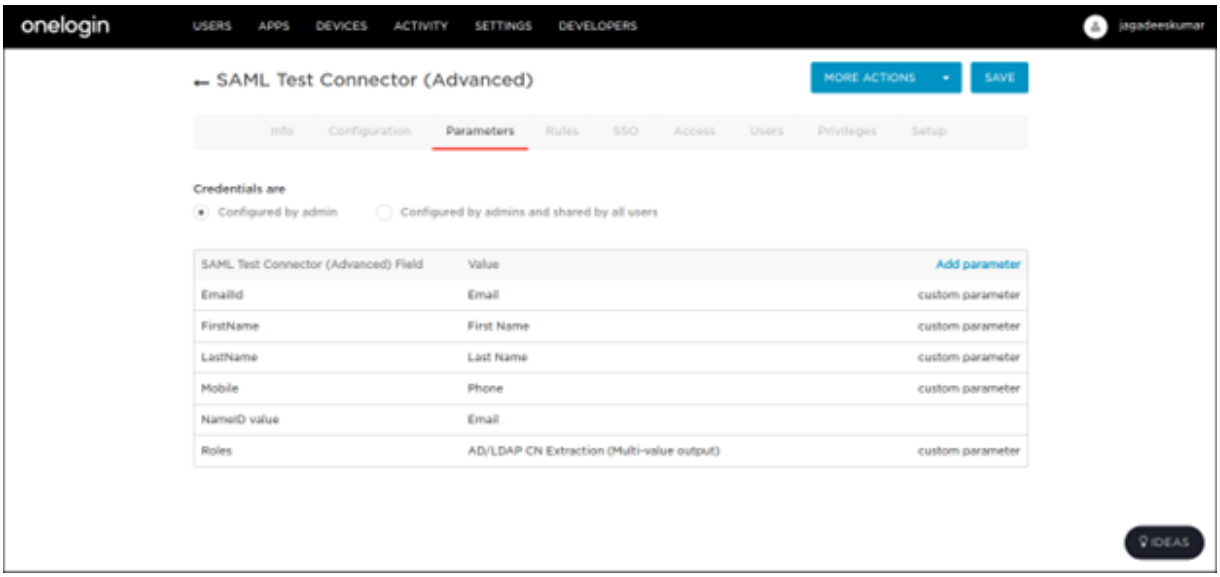


OneLogin without AD integration: Pass the roles field with user roles as value.



9. The following parameters have to be passed to AppViewX through the SAML assertion.

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10. Assign application to User and Role.
    a. Download the federation metadata and click **Save**.
    b. Create the **UserGroup** within the roles in the administration section.
    c. Assign the created application to the user group.
    d. Sync users will subsequently be added to this user group.

Okta Integration

The below steps are performed at the IdP end. The navigation and screenshots might differ based on the version of the IdP.

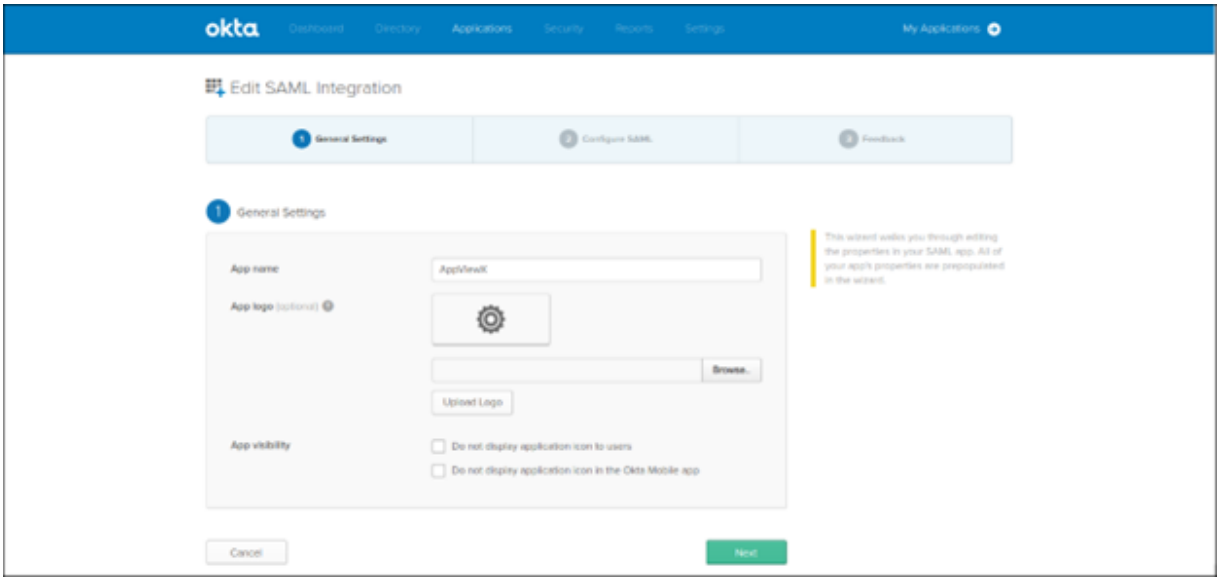
Complete the following steps to begin the IDP configuration:

1. As an admin user or a user with the privilege to create an application, log in to the IDP and start creating the application.
2. Enter the basic details, name of the application, and logo update, if required.
3. Enter the configuration information of the service provider retrieved in the previous steps.
4. Enter the user attributes to be passed to AppViewX during the SAML assertion.
5. Download or copy the IDP metadata.
6. Map the Application to a user group or the user to the application.

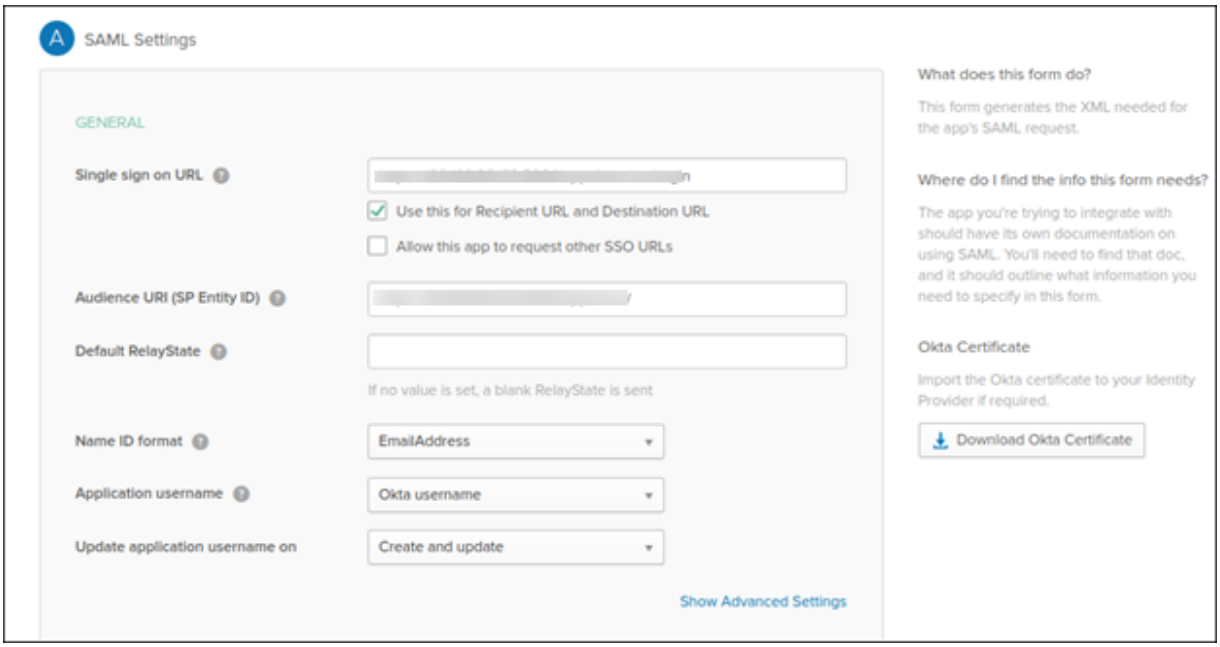
Steps to add an application in OKTA:

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1. Create an application.

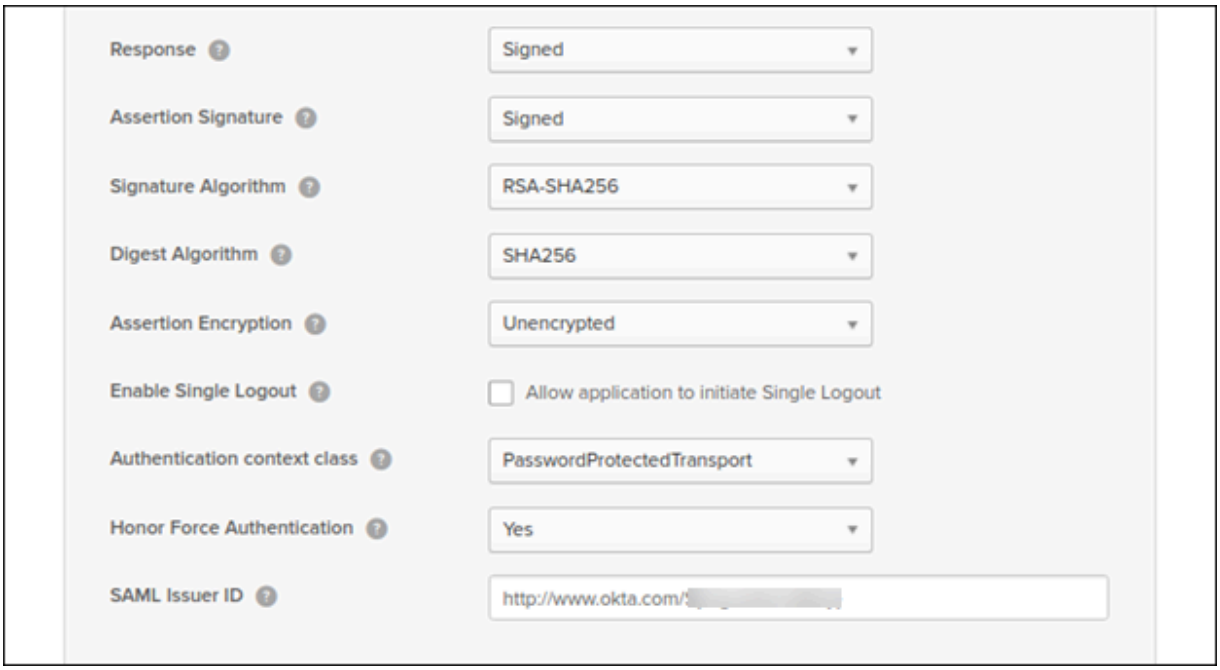


2. Configure service provider details.

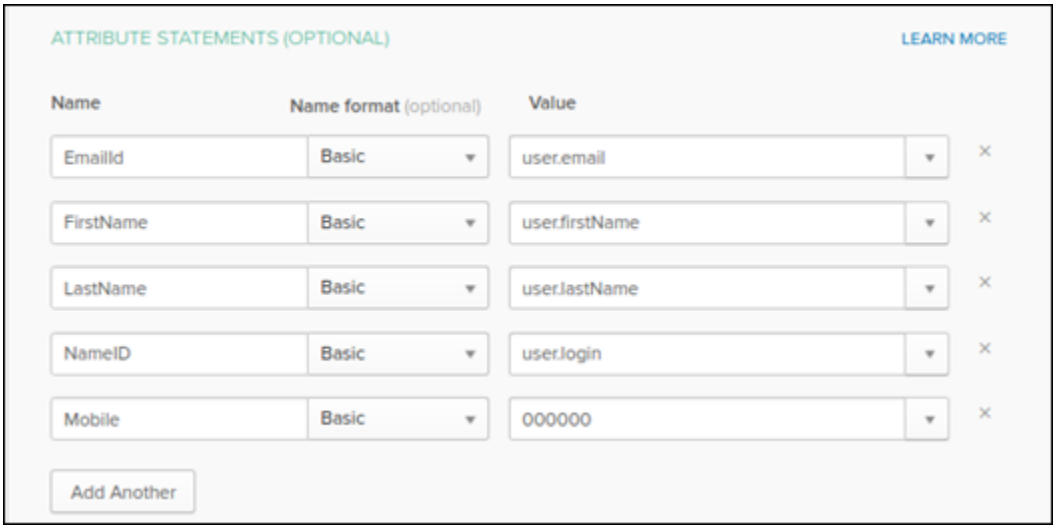


3. Show Advanced Settings screen.

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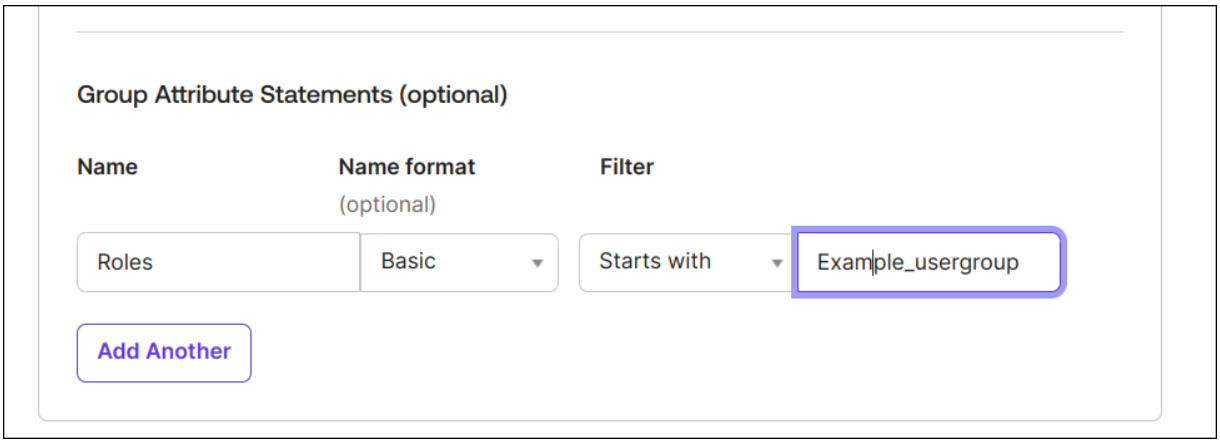


4. Configure the User Attributes to be passed during the SAML assertion.



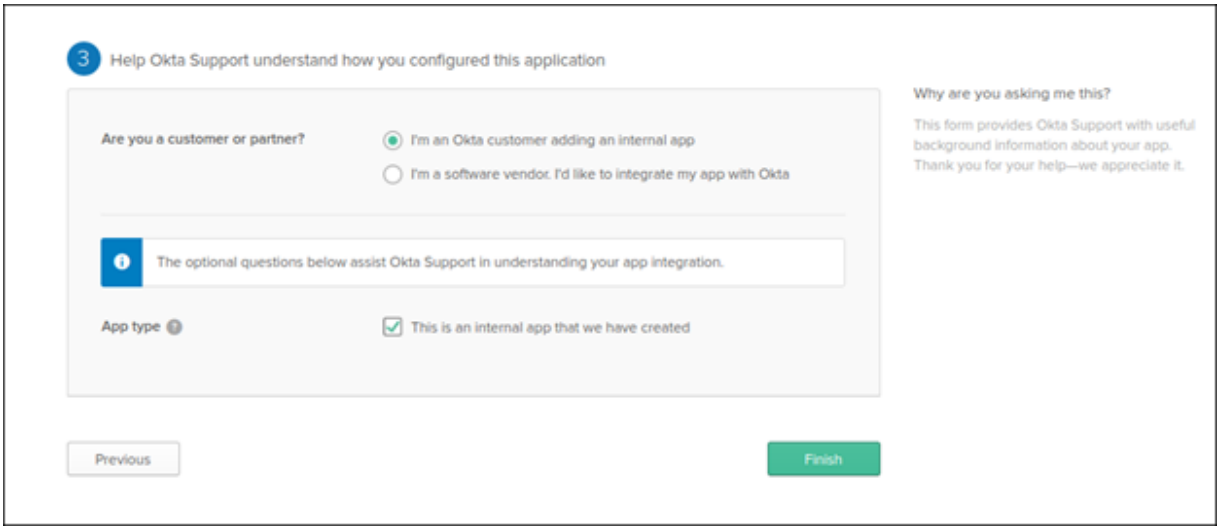
5. Create a user group within AppViewX using the identical group name as in OKTA. To access the instructions for creating a user group, click here.
6. Configure the User Group Attributes to be passed during the SAML assertion.

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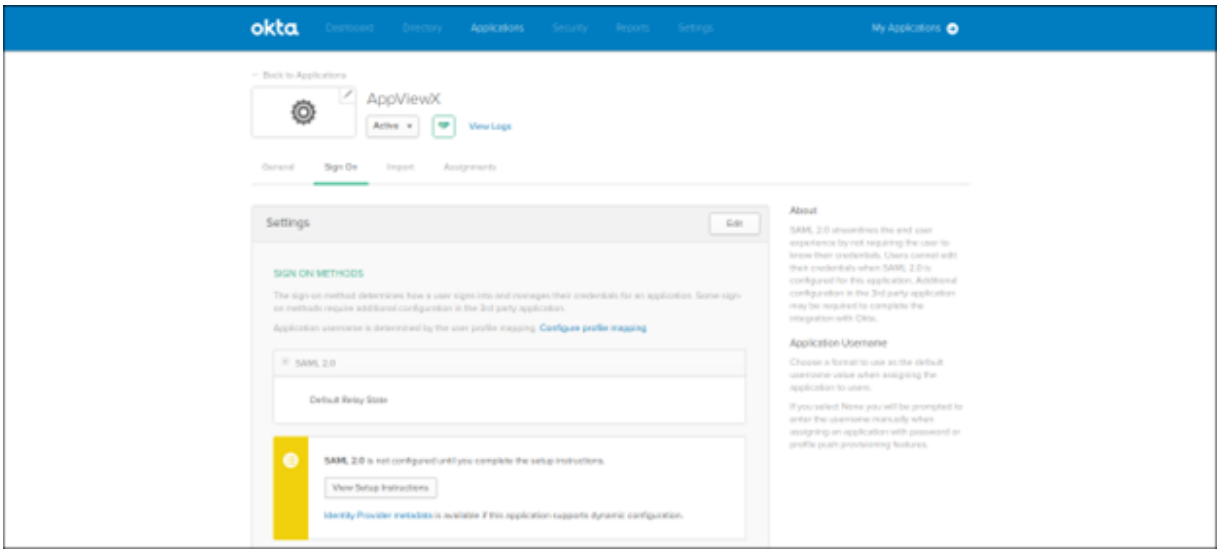
Choose Filter based on the requirement.

7. Finish the IDP configuration.



8. Click the View Setup Instructions in the Sign On tab.

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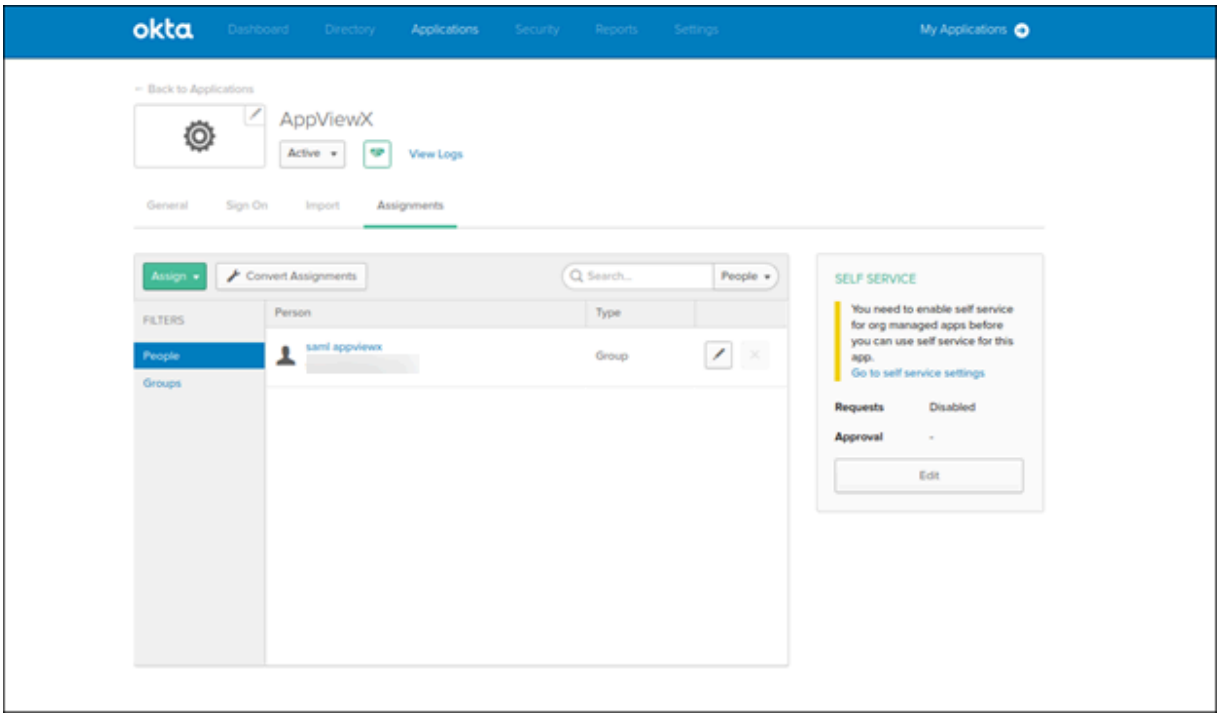


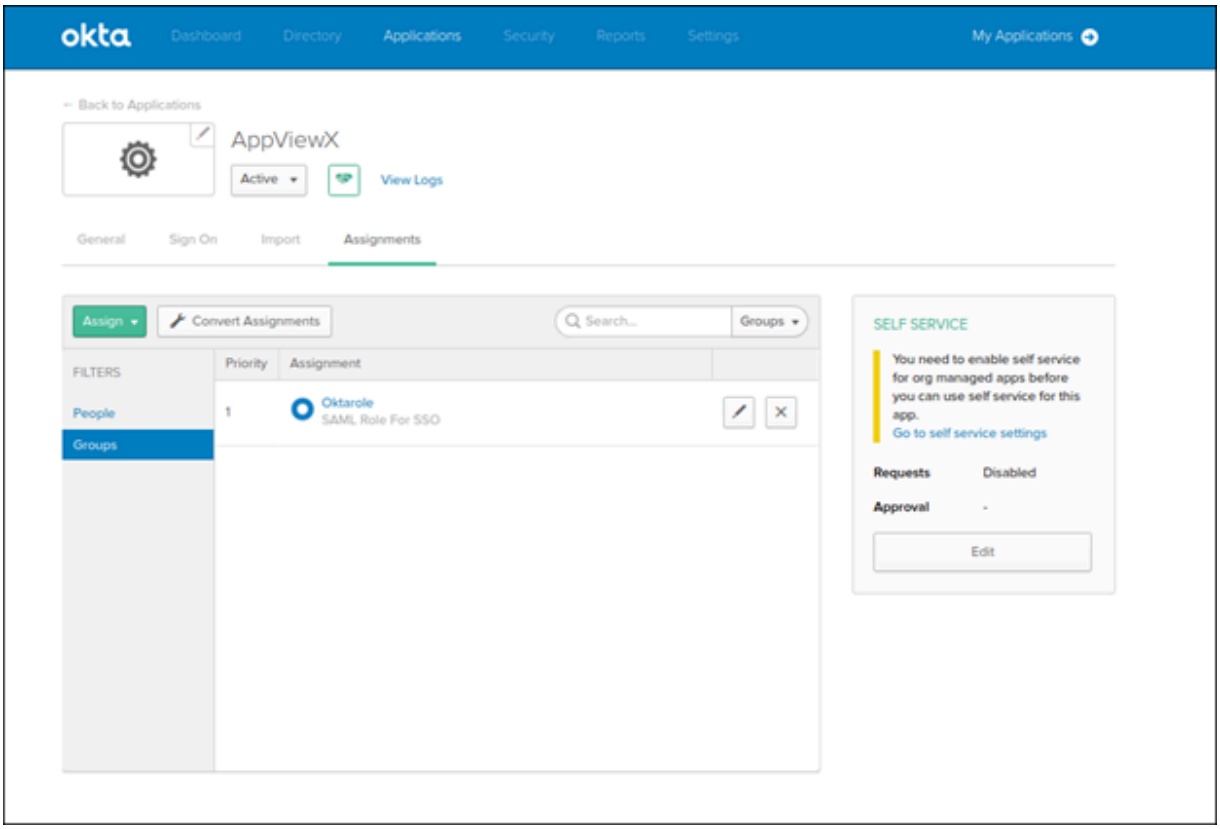
9. Copy and paste the content from the Optional section and save it as an XML file.



10. Map the application to a User or User Group.

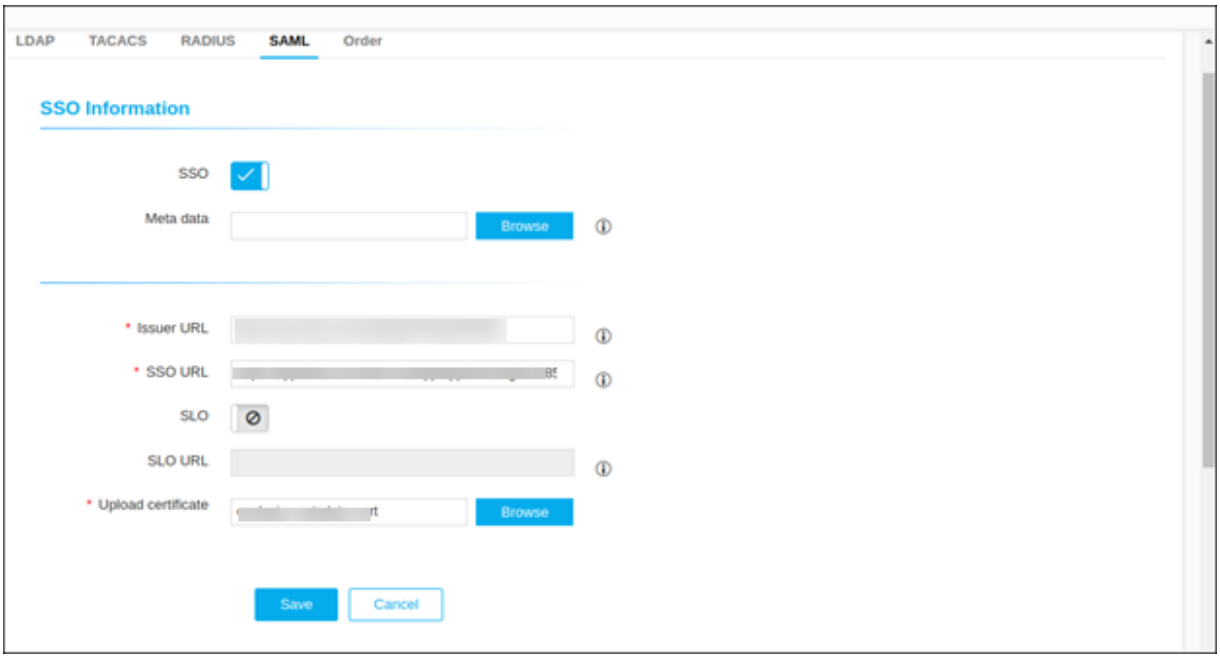
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11. Browse and upload the IDP metadata to AppViewX.

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12. Click **Save**.

PingOne SSO

With PingOne, you can use the PingOne user directory or an external identity provider.

Using an external identity provider allows linked users to authenticate using the credentials provided by the external identity provider. An external identity provider includes mapping PingOne user attributes to attributes from the identity provider.

- Creating an Environment
- Adding a SAML Application
- Editing a SAML Application
- Mapping Attributes
- Creating a Registration Application
- Configuring User, User Group, Roles, Reset Password
- Downloading IdP Metadata for an Application
- Adding a Certificate and Key Pair

Creating an Environment

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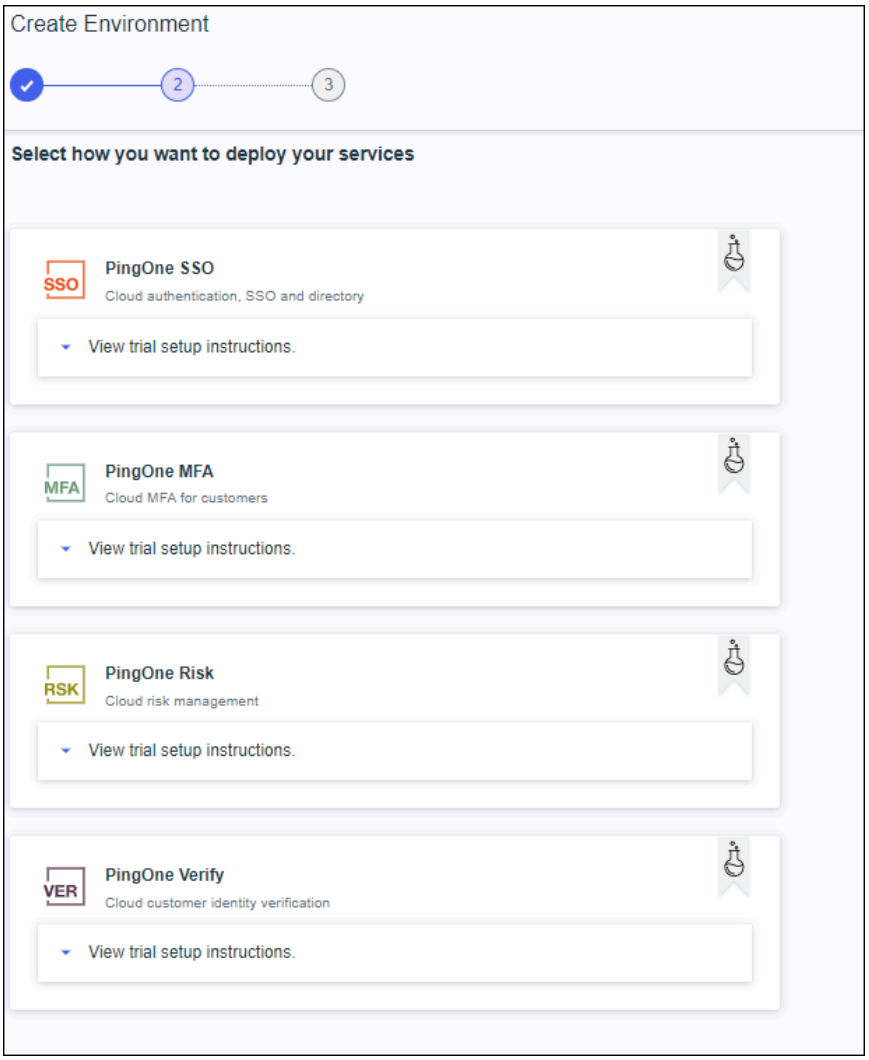
To create a passwordless login experience, you must first create an environment that contains PingOne and PingOne MFA.

1. On the PingOne **Home** page, click **Add Environment**.



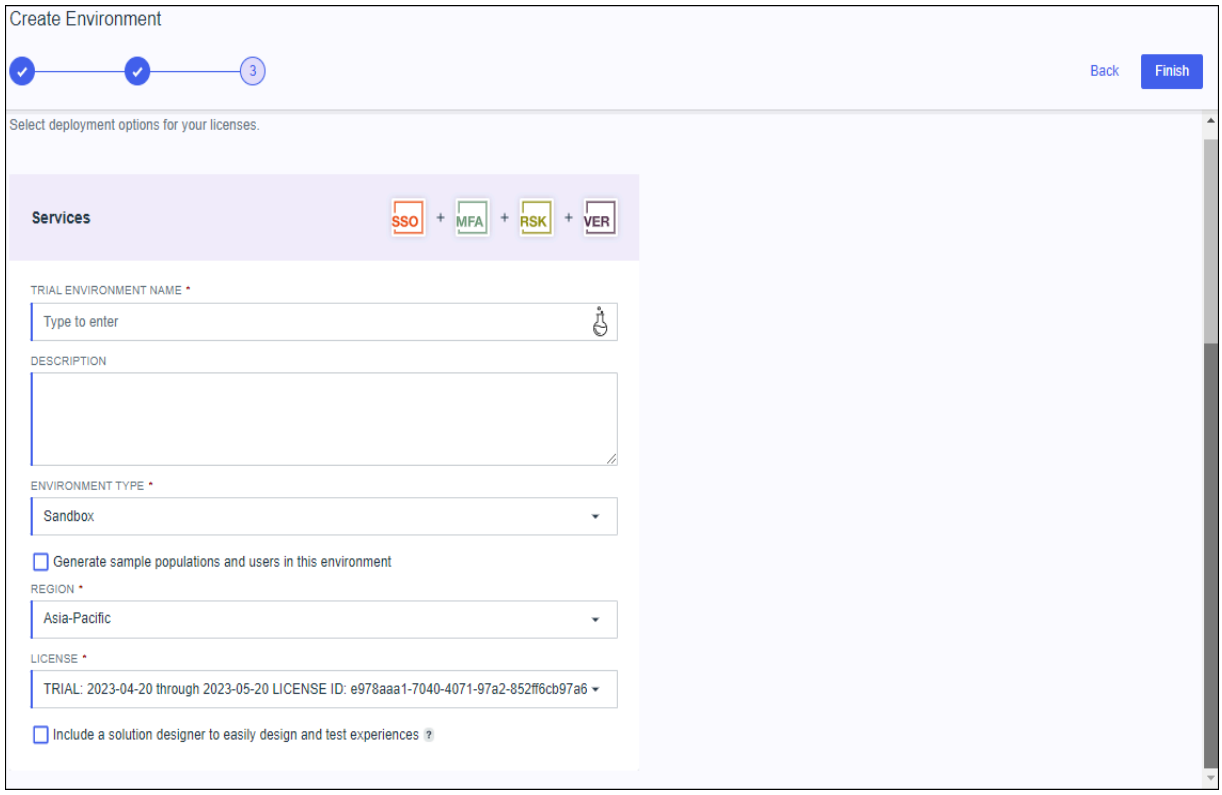
2. Click **Customer solution**, then click **Next**.
3. Click **Next**.

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4. Select **PingOne & PingID** details from the dropdown.
5. Click **Next**.

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6. In the **Environment Name** field, enter a name for the trial environment.
7. In the **Description** field, enter a description for the trial environment.
8. Select the **Environment Type** from the dropdown list.
9. Select the **Region** from the dropdown list.
10. From the **License** list, select a license.
11. Click **Finish**.

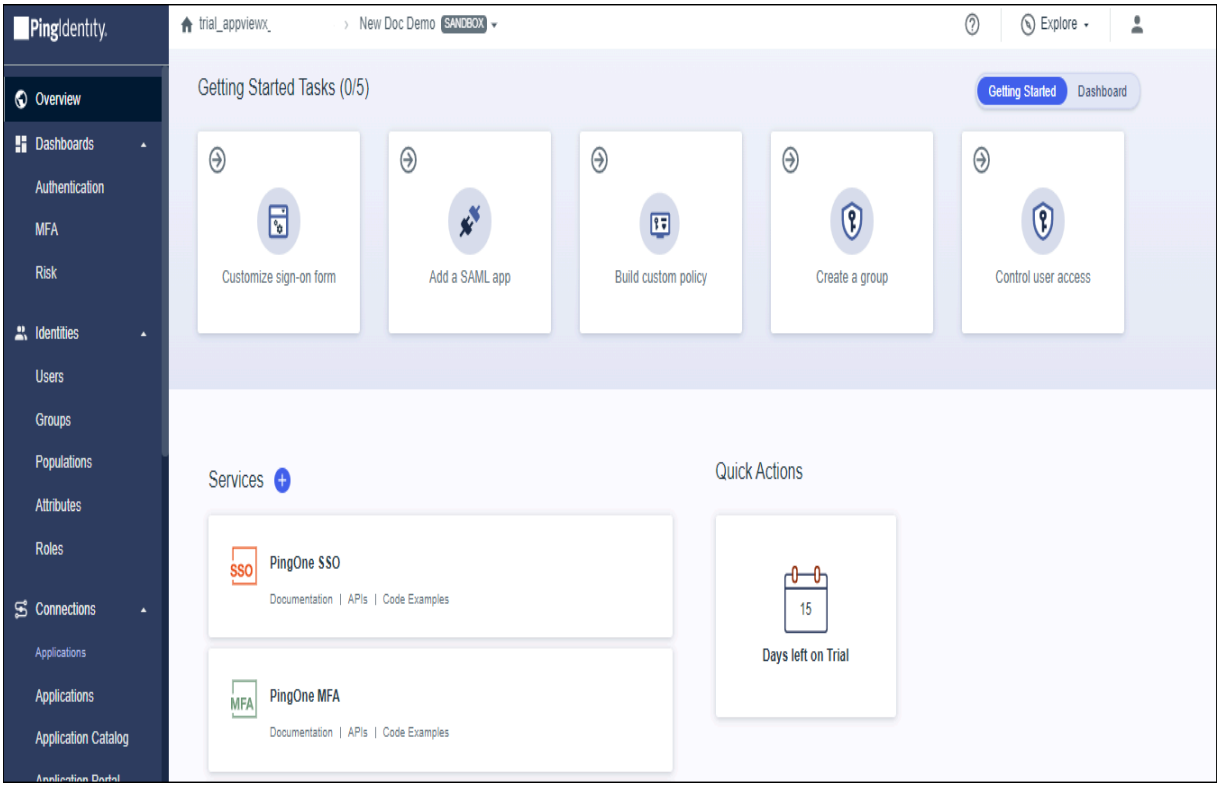
    PingOne creates the new environment and returns you to the **Home** page.



12. Click on the new environment to open it.

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Displays the Identity provider environment setup page.



Adding a SAML Application

Add applications to your environment so that PingOne can manage access to the applications.

Use the **Applications** page to add an application to be managed by PingOne. For information about the different types of applications, see Applications.

Note: Some application settings can only be configured after the application is created.

PingOne supports the following application types:

- SAML
- OIDC
- Native
- Single page
- Worker

The steps for adding a SAML application is as follows:

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1. Go to **Connections > Applications**.
2. Click the **+Add Application** icon on the top-right corner of the screen.
3. Create the application profile by entering the following details:
   - **Application name**: A unique identifier for the application.
   - **Description** (optional): A brief characterization of the application.
   - **Icon** (optional): A graphic representation of the application. Use a file up to 1MB in JPG, JPEG, GIF, or PNG format.
4. Choose the **Application Type**. You can also choose **Application Catalog** to use a templated integration.
5. If you're creating a **SAML Application**, click **Configure**, and then specify the details of the connection between the application and PingOne. You can enter the values manually, or import them from a file or URL.

   Choose from:

   - Import the configuration details from an XML metadata file. Select **Import Metadata**. Click **Select a File** and then select an XML metadata file on your file system. Click **Open**.

     The configuration values are populated based on the information in the metadata file.

     Note: If the metadata file does not specify all the configuration values, you will have to enter the missing values manually.

   - Import the configuration details from a metadata URL. Select **Import from URL**. Enter the URL and then click **Import**.

     Note: The URL must be a valid absolute URL.

   The configuration values are populated based on the information from the URL.

   - Enter the configuration details manually. In the **ACS URLs** field, enter the Assertion Consumer Service (ACS) URLs. You must specify at least one URL, and the first URL in the list is used as the default.

   In the **Entity ID** field, enter the service provider entity ID used to look up the application. The Entity ID is a required property and is unique within the environment.
6. Click **Save**.

   After the application is created, you can edit the application settings, configure application policies, and control application access.

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Editing a SAML Application

Use the **Applications** page to edit existing SAML applications.PingOne supports the following application types: The steps for adding a SAML application is as follows:

1. Go to **Connections** > **Applications**.
2. Browse or search for the application that you want to edit.
3. Click the application entry to open the details panel. Click the tab that you want to edit, and then click the pencil icon.
4. For **Overview**, enter or edit the following:
   - **Application Name**: A unique identifier for the application.
   - **Description**: A brief characterization of the application (optional).
   - **Icon** (optional): A pictorial representation of the application. Use a file up to 1MB in JPG, JPEG, GIF, or PNG format.
   - **Home page URL**: The default home page for the application.
   - **Signon URL**: The URL to which the application requests that the end user be redirected to sign on.

   Note: If you created this application using the **Application Catalog** page, you'll have the option to enable advanced configuration options. Click the **Enable Advanced Configuration** button. This option gives you access to all application settings on the **Configuration** tab.

5. For **Configuration**, enter or edit the following.

Field	Description
ACS URLs	The Assertion Consumer Service URLs. You must specify at least one URL, and the first URL in the list is used as the default. If you are using a custom domain, you can toggle the view between the custom and original URLs. The original and custom URLs will continue to work.
Signing certificate	The certificate that confirms that requests, responses, and assertions actually came from the identity provider. Select the appropriate certificate from the list of available certificates. To add a certificate, see Adding a certificate and key pair. Select whether to sign assertions, responses, or assertions and responses. Select the signing algorithm (RSA_SHA256, RSA_SHA384, or RSA_SHA512).

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Field	Description
Encryption	If selected, the assertions PingOne sends to the SAML application will be encrypted. **Note:** Available for SAML 2.0 applications only. Select the algorithm for encrypting the assertions, either AES_128 or AES_256 (recommended). Import a certificate or select an existing one from the list of available. To add a certificate, see Adding a certificate and key pair.
Entity ID	The service provider entity ID used to look up the application. This is a required property and is unique within the environment.
SLO endpoint	The URL of the single logout service. PingOne redirects the browser to this location when it needs to send an SLO message to the service provider.
SLO response endpoint (optional)	The URL of the single logout response service. You can use this option if you have a separate service for single logout responses. If this value is blank, PingOne sends responses to the SLO endpoint.
SLO binding	The SAML binding used by the application. The default is HTTP POST. Select HTTP Redirect as needed.
Subject NameID format	A string that specifies the format of the Subject NameID attribute in the SAML assertion. Options are: • **urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified** (default). The subject NameID is not specified. Use this format if you are not sure which format to use. • **urn:oasis:names:tc:SAML:1.1:nameid-format:emailAddress**. The Subject NameID is in the form of an email address. • **urn:oasis:names:tc:SAML:2.0:nameid-format:persistent**. The Subject NameID is an opaque unique identifier for a user that retains the same value over time. • **urn:oasis:names:tc:SAML:2.0:nameid-format:transient**. The Subject NameID is a randomly generated identifier. A different value is used for each single sign-on (SSO) for a given user.
Assertion validity duration	The maximum amount of time that an assertion is valid (in seconds).

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Field	Description
Target application URL	This option is required by some applications as the target URL. It's used in identity provider identity provider (IdP)initiated SSO for deep-linking. The application URL is passed in the `RelayState` parameter by the IdP.
Enforce signed Authn request	Require that authentication requests be signed. Select the option and then select or import a certificate.
Verification certificate	A certificate that confirms that the SAML assertions actually came from the sender. Select or import the appropriate certificate. The list shows the certificates that are available. To add a certificate, see Adding a certificate and key pair.

6. For **Attribute mappings**, select a PingOne user attribute and map it to an attribute in the application. For more information, see Mapping attributes.
   a. Enter a SAML attribute and then select the corresponding PingOne attribute from the list.
   b. Click the **More Options** (three vertical dots) icon, to configure `nameFormat` for the SAML attribute. If you want to use a name format other than `Subject`, select an option from the list. If you don't select an option, PingOne will use the `basic` format as default. The options are:
      - **uri**: The attribute follows the convention for URI references. The interpretation of the URI content is application-specific.
      - **basic**: The strings in the attribute must be drawn from the values belonging to the primitive type `xs:Name`.
      - **unspecified**: The attribute can be any format. The interpretation of the content is application specific.
   c. Click the gear icon to use the expression builder to build an attribute mapping. See Using the expression builder.
   d. Select **Required** to define the attribute as required for the application.
7. For **Policies**, select the authentication policies for the application.

   If you have a DaVinci license, you can select PingOne policies or DaVinci Flow policies, but not both. If you don’t have a DaVinci license, you’ll see PingOne policies only.

   To use a PingOne policy, Click **+ Add policies** and then select the policies that you want to apply to the application. Click **Add**. The policies are applied in the order in which they appear in the list. PingOne evaluates the first policy in the list first. If the requirements of the policy are not met, PingOne moves to the next policy in the list. For more information, see Authentication policies for applications.

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To use a DaVinci Flow policy, you must clear all PingOne policies. Click the **Deselect all PingOne policies** button. In the confirmation message, click **Continue**. Click the **DaVinci Policies** tab, and then select the policies that you want to apply to the application. PingOne applies the first policy in the list.

8. For **Access**, enter or edit the following:
   - **Application portal display**: Determines whether an application icon appears in the application portal even if the user is allowed to access the application in the application portal based on the group membership policy. For more information, see Application access control.
   - **Admin only access**: Specifies that a user with an administrator role is required to access the application. The user must have one of the following roles: **Organization Admin**, **Environment Admin**, **Identity Data Admin**, or **Client Application Developer**.
   - **Group membership policy**. Select the group membership policy for the application. For more information, see Groups.
9. Click **Save**.

Mapping Attributes

You can map PingOne user attributes to SAML or OIDC attributes to and from external applications, resources, identity providers, and provisioning connections. For example, you could map **Email Address** in PingOne to **NameID** in an application.

When mapping multi-valued attributes to and from PingOne, consider the following conditions.

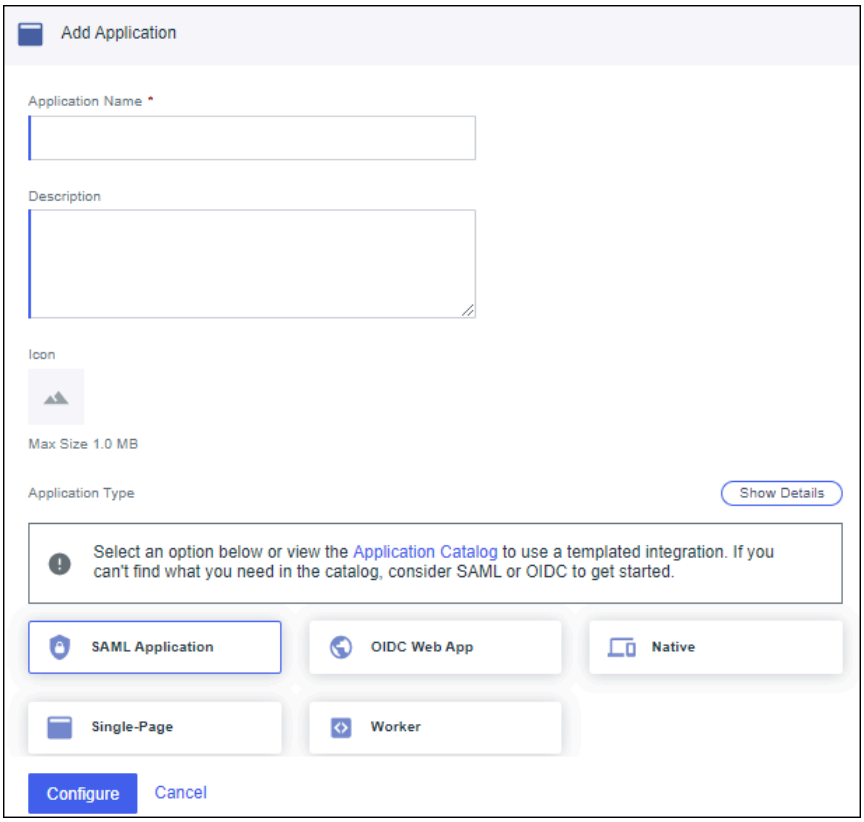
- If you map a multi-valued PingOne attribute to an attribute for an external application, the claim in the token or the attribute in the assertion will be multi-valued.
- If you map an external attribute to a PingOne attribute, PingOne will evaluate the mapping as follows:
- If you map an external multi-valued attribute to a multi-valued PingOne attribute, PingOne will add all values to the PingOne attribute.
- If you map an external multi-valued attribute to a single-valued PingOne attribute, PingOne uses only the first value of the external multi-valued attribute.
- If you map an external single-valued attribute to a multi-valued PingOne attribute, PingOne will take the single value and add it to the multi-valued PingOne attribute to create a multi-valued attribute containing one value.

Creating a Registration Application

Create an application that your users can use to register.

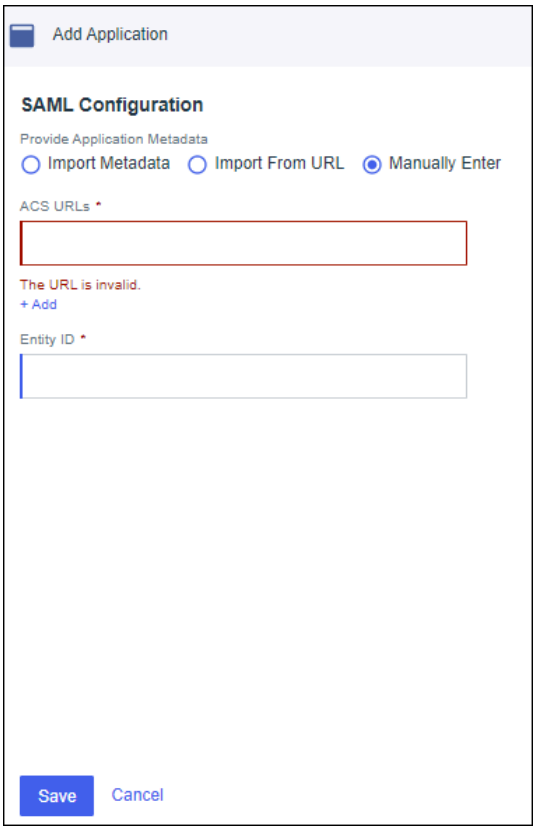
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1. To access the navigation pane, in the top-left corner of the screen, Click **Connections** > **Applications**.
2. Click the **+Add Application**.
3. On the **Choose Application Type Page**, Select **SAML Application**.



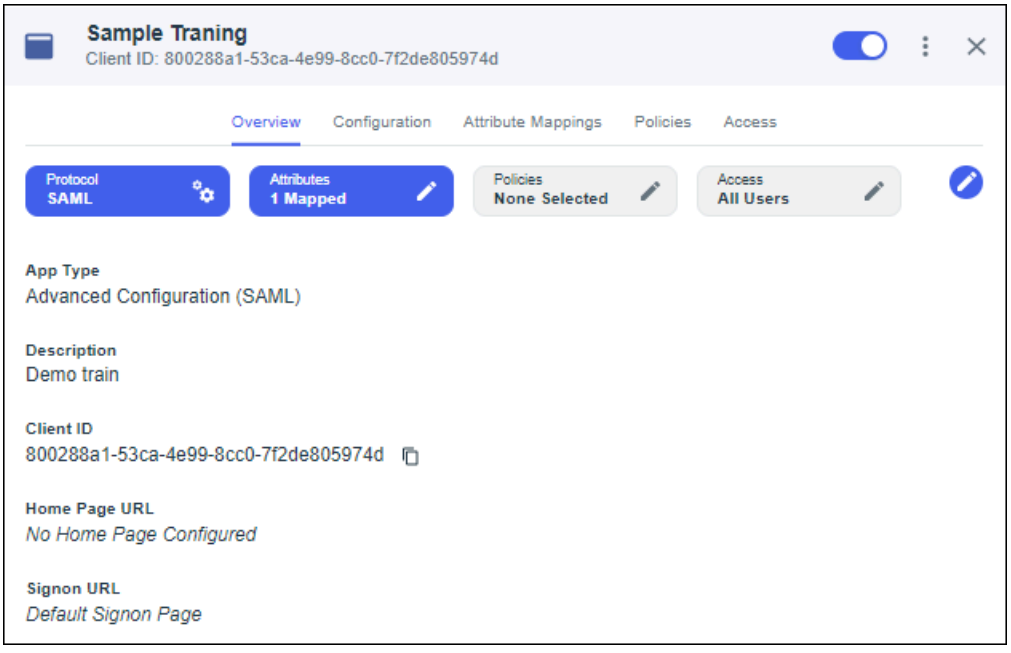
4. Click **Configure**.

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5. Select **Manually Enter** for providing Application Metadata.
6. In the **ACS URLs** field, enter *https://httpbin.org/anything*.
7. In the **Entity ID** field, enter httpbin, and then click **Save**.

   PingOne adds the application to the **Applications** list.



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8. Click the **Configuration** tab, and then click the **Pencil** icon.
9. In the **Assertion Validity Duration (in seconds)** field, enter 3600.
10. Click **Save**.
11. Enable the **Toggle** in the top right corner after configuring the application.

Configuring User, User Group, Roles, Reset Password

Adding a User

Use the **Users** page to add users to the directory.

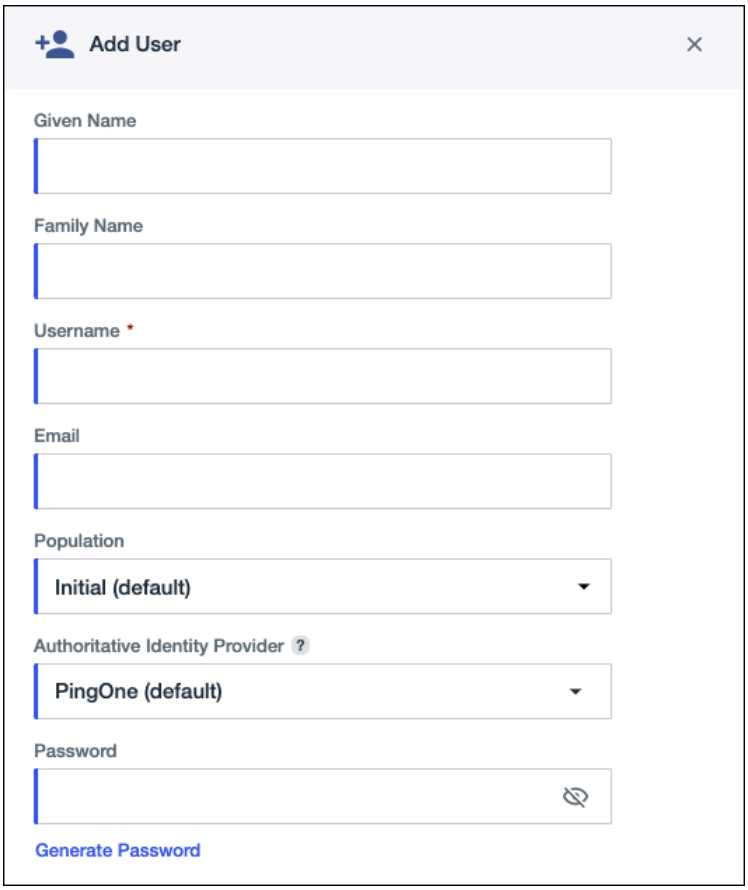
Important: In environments using PingFederate as the identity provider, adding a user in PingOne does not create the user in the PingFederate user directory. The ability to create a user in PingOne is provided as a useful option for MFA testing.

Note: If your environment is set up with custom user attributes, the user fields might not match the ones described here.

To add users,

1. Go to **Identities** > **Users**.
2. Click the **+** icon.
3. Enter the following information.

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Field	Description
Given name	The user's first name.
Family name	The user's last name.
Username	A unique identifier for the user. **Note:** In a workforce environment, usernames cannot be changed after they have been set.
Email	A valid email address for the user.
Population	The population to which the user should belong. If you don't specify a population, the user will be added to the default population. For more information, see Populations.

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Field	Description
Authoritative identity provider	If you have configured an external identity provider, select it from the list. An authoritative identity provider has authority over user records and credentials. For more information, see Authoritative identity providers.
Password	An initial password for the user. Click Generate password to have PingOne create a strong password for you. Click the eye icon to show the password in clear text.

4. Click **Save**.
   The user is created in the PingOne directory. You can edit a user profile after it has been created.

Assigning a User Role

Use the **Users** page to add roles to users in the directory. Roles determine the permissions for each user when using the system.

1. Go to **Identities** > **Users**.
2. Locate the user you want to edit. You can browse or search for users.
3. Click the user entry to open the user details panel
4. Click the **Roles** tab to see the currently assigned roles.
5. Do one or more of the following:

   Choose from:

   - **Add a role**. To add roles to the user, click **Grant roles**. Select or clear the appropriate responsibilities. To see all responsibilities, click **Available responsibilities**. To see only the currently assigned responsibilities, click **Granted responsibilities**.

     Tip: Click **Select all** or **Remove all** to select or clear all available responsibilities.

   - **Reduce access for a responsibility**. You can choose to grant fewer responsibilities than the admin account that created the user. Use this feature to limit the user's access to a particular environment

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or population. Click the funnel icon, and then select or clear the appropriate environments or populations.

- **Remove a role**. Locate the role you want to remove, and then clear the check box for that role.

6. Click **Save**.

Creating a Group

Use the **Groups** page to create groups. You can create static and dynamic groups.

Note: You must have the **Identity Data Admin** role to create or edit groups. With the **Identity Data Read Only** role, you can view groups and group membership, but you can't create or edit groups.

Note: If your environment is set up with custom user attributes, the user fields might not match the ones described here.

1. Go to **Identities** > **Groups**.
2. Click the **+** icon.
3. Enter the following information.

Field	Description
Group name	A name for the group. The name must be unique within the environment for environment groups, and unique within a population for population groups.
Description (optional)	A brief characterization of the group.
Population (optional)	The population in which the group will be created. Users with the **Environment Admin** role can create groups at the environment level, but users with the **Identity Admin** role must assign a group to a population for which they are an **Identity Admin**. If you select a population, the group can contain users from that population only.

4. Click **Save**.

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Adding Users to a Group

Use the **Users** page to manually add or remove users from a group.

1. Go to **Identities** > **Users**.
2. Locate the user you want to view. You can browse or search for users. The results list is updated as you enter the search query.
3. Click the user entry to open the user details panel.
4. Click the **Groups** tab.
   The list shows current group membership.
5. Click the **Pencil** icon.
6. Do one or more of the following:
   - To add the user to a group, select the check box next to the group name. A check mark appears.
   - To remove a user from a group, clear the check box next to the group name. The check mark disappears.

   Note: If a user is in a group due to matching a filter, you can't directly remove a user that was added to a dynamic group. To remove a user from a dynamic group, change the filter criteria or modify user attributes to no longer match the filter criteria.

7. Click **Save**.

Providing Access to a Group

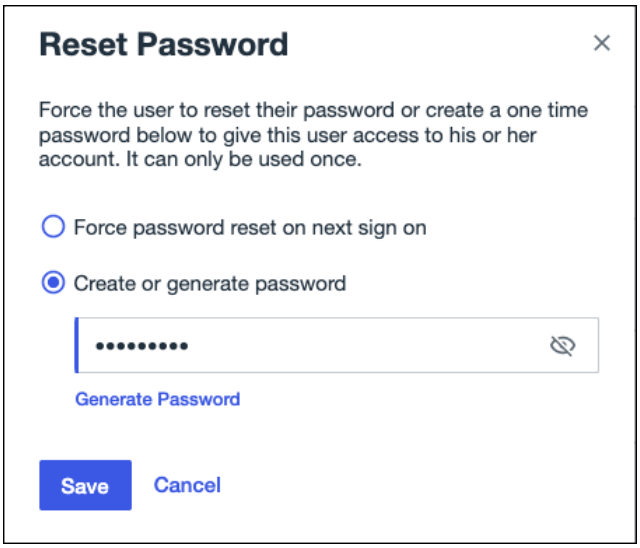
1. Go to **Identities > Users**.
2. Click the **Access** tab.
   The list shows current group membership.
3. Click the **Pencil** icon.
4. Do one or more of the following:
   - To add the user to a group, select the check box next to the group name. A check mark appears.
   - To remove a user from a group, clear the check box next to the group name. The check mark disappears.
   - Any user having access to this group will have access to AppViewX.
5. Click **Save**.

Resetting a User Password

Use the **Users** page to reset a user password. When you reset a user's password, you can create a new password for the user, or force the user to choose a new password the next time they sign on.

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1. Go to **Identities** > **Users**.
2. Locate the user whose password you want to reset. You can browse or search for users.
3. On the right side of the user entry, click the three dots options menu and then click **Reset Password**.
4. In the **Reset Password** window, select one of the following:



   - **Force password reset on next sign on**. The user will be prompted to change their password the next time they sign on.
   - **Create or generate a password**. Enter a temporary password or click **Generate Password** to have PingOne create a secure password. Copy the password if needed.
5. Click **Save**.

Downloading IdP Metadata for an Application

PingOne generates a metadata file that contains configuration details for single sign-on (SSO). You can use the identity provider (IdP) metadata to share configuration information between the IdP and the service provider (SP). The metadata includes, for example, profile and binding support, connection endpoints, and certificate information.

1. Go to **Connections** > **Applications**.
2. Locate the application for which you want to download the IdP metadata. You can browse or search for applications.
3. Click the application entry to open the details panel.
4. Click the **Configuration** tab.
5. Click **Download metadata**.
   The file is saved to your local device storage.

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Adding a Certificate and Key Pair

Use the Certificates and key pairs page to set up a certificate for your environment.

The certificate must be valid when you add it to PingOne. You cannot add a certificate before its validity period begins (the certificate's NotBefore date) or after it expires (the certificate's NotAfter date). The private key must be unencrypted. You cannot upload a private key that is protected by a password or passphrase. The certificate, private key, and certificate chain must all be PEM-encoded unless uploading a pkcs12 file format.

1. Go to **Connections** > **Certificates & KeyPairs**.
2. Click **+ Add** and then click **Create key pair**.
3. Enter the following information:

Option	Description
Common name	The server name that is covered by the certificate. It is typically made up of the domain name, such as www.example.com. Do not use special characters (?, $, % and so on), IP addresses, port numbers, or http:// or https:// in the common name.
Usage type	Certificates can be used for signing and verification, encryption, or SSL. Select the primary usage for this certificate.
Organization	The corporation, university, or government agency that is covered by the certificate. Use the legal name under which your organization is registered. Do not abbreviate or use any of these symbols: ! @ # $ % ^ * ( ) ~ ? > < / \.
Organization unit	A division within the primary organization, such as Engineering or Human Resources. If your organization is doing business as a trade name, you can specify the trade or DBA name in this field.
City	The city in which the organization is located. Do not use abbreviations. **For example**, spell Saint Louis rather than St. Louis.
State	The state or province in which the organization is located.
Country	The two-character ISO 3166-1 country code. **For example**, US for the United States.

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Option	Description
Validity days	The number of days the key is valid, with a maximum of 730 days.
Key algorithm	The public key algorithm with which to generate the public-private key pair. Choose RSA (Rivest Shamir Adleman) or EC (Elliptic Curve).
Key size bits	The number of bits in the key's algorithm. The available values depend on the selected key algorithm.
Signature algorithm	The cryptographic algorithm used by the certification authority to sign the certificate. The available values depend on the selected key algorithm.

4. Click **Save and Finish**.

Troubleshooting

Enable the SAML extension in the browser. While performing the login, enable the DEV tools and open the SAML tab. During the operation, the SAML assertions are passed in the HTTP headers. Similar to the external authentication configuration, if the role name passed in the SAML assertion matches the role name in the AppViewX database, the login will be successful.

Sample Configuration of SAML Assertion

Number of SAML Assertions in HTTP Headers



Sample SAML Assertion

```
<?xml version="1.0" encoding="UTF-8"?>

<saml2p:Response Destination="https://192.168.x.x:31443/appviewx/ssoLogin"
```

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```
  ID="id246345791662193091218321378" InResponseTo="ONELOGIN_23e56e9e-99e6-449f-ace2-67002e6fcc91"
  IssueInstant="2019-02-06T13:46:48.185Z" Version="2.0"
  xmlns:saml2p="urn:oasis:names:tc:SAML:2.0:protocol" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <saml2:Issuer Format="urn:oasis:names:tc:SAML:2.0:nameid-format:entity"
     xmlns:saml2="urn:oasis:names:tc:SAML:2.0:assertion">http://www.okta.com/exk9y6yf2Td4qxk5M356</saml2:Issuer>
  <ds:Signature xmlns:ds="http://www.w3.org/2000/09/xmldsig#">
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Algorithm="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256"/>
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     </ds:SignedInfo>

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```


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```
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        </saml2:AuthnContext>
    </saml2:AuthnStatement>
    <saml2:AttributeStatement xmlns:saml2="urn:oasis:names:tc:SAML:2.0:assertion">
        <saml2:Attribute Name="EmailId" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:basic">
            <saml2:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
                xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">saml@appviewx.com</saml2:AttributeValue>
```


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```
        </saml2:Attribute>
        <saml2:Attribute Name="FirstName" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:basic">
          <saml2:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
            xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">saml</saml2:AttributeValue>
        </saml2:Attribute>
        <saml2:Attribute Name="LastName" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:basic">
          <saml2:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
            xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">appviewx</saml2:AttributeValue>
        </saml2:Attribute>
        <saml2:Attribute Name="NameID" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:basic">
          <saml2:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
            xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">saml@appviewx.com</saml2:AttributeValue>
        </saml2:Attribute>
        <saml2:Attribute Name="Mobile" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:basic">
          <saml2:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
            xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">0</saml2:AttributeValue>
        </saml2:Attribute>
        <saml2:Attribute Name="Roles" NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:basic">
          <saml2:AttributeValue xmlns:xs="http://www.w3.org/2001/XMLSchema"
            xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="xs:string">oktarole</saml2:AttributeValue>
        </saml2:Attribute>
      </saml2:AttributeStatement>
    </saml2:Assertion>
</saml2p:Response>
```

The data in bold contains the attributes passed to AppViewX for a successful login. If this data is not passed in assertion, the assertion must be revisited.

Vendors Certified with AppViewX

AppViewX has been certified with the below SAML 2.0 enabled SSO vendors:

- Okta
- OneLogin
- ADFS
- Forgerock
- Idaptive

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- Azure
- PingIdentity

OpenID Connect (OIDC)

Overview

OpenID Connect (OIDC) is an identity layer built on top of the OAuth protocol, which provides a modern and intuitive Single Sign-on (SSO) experience for you and your end-users. For example, administrators can configure Single Sign-on with a third-party identity provider that supports OpenID Connect. Users then have the option to log in to the application using their identity provider credentials.

Before you begin

- Register AppViewX as an OIDC application with your Identity Provider (IdP) and note the Client ID, Client Secret, and Well-known configuration URL.
- The OIDC entity profile must be an authorization code grant type.
- Enable SSO with Authentication Protocol as OIDC in AppViewX.
- Role required: admin
- OIDC based SSO is supported from AppViewX release 21.1.X and above.

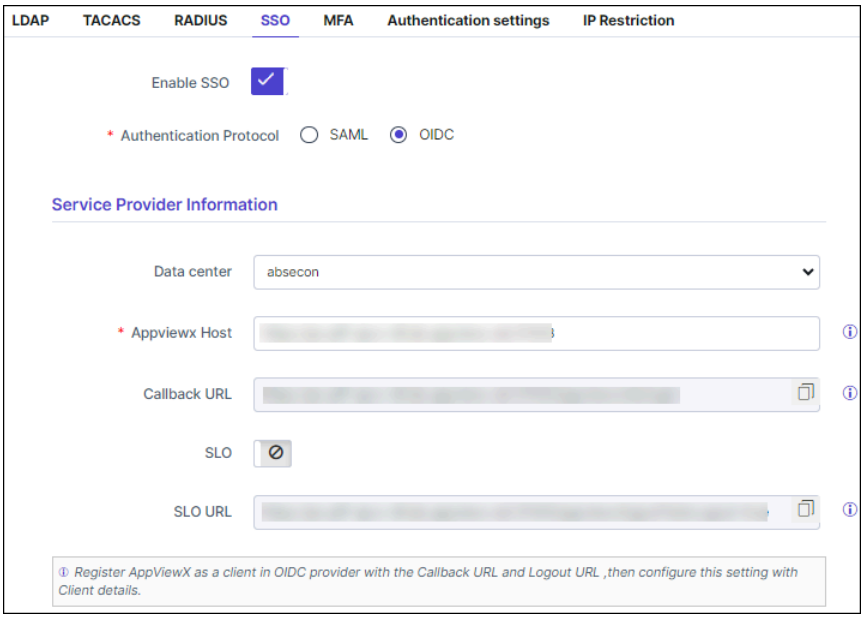
- AppViewX Integration with OIDC Provider
- Login Workflow
- Steps to Integrate OIDC

AppViewX Integration with OIDC Provider

To integrate AppViewX with OIDC provider, follow the below steps:

1. On the **Settings :: Authentication** page, under the **SSO** tab, turn on the **Enable SSO** toggle.
   The **Authentication Protocol** options are displayed.
2. Select **OIDC** as the **Authentication Protocol**.
   The **Service Provider Information** section will automatically populate based on the OIDC selection.
3. Copy the **Callback URL** and **SLO URL**, which has to be configured at the OIDC identity provider settings for AppViewX, from the **Service Provider Information** section.

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4. Under the IDP Configuration section, enter the required field information.

Field descriptions for IDP Configuration

Field	Description
***Client Name**	Unique name for the OIDC identity provider configuration.
***Client ID**	The client ID of the application that is registered in the third-party OIDC identity provider.
***Client Secret**	The client secret of the application that is registered in the third-party OIDC identity provider. **Note:** While configuring or editing, a view icon will appear, enabling the user to see the client secret. After saving, the client secret is encrypted and the UI will show a masked value.
***Discovery Endpoint (Well known) URL**	The URL contains metadata about the third-party OIDC identity provider.
** : Mandatory fields*	

5. Under the **Advanced** section, turn the **Local Authorization** toggle on/off to define custom claim mapping based on the ID claims which are sent from the OIDC Identity provider.

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Turn the **Local Authorization** toggle **on** to define the following privileges:

a. When a user from an OIDC provider tries to log in to AppViewX for the first time, the user account will be created under Account > User within AppViewX. But users will not be allowed to perform any operations until Admin assigns the user to the respective User Group.

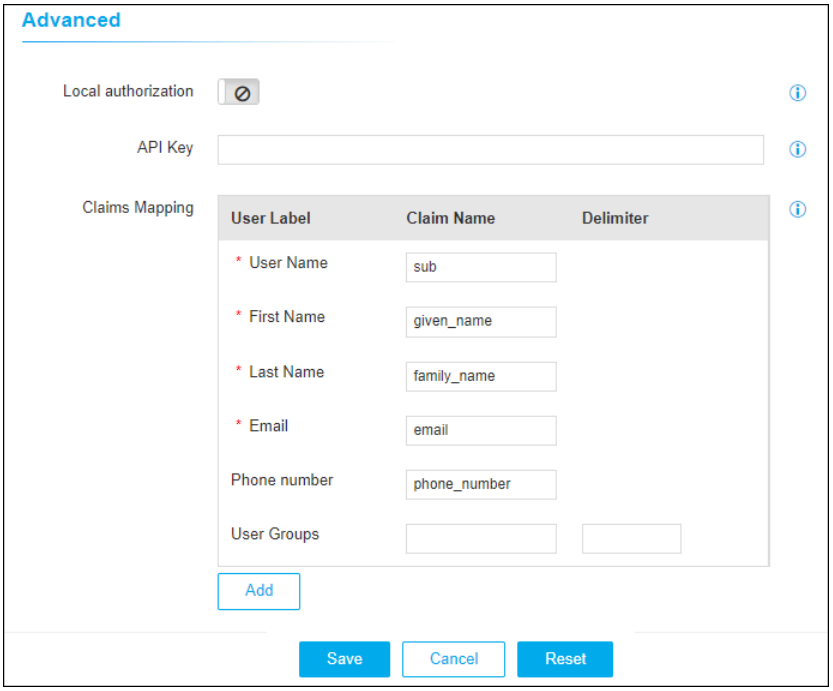
b. To enable the user with a successful login, an User Group must be created as a prerequisite, and the User Group must be assigned with Roles and Resources permissions for the SSO users and has to be assigned within AppViewX by mapping the users to the User Group.

Turn the **Local Authorization** toggle **off** to define the following privileges:

a. When a user from an OIDC provider tries to log in to AppViewX, with Local Authorization disabled it is assumed that the Security Groups are passed as a part of the ID token.

b. Create the required Security Group under the **Menu > Account > User Groups** within AppViewX by assigning respective Roles and Resources.

6. Under the **Advanced** section, enter the API Key if provided by the OIDC provider.
7. Navigate to **Advanced > Claims Mapping**, enter the required field information to map the claim keys against the AppViewX User Label for the user profile information to be stored in the AppViewX expected format.

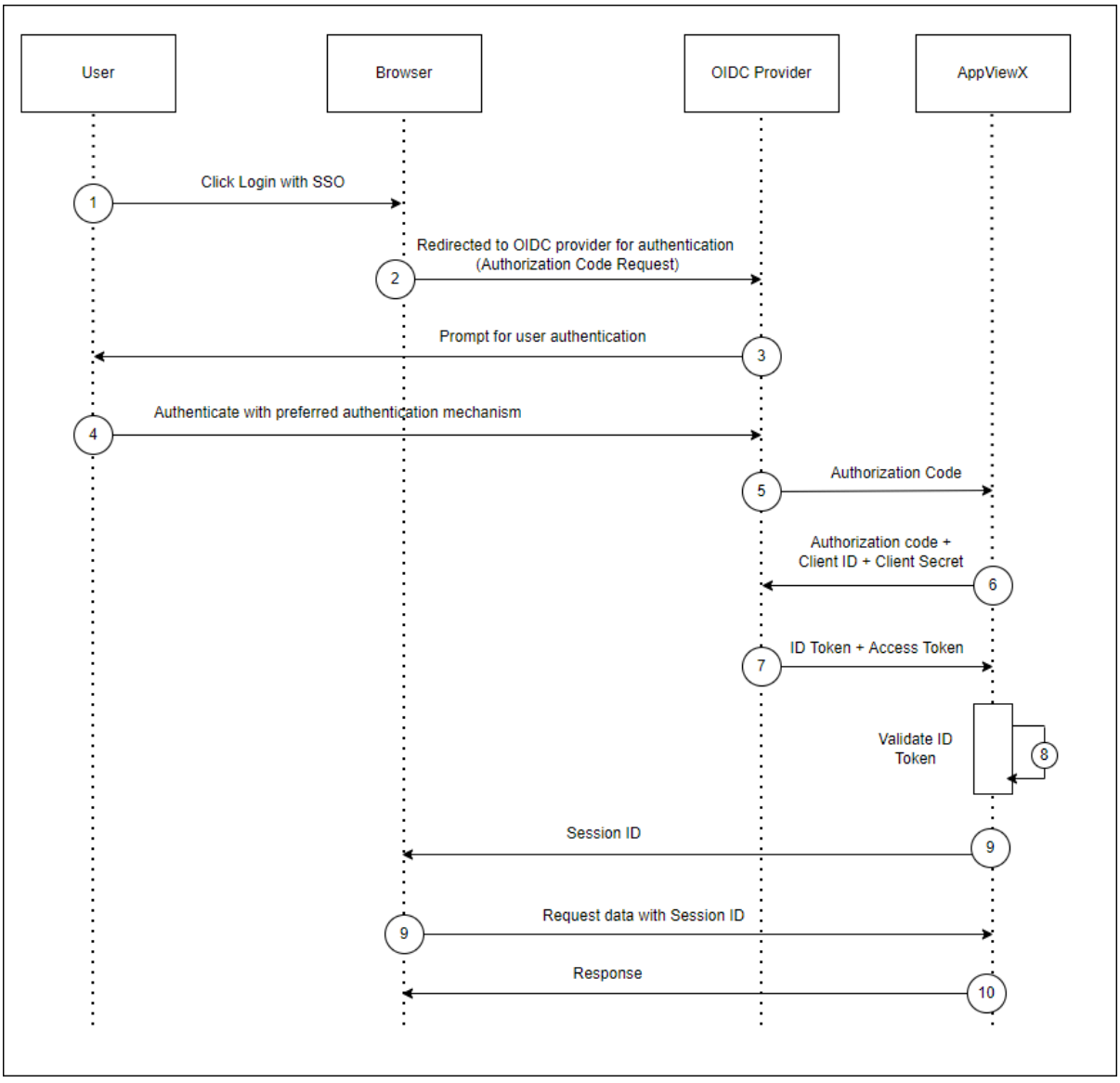


For example:

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- An identity provider can send the user login name with the key called sub in the ID token and another identity provider can send the user login name with the key called upn.
- The administrator can configure/modify the claim setting against the User Name either as sub or upn based on the ID claim response sent by the OIDC vendor.
- Similarly, custom claims can be configured and additional claims for the user profile if required. Currently, these custom claims stored in the user profile will not be shown along with the user profile on the AppViewX web application.

Login Workflow



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1. When user tries to login with SSO in AppViewX, user will be redirected to the OIDC provider's login page.
2. The user can now use the preferred authentication mechanism to login to the OIDC. After successful authentication, OIDC provider will send Authorization code to AppViewX.
3. AppViewX will then send the Client ID and Client Secret along with that Authorization code to the OIDC provider.
4. OIDC provider validates the client credentials and authorization. On successful validation, it returns ID Token and Access Token to AppViewX.
5. AppViewX validates the ID Token and uses the user information received in ID token.
6. If a user tries to login for the first time, then that user account will be created in AppViewX using the details fetched from ID Token.
7. If Local Authorization is enabled, the admin must map the user to the respective user group to grant necessary permission and scope of management.
8. Upon completion of the user mapping, the user can access the AppViewX console. Any attempt to log in before this mapping results in an error.
9. If Local Authorization is disabled, then the authorization in AppViewX will be performed based on the groups the user exists in IDP.
10. AppViewX will compare the user group details available in the ID token with the existing user groups in AppViewX. If the same user groups exists in both, then the user will be assigned with permissions and the scope of those groups. Else, user will not have any permissions within AppViewX.



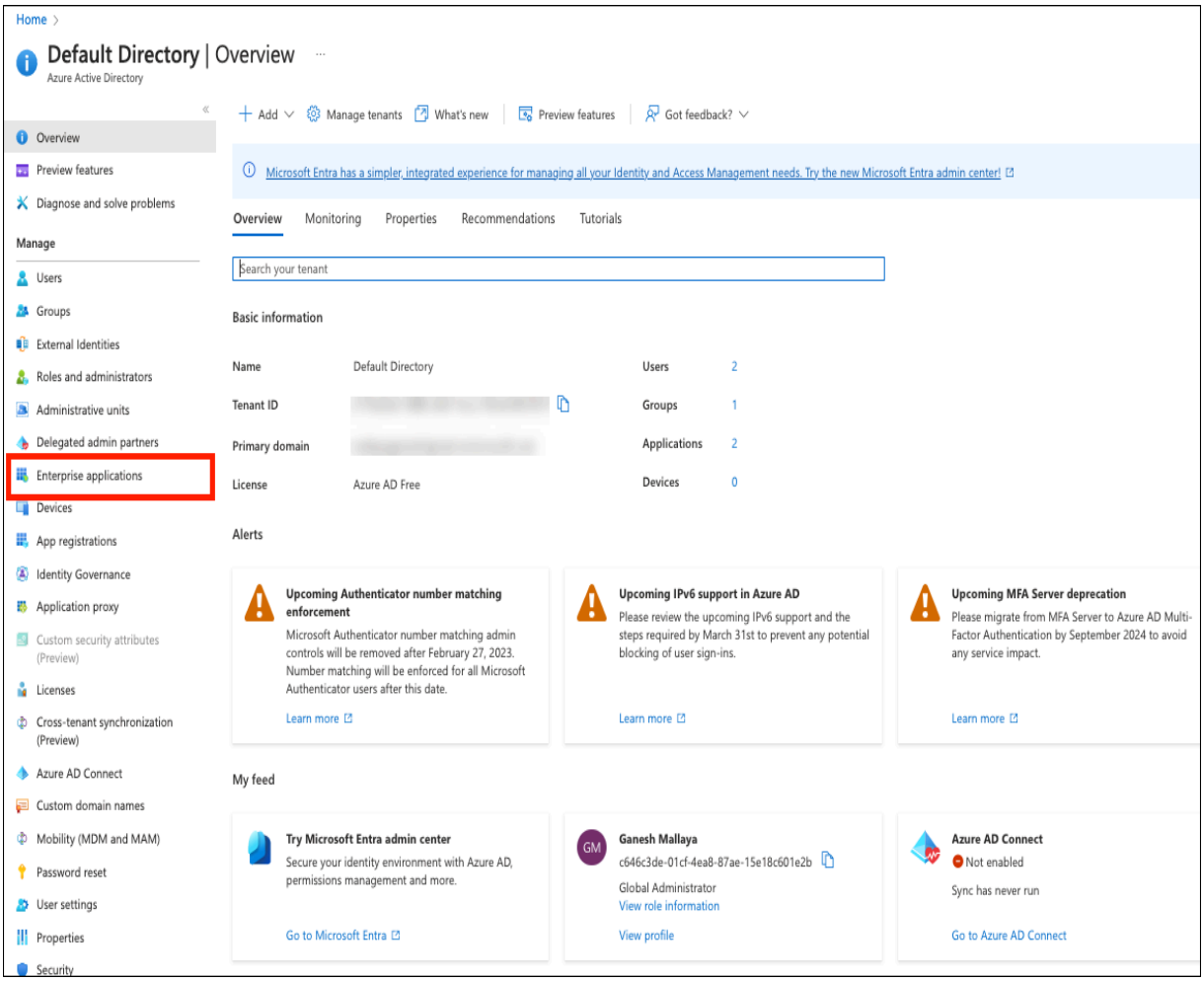
Note: For Microsoft Azure, the token configuration should be configured with custom claims for sending user login name with the claim as upn and a group claim to send security groups as User Group.

Steps to Integrate OIDC

To integrate with AppViewX – Azure using OIDC

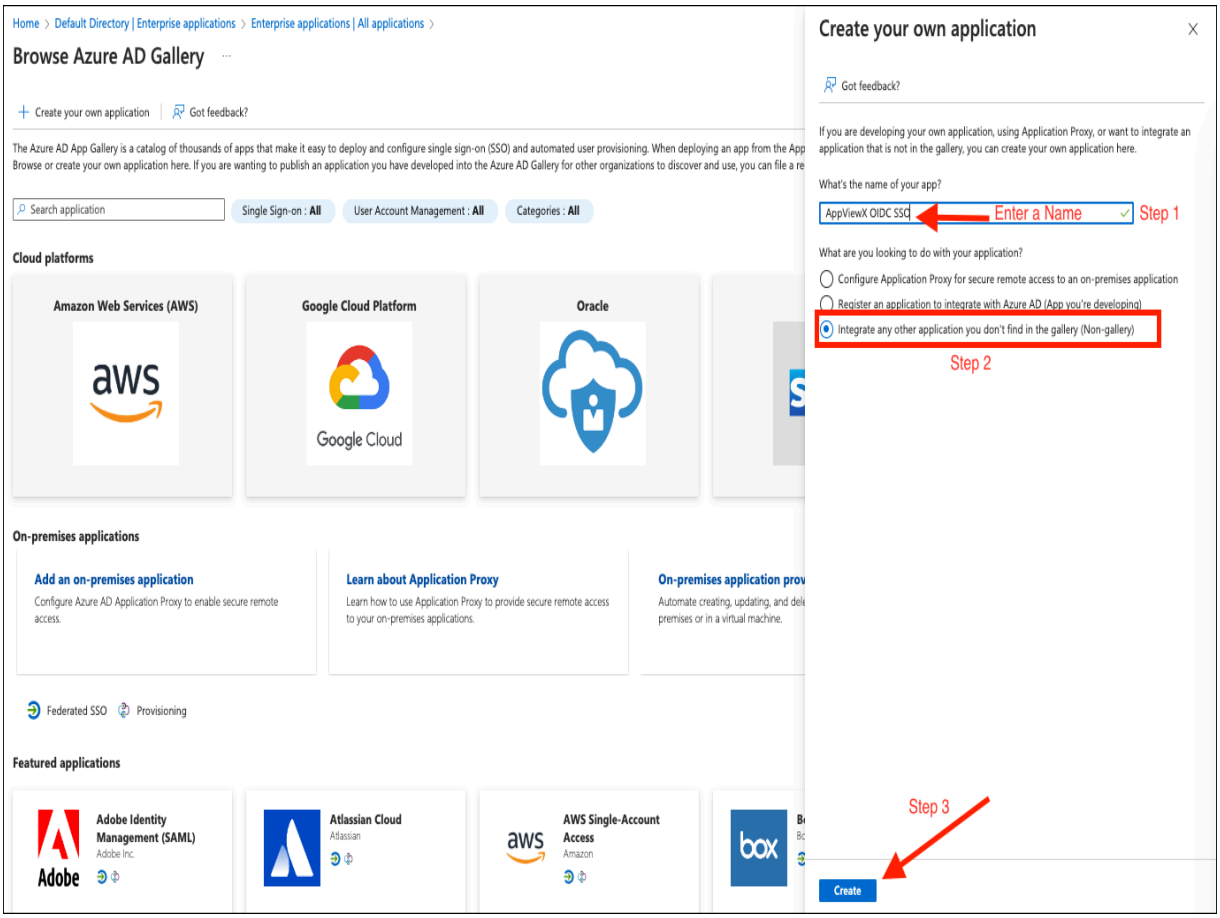
1. From the Microsoft **Azure Home > Default Directory** Overview page, create an app under Enterprise Application within the **Azure Active Directory** (AAD).
2. Click **Enterprise applications**.

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3. Click **New application**.
4. Click **Create your own application**.
5. In the Create your own application slider screen, perform the following:

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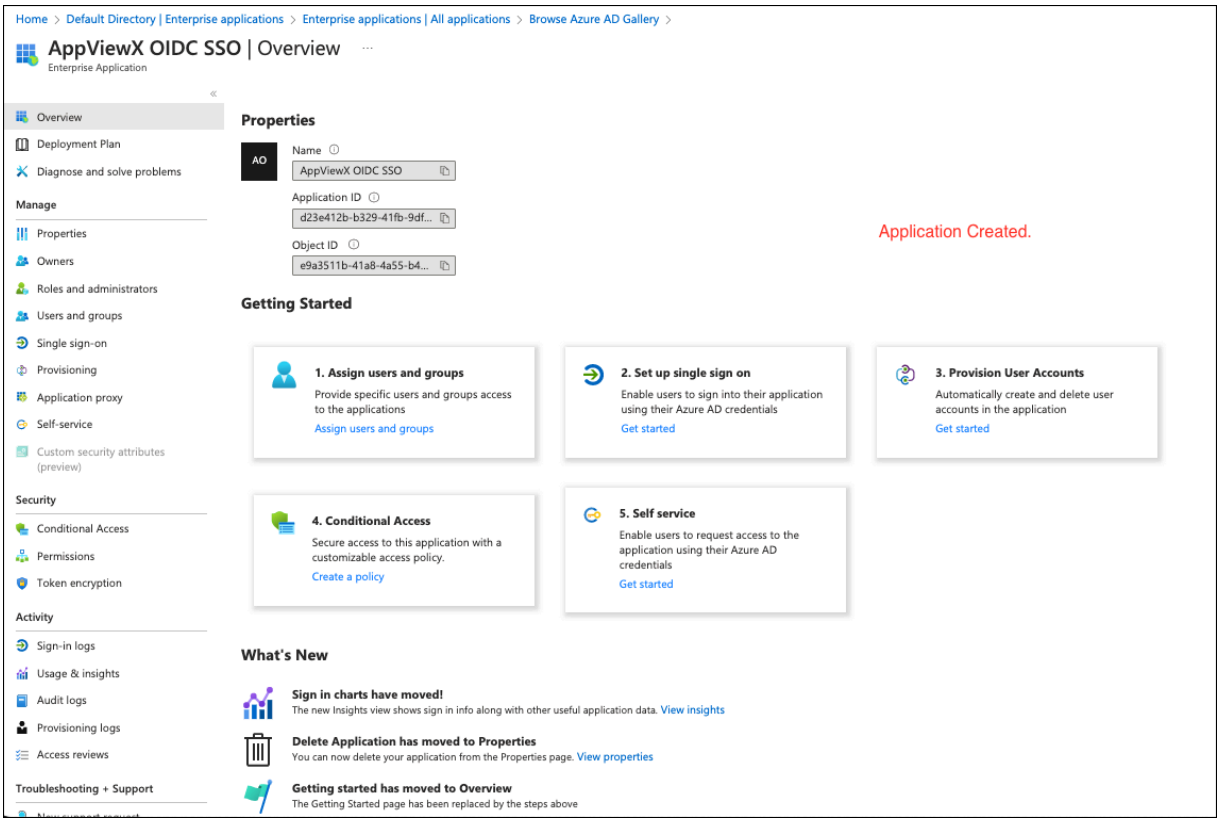
a. Enter a name in the **What's the name of your app?** field

b. Select the radio button **Integrate any other application you don't find in the gallery**

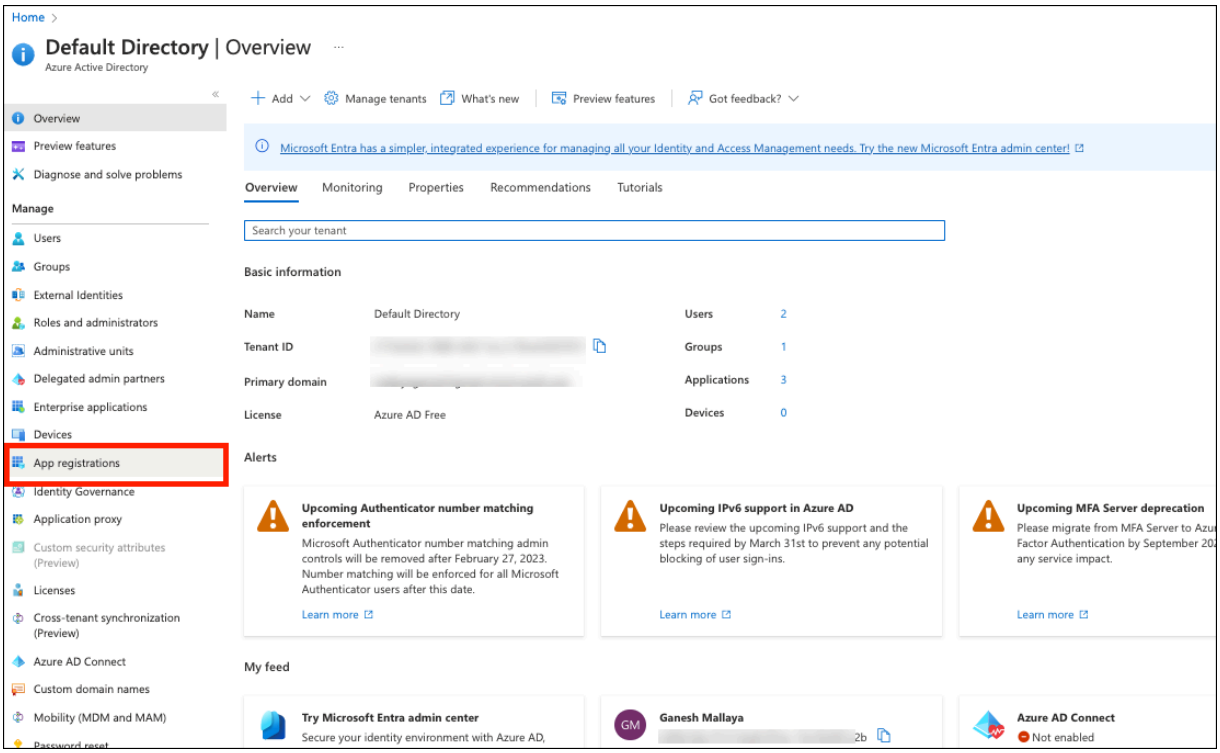
c. Click **Create**

The application is created successfully and the details are displayed as shown below. Verify the details.

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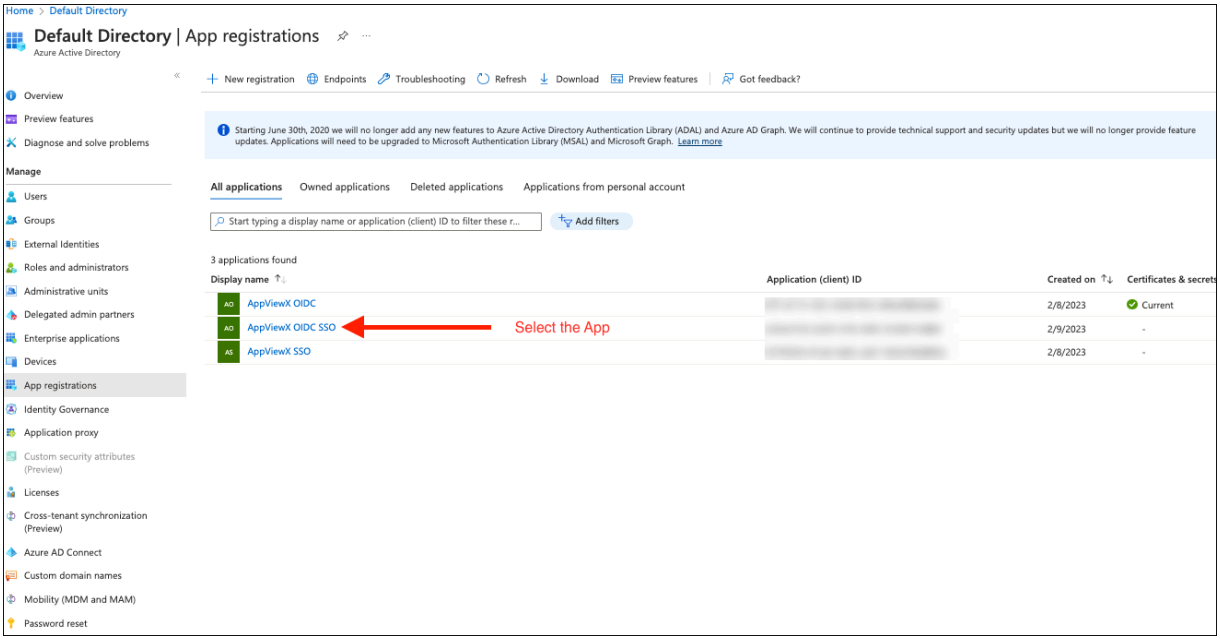


6. Navigate to **Overview**, and then click **App Registration**.

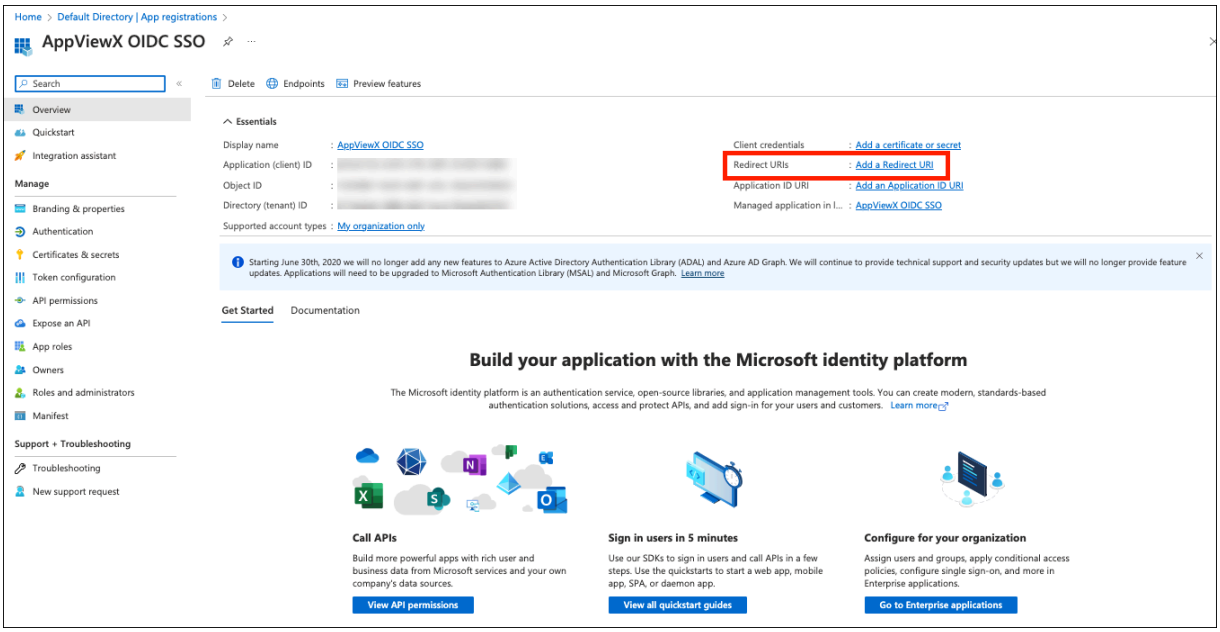


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7. Select the App created.

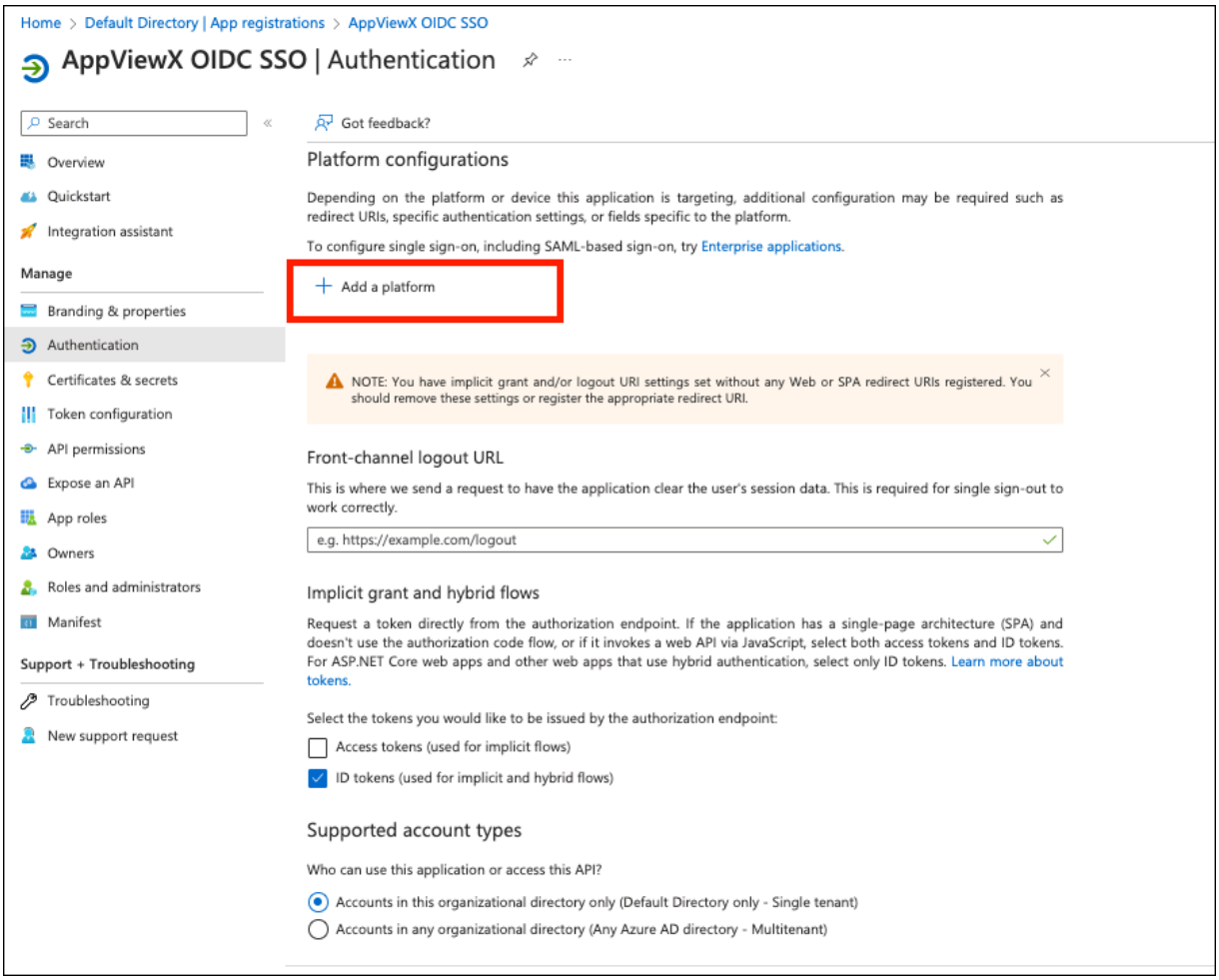


8. Setup the Redirect URI for web-based application.
9. Click **Redirect URI** from the overview page of the App.



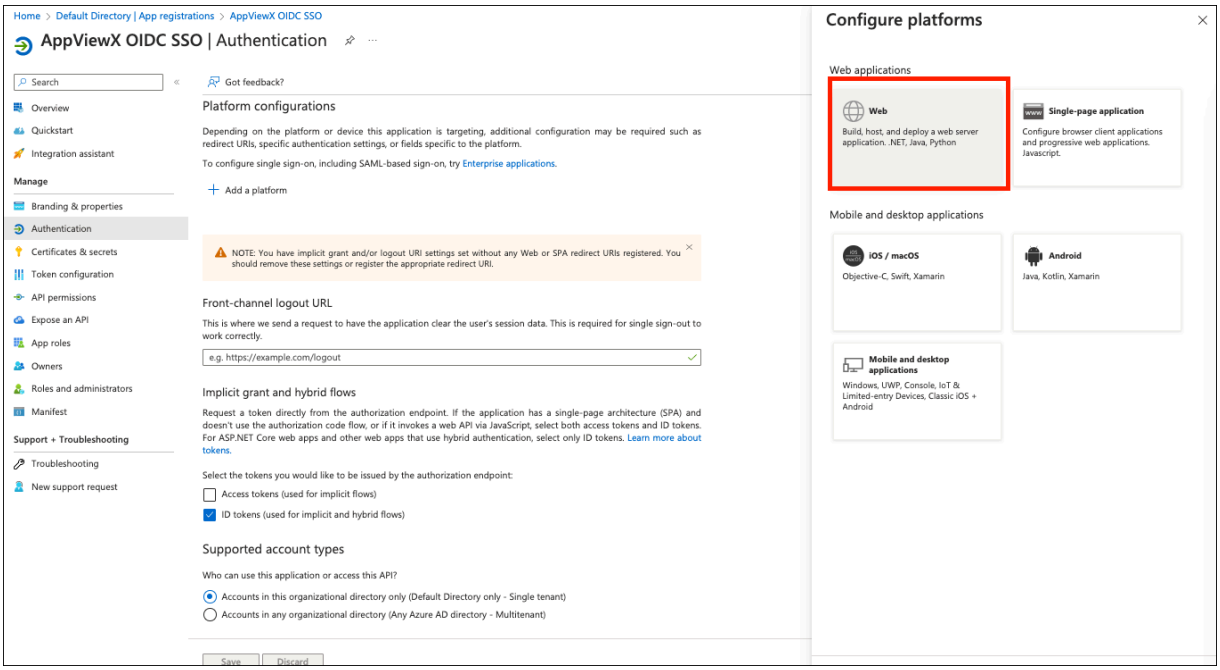
10. Click **Add a Platform**.

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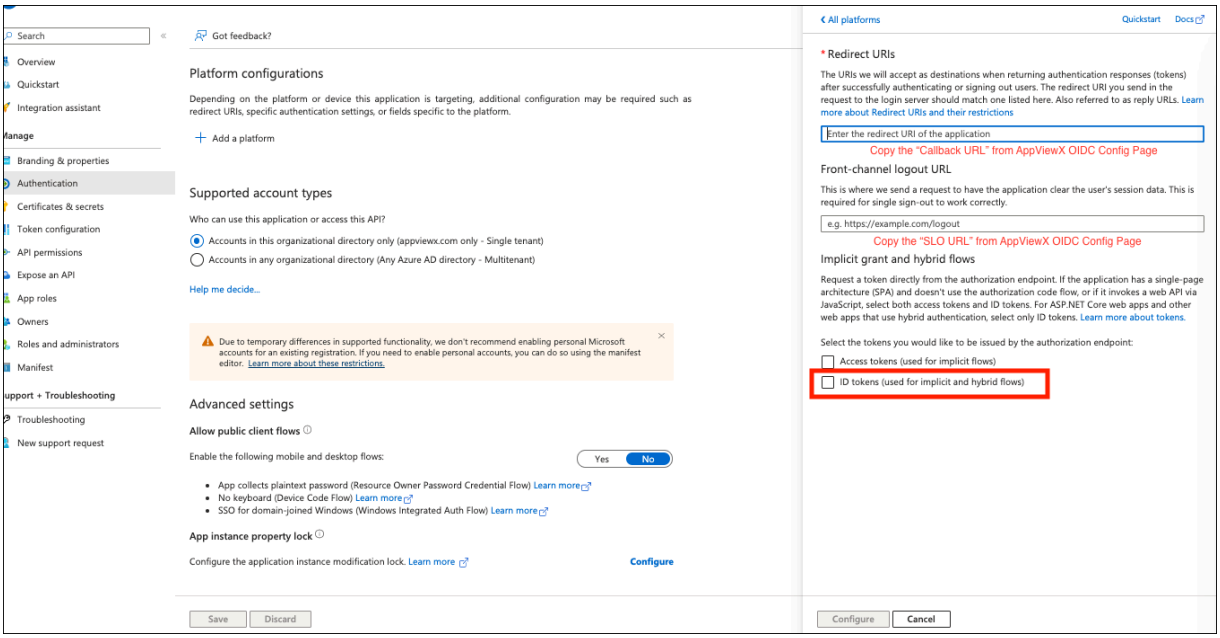


11. Select the **Web** platform and copy-paste the links from the AppViewX GUI.

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12. Copy paste the URL from AppViewX GUI as follows:



a. Copy the Callback URL from the AppViewX GUI and paste it into the first field on the right.

b. Copy the SLO URL from AppViewX GUI to the second field on the right.

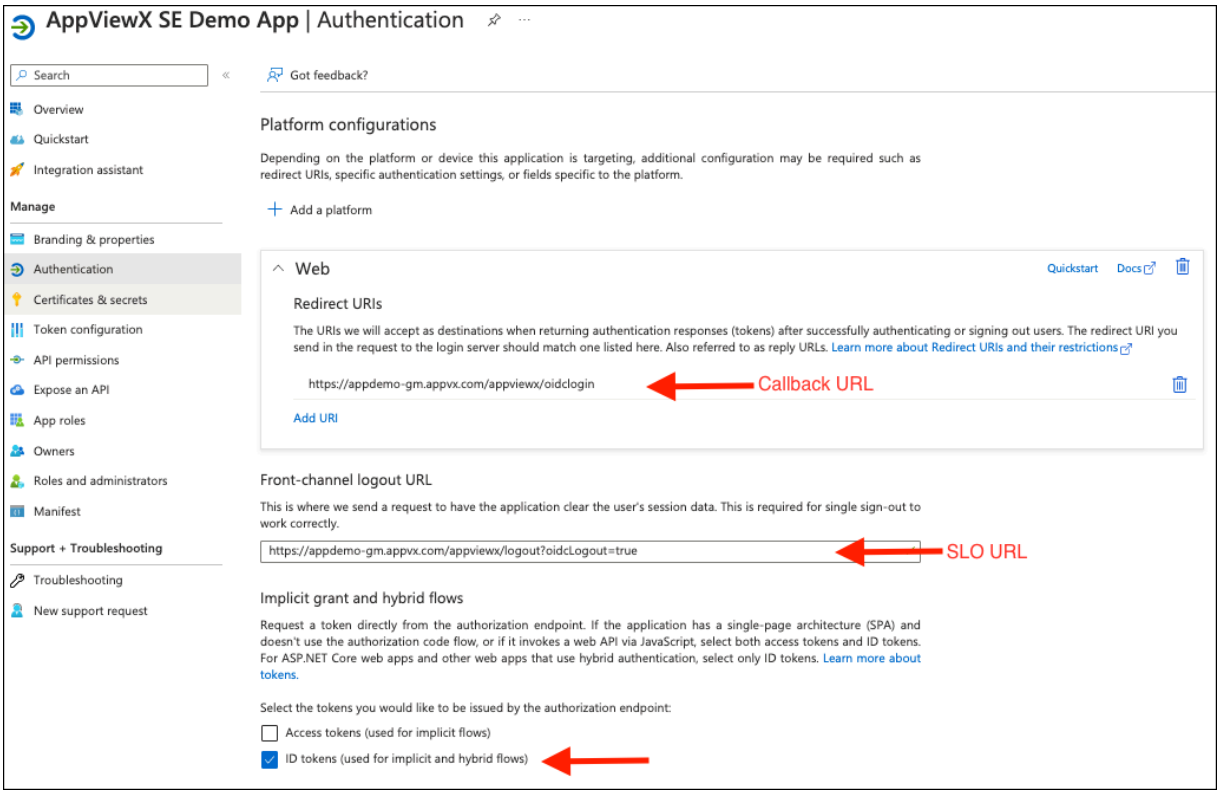
c. Select the check box **ID Tokens**.

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d. **Note:** Applicable for implicit and hybrid flows.

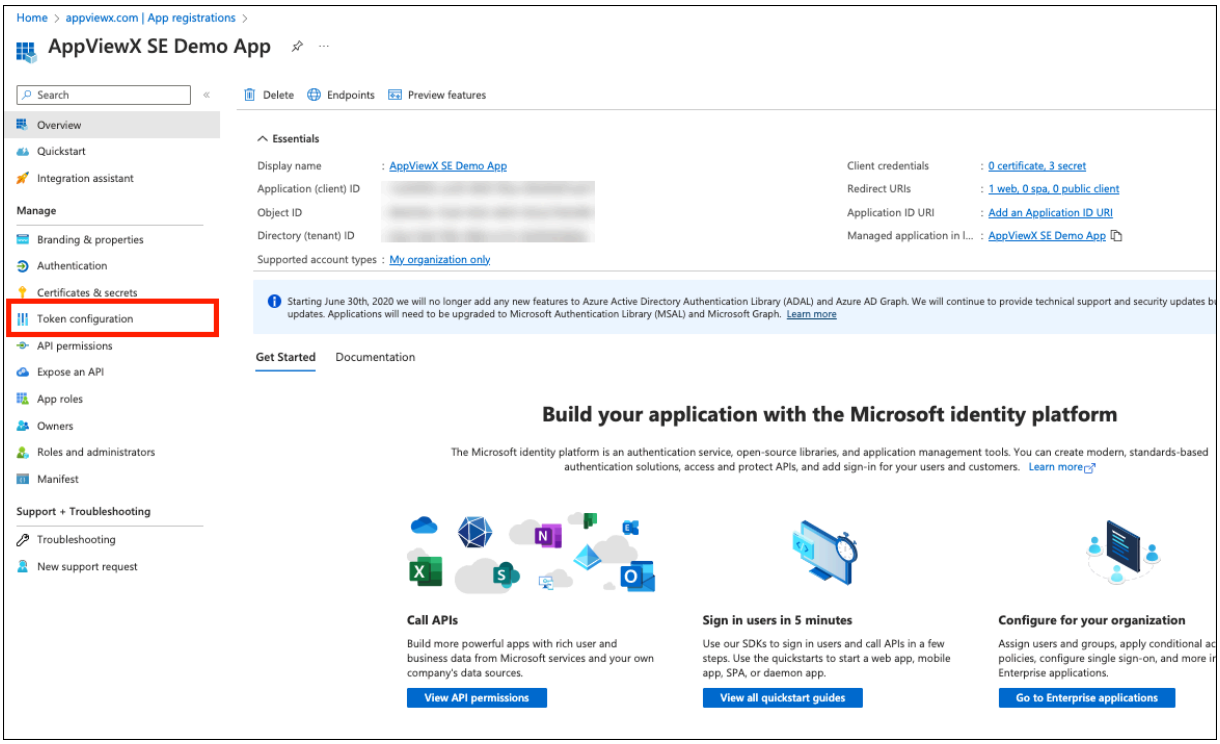
Click **Configure**.

13. Verify the details of the Redirect URL.

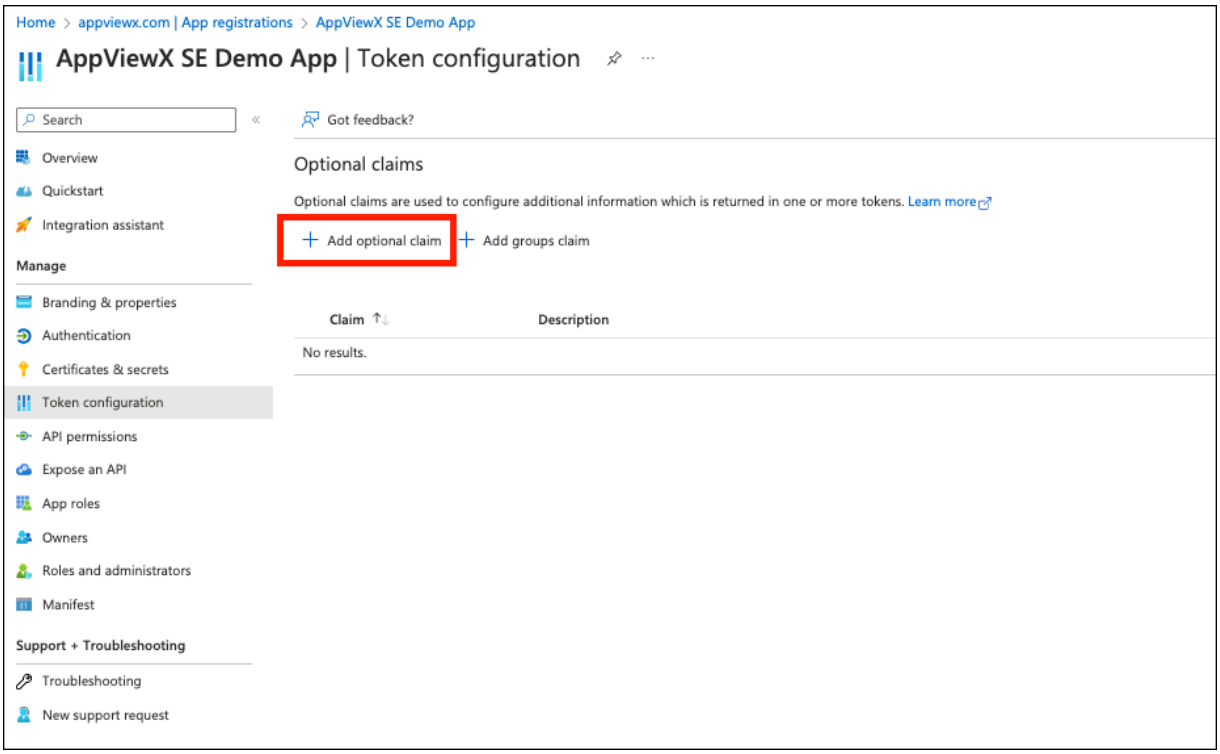


14. Click **Token configuration**.

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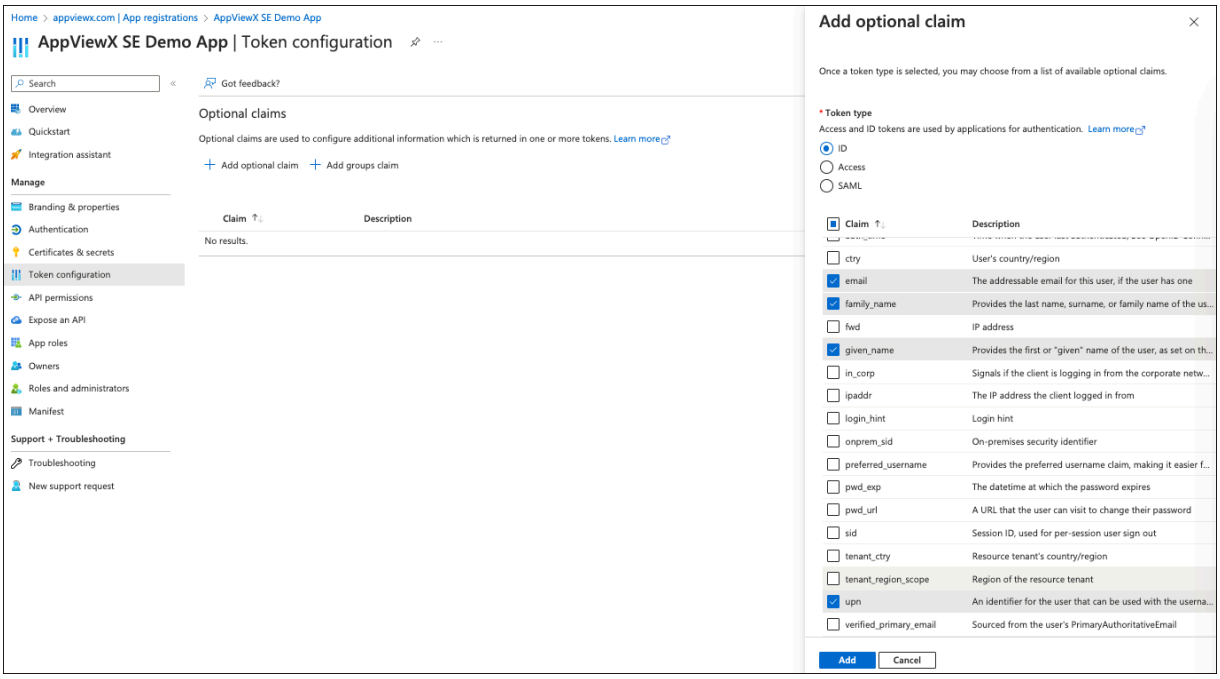


15. In the Token configuration page, click **Add optional claim**.



Perform the following on the right slider screen:

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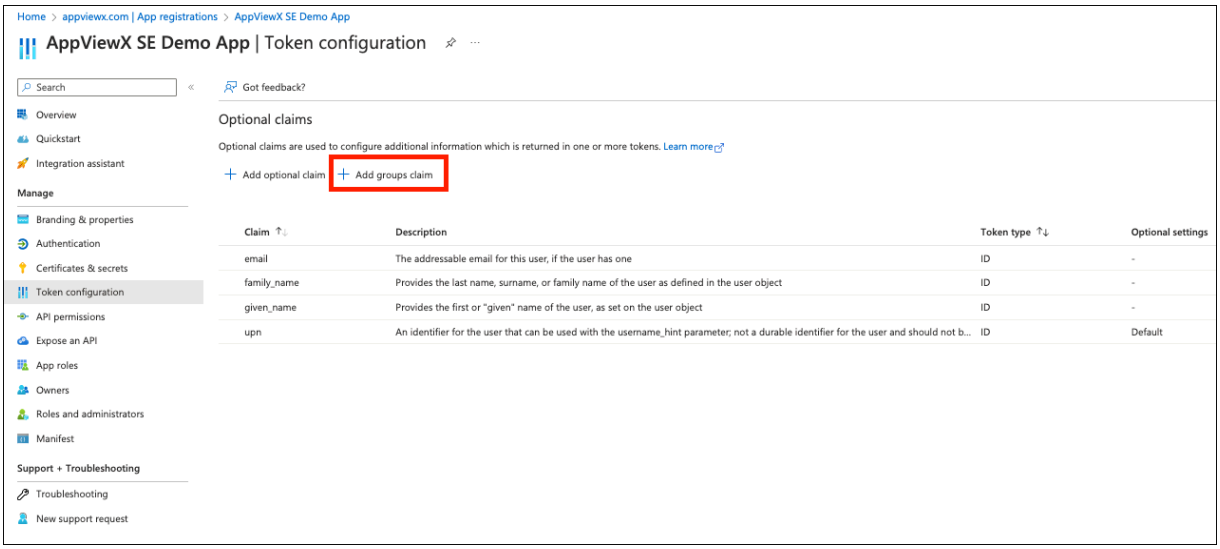


a. In the Token type, select the **ID** radio button.

b. Select the specified claims from the available list.

c. Click **Add**.

16. Click **Add group claims** and perform the following on the right slider page.



a. Select the **Security groups** checkbox.

b. From the ID section select the radio button for **AccountName**.

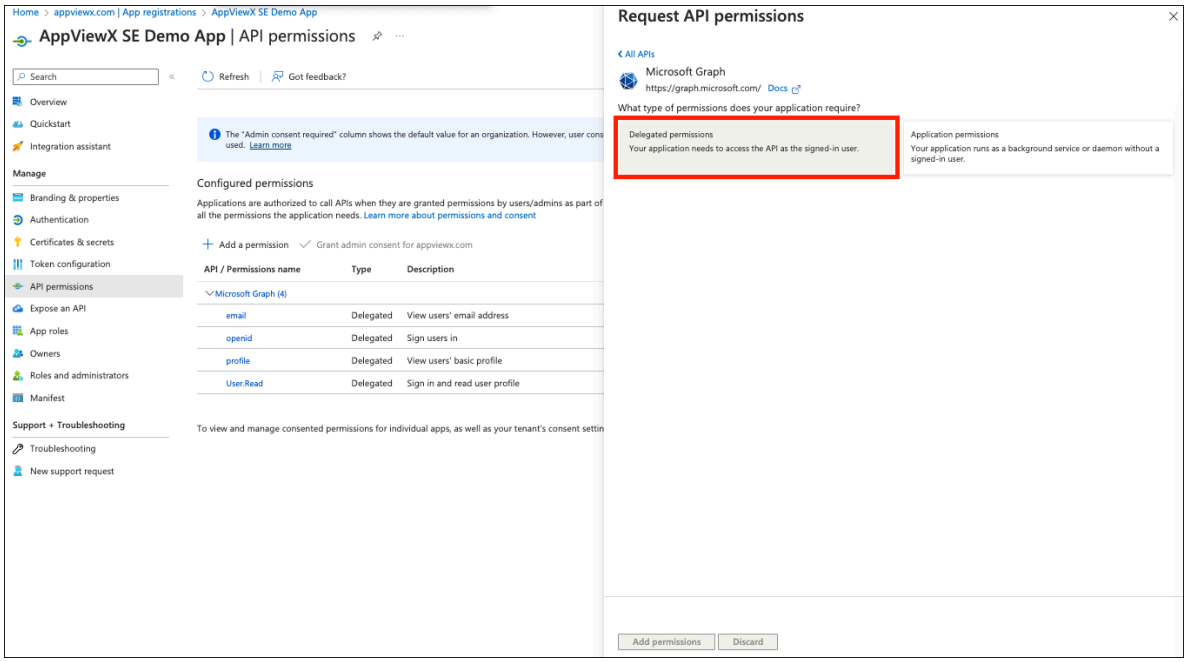
17. Copy paste the Claims Mapping from Columns Claim in AppViewX as below.
18. To create API permissions for claim mapping, click **API Permissions**.
19. To configure the API Permissions from Microsoft Graph.

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a. Click **Add a Permissions**.

b. Select **Microsoft Graph**.

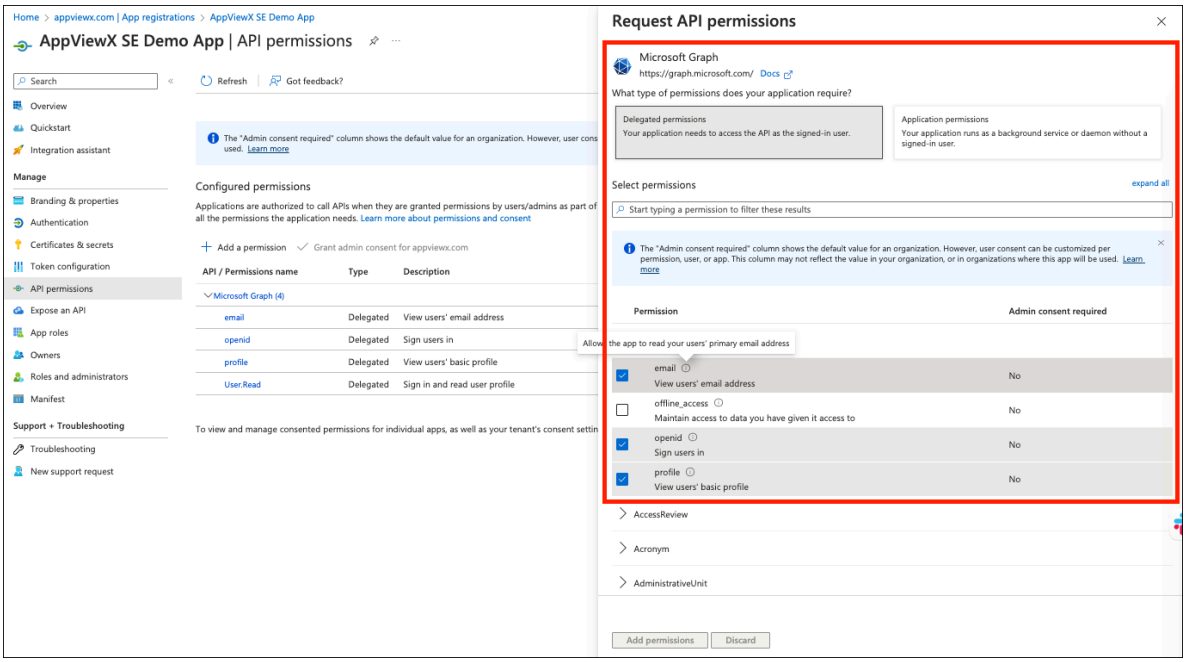
c. Select **Delegated permission**.



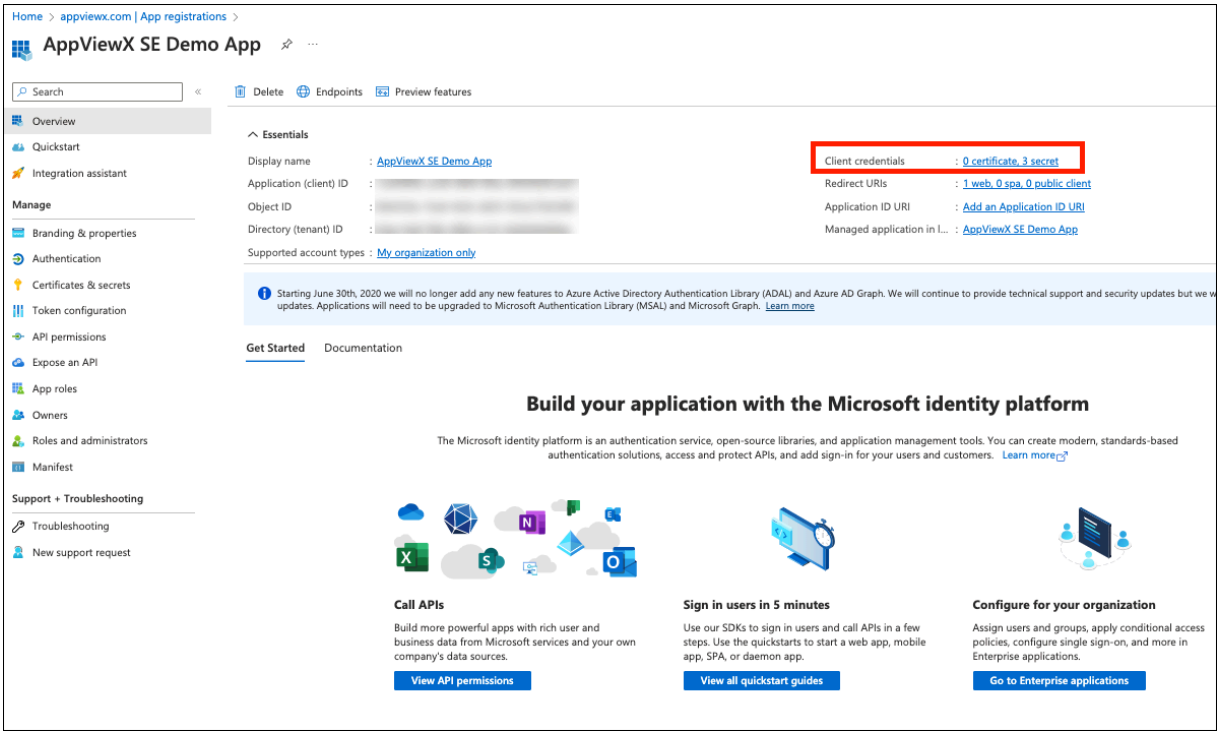
d. Click the following check-box on the Select Permissions section.

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- email
- openid
- profile.



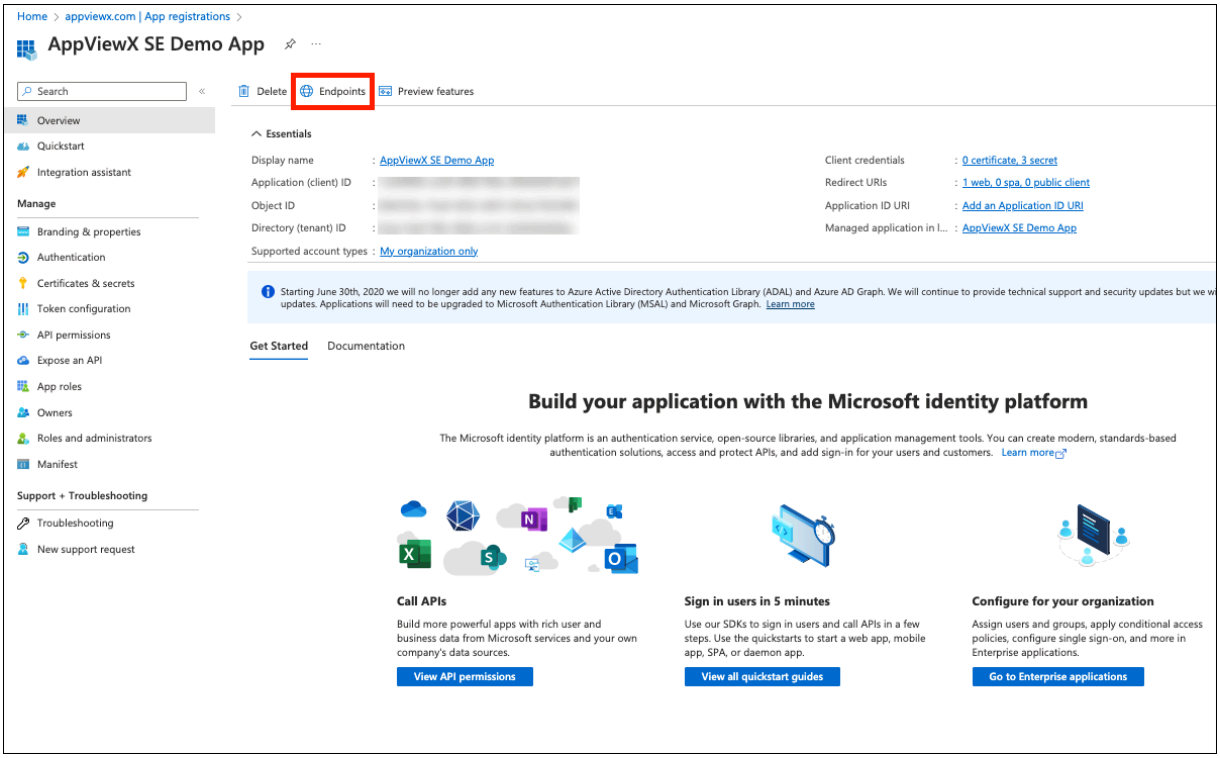
20. To create client secret for the App, click **Client credentials**.



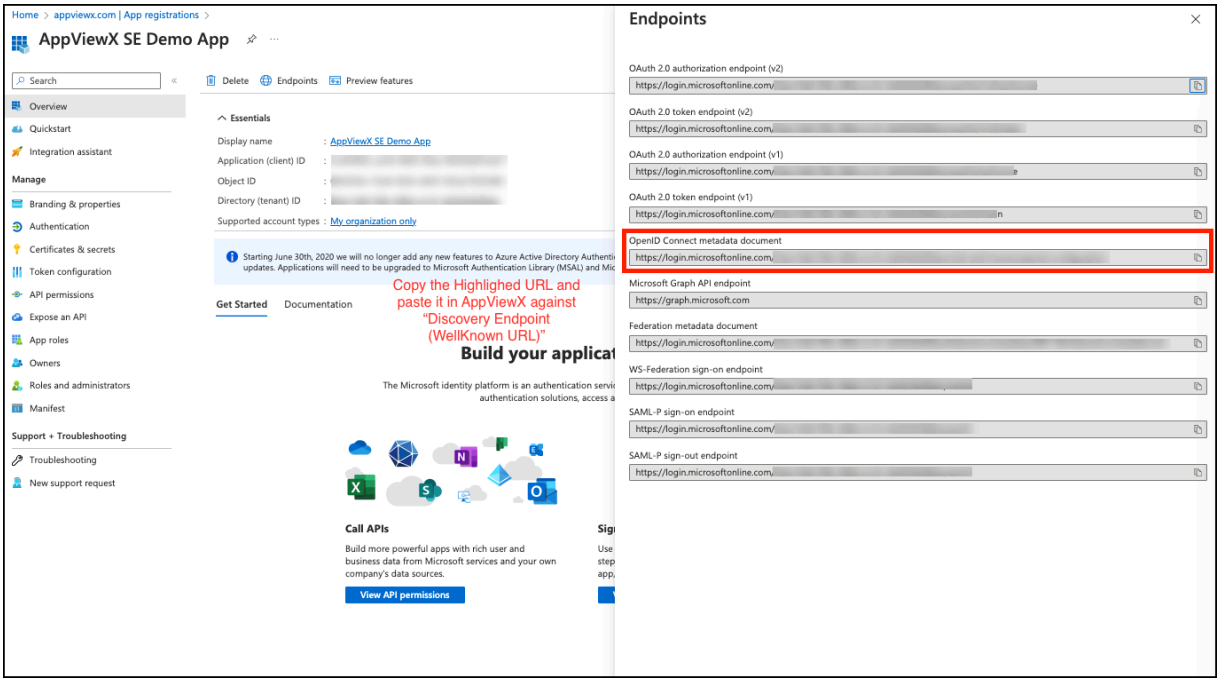
- Click **New client secret**, copy the secret and save it securely.

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21. To copy the Endpoint Details from App Overview Page, click **Endpoints**.

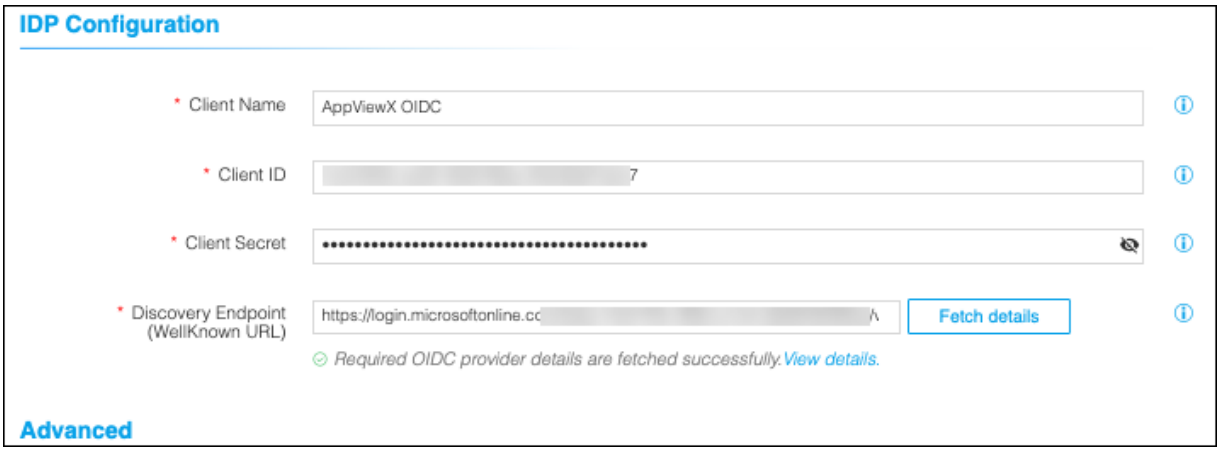


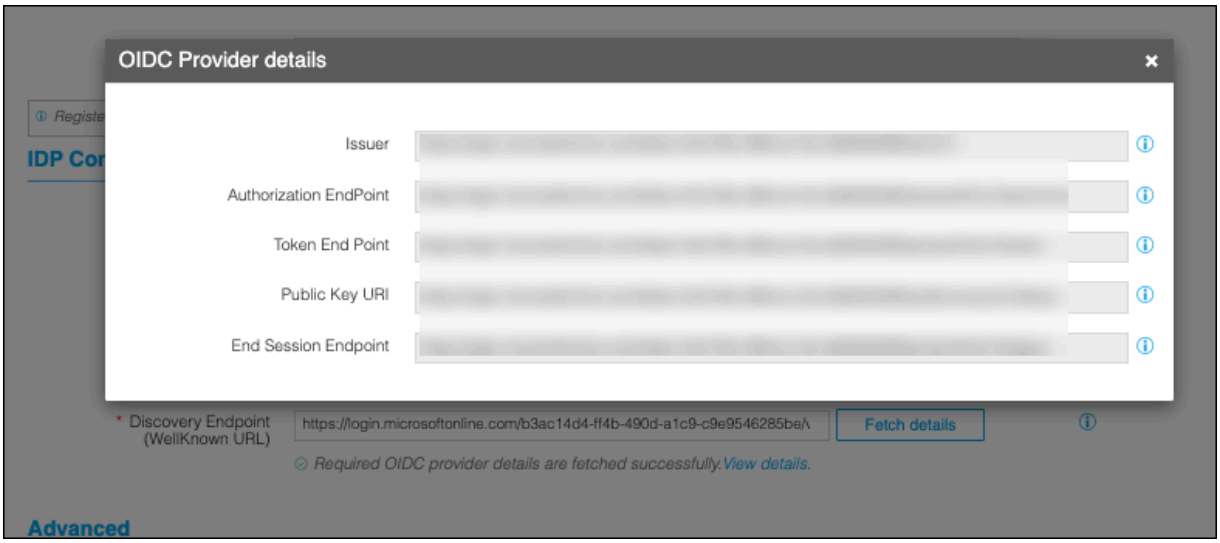
- Copy the URL from **OpenID Connect metadata document** field. **Discovery Endpoint (WellKnown URL)**.



22. Configure the Client ID, Secret Key, and OpenID Wellknown URL in AppViewX GUI.

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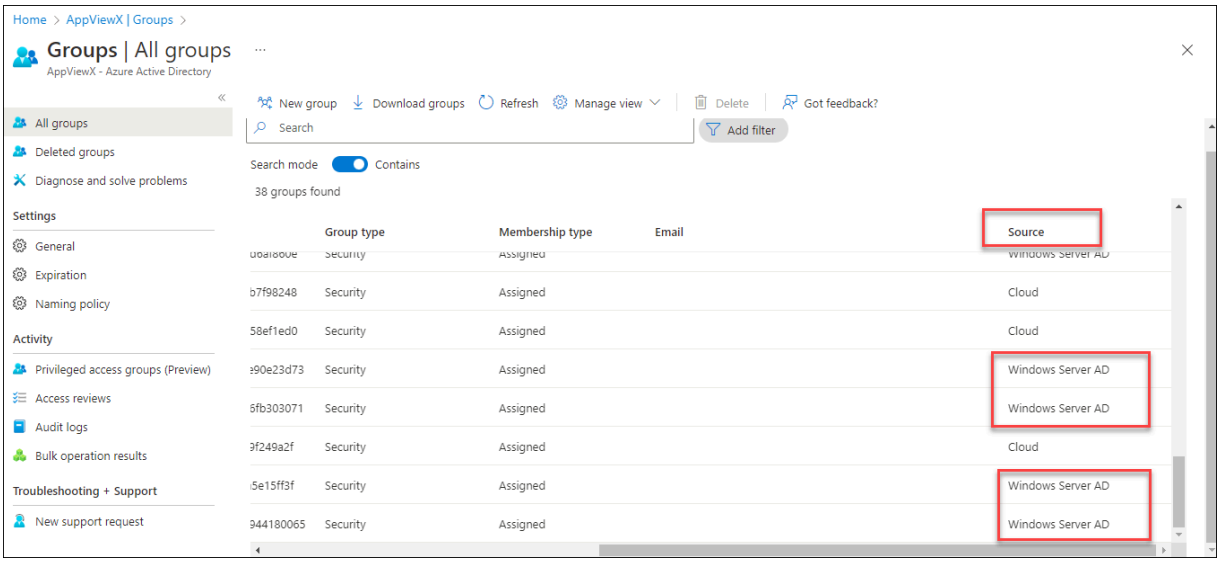




23. Create the Security Group within Azure, adding it in AppViewX under **Accounts > User groups**.
24. Proceed with user authentication, ensuring alignment of AppViewX roles with the designated user groups.

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Note: Use the security groups with source as **Windows Server AD**.



SCIM Configuration

SCIM, or System for Cross-domain Identity Management, is a standardized protocol designed for efficient management of user identities across different systems and platforms. It simplifies user provisioning and deprovisioning processes by offering a consistent approach for user lifecycle management. SCIM operates over HTTP and uses JSON for data exchange, allowing seamless integration with various applications and services. Its core functions include user provisioning, updating user attributes, and deprovisioning users when they leave the organization. SCIM streamlines identity management, enhances security, and reduces administrative complexity through automated processes.

- SCIM Vendor-Side Configuration

Accessing SCIM Configuration Settings

Prerequisites:

1. Ensure that the SSL certificate for the AppViewX website is sourced from a trusted public Certificate Authority (CA).
2. Verify that the IDP server supports SCIM 2.0.

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New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **ACCESS MANAGEMENT**, select **SCIM**. The **Settings :: SCIM** page is displayed with the **SCIM** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **SCIM**. The **Settings :: SCIM** page is displayed with the **SCIM** tab open by default.
For more information on how to switch between menus, click here.	

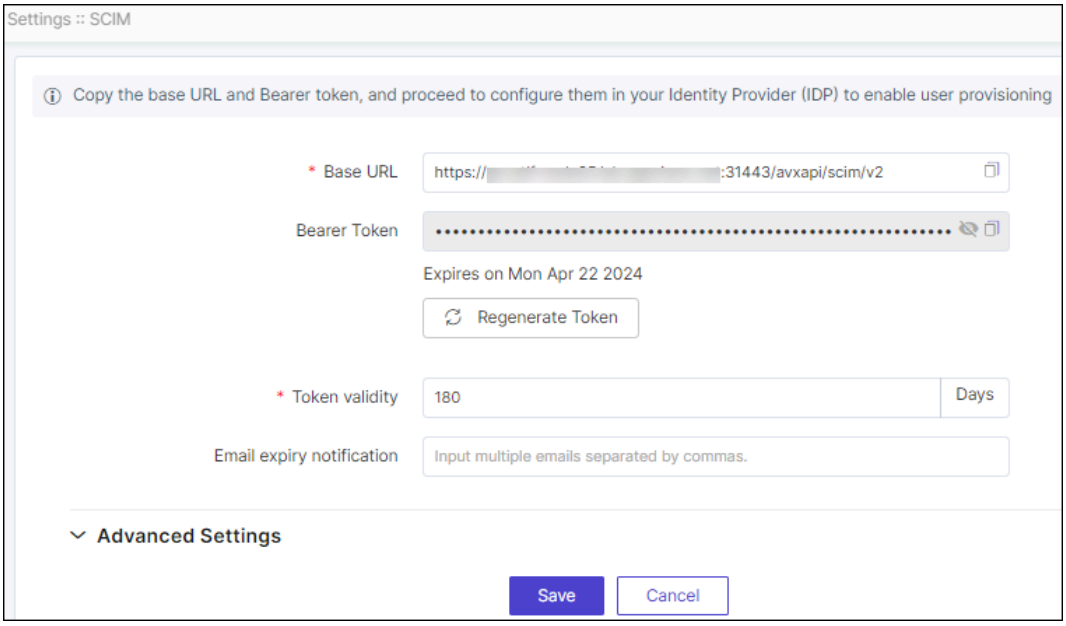
Configuring SCIM Settings with AppViewX

To configure SCIM settings with AppViewX:

1. On the **Settings :: SCIM** page, Click **Generate Token**.



2. Once the bearer token is generated, the token validity and email expiry notification fields are visible.



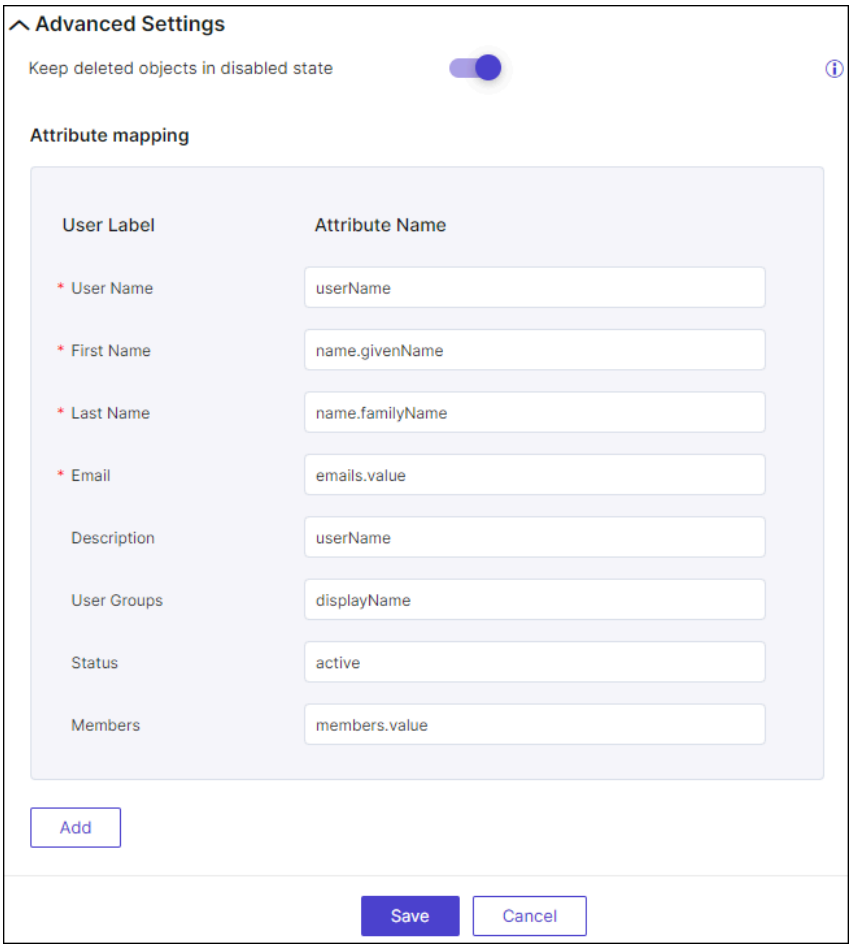
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Field descriptions for SCIM

Fields	Description
***Base URL**	The Base URL is visible in this field.
Bearer Token	The generated bearer token is visible in this field. The token's expiration date and day are shown below the field, along with the option to Regenerate the token.
***Token Validity**	Enter the validity period of the token in terms of the number of days. By default, token validity is 180 days. It is customizable.
Email expiry notification	To send the email notification for token expiry, enter the email address where the notification should be sent. Separate multiple email addresses with a comma.
** : Mandatory fields*	

3. Enter the required field information.
4. Under the **Advanced Settings** section, enable the toggle to retain deleted objects in a disabled state. When a user or group is removed from the Identity Provider, instead of immediate deletion, the user or group will transition to a disabled state within AppViewX.
5. In the **Attribute Mapping** section, make the necessary changes to map the claim keys to the AppViewX **User Label** with the **Attribute Name**.

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For example:

- An identity provider can send the user login name with the key called userName in the request and another identity provider can send the user login name with the key called upn.
- The administrator can configure or modify the claim setting against the User Name either as userName or upn based on the ID claim response sent by the SCIM vendor.
- Similarly, custom attributes can be configured and additional attributes for the user profile if required. Currently, these custom attributes stored in the user profile will not be shown along with the user profile on the AppViewX web application.

6. Click **Save**.

   Copy the base URL and bearer token, to configure them in your (IDP) to enable user provisioning.

What to do next:

- Configure your (IDP) for SCIM provisioning using **Microsoft Azure**, **CyberArk** or **OKTA**.

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SCIM Vendor-Side Configuration

Configure your (IDP) for SCIM provisioning using **Microsoft Azure**, **CyberArk** or **OKTA**.

- Configuring Microsoft Azure
- Configuring CyberArk
- Configuring OKTA

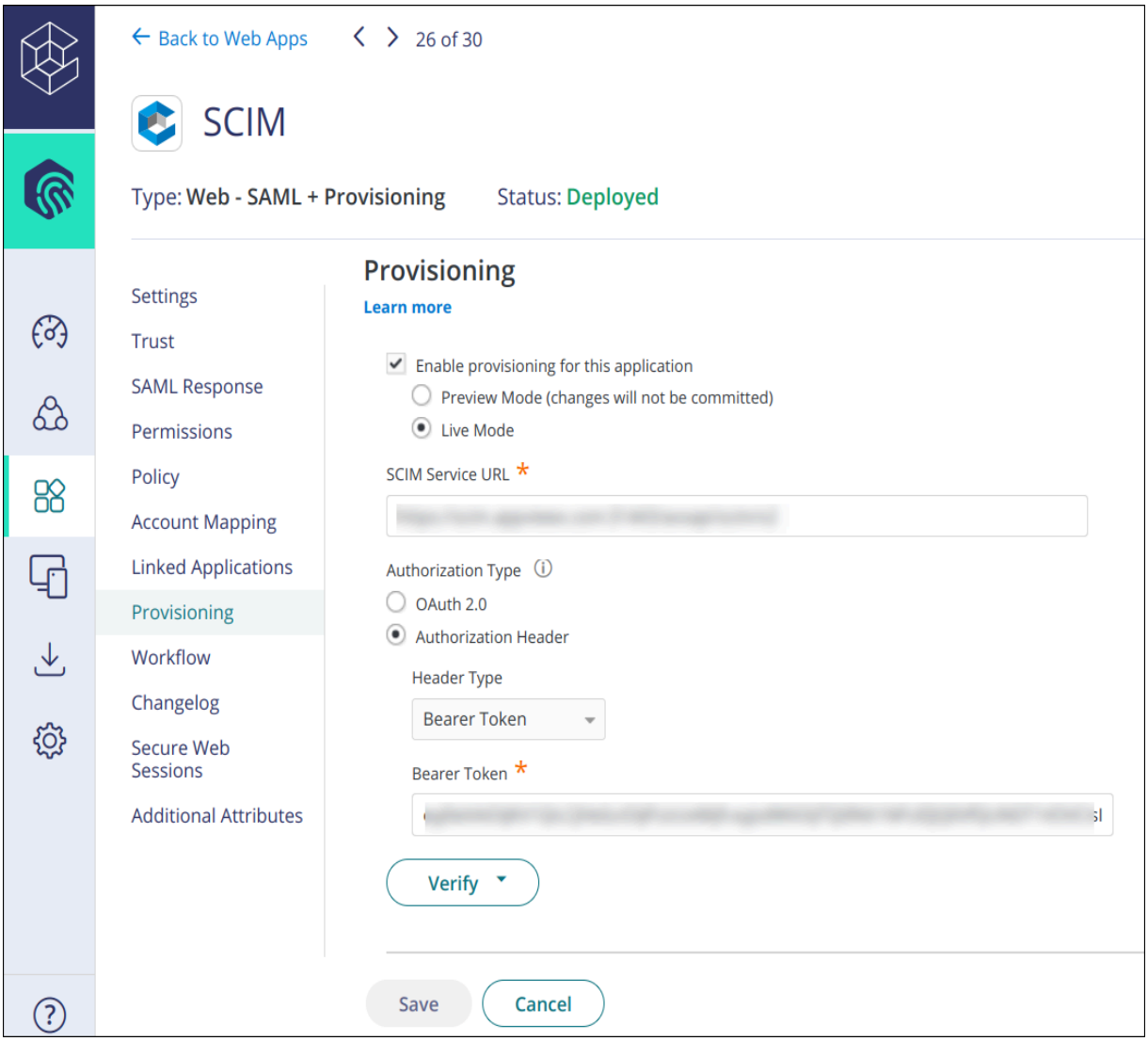
Configuring Microsoft Azure

1. Go to **Microsoft Azure** portal, click **Enterprise Applications**.
2. Click **+New Application**.
3. Click **+Create** your own application.
4. Enter a Name for the application.
5. Select “Integrate any other application you don't find in the gallery (Non-gallery)” and click Create.
6. Under the Manage menu, click **Provisioning**.
7. Upon opening the application, the "Get Started" page will be displayed. Click on "**Get Started**" to proceed.
8. Set Provisioning Mode to Automatic.
9. Enter the **Base URL** that was copied earlier.
10. Enter the **Bearer Token** that was generated earlier.
11. Click **Test Connection** and wait for the message that confirms that the credentials are authorized to enable provisioning.
12. Click **Save**.

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Configuring CyberArk

1. On the Identity Administration portal, go to the Provisioning page of your deployed application.



2. Select **Enable provisioning for this application**.
3. Select **Live Mode**.
4. Enter the service provider's SCIM URL for the **SCIM Service URL**.
5. Select **Authorization Type** as **Authorization Header**.
6. Select **Header Type** as **Bearer Token**.
7. Enter the Bearer Token to the Bearer Token field that you generated earlier.
8. Click **Verify** to have CyberArk Identity verify the connection and save the provisioning details.

For more details on steps for Configuring CyberArk.

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Configuring OKTA

Prerequisites:

1. Login to AppViewX and Go to **Menu** > **Platform** > **Access Management** > **SCIM**.
2. Copy the value in the **Base URL** field onto a notepad.
3. In the **Bearer Token** field, click **Generate Token** and copy the token value on to a notepad.

Steps to Configure OKTA:

1. Login to the Okta Admin Console *https://{yourSubdomain}.okta.com/login/default* with valid credentials.
2. From the left menu, click **Applications** > **Application**.
3. On the **Applications** page, click **Create App Integration**.
4. On the **Create a new application pop-up**, select **SAML 2.0**, and click **Next**.
   The **Create SAML Integration** page is displayed.
5. On the **Create SAML Integration** page, **General Settings** tab, in the **App name** field, enter a suitable name and click **Next**.
6. On the **Create SAML Integration** page, **Configure SAML** tab enter valid values in the following mandatory fields:
   - **Single sign-on URL**
   - **Audience URI (SP Entity ID)**

   For the other fields, keep the default values or edit as required and click **Next**.
7. On the **Create SAML Integration** page, **Feedback** tab, in the **App type** field, select **This is an internal app that we have created** and click **Finish**.
   The **Test** page is displayed.
8. On the **Test** page, **General** tab, click **Edit**.
9. In the **Provisioning** field, select **SCIM** and click **Save**.
10. On the **Test** page, click **Provisioning** tab and click **Edit**.
11. Enter valid values in the following fields:
    - **SCIM connector base URL** - Enter the base URL noted in the prerequisites.
    - **Unique Identifier field for users** - enter *userName*.
    - **Supported provisioning actions**- select the values *Push New Users*, *Push Profile Updates*, *Push Groups*.
    - **Authentication Mode** - select *HTTP Header*.
    - In the **HTTP Header** section, in the **Authorization** field, enter the bearer token value noted in the prerequisites.
12. Click **Test Connector Configuration** to verify the connection.
13. Click **Save**.

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MFA Settings Configuration

MFA Settings Configurations refers to the process of configuring Multi-Factor Authentication (MFA) settings within a system or application. This involves setting up additional security measures beyond passwords, such as OTP (One-Time Password), biometric verification, or other methods, to enhance the authentication process and bolster security.

Accessing MFA Settings Configuration

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **ACCESS MANAGEMENT**, select **MFA**. The **Settings :: Authentication** page is displayed with the **MFA** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Authentication**. The **Settings :: Authentication** page is displayed with the **LDAP** tab open by default. 3. Click the **MFA** tab.
For more information on how to switch between menus, click here.	

Configuring the MFA Settings

MFA is one of the most effective ways to prevent unauthorized access as it requires additional validation of login credentials during a user's authentication process. MFA can be as straightforward as a user providing their password, then entering an accompanying numeric code (OTP) from an Email Text.

Prerequisites for On-Prem

1. SMTP configuration should be done before enabling MFA.
2. Email should be configured for "Admin user" before enabling MFA.
3. **If there is communication or any other issue with SMTP, then local users cannot login to AppViewX if MFA is enabled. So, our recommendation is to maintain high availability for SMTP.**

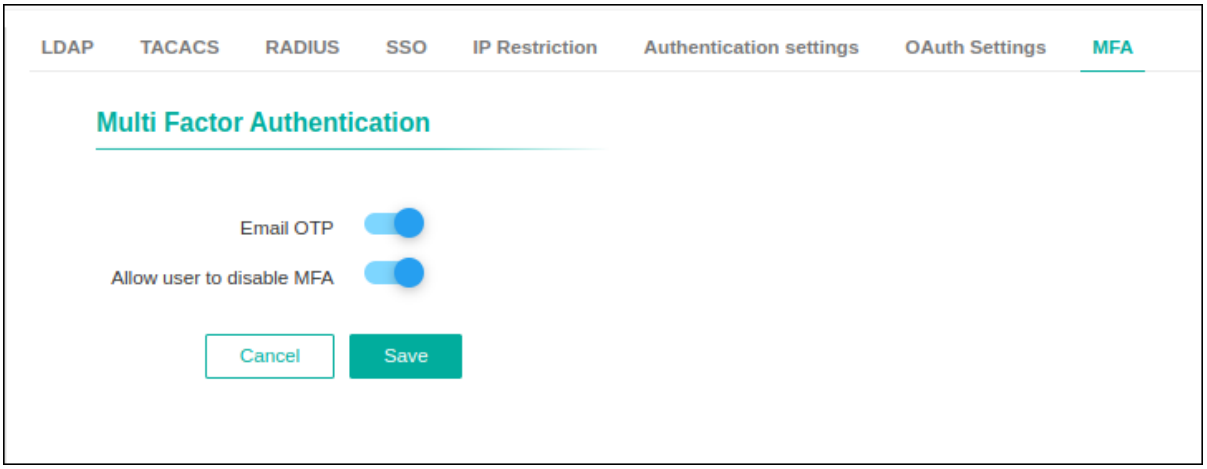
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Note:

- In **On-Prem**, only the **"Admin user"** can configure MFA settings, and in **SaaS,** only the **"Account owner"** can configure MFA settings.
- For **SaaS** deployment, MFA is enabled by default for the Account Owner. You cannot disable MFA for the account owner.

To configure the MFA settings:

1. On the **Settings :: Authentication** page, under the **MFA** tab, select **Email OTP** to enable multi factor authentication.
2. The Audit logs for enable/disable **MFA** are `User: <Username> update MFA settings and enabled/disabled MFA`.
3. On selecting Email OTP, the **Allow user to disable MFA** option appears, which can be enabled or disabled based on the user's requirement.
4. If the admin disables the **Allow user to disable MFA** option, it will enforce MFA usage for all the users. If enabled by the admin, users can enable/disable MFA usage from their user profile settings.



5. The Audit logs for enable/disable **Allow user to disable MFA** are `User: <Username> updated MFA settings and enabled/disabled Allow user to disable MFA`.
6. Click **Save**.

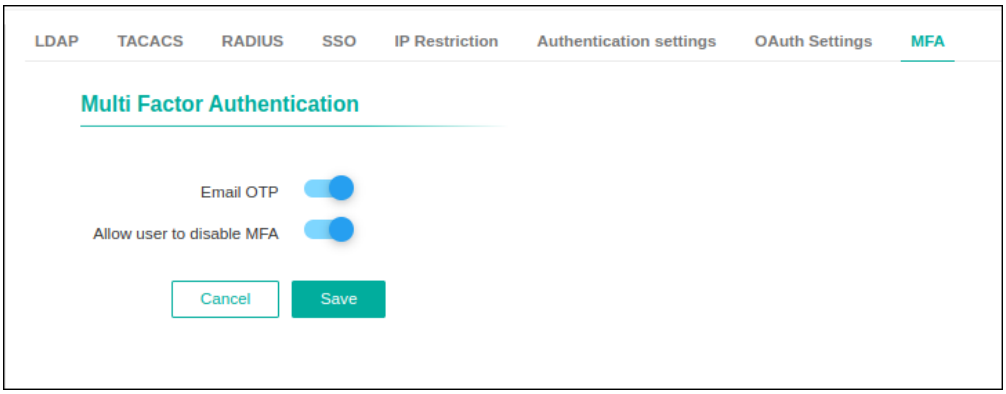
MFA Settings for User Profile

Admin has provision to control MFA feature for the user role.

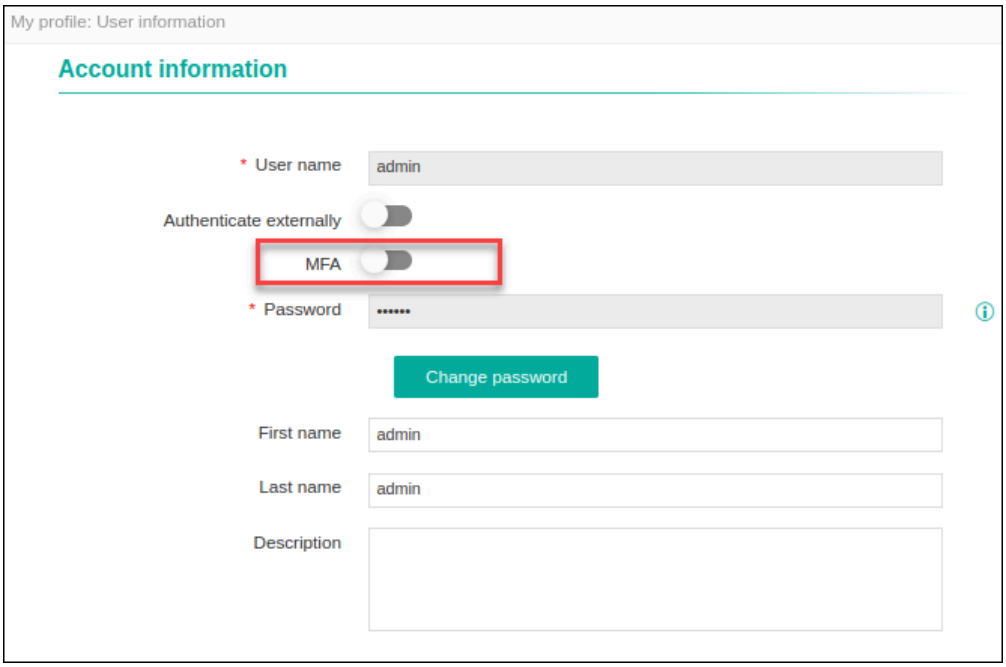
The following steps explains access to enable/disable MFA from user profile:

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1. On selecting email OTP, the **Allow user to disable MFA** option appears. This can be enabled or disabled based on the user's requirement.

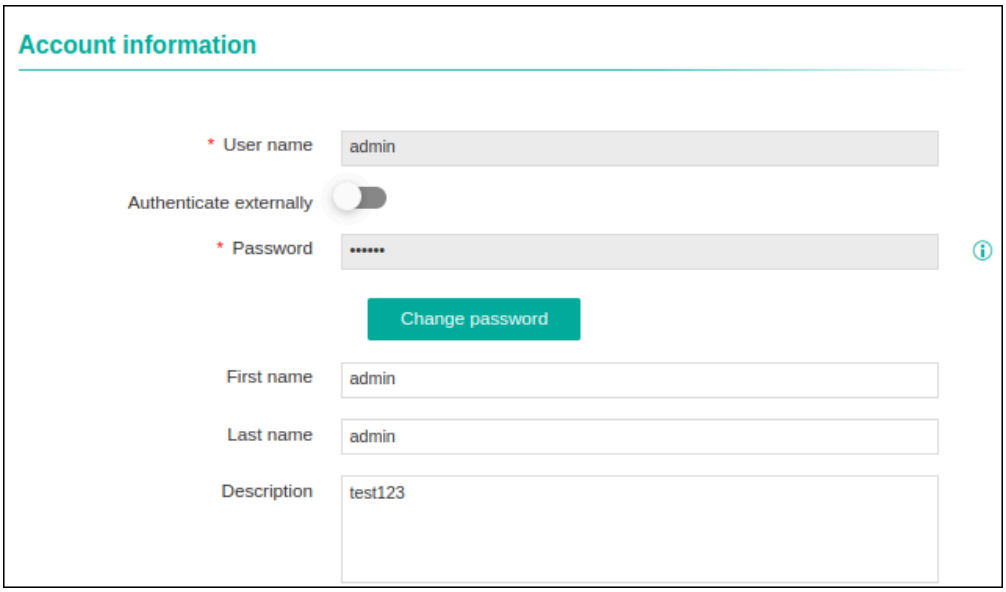


2. If the admin enables **Allow user to disable MFA**, then users have provision to enable/disable MFA and **MFA** option appears in user profile.



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3. If the admin disables **Allow user to disable MFA**, then users can not see **MFA** option in the user profile.



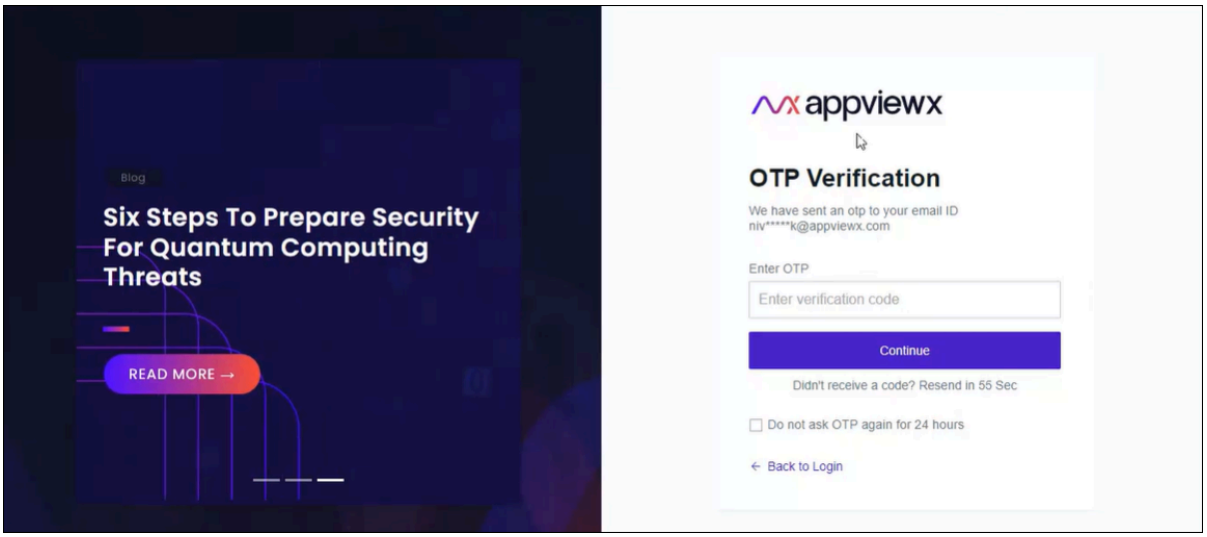
Logging in using MFA

The following steps explains access to AppViewX Login using MFA:

1. Log in using your user credentials.

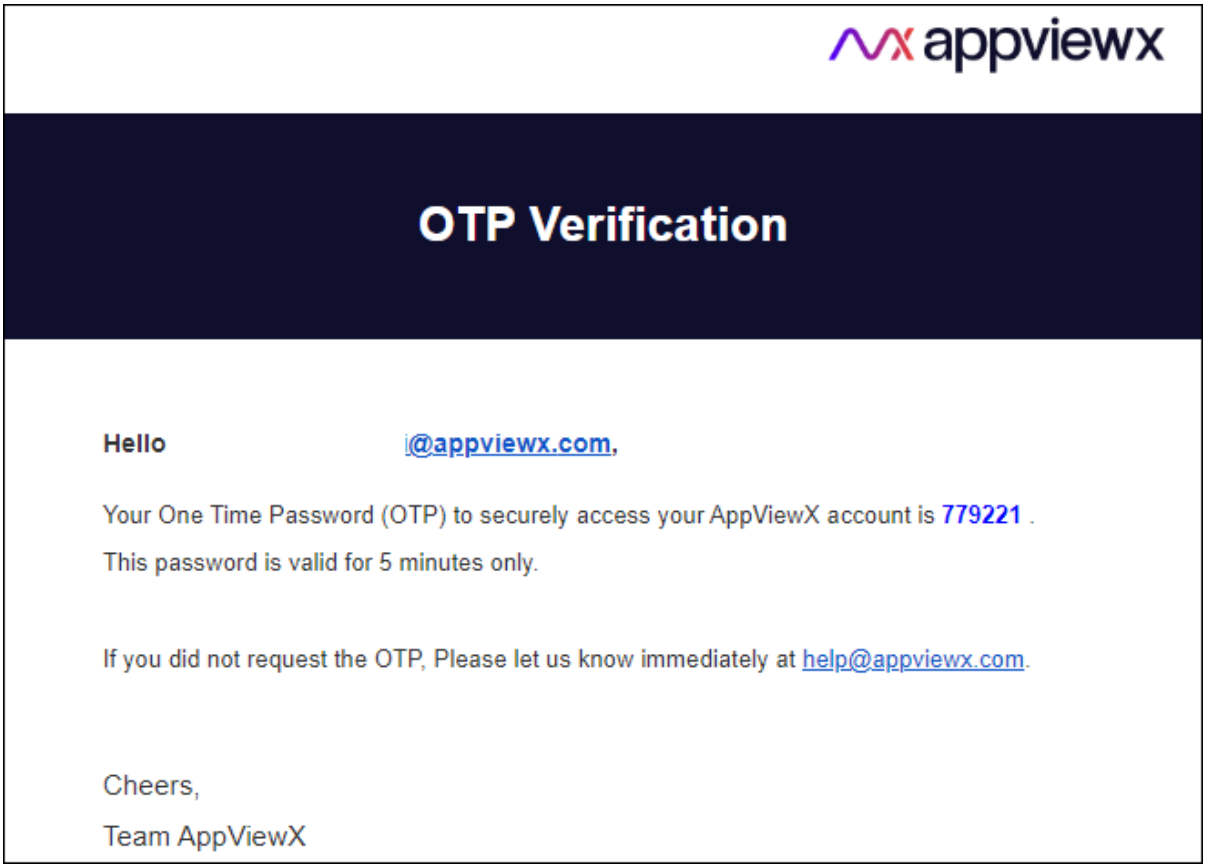
   The MFA system generates a random six digit numeric value and sends OTP to the registered user's email ID.

2. User authentication (**OTP Verification**) screen is displayed.



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3. Enter OTP which is sent to your registered email ID.



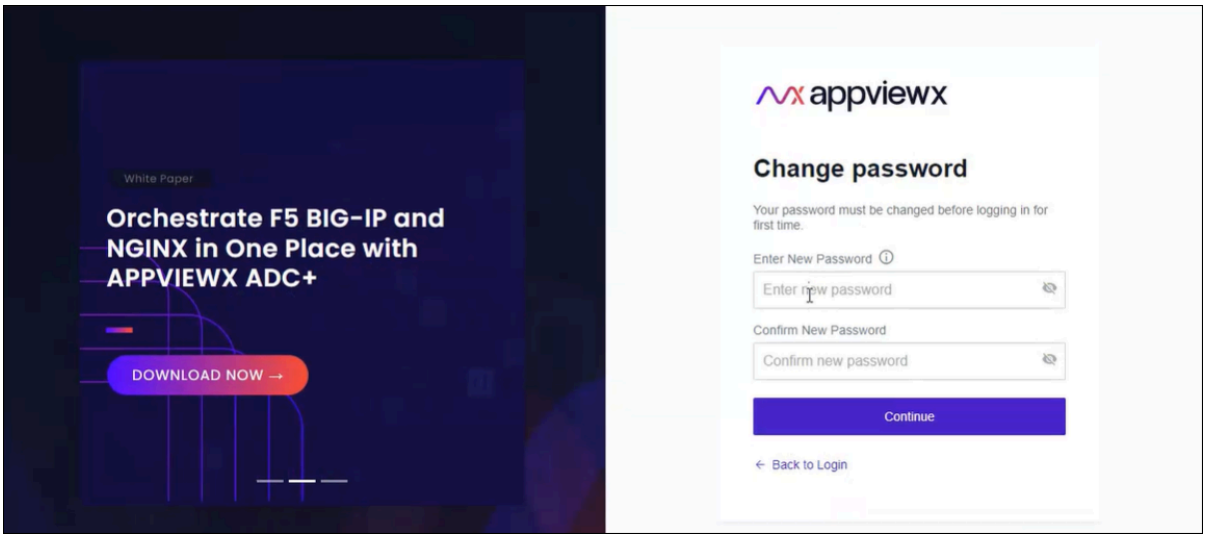
4. OTP Validation.
   - OTP sent to Email will be valid only for next five minutes.
   - Users will be locked if wrong OTP is entered more than five times.
   - Once the user is locked for 15 minutes, an auto-generated Email is received asking to contact the administrator to unlock.
5. Resend OTP - MFA.
   - Resend option will be enabled after ***60 seconds***.
   - Resend option will be available only five times for wrong attempt.
   - Users will be locked if resend OTP is attempt for more than five times.
   - Once the user is locked for 15 min, an auto-generated Email is received asking to contact the administrator to unlock.

> **Note:** Users can select **Do not ask OTP again for 24 hours** during login and disable OTP Verification for next consecutive logins for 24 hours.

6. Click **Continue**.

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7. The Audit log for invalid OTP is `Login failed for user: <Username> due to Invalid OTP`.
8. **Change Password** page is displayed for the users logging in for the first time.



9. Enter the New password in the required fields.

> **Note:** The new password should have:
> • At least one uppercase, lowercase, and numeric character
> • At least one special character (~!@#$^&*_-+=|())
> • 8 to 128 characters.

> **Note:** The new password should not contain:
> • The user name
> • The same character more than three times consecutively
> • Blank space and special characters other than (~!@#$^&*_-+=|()).

10. Click **Continue**.

Authentication Settings Configuration

Authentication Settings Configuration refers to the process of defining and customizing authentication mechanisms within a system or application. It involves configuring various authentication methods, settings, and security protocols to control user access and verify their identities during login or access attempts.

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Accessing the Authentication Settings Configuration Settings

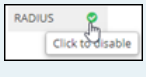
New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **ACCESS MANAGEMENT**, select **Authentication settings**. The **Settings :: Authentication** page is displayed with the **Authentication settings** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Authentication**. The **Settings :: Authentication** page is displayed with the **LDAP** tab open by default. 3. Click the **Authentication settings** tab.
For more information on how to switch between menus, click here.	

Access Management: Configuring Authentication Settings

In addition to configuring authentication settings, AppViewX also lets you enable birthright provisioning for new users, configure the order in which user credentials are authenticated, enable/disable an authentication check, and other user and node settings.

To configure the authentication settings:

1. On the **Settings :: Authentication** page, under the **Authentication settings** tab, to enable **Birthright provisioning** for new users who log into the system with a predefined set of permissions (associated with the user group), turn on the **Enable Birthright** toggle.
   To do this, the admin should select the user group (Assigned with the defined permissions), which will act as a default user group for all the users logging in to AppViewX. Fore more details, refer to the content on creating a role and associating it with a user group.
2. To define the order in which the authentication settings will be checked, in the **Order** section, drag and drop the authentication labels to the required corresponding levels.
   If the level 1 check is set to Local and the level 2 check is set to LDAP, user credentials will be authenticated locally first and then on the LDAP server.

   Note: You can also disable, and then enable a level of authentication. To do this, click the green tick 

   next to the server name.

3. In the **User settings** section, enter the required field information.

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Field descriptions for User settings

Field	Description
Create User with an unique E-mail ID	To ensure that every AppViewX user has a unique email ID, turn on this toggle.
Create User on Authorization Failure	To create a user even if authorization fails (but the user is authenticated successfully), turn on this toggle.
Exclude domain name from User name	To exclude the domain name from the username during SSO or LDAP logins, turn on this toggle.
Idle Session Timeout	Users can enter the idle web session timeout limit in minutes. AppViewX lets you set a session timeout limit between 2 and 480 minutes.
Enable Max Session Timeout	Enable the toggle to enter the max session timeout duration, which will force the session to expire even if idle time never expires.
Max Session Timeout	This field appears only when the **Enable Max Session Timeout** toggle is turned on. AppViewX lets you set **Max Session Timeout** limit between 100 and 7200 minutes. To set a max session timeout limit, enter the value in minutes. **Note:** The session timeout expiration notification appears 4 minutes and 1 minute prior to the session's expiration.

4. If the AppViewX node password is updated, in the **Node Settings** section, enter the updated Node Password.

   Note: The value entered in the Node Password field should be the same as the node password. To apply the changes, restart the avx-config-server pod in every datacenter.

5. Click **Save**.

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OAuth Settings

OAuth Settings typically refer to the configuration and management of OAuth (Open Authorization) protocols within an application or system. These settings encompass various parameters and configurations that govern OAuth-based authentication and authorization processes, including client IDs, client secrets, token lifetimes, scopes, and callback URLs, among others. Managing OAuth settings allows defining secure and authorized access for users or applications to protected resources.

Accessing OAuth Settings Configuration

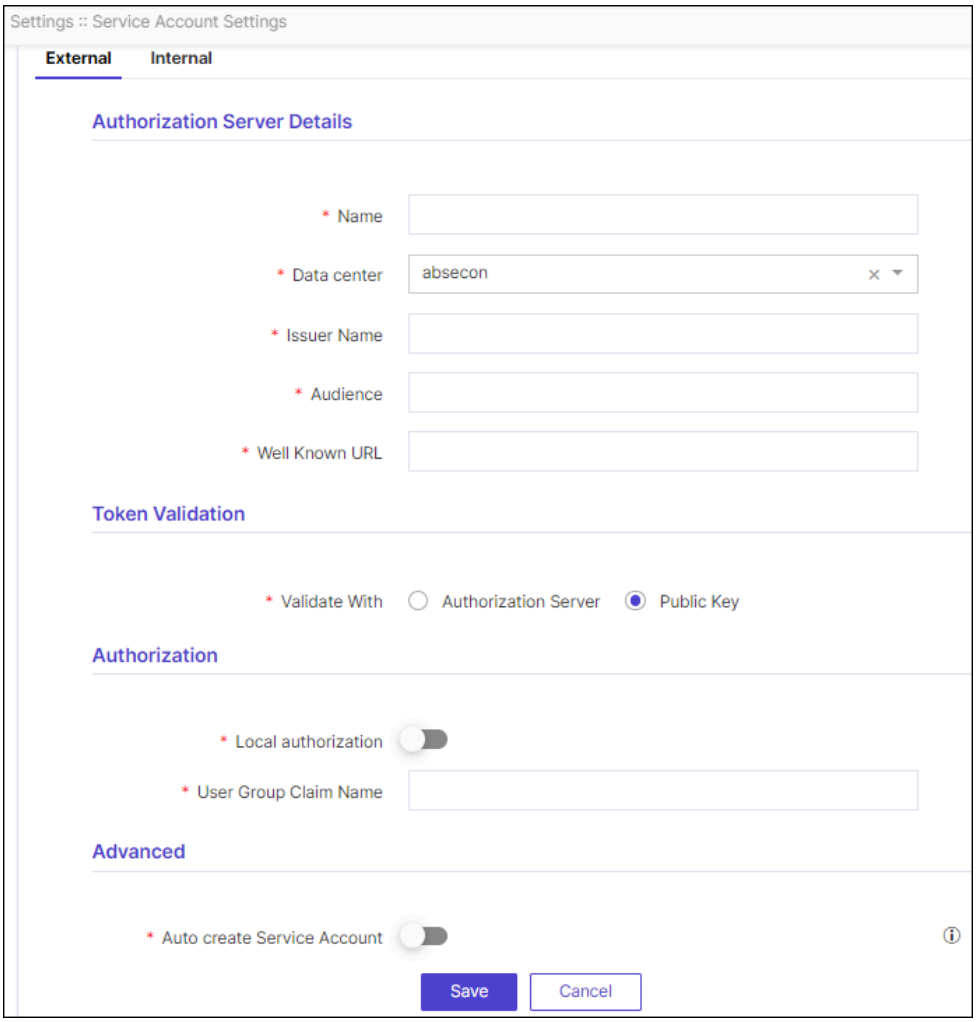
New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **ACCESS MANAGEMENT**, select **OAuth Settings**. The **Settings :: Service Account Settings** page is displayed with the **External** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **OAuth Settings**. The **Settings :: Service Account Settings** page is displayed with the **External** tab open by default.
For more information on how to switch between menus, click here.	

Configuring External OAuth Settings

To configure External OAuth settings, follow the below steps:

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1. On the **Settings :: Service Account Settings** page, under the **External** OAuth Settings tab, enter the required field information.



2. In the **Authorization Server Details** section, enter the following details.

Field descriptions for Authorization Server Details

Field	Description
***Name**	Enter the unique name for the Authorization server.
***Data center**	From the options available in the dropdown, select the data center.
***Issuer Name**	Enter the issuer name of the token, ensuring it matches the value in the issuer token claim.
***Audience**	Enter the audience claim value.

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Field	Description
***Well Known URL**	Enter the well known URL of the Authorization server.
*: *Mandatory fields*	

3. In the **Token Validation** section, enter the following details.

Field descriptions for Token Validation

Field	Description
***Validate With**	Select the **Validation** type: • **Authorization Server**: To validate with Client ID and Client Secret, Select **Authorization Server** option. • **Public Key**: To validate using a Public Key, Select **Public Key** option.
***Client ID**	This field is displayed when **Validate With** is selected as **Authorization Server**. Enter the Client ID that is generated in the OAuth server when the OAuth client is created. **Note:** This client ID is generated in the OAuth server for AppViewX.
***Client Secret**	This field is displayed when **Validate With** is selected as **Authorization Server**. Enter the Client Secret that is generated in the OAuth server when the OAuth client is created. **Note:** This client secret is generated in the OAuth server for AppViewX.
*: *Mandatory fields*	

Note:
- If the token is valid and a service account has not been created, an automatic process will generate the service account, using the client ID as the login name.
- When the service account is automatically created, there is a chance of authorization failure resulting from unassigned user groups. To resolve this, manually assign the required user group to the service account.

4. In the **Authorization** section, enter the following details.

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Field descriptions for Authorization

Field	Description
***Local authorization**	To enable or disable local authorization for authentication with the OAuth server and authorization within AppViewX, if the OAuth server is unable to pass the roles or user groups as part of the token and requires AppViewX to perform the authorization, then the above feature can be used.
***User Group Claim Name**	This field is displayed when the **Local authorization** is disabled. Enter the user group's claim name from the token. **Note:** Ensure that the user group already exists in AppViewX; if it doesn't, create a new user group with the same name.
*: *Mandatory fields*	

5. In the **Advanced** section, enter the following details.

Field descriptions for Advanced

Field	Description
***Auto create Service Account**	If enabled, AppViewX will automatically create a Service Account upon the first login attempt; otherwise, manual creation in AppViewX is necessary for it to function.
*: *Mandatory fields*	

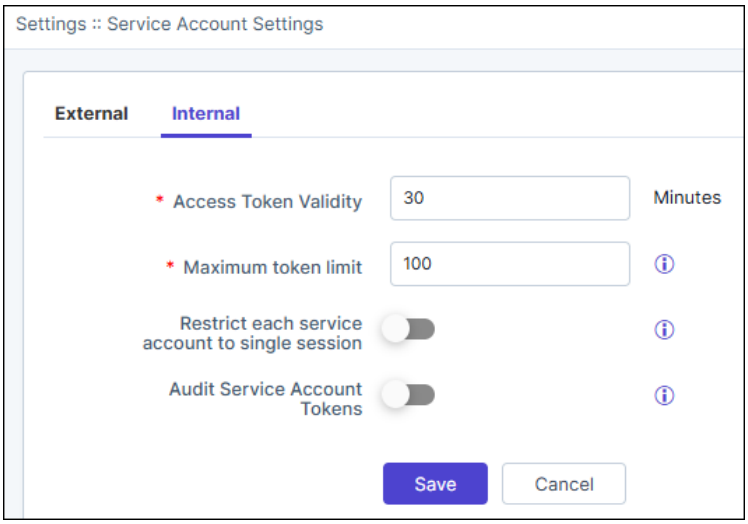
6. Click **Save**.

Configuring Internal OAuth Settings

To configure Internal OAuth settings, follow the below steps:

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1. On the **Settings :: Service Account Settings** page, under the **Internal** OAuth Settings tab, enter the required field information.



Field descriptions for Internal OAuth Settings

Field	Description
***Access Token Validity**	Enter the access token's validity in the number of minutes.
***Maximum token limit**	The maximum number of live tokens permitted from service accounts. Enter a value between 1 to 200.
Restrict each service account to single session	Enable the toggle to limit each service account to have only one valid Access token at a time, thereby restricting them to use only one session at a time. **Note:** If the toggle is disabled, then a maximum of 100 Access tokens can be created in parallel for a single service account which allows using multiple sessions in parallel with the same service account.
Audit Service Account Tokens	Based on resource considerations, admins can enable or disable the toggle button to control token-related

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Field	Description
	audit logging. Source details (IP, user agent, etc.) are included in the logs. • Captures and displays token generation events when a service account invokes an API. • Logs failed attempts when an expired token is used.
*: *Mandatory fields*	

Note: Whenever an Access Token expires, an HTTP Error Code 401 is displayed in the API response. The client application can generate a new Access Token using the Client ID and Client Secret.

2. Click **Save**.

IP Restriction Configuration

IP Restriction Configuration involves setting up limitations on network access based on specific IP addresses or ranges, controlling the ability to access a system, network, or application based on predefined rules or allowed IP ranges.

Accessing the IP Restriction Configuration Settings

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **ACCESS MANAGEMENT**, select **IP Restriction**. The **Settings :: Authentication** page is displayed with the **IP Restriction** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Authentication**. The **Settings :: Authentication** page is displayed with the **LDAP** tab open by default. 3. Click the **IP Restriction** tab.
For more information on how to switch between menus, click here.	

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Configuring the IP Restrictions

For enhanced security and if the administrator wants to whitelist specific IP addresses for user login, AppViewX lets you configure IP restrictions to allow access from whitelisted IP addresses/subnet ranges.

To configure IP restrictions:

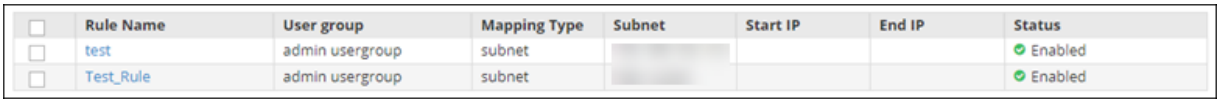
1. On the **Settings :: Authentication** page, under the **IP Restriction** tab, and **General Information** section, turn on the **Enable IP Restriction** toggle.
2. In the **IP/Subnet Configuration** section, enter the required field information.

Field descriptions for IP/Subnet Configuration

Field	Description
***Rule Name**	Rule name for a whitelisting condition.
***User group**	Select the user group to which this rule will apply, from the dropdown menu, . Only the users from the selected user group will be allowed to login to AppViewX from the whitelisted IP address/subnet range.
Mapping Type	Select one of the two mapping types: • **IP Range** • **Subnet**.
***Start IP**	Enter the starting IP address for the whitelisted IP/subnet range. **Note:** The IP/subnet range should be specified in the ascending order. This field is displayed only when **Mapping Type** is selected as **IP Range**.
End IP	Enter the ending IP address for the whitelisted IP/subnet range. **Note:** The IP/subnet range should be specified in the ascending order. This field is displayed only when **Mapping Type** is selected as **IP Range**.
***Subnet**	Enter the Subnet network range to whitelist. This field is displayed only when **Mapping Type** is selected as **Subnet**.
** : Mandatory fields*	

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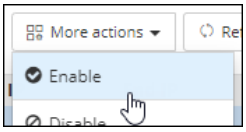
3. To save the IP restriction settings, click **Add** or to reconfigure the settings, click **Reset**.
   The IP restriction settings thus configured are saved and displayed in the table shown at the end of the screen.



Enabling a IP Restriction Rule

To enable a IP restrictions rule:

1. On the **Settings :: Authentication** page, under the **IP Restriction** tab, from the table at the end of the page, for the IP restrictions rule you want to enable, select the check box corresponding to that rule.
2. From the **More actions** dropdown menu, click **Enable**.

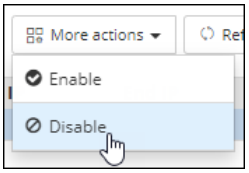


3. In the **Enable** dialog box, click **Yes**.

Disabling an IP Restriction Rule

To disable a IP restrictions rule:

1. On the **Settings :: Authentication** page, under the **IP Restriction** tab, from the table at the end of the page, for the IP restrictions rule you want to disable, select the check box corresponding to that rule.
2. From the **More actions** dropdown menu, click **Disable**.

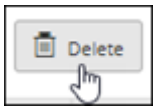


3. In the **Disable** dialog box, click **Yes**.
   The selected rule is disabled.

Deleting an IP Restriction Rule

To delete an IP restrictions rule:

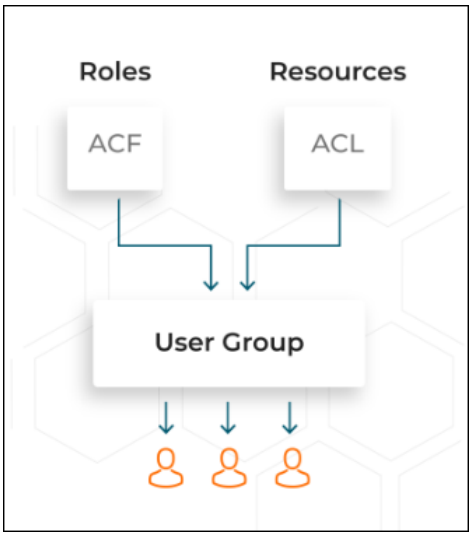
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1. On the **Settings :: Authentication** page, under the **IP Restriction** tab, from the table at the end of the page, for the IP restrictions rule you want to delete, select the check box corresponding to that rule.
2. Click 

(Delete).
3. In the **Confirmation** dialog box, click **Yes**.
   The selected rule is deleted.

Identity: Configuring Role and Resource-Based Access Control

AppViewX offers comprehensive support for Role and Resource-Based Access Control (RBAC). RBAC is a method of restricting AppViewX functions, network resources that can be managed and monitored in AppViewX based on the roles of individual users within an enterprise. It allows you to integrate with the existing identity stores such as Active Directory (AD) and Lightweight Directory Access Protocol (LDAP) to enforce authorization policies. Roles and Resources can be customized to suit any organizational structure and user requirements.



RBAC lets employees have access rights only to the AppViewX functions and network resources they need to do their jobs and prevents them from accessing information that doesn't pertain to them.

Benefits of RBAC

Using RBAC should improve operational efficiency, enhance compliance, provide administrators increased visibility, reduction in costs, decrease in risk of breaches, and data leakage.

- RBAC: Predefined Roles, Resources, and User Groups
- RBAC Quick Configuration

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- Managing Users
- Managing User Groups
- Managing Roles
- Managing Resource
- Service Accounts

RBAC: Predefined Roles, Resources, and User Groups

To expedite the RBAC configuration, AppViewX ships the following set of predefined roles, resources and user groups:

- **CLM Requester**
- **CLM Level 1 Approver**
- **CLM Level 2 Approver**
- **CLM Auditor**

On day 0 of your using the application, these, along with the **superadmin** role, will be available by default for you to map to your users, as well as to clone and/or modify as required.

CLM Requester

- **Role**: Low-level user allowed to submit requests to enroll, renew/regenerate, revoke, push to device, roll back on the resources assigned to the user
- **Resources**: CLM related visual workflows will be mapped and provided with the submit permission for the CLM actions. The default certificate group will be mapped.
- **User Group**: Mapping between the **CLM Requester** role and the **CLM Requestor** resource



Note: Once a request has been submitted, ensure that the requisite approvers are duly informed.

CLM Level 1 Approver

- **Role**: Level 1 approval role for all CLM actions
- **Resources**: CLM related visual workflows will be mapped and provided with the approve permission for CLM actions. The default certificate group will be mapped.
- **User Group**: Mapping between the **CLM Level 1 Approver** role and the **CLM Level 1 Approver** resource

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Note: To check requests pending approvals, go to (**Menu**) > **CERT+** > **Automation** > **My Requests** > **Open**.

Tip: You can also go to the certificate inventory and search for the common name of the certificate that needs to be approved. Click the common name to be redirected to the holistic view of the required certificate.

CLM Level 2 Approver

- **Role**: Level 2 approval role for all CLM actions
- **Resources**: CLM related visual workflows will be mapped and provided with the implement permission for CLM actions. The default certificate group will be mapped.
- **User Group**: Mapping between the **CLM Level 2 Approver** role and the **CLM Level 2 Approver** resource

Note: To check requests pending implementation approvals, go to (**Menu**) > **CERT+** > **Automation** > **My Requests** > **Open**.

Tip: You can also go to the certificate inventory and search for the common name of the certificate that needs to be approved for implementation. Click the common name to be redirected to the holistic view of the required certificate.

CLM Auditor

- **Role**: Auditor role for all CLM actions
- **Resources**: CLM related visual workflows will be mapped and provided with read permission for the CLM actions. The default certificate group will be mapped.
- **User Group**: Mapping between the **CLM Auditor** role and the **CLM Auditor** resource.

Note: To check requests raised/approved/open for approvals, go to (**Menu**) > **CERT+** > **Automation** > **My Requests** > **All**.

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Accessing the Predefined RBAC Configuration

- Go to  (**Menu**) > **Platform** > **Identity** > **Role**.

  The **Role** page is displayed. The predefined roles are listed here.

  The subsequent sections cover the instructions for cloning and modifying roles, resources, and user groups.

RBAC Quick Configuration

Simplified RBAC Configuration in AppViewX

To simplify existing RBAC Configuration in AppViewX for the Account Administrator, the Quick Config wizard flow option has been introduced in the existing Authentication, User groups, Roles and Resources. Using the Quick Config option, users should be able to perform all the following actions in the same wizard flow:

- Configure external authentication or single-sign-on for users to log in to AppViewX
- Add users groups into AppViewX by pulling specific user groups from AD into AppViewX based on specific patterns/keywords/codes and support Bulk Export/Import option to onboard user groups
- Pre-packaged roles for ADC, Cert, Security, and Automation modules to assign permissions to user groups
- Simplifying custom role creation by providing information help against each ACF explaining the significance of the functionality
- Dynamic rule-based resource tagging of newly discovered ADC objects, Certificates based on Query or using a script and assigning permissions to user groups dynamically.

- Authentication
- Resource
- Role
- User Group

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Accessing Quick Config Settings

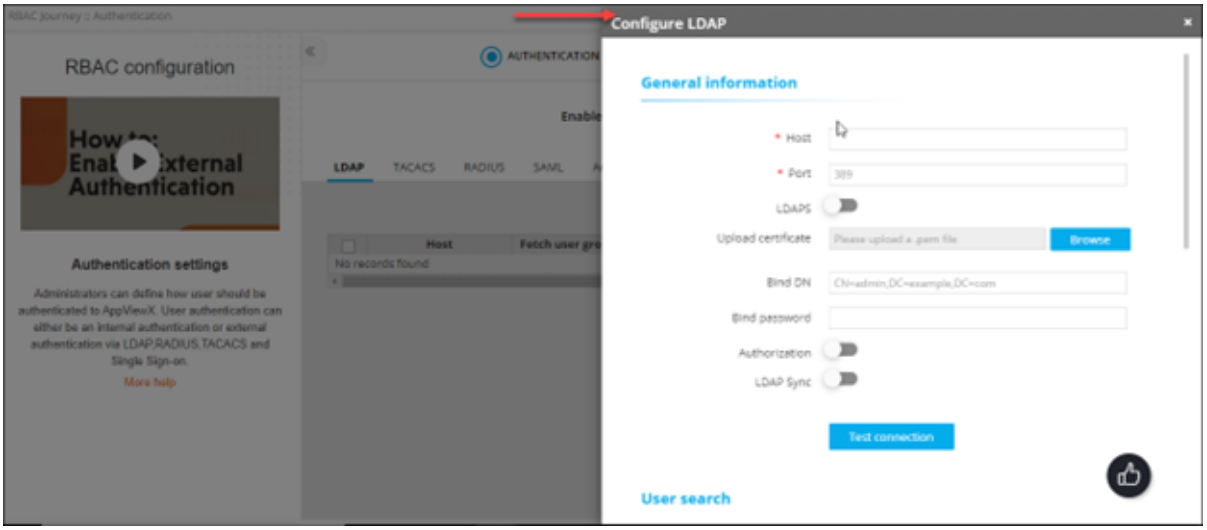
New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **ACCESS MANAGEMENT**, select **Quick Config**. The **RBAC Journey :: Authentication** page is displayed with the **LDAP** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Authentication**. The **Settings :: Authentication** page is displayed with the **LDAP** tab open by default. 3. From the top right corner of the screen, click **Quick Config**. The **RBAC Journey :: Authentication** page is displayed with the **LDAP** tab open by default.
For more information on how to switch between menus, click here.	

Authentication

Configure the Role-Based Access Control for LDAP

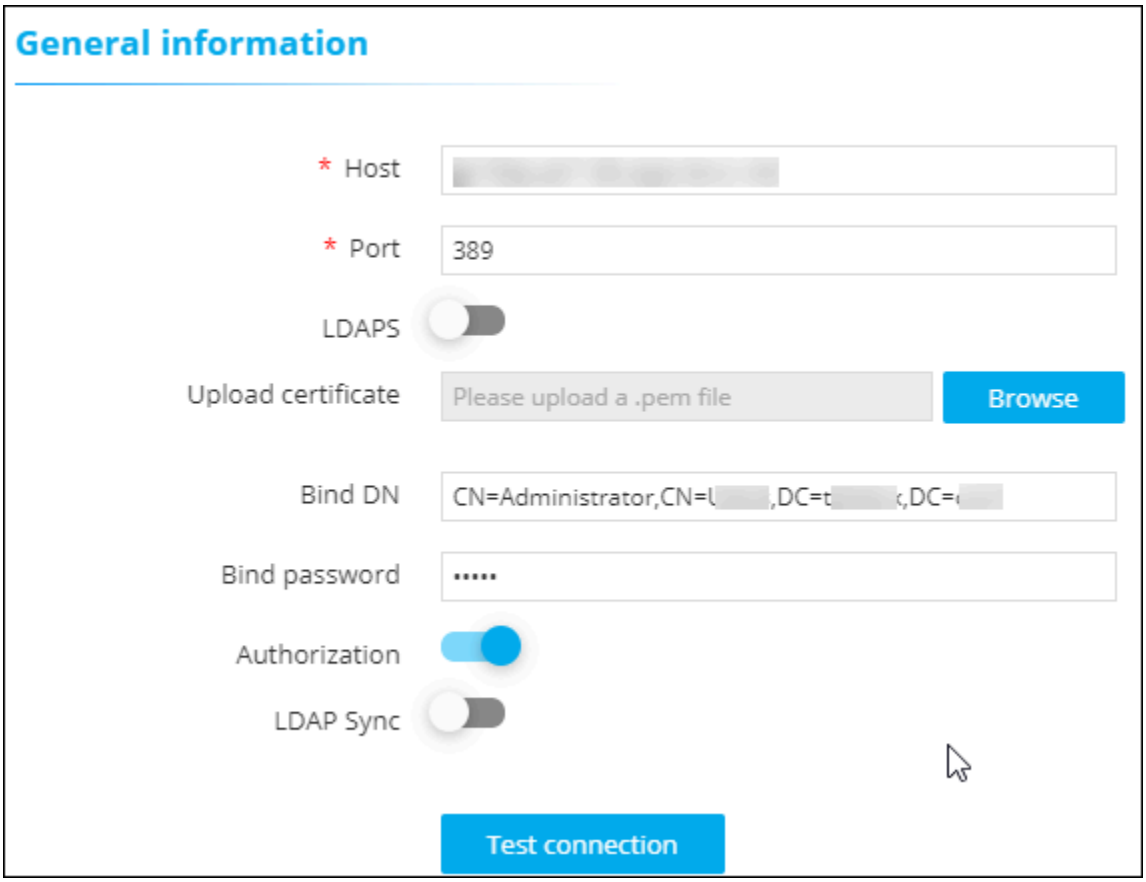
To configure the RBAC settings for LDAP:

1. On the **RBAC Journey :: Authentication** page, click **Configure LDAP**.
   The **Configure LDAP** action pane is displayed.



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2. In the **General Information** section, enter the following details (sample values are shown in the image).



Field descriptions for General Information

Field	Description
***Host**	Host name (domain name) of the LDAP server.
Port	Port number of the LDAP server. This value is entered based on the port number used in your deployment. By default, port number **389** is used for a LDAP configuration and port number 636 is used for a LDAPS configuration.
LDAP	The LDAPS protocol is used for secure communication between AppViewX and Active Directory/Open LDAP. To enable use of the LDAPS protocol authentication, instead of the LDAP protocol, turn on this toggle.

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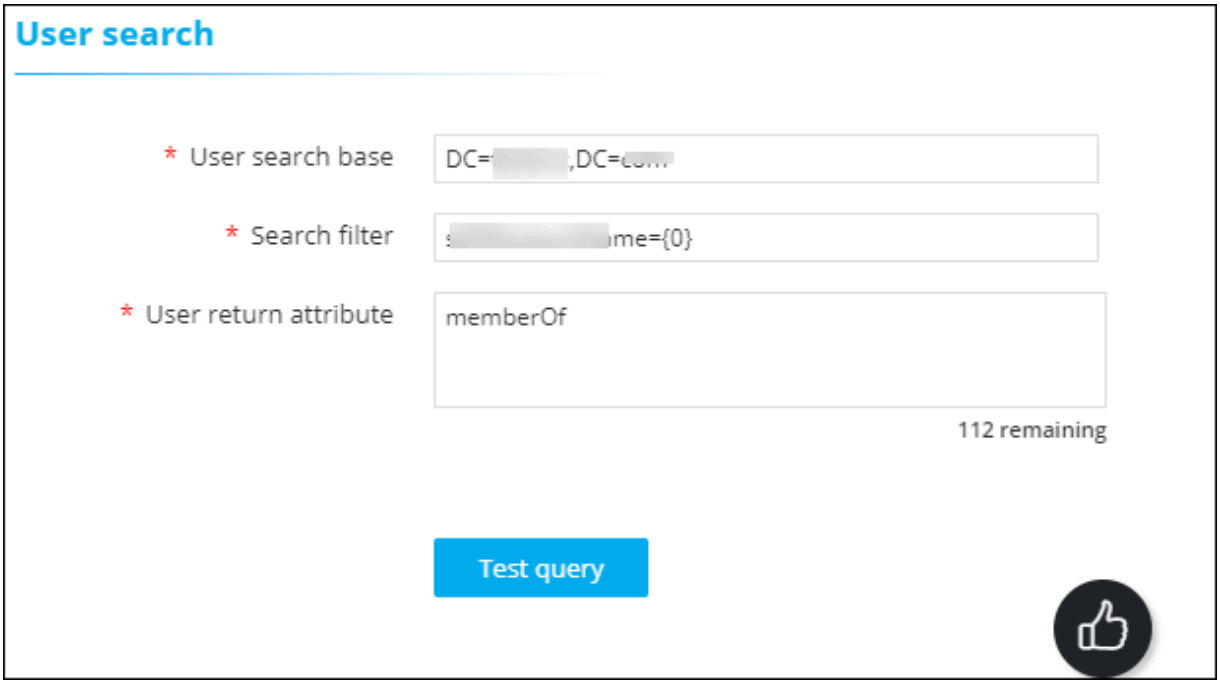
Field	Description
Upload certificate	This field is enabled only when the **LDAPS** is enabled. To upload a LDAP server certificate: a. Click **Browse Certificate**. b. Navigate to the location of the **.pem** certificate file. If the LDAP servers are load balanced with VIP, upload the root certificate of the LDAP server instead of the server certificate. c. Select the certificate to be uploaded and click **Open**. The selected certificate is uploaded. **Note:** Only a single certificate can be uploaded for each server.
Bind DN	Username of the base authentication endpoint that will be used to connect to LDAP.
Bind Password	The password of the base authentication endpoint that will be used to connect to LDAP.
Authorization	To check user permissions at the time of authentication, select this check box. In addition to authentication, AppViewX also lets you perform user authorization against the LDAP server. To enable authorization along with authentication, select this check box. **Note:** If Authorization is not enabled, AppViewX will only carry out LDAP authentication for the given user.
LDAP Sync	To enable the use of the SSH module in AppViewX for SSH key discovery use case, turn on this toggle.
*: *Mandatory fields*	

3. After entering the above connection details, to test if the host is reachable and the port is valid for establishing an LDAP/LDAPS connection, click **Test Connection**.

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Note: You can test the connection of LDAPS only when you save all of the configuration details. Bind DN and Bind password details cannot be validated through a test connection.

4. The **User Search** section collects information to validate a user's presence in the Active Directory. In the **User Search** section, enter the following details(sample values are shown in the image).

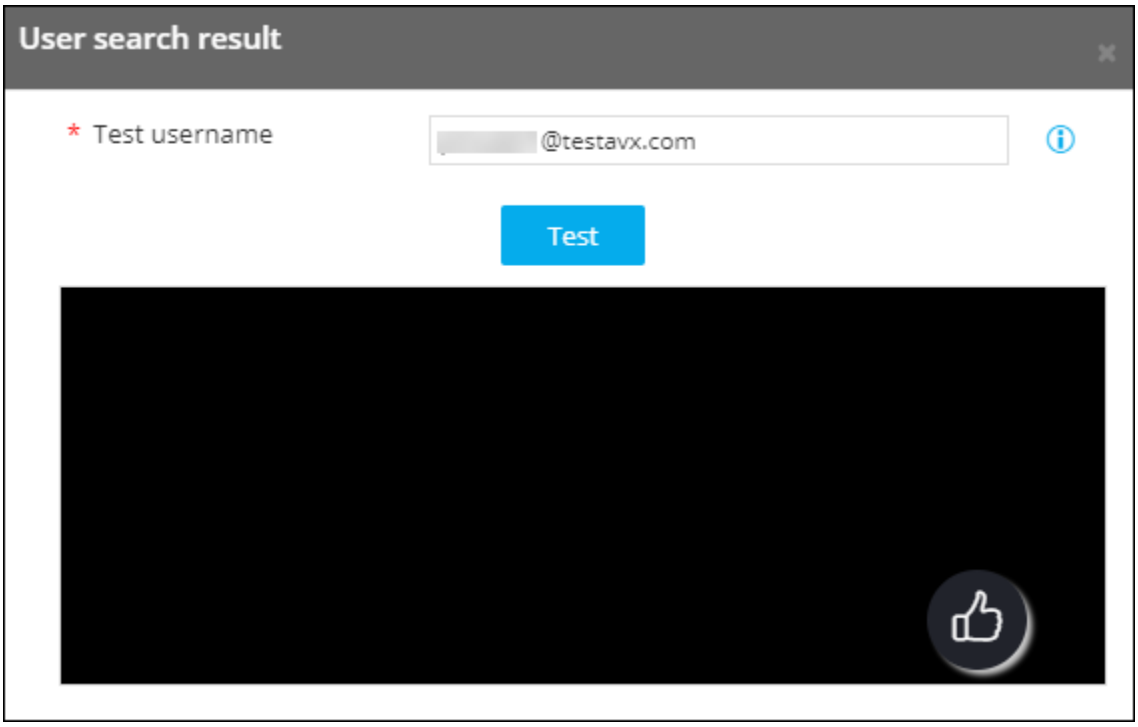


Field descriptions for User search

Field	Description
***User search base**	Base directory where the user is present.
***Search filter**	Criteria for searching for the user from the search base.
***User return attribute**	User information to be retrieved from the search base. **Note:** • This field is enabled only when the **Authorization** toggle (in the **General Information** section) is turned on. • You can specify only User return attribute. .
*: *Mandatory fields*	

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5. After entering the above details, to test if the user is present in the Active Directory, click **Test query**.
6. In the **User search result** action pane, enter the **Test username** and click **Test**.



Note: You are allowed to check the query response for User search and Group search only when the connection is valid.

7. To test which user group the user belongs to, in the **Group search** section, enter the following details:

Note: This section is enabled only when the **Authorization** toggle (in the **General Information** section) is turned on.

Field descriptions for Group search

Field	Description
Group search base	Base directory where the user group is present.
Search filter	Criteria to search the user group from the search base.

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Field	Description
Group return attribute	User group information to be retrieved from the search base.

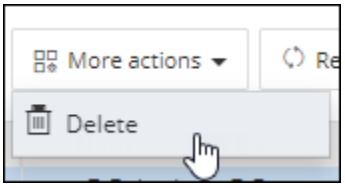
Note:

- You are allowed to check the query response for User search and Group search only when the connection is valid.
- Group search can be performed only if the customer's LDAP is of type Open LDAP. Microsoft Active Directory does not need group search configuration. For Open LDAP, group search needs to be configured mandatorily. The User return attribute in the User search section does not return the group membership details.
- In the case of multiple LDAP servers, to define/update the order in which the servers will be authenticated, drag and drop the entries in this table.

Deleting a LDAP Configuration

To delete a LDAP configuration:

1. On the **RBAC Journey :: Authentication** page, from the table of LDAP configurations, to delete a LDAP configuration, select the check box corresponding to that entry.
2. From the **More actions** drop-down menu, click **Delete**.



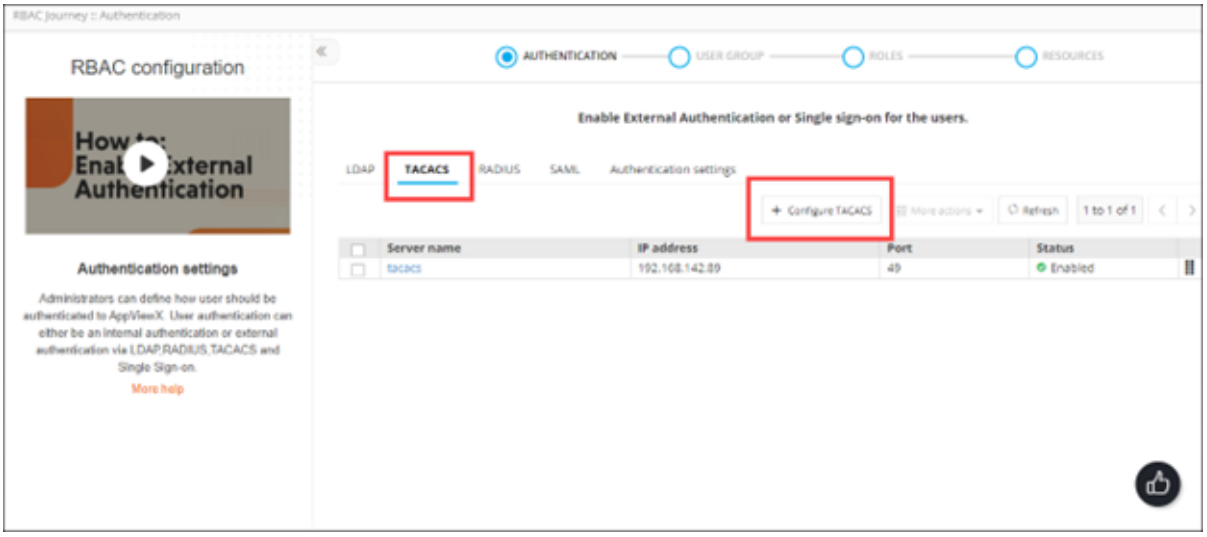
3. In the **Confirmation** dialog box, click **Delete**.
   The selected configuration is deleted.

Configuring Role-Based Access Control for TACACS

To configure RBAC for TACACS authentication:

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1. On the **RBAC Journey :: Authentication** page, click the **TACACS** tab and click **Configure TACACS**.



The **Configure TACACS** action pane is displayed.

2. Enter the field information as shown in the table below:

Field descriptions for TACACS Test connection

Field	Description
***Server name**	Name of the TACACS server.
***IP address**	IP address of the TACACS server.
***Port**	Port number of the TACACS server
*: *Mandatory fields*	

3. To test the connectivity between AppViewX and the IP address mentioned above, click **Test connection**.
4. Enter the field information as shown in the table below::

Field descriptions for TACACS

Field	Description
***Secret key**	A unique key for authentication between the AppViewX server and the TACACS server.
***Service**	Name of the service used by the user requested to be authorized. Specifying the service name is mandatory because it enables the TACACS + server to behave according to the type of each authorization request.

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Field	Description
	Commonly, the Point-to-Point Protocol (PPP) is used for authorization checks.
***Protocol**	The protocol associated with the value specified in Service Name, which is a subset of the associated service being used for client authorization or system accounting Commonly, the Internet Protocol (IP) is used as the modifier with PPP to indicate the protocol layer for authorization check.
***Authorization Attribute Name**	Attribute that will be returned from the TACACS server to authenticate and authorize the connection between the AppViewX server and the TACACS server.
*: *Mandatory fields*	

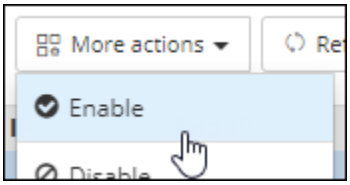
5. To save the TACACS authentication settings, click **Add** and to reconfigure the settings, click **Reset**.
   The TACACS authentication settings thus configured are saved and displayed in the table.

> **Note:** In the case of multiple TACACS servers, to define/update the order in which the servers will be authenticated, drag and drop the entries in this table.

Enabling a TACACS Configuration

To enable a TACACS configuration:

1. On the **RBAC Journey :: Authentication** page, click the **TACACS** tab.
2. From the table of TACACS configurations, for the configuration you want to enable, select the check box corresponding to that entry.
3. From the **More actions** drop-down menu, click **Enable**.



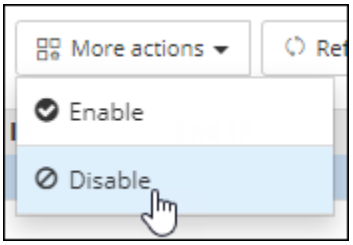
4. In the **Confirmation** message dialog box, click **Proceed**.
   The selected configuration is enabled.

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Disabling a TACACS Configuration

To disable a TACACS configuration:

1. On the **RBAC Journey :: Authentication** page, click the **TACACS** tab.
2. From the table of TACACS configurations, for the configuration you want to disable, select the check box corresponding to that entry.
3. From the **More actions** drop-down menu, click **Disable**.

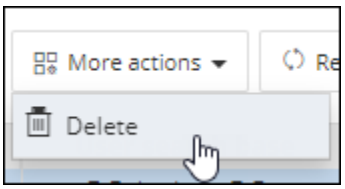


4. In the **Confirmation** message dialog box, click **Proceed**.
   The selected configuration is disabled.

Deleting a TACACS Configuration

To delete a TACACS configuration:

1. On the **RBAC Journey :: Authentication** page, click the **TACACS** tab.
2. From the table of TACACS configurations, for the configuration you want to delete, select the check box corresponding to that entry.
3. From the **More actions** drop-down menu, click **Delete**.



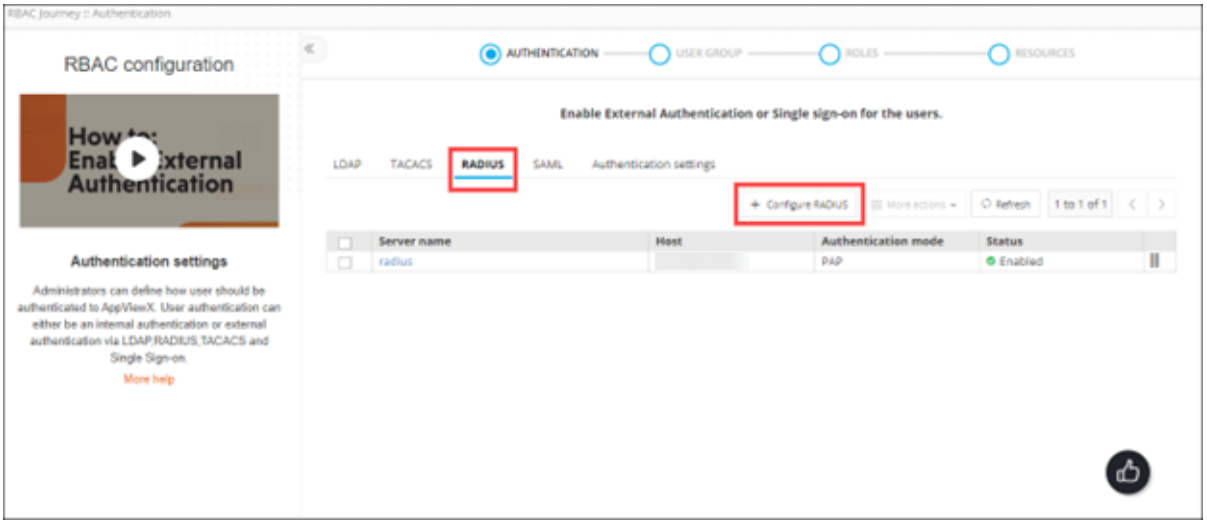
4. In the **Confirmation** message dialog box, click **Proceed**.
   The selected configuration is deleted.

Configuring Role-Based Access Control for RADIUS

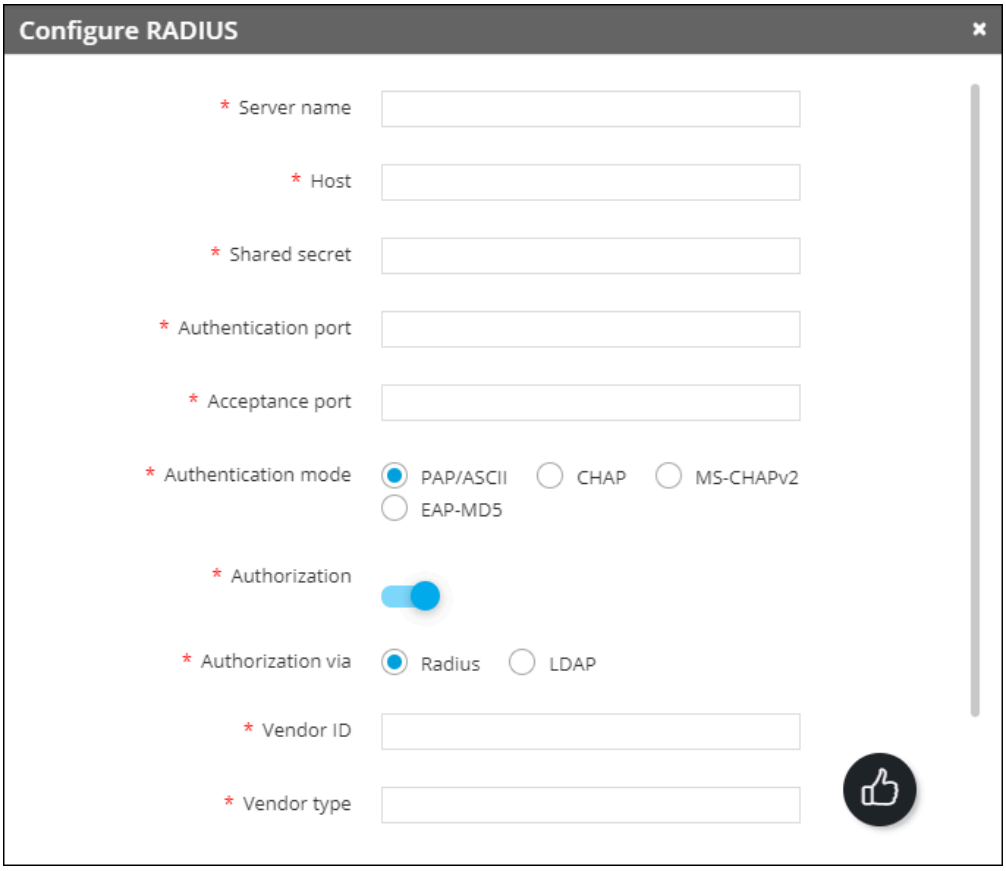
To configure RBAC for RADIUS authentication:

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1. On the **RBAC Journey :: Authentication** page, click the **RADIUS** tab and click **Configure RADIUS**.



The Configure RADIUS action is displayed.



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Field descriptions for RADIUS

Field	Description
***Server Name**	Name of the RADIUS server.
***Host**	The IP address of the RADIUS server.
***Shared secret**	A unique key for authentication between the AppViewX server and the RADIUS server.
***Authentication port**	Port number that AppViewX will use for authentication. The default authentication port number is 1812. Please check with your sysadmin if your organization uses a different port number.
***Acceptance port**	Port number that AppViewX will use to accept a response from the RADIUS server. The default acceptance port number is 1813. Please check with your sysadmin if your organization uses a different port number.
***Authentication mode**	Select one of the following authentication modes: • PAP/ASCII • CHAP • MS-CHAPv2 • EAP-MD5. **Note:** Ensure that the selected authentication mode is also confirmed in the RADIUS server settings.
Authorization via	Select from one of the following authorization modes: • RADIUS • LDAP. This field is enabled only when the Authorization toggle is turned on.
***Vendor ID**	Enter the vendor ID. This field is enabled only when the Authorization toggle is turned on and authorization is done via the RADIUS server.

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Field	Description
	Note: AppViewX does not have a unique vendor ID. We use a free vendor ID: **500**. Ensure that this is configured as part of the RADIUS server settings.
***Vendor type**	Enter the vendor type. This field is enabled only when the Authorization toggle is turned on and authorization is done via the RADIUS server. **Note:** AppViewX does not have a unique vendor type. We use a free vendor ID: **200**. Ensure that this is configured as part of the RADIUS server settings.
***LDAP**	From the dropdown menu, select the LDAP server to be used for the authorization. This field is enabled only when the Authorization toggle is turned on and authorization is done via the LDAP server.
*: *Mandatory fields*	

2. To save the RADIUS authentication settings entered above, click **Add** or to reconfigure the settings, click **Reset**.
   The RADIUS authentication settings thus configured are saved and displayed in the table.

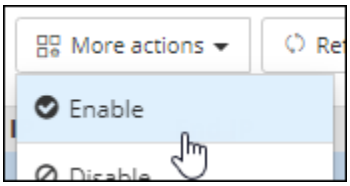
Note: In the case of multiple RADIUS servers, to define/update the order in which the servers will be authenticated, drag and drop the entries in this table.

Enabling a RADIUS Configuration

To enable a RADIUS configuration:

1. On the **RBAC Journey :: Authentication** page, click the **RADIUS** tab.
2. From the table of RADIUS configurations, for the configuration you want to enable, select the check box corresponding to that entry.
3. From the **More actions** drop-down menu, click **Enable**.

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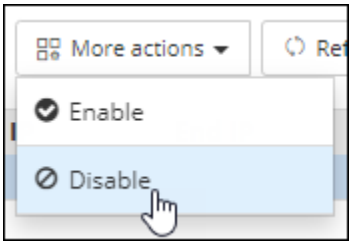


4. In the **Confirmation** message dialog box, click **Proceed**.
   The selected configuration is enabled.

Disabling a RADIUS Configuration

To disable a RADIUS configuration:

1. On the **RBAC Journey :: Authentication** page, click the **RADIUS** tab.
2. From the table of RADIUS configurations, for the configuration you want to disable, select the check box corresponding to that entry.
3. From the **More actions** drop-down menu, click **Disable**.

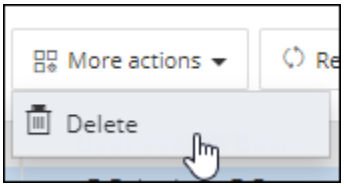


4. In the **Confirmation** message dialog box, click **Proceed**.
   The selected configuration is disabled.

Deleting a RADIUS Configuration

To delete a RADIUS configuration:

1. On the **RBAC Journey :: Authentication** page, click the **RADIUS** tab.
2. From the table of RADIUS configurations, for the configuration you want to delete, select the check box corresponding to that entry.
3. From the **More actions** drop-down menu, click **Delete**.



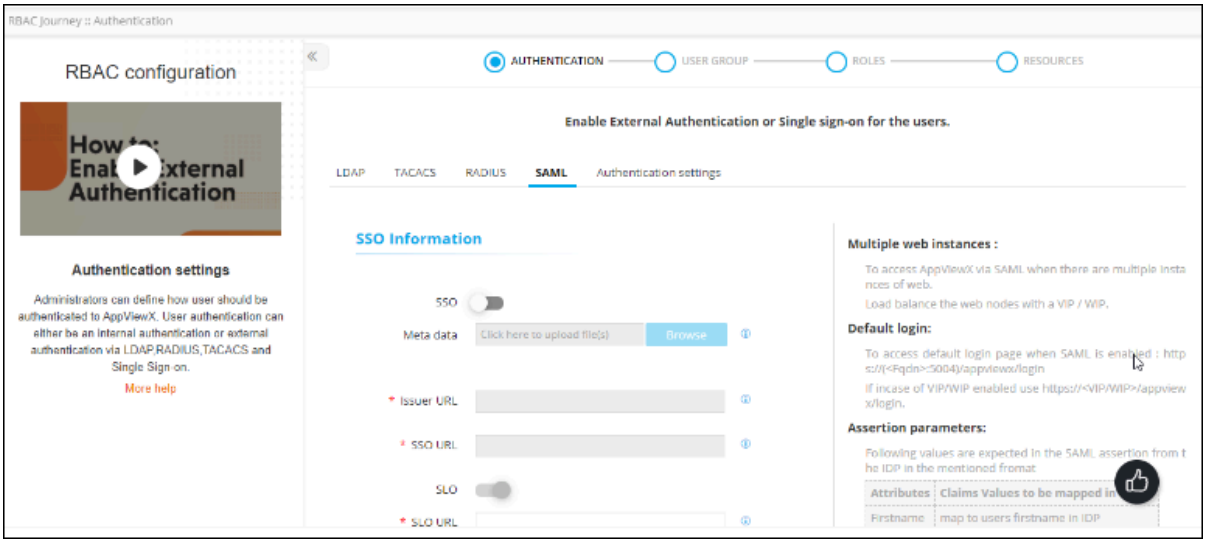
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4. In the **Confirmation** message dialog box, click **Proceed**.
   The selected configuration is deleted.

Configuring Single Sign On Settings with AppViewX

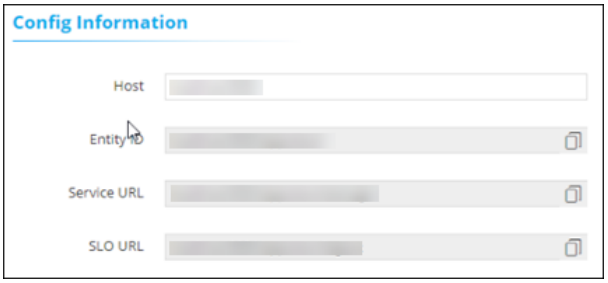
To configure single sign on settings with AppViewX:

1. On the **RBAC Journey :: Authentication** page, click the **SAML** tab.



2. In the **SSO Information** section, enter the following details:

Field descriptions for SSO Information

Field	Description
SSO	To use SAML authentication for Single Sign On, turn on the **SSO** toggle. The **Config Information** section is displayed with the field information auto-populated as shown below: 

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Field	Description
Metadata	To import an identity provider (IdP): a. Click **Browse**. b. Navigate to the location where the XML metadata file is stored. c. To upload the file, click **Open**. **Note:** You can also copy and paste the metadata information from the XML file into the metadata contents text boxes in the **Config Information** section.
***Issuer URL**	Entity ID of the IdP. This field is enabled only when the **SSO** toggle in the **SSO Information** section is turned on.
***SSO URL**	For AppViewX to send the authentication request, enter the URL of the protected endpoint provided by your IdP. This field is enabled only when the **SSO** toggle in the **SSO Information** section is turned on.
SLO	To enable single log out, turn on the **SLO** toggle. This will log out the user from AppViewX and the IdP.
***SLO URL**	URL of the IdP protocol endpoint. This field is enabled only when the **SSO** toggle in the **SSO Information** section is turned on. **Note:** This field is mandatory only when the **SLO** toggle in the **SAML details** section is turned on.
***Upload certificate**	To upload a certificate: a. Click **Browse Certificate**. b. Navigate to the location of the **.pem** certificate file. c. Select the certificate file to be uploaded and click **Open**.The selected certificate is uploaded.

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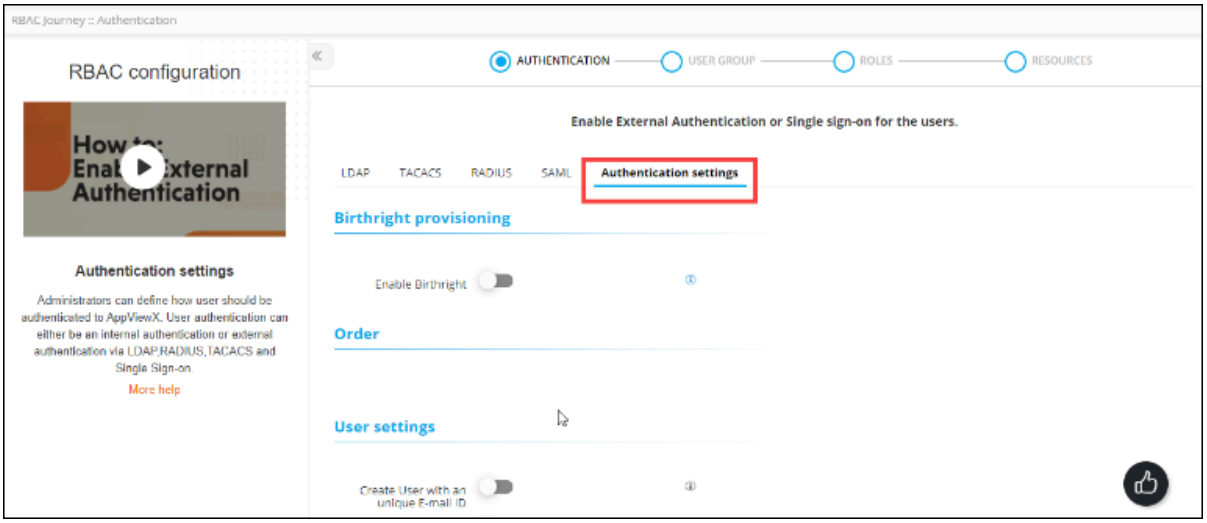
Field	Description
	This field is enabled only when the **SSO** toggle in the **SSO Information** section is turned on. **Note:** A certificate is to be uploaded only when the certificate of the IDP is not available as a part of the metadata.
Local authorization	To enable SAML only authentication in IdP and for authorization to be carried out in AppViewX, enable this toggle key. **Note:** Authorization can be done by assigning user groups manually to the user or enabling birthright role.
*: *Mandatory fields*	

3. To save the SAML authentication settings, click **Save**.
4. To cancel the authentication settings, click **Cancel**.

Configuring Authentication Settings RBAC Quick Config

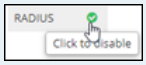
To configure the authentication settings:

1. On the **RBAC Journey :: Authentication** page, click the **Authentication Settings** tab.



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2. To enable **Birthright provisioning** for new users who log into the system with a predefined set of permissions (associated with the user group), turn on the **Enable Birthright** toggle.
3. To define the order in which the authentication settings will be checked, in the **Order** section, drag and drop the authentication labels to the required corresponding levels.
   If the level 1 check is set to Local and the level 2 check is set to LDAP, user credentials will be authenticated locally first and then on the LDAP server.

> **Note:** You can also disable, and then enable a level of authentication. To do this, click the green tick 
>
> next to the server name.

4. In the **User settings** section, enter the required field information.

Field descriptions for User settings

Field	Description
Create User an unique E-mail ID	To ensure that every AppViewX user has a unique email ID, turn on this toggle.
Create User on Authorization Failure	To create a user even if authorization fails (but the user is authenticated successfully), turn on this toggle.
Session Timeout	AppViewX lets you set a session timeout limit between 2 and 480 minutes. To set a web session timeout limit, enter the value in minutes.

5. If the AppViewX node password has been changed, in the **Node Settings** section, enter the updated Node Password.

> **Note:** The value entered in the Node Password field should be the same as the node password. To apply the changes, restart the avx-config-server pod in every datacenter.

6. Click **Save**.

Resource

The resource allows you to specify access at a granular level across all the devices and modules of AppViewX listed in this section, where the permission definitions are independent of each other. The resources can be assigned only to a User group. The resources that are assigned to the user groups will automatically inherit the permissions associated with that resource. User groups can be assigned more than one resource.

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AppViewX enables the following resource-related features:

- Dynamic rule-based resource tagging of newly discovered ADC objects, Certificates based on Query using object/Certificate fields available within in AppViewX.
- Dynamic rule-based resource tagging of newly discovered ADC objects, Certificates using a script to tag based on data available with external tools (SNOW, Other CMDB, etc.).
- Rule templates are pre-shipped to ease the rule creation to dynamically tag resources.
- Dynamically created resources can be assigned to user groups dynamically by mapping the respective rule to the required user groups as part of the Rules in Use inventory in the wizard flow.
- Manage the order of execution for the RBAC rules.
- Manage short circuit option to dynamically tag ADC objects

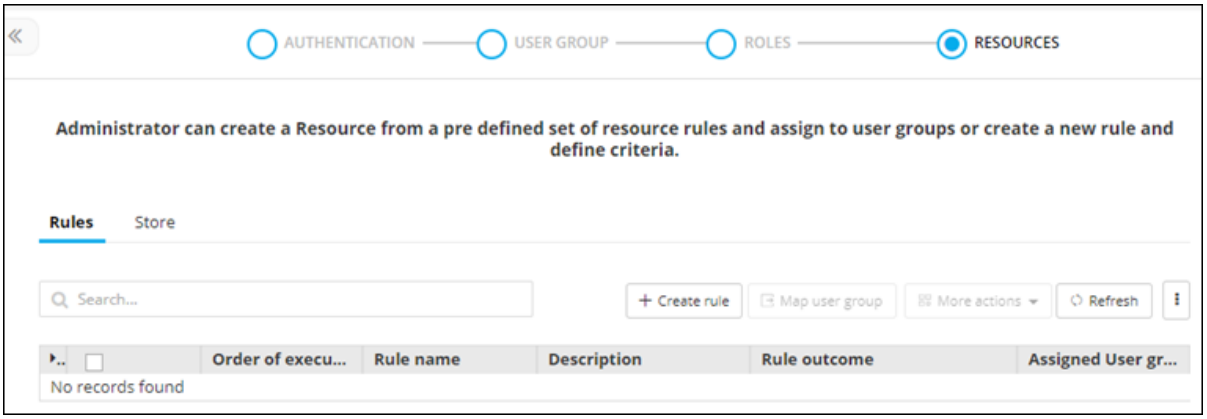
Note:

- This dynamic resource tagging is only for newly discovered ADC objects and certificates.
- Objects/Certificates and the respective permissions part of the existing resources will not be updated/changed.

Create an RBAC Rule to Tag ADC Objects Using a Query

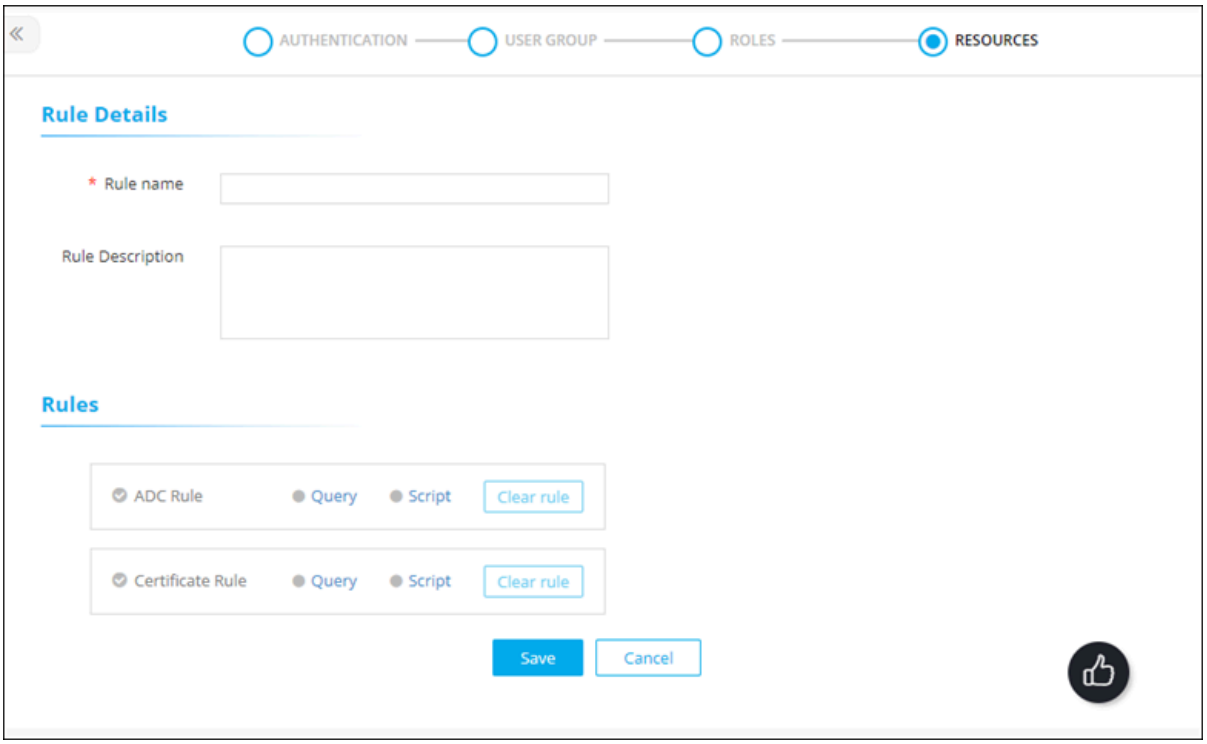
To create a RBAC rule to tag resources using a query:

1. On the **RBAC Journey :: Authentication** page, navigate to the **RESOURCES** stage as part of the wizard flow to add roles into AppViewX, with the **Rules** tab displayed by default.



2. Click + Create rule.
   The **Rules :: Create** screen is displayed.

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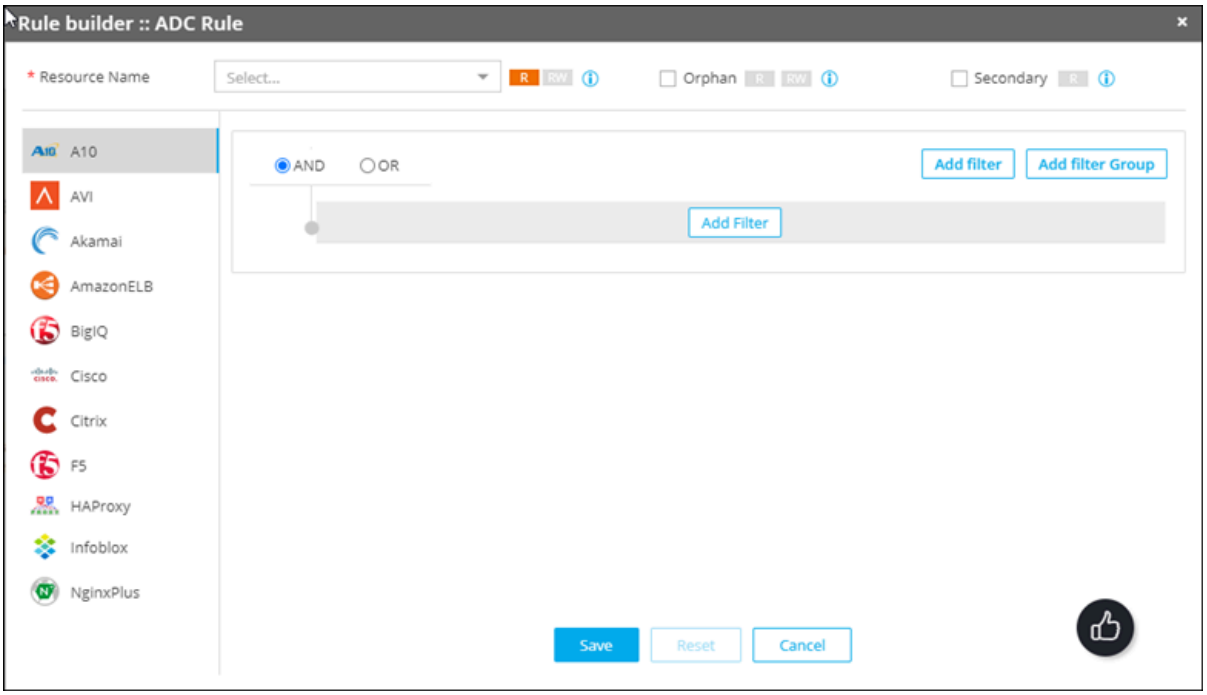
3. In the **Rule Details** section, enter the following details:

Field descriptions for Rule Details

Field	Description
***Rule Name**	Resource name.
Rule Description	Brief description of the resource/granular level accesses associated with the resource.
*: *Mandatory fields*	

4. To configure a rule to dynamically tag ADC objects using Query, in the **Rules** section, for the **ADC Rule**, select **Query**.
5. The **Rule builder :: ADC Rule** action pane is displayed.

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6. On the **Rule builder :: ADC Rule** action pane, click **Add Filter**.
7. Select the field, condition and enter the value to be monitored for dynamic tagging of ADC objects based on rule condition.

Configuring a Variable as a Filter Condition Value based on Patterns

A variable can be defined with a pattern as specified below:

1. Select any one required field, then select condition as “Variable”, define value in the format of <%variable%>. Example: A virtual server configured with the pattern vs_prod_support.appviewx.com can be defined as vs_<%variable1%>_support.appviewx.com [where <%variable1%> can match to name UAT, DEV, etc.].
2. Multiple variable definitions for the same object pattern can be defined as. vs_<%variable1%>_<%variable2%>_support.appviewx.com [where <%variable1%> can match to name UAT,DEV etc and <%variable2%> can match to name sales,marketing etc].
3. Variables can be used only across one field in a Rule.
4. Variable name should follow the below standards:
   - Only alphanumerics [A-Z, a-z, 0-9].
   - Special characters underscore [_].
   - Placeholder is <% for beginning and %> for ending.
5. Specify a resource name.

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Configuring the Resource Name

To create resources dynamically based on patterns, resource name can be configured in the following ways:

1. Provide the resource name of an existing resource by choosing the resource name from dropdown.
2. Provide a static name to the resource. [when rule matches the resource name would be created on demand].
3. Provide a pattern for the resource name. [provide the variable pattern defined in the query as the resource name].
4. Click either the R (Read-only) or RW (Read/Write) button to designate whether user groups assigned to the resource have read-only or read/write permissions on the ADC objects.

> **Note:** The ADC objects tagging has two additional fields that allow you to assign global permissions for orphan and secondary ADC objects to the resource you are creating. Users cannot assign individual permissions to orphan and secondary objects.

To enable this:

a. Next to the **Resource** name, select the checkbox beside Orphan if you want to assign global permissions for orphan objects.
b. Click either the **R** or **RW** icon to give users assigned to the resource Read-Only or Read/Write permissions on all orphan objects.
c. Select the checkbox beside **Secondary** if you want to assign global permissions for secondary objects.
d. Click the **R** icon to give user groups assigned to the resource Read-Only permissions on all secondary objects. The **RW** icon is not available because you cannot grant Read/Write access to secondary objects.
e. Click **Save**.

   Saved rules will be displayed in the **Rules** tab.

f. Go to the Rules tab by clicking on Resource in the breadcrumb.
g. Rule Summary details (Rule Name, Description, Rule Outcome) are displayed in the Rule Inventory table.
h. Enable the rule by clicking on the respective status icon for the rule to be actively running.

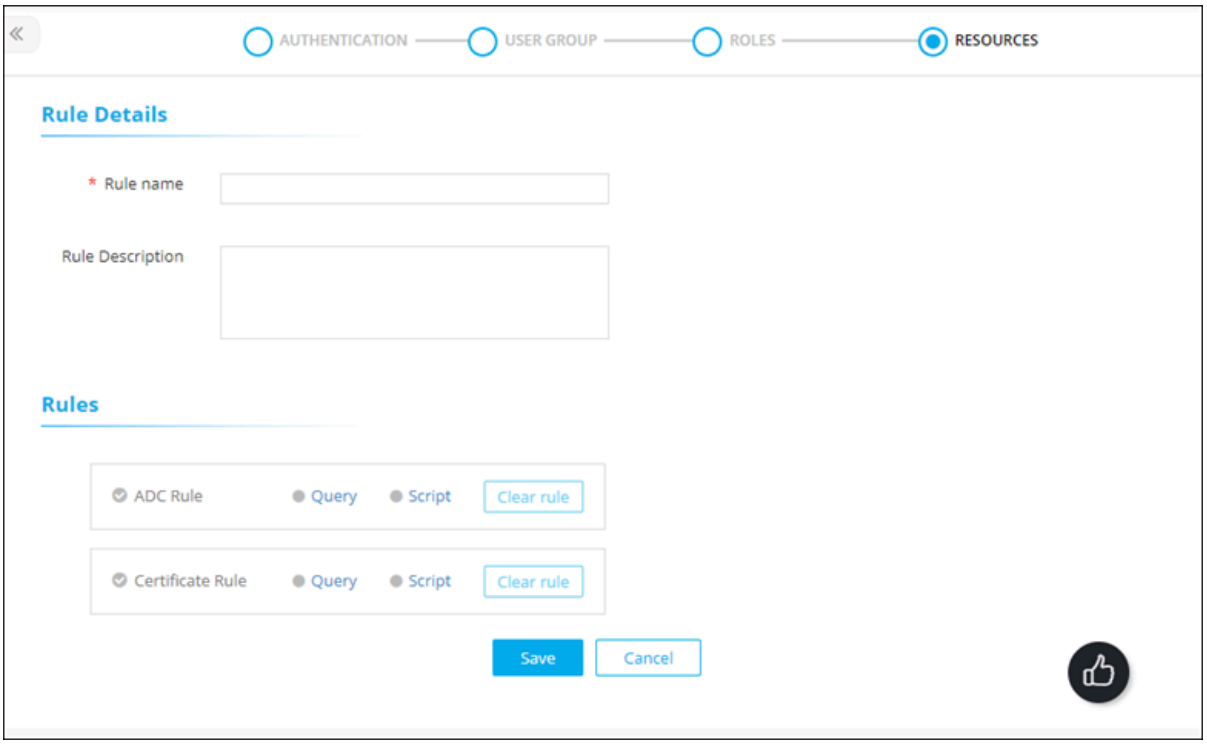
Create an RBAC Rule to Tag ADC Objects/Certificates using a Script

To create a RBAC rule to tag ADC objects/certificates using a script:

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1. On the **RBAC Journey :: Authentication** page, navigate to the **RESOURCES** stage as part of the wizard flow to add roles into AppViewX, with the **Rules** tab displayed by default.
2. Click + Create rule.

   The **Rules :: Create** screen is displayed.



3. In the **Rule Details** section, enter the following details:

Field descriptions for Rule Details

Field	Description
***Rule Name**	Resource name.
Rule Description	Brief description of the resource/granular level accesses associated with the resource.
*: *Mandatory fields*	

4. In the Rules section, choose the ADC Rule and select 'Script' to configure a rule for dynamically tagging ADC objects using a Query.
5. Configure the details of the script, provide a resource name and assign required permissions. For ADC Objects, Orphan and Secondary objects need to be assigned globally. For Certificates, Certificate Group Name need to be provided.
6. Click **Save**.

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Saved rules will be displayed in the **Rules** tab.

7. Go to the Rules tab by clicking on Resource in the breadcrumb. Rule Summary details (Rule Name, Description, Rule Outcome) are displayed in the Rule Inventory table.
8. Enable the rule by clicking on the respective status icon for the rule to be actively running.

Configuring the Certificate Group Name

To create certificate groups dynamically based on patterns, the certificate group name can be configured in the following ways:

1. Provide the certificate group name of an existing resource by choosing the certificate group name from the dropdown menu.
2. Provide a static name to the certificate group name. [When rule matches the resource name would be created on demand].
3. Provide a pattern for the certificate group name. [Provide the variable pattern defined in the query as the resource name].

For example, Resource_<%variablename%> | <%variablename%>_Resource | <%variablename%>

Configuring the Resource Name Based on Patterns

To create resources dynamically based on patterns, the resource name can be configured in the following ways:

1. Provide the Resource Name of an existing resource by choosing the Resource Name from Drop Down.
2. Provide a Static Name to the Resource. [When Rule matches the Resource Name would be created on Demand].
3. Provide a Pattern for the Resource Name. [Provide the variable pattern defined in the Query as the Resource Name]. For example, Resource_<%variablename%> | <%variablename%>_Resource | <%variablename%>.
4. Click either the R (Read-only) or RW (Read/Write) button to designate whether user groups assigned to the resource have read-only or read/write permissions on the certificate groups.
5. When you are finished configuring the Certificate rule, click Save. Saved rules will be displayed in the Rules tab.
6. Go to the Rules tab by clicking on Resource in the breadcrumb. Rule Summary details (Rule Name, Description, Rule Outcome) are displayed in the Rule Inventory table.
7. Enable the rule by clicking on the respective status icon for the rule to be actively running.

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Clone a Rule

To clone a rule:

1. On the **RBAC Journey :: Authentication** page, navigate to the **RESOURCES** stage as part of the wizard flow to add roles into AppViewX, with the **Rules** tab displayed by default.
2. For the resource you want to clone, select the check box against that resource.
3. From the **More actions** drop-down menu, click **Clone**.
4. In the **Clone** rules dialog box, enter a name for the cloned rule and click **Save**.
   Rule details will be closed and will be opened in edit mode for any further modification on description/ rule conditions.
5. Once the rule is saved, enable the rule by clicking on the respective status icon for the rule to be actively running in the rules inventory table.

Delete a Rule

To delete a rule:

1. On the **RBAC Journey :: Authentication** page, navigate to the **RESOURCES** stage as part of the wizard flow to add roles into AppViewX, with the **Rules** tab displayed by default.
2. For the resource you want to delete, select the check box against that resource.
3. From the **More actions** drop-down menu, click **Delete**.
4. In the **Confirmation** dialog box, click **Yes**.

RBAC Rule Mapping to User Groups to Dynamically Provide Access for Resources to User Groups

To create a RBAC rule to dynamically provide access for resources to user groups:

1. On the **RBAC Journey :: Authentication** page, navigate to the **RESOURCES** stage as part of the wizard flow to add roles into AppViewX, with the **Rules** tab displayed by default.
2. For the resource you want to map to user groups, select the check box against that resource.
3. Click 

.
4. In the **Map user group** action pane, select the user groups the resource will be mapped to.
5. Click **Save**.

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Managing Order of Execution and Short Circuit Configuration for Rules

For managing the order of rule execution to avoid conflicts across multiple rules matching similar conditions and tag to expected resources:

1. In the rule inventory table, click and hold a rule name and drag it up or down to change the order of execution of rules in use in the system.
2. The order will be automatically saved or click the up or down arrows beside each rule name to update the rule execution order.

Key points for consideration:

- Order of execution needs to be maintained by the user only to manage certificates tagged to expected certificate groups configured part of a rule, as certificates can’t be part of multiple certificate groups.
- Based on the order of execution and matching rule condition, certificates will be only tagged to the certificate group at the top of rule execution order even though other RBAC rules down the order have a matching condition.
- Order of execution also needs to be maintained by the user for ADC objects tagging to a specific resource only when Short circuit option is turned on for ADC.
  - By default, a short circuit will be turned off for ADC as ADC objects can be tagged to multiple resources. There is no such restriction for ADC as it is existing for a certificate tagging. For certificates, a short circuit will always be turned on and can’t be changed by the user.
  - To enable a short circuit for ADC, click More icon under the Rules Inventory>> Enable Short Circuit for ADC.

Role

Each role assigns a specific set of permissions relating to the modules that can be accessed and the tasks that can be performed in each AppViewX module. The roles can be assigned only to a User group. The user groups that are assigned with a role will automatically inherit all the associated permissions. User groups can be assigned more than one role.

AppViewX enables the following role-related features:

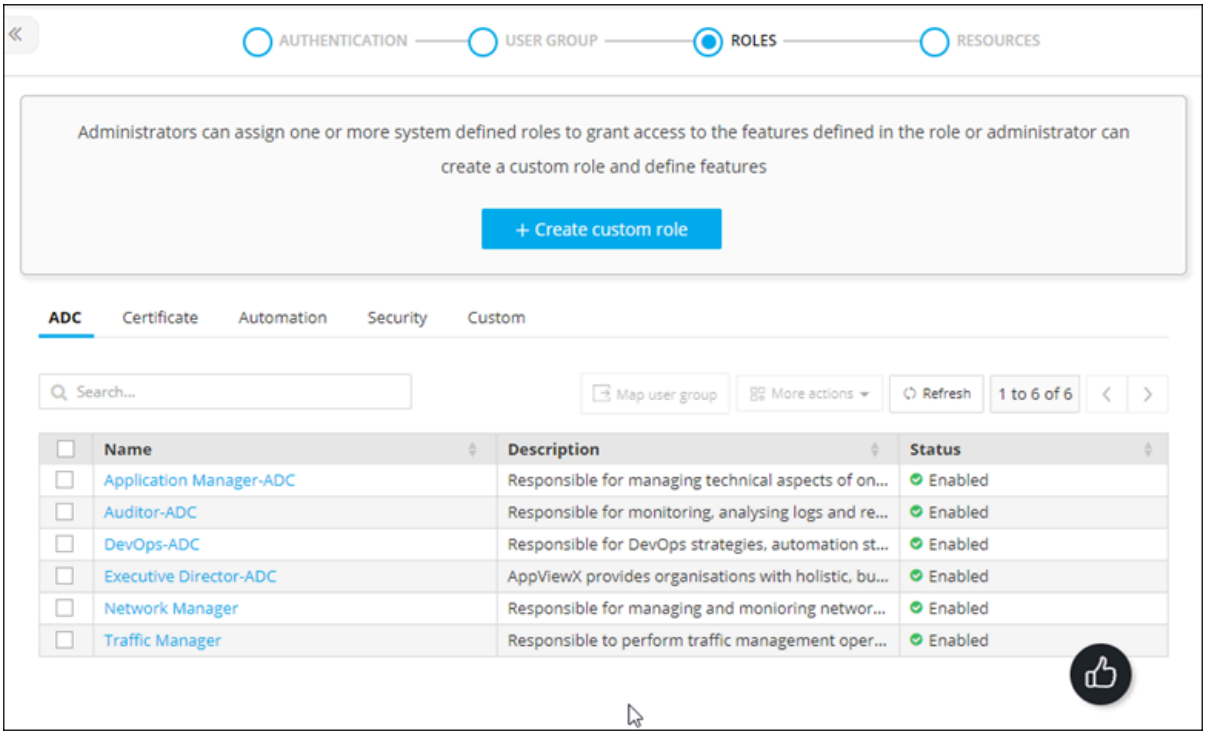
- Out of the Box (OOB) roles are available for ADC, Certificates, Security, and Automation modules.
- OOB roles can be cloned, enabled, and disabled. OOB roles can’t be updated/deleted.
- Administrators can also create custom roles. Custom roles can be updated, deleted, enabled and disabled.
- Users can either use OOB roles (if suits their needs) or custom roles to map to user groups.

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Creating a Custom Role

To create a custom role:

1. On the **RBAC Journey :: Authentication** page, navigate to the **ROLES** stage as part of the wizard flow to add roles into AppViewX.



2. Click **Create custom role**.
   The **Create custom role** action pane is displayed.
3. Under the **Information** tab, enter the following details:

Field descriptions for Information

Field	Description
***Name**	Role name.
Description	Brief description of what users assigned to the role can do and/or what features or functionalities are associated with the role.
*: *Mandatory fields*	

4. Click **Save**.
5. In the **Authorized functions** section, select the check box against the functionalities that you want to associate with the role.

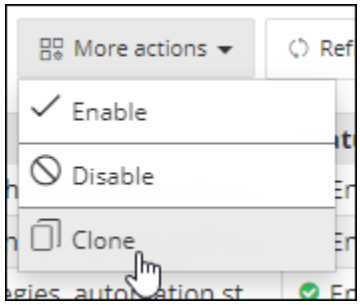
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6. To assign functions at a granular level, click the icon for the functions check box and then select individual sub-options within the functions.
7. Click **Save**.

Cloning a Role

To clone an existing role to a custom role:

1. On the **RBAC Journey :: Authentication** page, navigate to the **ROLES** stage as part of the wizard flow to add roles into AppViewX.
2. For the role, you want to clone, select the check box against that role.
3. From the **More actions** drop-down menu, select **Clone**.



4. In the **Clone** action pane, modify the details in the **Information** and **Authorized functions** sections as required.
5. Click **Save**.

Modifying a Role

To modify a custom role:

1. On the **RBAC Journey :: Authentication** page, navigate to the **ROLES** stage as part of the wizard flow to add roles into AppViewX.
2. Click the role name you want to modify.
3. The **Edit role** action pane is displayed for the selected role.
4. Modify the details in the **Information** and **Authorized functions** sections as required.
5. Click **Save**.

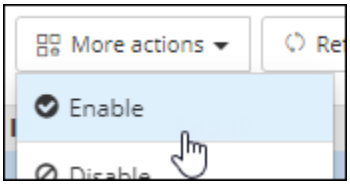
> **Note:** Out of the box role functions can not be edited. Only custom role functions can be edited.

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Enabling a Role

To enable a role:

1. On the **RBAC Journey :: Authentication** page, navigate to the **ROLES** stage as part of the wizard flow to add roles into AppViewX.
2. To enable a role, select the check box against that role.
3. From the **More actions** dropdown menu, select **Enable**.



4. In the **Enable** role(s) dialog box, click **Yes**.

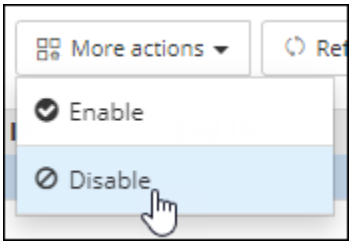
Disabling a Role

Note:

- You cannot disable roles that have active users associated with them.
- The users associated with a disabled role through a user group will not be allowed to log in to AppViewX.

To disable a role:

1. On the **RBAC Journey :: Authentication** page, navigate to the **ROLES** stage as part of the wizard flow to add roles into AppViewX.
2. To disable a role, select the check box against that role.
3. From the **More actions** dropdown menu, select **Disable**.



4. In the **Disable** role(s) dialog box, click **Yes**.

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Mapping Role to User Groups

To map roles to user groups:

1. On the **RBAC Journey :: Authentication** page, navigate to the **ROLES** stage as part of the wizard flow to add roles into AppViewX.
2. For the role, you want to map to user groups, select the check box against that role.
3. Click 

.
4. In the **Mapping user group** action pane, select the user groups the role will be mapped to.
5. Click **Save**.
   The saved list of user groups will be displayed as a hyperlink in the rule inventory for each group.

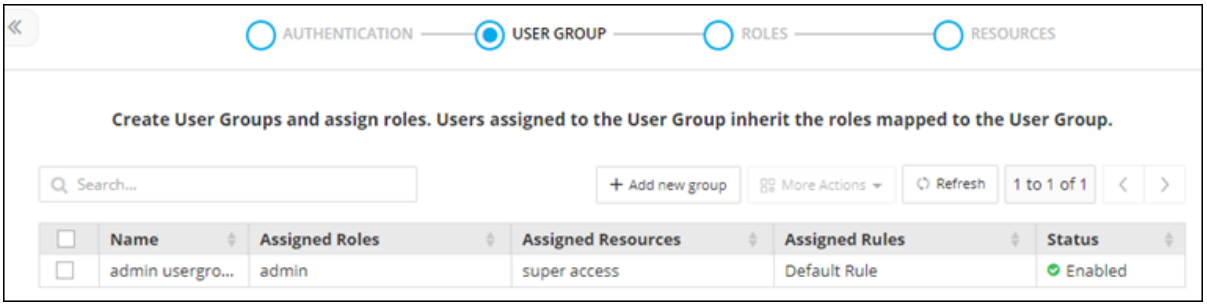
User Group

A user group is a group of individuals that have access to the same roles and resources. When you associate a role and resource with a user group, the users within that user group are granted all of the roles and resources' corresponding privileges and permissions. User Groups can be created manually or synced from the Active Directory or can be bulk uploaded using a spreadsheet.

Note: You can associate the roles and resources only with the user groups.

Once Authentication details are configured:

1. Go to the **User Group** stage as part of the wizard flow to add user groups into AppViewX.



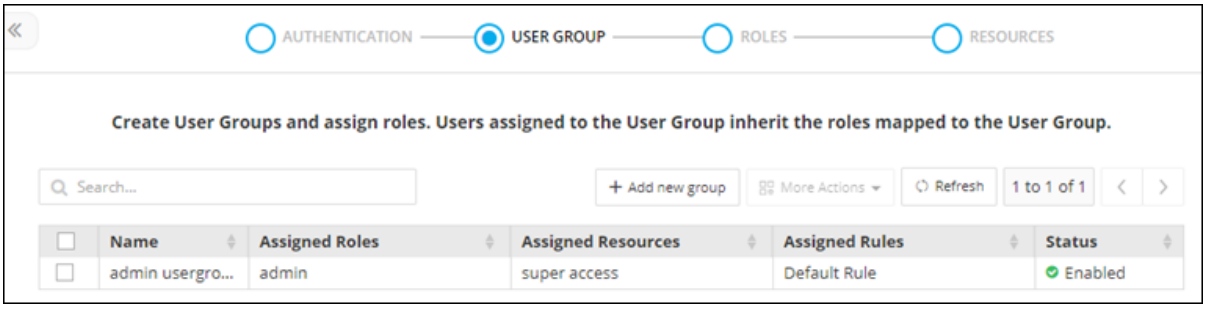
   The User group inventory table is displayed with the list of available user groups in AppViewX along with corresponding roles and resources mapping.
2. In the User group stage, user group creation can be done by fetching groups from LDAP or through bulk import.
3. In addition to this, existing user groups can be cloned, enabled, disable, and deleted.

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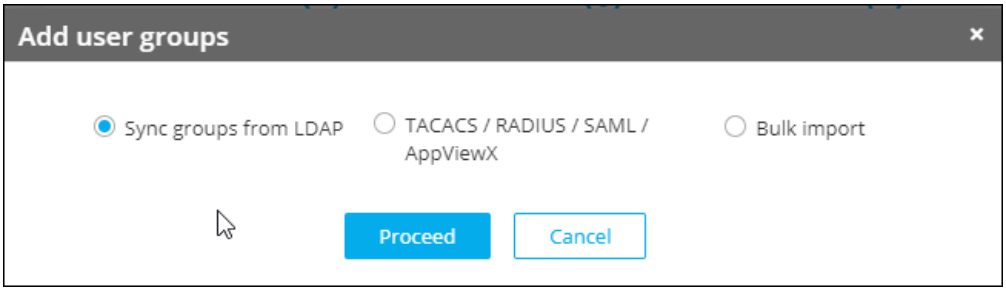
Adding a New User Group by Syncing Groups from LDAP

To create a new user group by syncing groups from LDAP:

1. On the **RBAC Journey :: Authentication** page, navigate to the **USER GROUP** stage as part of the wizard flow to add user groups into AppViewX.

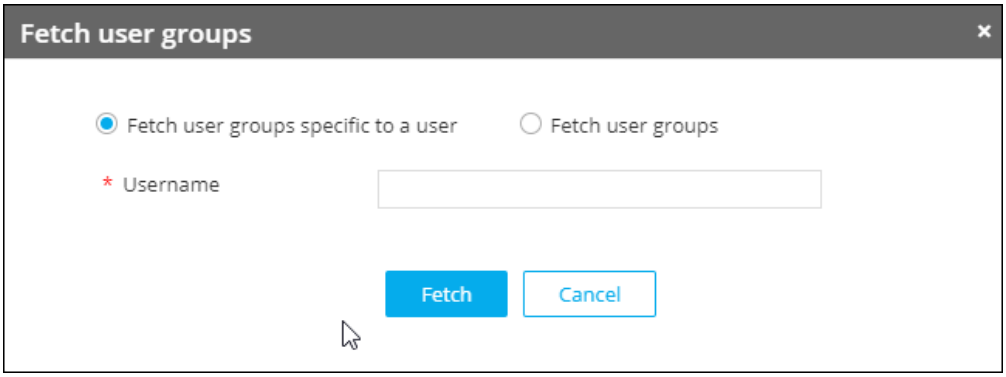


2. Click + Add new group.
3. From the **Add user groups** dialog box, select **Sync groups from LDAP** and click **Proceed**.



The LDAP inventory table is displayed.

4. To view the user groups available in the AD and create or map them with the existing user groups in AppViewX, from the LDAP inventory table, click Fetch.
The **Fetch user groups** dialog box is displayed.



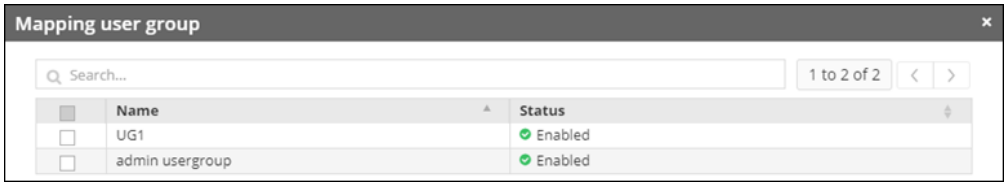
5. In the **Fetch user groups** dialog box:

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- To fetch user groups according to a specific user, select **Fetch user groups specific to a user** and enter the **Username** of the AD user.
- To fetch user groups by a specific name, select **Fetch user groups** and type the **User group name** from the AD.

> **Note:** You can search the user group either by entering the complete user group name or using wild card characters (*).

6. Click **Fetch**.
   A table containing the AD group names and their corresponding AppViewX user group names is displayed.
7. Select the AD user group(s) that must be created with the same name in AppViewX and click Save to Appviewx.
8. To select the AD user group(s) to be mapped with the existing AppViewX user group:
   a. Select the user group to be mapped with the existing AppViewX user group.
   b. From the **More actions** list, select **Create Map**.
   c. From the **Mapping user group** action pane, select the existing AppViewX user group to be mapped.



   d. Click **Save**.

   Selected AD user group(s) will be now mapped to the existing AppViewX user group and the same mapping will reflect in the AD group names table.

9. To export specific AD groups:
   a. Select the user group to be mapped with the existing AppViewX user group. From the **More actions** list, select **Export**.
   b. From the **Export user groups** action pane, select the **Selected group (S)** option and click **Yes**.
   c. To export all user groups, select the **All User Group(s)** option and click **Yes**.
   d. The selected/all user group(s) should be automatically exported in (.CSV) Format.

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Adding a New User Group using the TACACS/ RADIUS/ SAML/ AppViewX Option

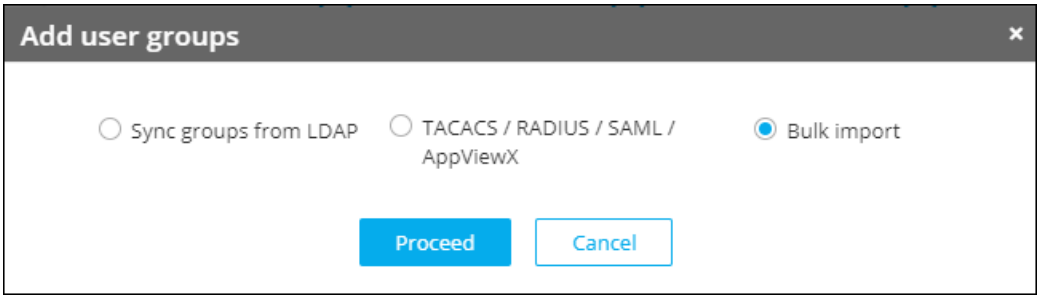
To create a new user group using the TACACS/RADIUS/SAML/AppViewX option:

1. On the **RBAC Journey :: Authentication** page, navigate to the **USER GROUP** stage as part of the wizard flow to add user groups into AppViewX.
2. Click + Add new group.
3. From the **Add user groups** dialog box, select **TACACS/RADIUS/SAML/AppViewX** and click **Proceed**.
4. Enter the **Name** and **Description** for the user group.
5. Click **Submit**.

Add New User Group by Bulk Import

To add a new user group using the bulk import feature:

1. On the **RBAC Journey :: Authentication** page, navigate to the **USER GROUP** stage as part of the wizard flow to add user groups into AppViewX.
2. Click + Add new group.
3. From the **Add user groups** dialog box, select **Bulk import**, and then click **Proceed**.



4. Click **Browse**.
5. To upload your CSV file, in the **Select a file** field, click **Browse**.

> **Note:** To view the sample file for the formatting of the CSV file, click .

6. Click **Upload**. User group validation is performed on the imported user groups and the validation status (Valid/Invalid) is displayed.

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> **Note:** The validation status can be invalid for reasons like duplicate group name, invalid group name (group name does not meet the group naming criteria, and so on).

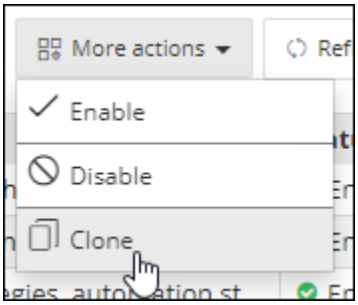
7. To save the user groups, select the list of user groups and click **Submit**.
   All user groups with the valid status will be saved into AppViewX.

> **Note:** Once you go back to the User group inventory table, you need to re-upload the file to add the user group.

Cloning a User Group

To clone a user group:

1. On the **RBAC Journey :: Authentication** page, navigate to the **USER GROUP** stage as part of the wizard flow to add user groups into AppViewX.
2. From the inventory table, select the user group to be cloned.
3. From the **More Actions** drop-down menu, select **Clone**.



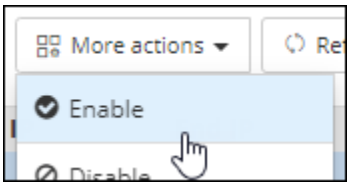
4. In the **Clone** dialog box, enter a name for the cloned user group and update the description, if required.
5. Click **Save**.

Enabling a User Group

To enable a user group:

1. On the **RBAC Journey :: Authentication** page, navigate to the **USER GROUP** stage as part of the wizard flow to add user groups into AppViewX.
2. From the inventory table, select the user group to be enabled.
3. From the **More Actions** drop-down menu, select **Enable**.

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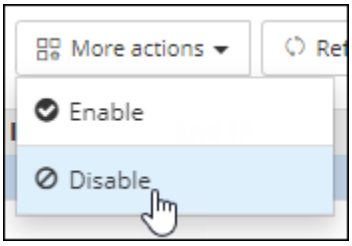


4. From the **Enable user group** dialog box, click **Yes**.

Disabling a User Group

To disable a user group:

1. On the **RBAC Journey :: Authentication** page, navigate to the **USER GROUP** stage as part of the wizard flow to add user groups into AppViewX.
2. From the inventory table, select the user group to be disabled.
3. From the **More Actions** drop-down menu, select **Disable**.

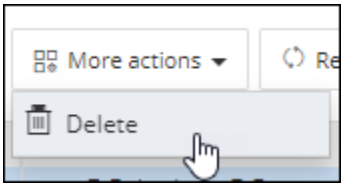


4. From the **Disable user group** dialog box, click **Yes**.

Deleting a User Group

To delete a user group:

1. On the **RBAC Journey :: Authentication** page, navigate to the **USER GROUP** stage as part of the wizard flow to add user groups into AppViewX.
2. From the inventory table, select the user group to be deleted.
3. From the **More Actions** drop-down menu, select **Delete**.



4. From the **Delete user group** dialog box, click **Yes**.

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Managing Users

A user is an individual who has access to AppViewX using a unique username and password maintained internally or by an external enterprise server such as Active Directories (AD).

To create user accounts, you must be assigned the Administrator role. Administrators can define how users should be authenticated to AppViewX. User authentication can either be an internal authentication or external authentication via LDAP, RADIUS, TACACS, and Single Sign-on.

Note: You must add a user to the user group as the roles and resources cannot be directly associated with the user.

Accessing the User Page

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **IDENTITY**, select **User**. The **User** page is displayed, with all the user groups listed with their **Name**, **Full Name**, and other related information.	From the main navigation menu, select **Account** > **User**. The **User** page is displayed, with all the user groups listed with their **Name**, **Full Name**, and other related information.
For more information on how to switch between menus, click here.	

Note: In the User Inventory:

- A delegated admin sees has access to users created by or under their delegated group.
- Users from other delegated groups or higher levels are completely hidden.

For more information, see RBAC Delegation.

Creating a User

To create a user:

1. On the **User** page, from the top right corner of the screen, click 

(Add) icon.
   The **Add** page is displayed, with the **Information** tab open by default.

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2. In the **Account Information** section, enter the following details:

Field descriptions for Account Information

Field	Description
***User name**	Enter the user name for the new user.
***Password**	Enter the password for the new user. The new password should have: • At least one uppercase, lowercase, and numeric character • At least one special character (~!@#$^&*_-+=\|()) • 12 to 128 characters. The new password should not contain: • The user name • The same character more than three times consecutively • Blank space and special characters other than (~!@#$^&*_-+=|()).
***Confirm Password**	Reenter the password for confirmation.
Authenticate externally	To allow authentication by external enterprise servers such as LDAP, TACACS, RADIUS, and so on, select this check box. **Note:** The **Password** and **Confirm Password** fields are disabled if **Authenticate externally** option is selected.
First name	New user's first name.
Last name	New user's last name.
Description	Descriptive information about the user such as their work location, workgroup, specialty, or any other details.
*: *Mandatory fields*	

3. In the **Contact Information** section, enter the following details:

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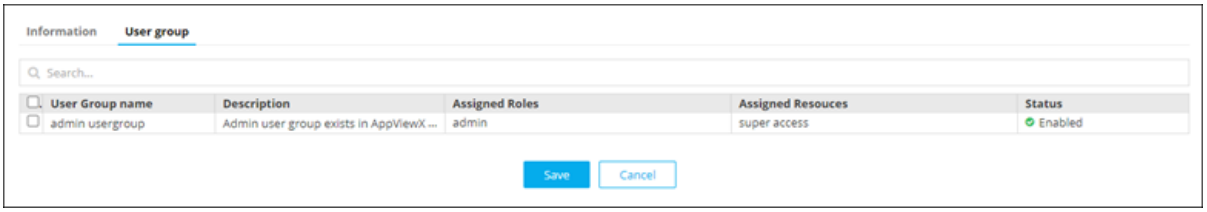
Field descriptions for Contact Information

Field	Description
***Preferred mode of contact**	From the following options, select the user's preferred mode of contact: • Email address • Phone number.
***Email address**	New user's email address.
***Phone number**	New user's phone number. **Note:** This field is required only when the preferred mode of contact is a phone number.
*: *Mandatory fields*	

4. Click **Save**.

Note: To log into AppViewX and access the product, users need to be assigned or mapped to a user group.

5. To add the user to a group, click the **User group** tab.



6. To add the user to a group, select the check box for that user group.
7. Click **Save**.
   The newly added user will appear in the User Inventory with additional information such as **Created time**, and **Modified time**.

Modifying a User

To modify a user:

1. On the **User** page, select the check box against the user you want to modify.
2. From the top right corner of the screen, click **(Modify)** icon.

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3. The **Modify** page is displayed, with the **Information** tab open by default.
4. In the **Account Information** section, update the required details:

Field descriptions for Account Information

Field	Description
***User name**	Enter the user name for the new user.
***Password**	Enter the password for the new user. The new password should have: • At least one uppercase, lowercase, and numeric character • At least one special character (~!@#$^&*_-+=\|()) • 12 to 128 characters. The new password should not contain: • The user name • The same character more than three times consecutively • Blank space and special characters other than (~!@#$^&*_-+=|()).
***Confirm Password**	Reenter the password for confirmation.
Authenticate externally	To allow authentication by external enterprise servers such as LDAP, TACACS, RADIUS, and so on, select this check box. **Note:** The **Password** and **Confirm Password** fields are disabled if **Authenticate externally** option is selected.
First name	New user's first name.
Last name	New user's last name.
Description	Descriptive information about the user such as their work location, workgroup, specialty, or any other details.
*: *Mandatory fields*	

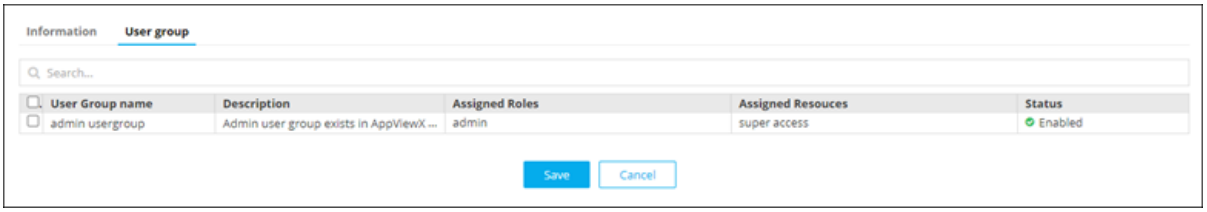
5. In the **Contact information** section, update the required details:

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Field descriptions for Contact Information

Field	Description
***Preferred mode of contact**	From the following options, select the user's preferred mode of contact: • Email address • Phone number.
***Email address**	New user's email address.
***Phone number**	New user's phone number. **Note:** This field is mandatory only if the preferred mode of contact is Phone number.
*: *Mandatory fields*	

6. Click **Save**.
7. To modify the user and user group mapping, by adding a new user group/deleting an existing user group, click the **User group** tab.



8. To add the user to a group, select the check box for that user group.
9. Click **Save**.

Deleting a User

To delete a user:

1. On the **User** page, select the check box against the user you want to delete.
2. From the top right corner of the screen, click **(Delete)** icon.
3. In the **Confirmation** dialog box, click **Yes**.
   The selected user is deleted.

Forcing Logout

To force logout a user:

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1. On the **User** page, select the check box against the user you want to delete.
2. From the top right corner of the screen, click **(Force Logout)** icon.
3. In the **Confirmation** dialog box, "*Force logout will immediately terminate the user's active sessions. Do you want to proceed?*"click **Yes**.
   The selected user is deleted.

Enabling a User

To enable a user:

1. On the **User** page, select the check box against the user you want to enable.
2. From the top right corner of the screen, click **(Enable)** icon.
3. In the **Confirmation** dialog box, click **Yes**.
   The selected user is enabled.

Disabling a User

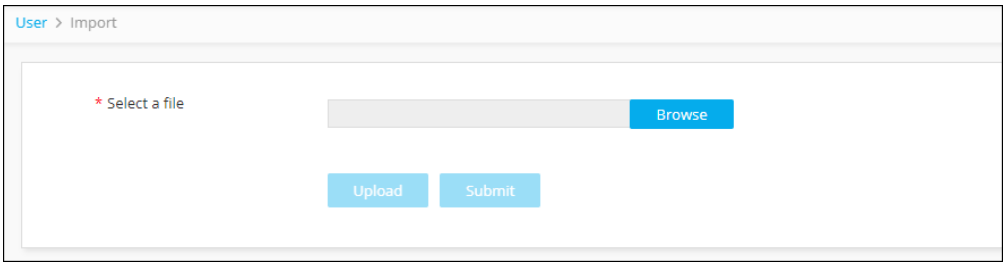
To disable a user:

1. On the **User** page, select the check box against the user you want to disable.
2. From the top right corner of the screen, click **(Disable)** icon.
3. In the **Confirmation** dialog box, click **Yes**.
   The selected user is disabled.

Importing a User

To import users into AppViewX:

1. On the **User** page, from the top right corner of the screen, click **(Import)** icon.
   The **Import** screen is displayed.



2. Click **Browse**, and then select the user file to upload.

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Note: The file must be in .csv format. To download a sample template file click the  icon on the top-right corner.

Tip: The most efficient way to import user details is to download the sample import file that is available by clicking the  (Sample file) icon in the Command bar of the Import screen, modify the contents, save it, and then import it into the system. This reduces the chance of error messages appearing during the import process.

3. Click **Upload** to see the user details displayed in the user interface.

Note: The user details displayed at this point are only for review; the user details have not been imported yet.

4. Review the details of each user in the import file. If you do not want to import specific users, deselect the checkboxes beside their names.
5. Click **Submit**.

Managing User Groups

A user group is a set of individual users assigned with the same roles and resources. You can associate one or more roles and resources to a user group. Users within that user group are granted the role and resource permissions.

Note: You can associate roles and resources only with user groups.

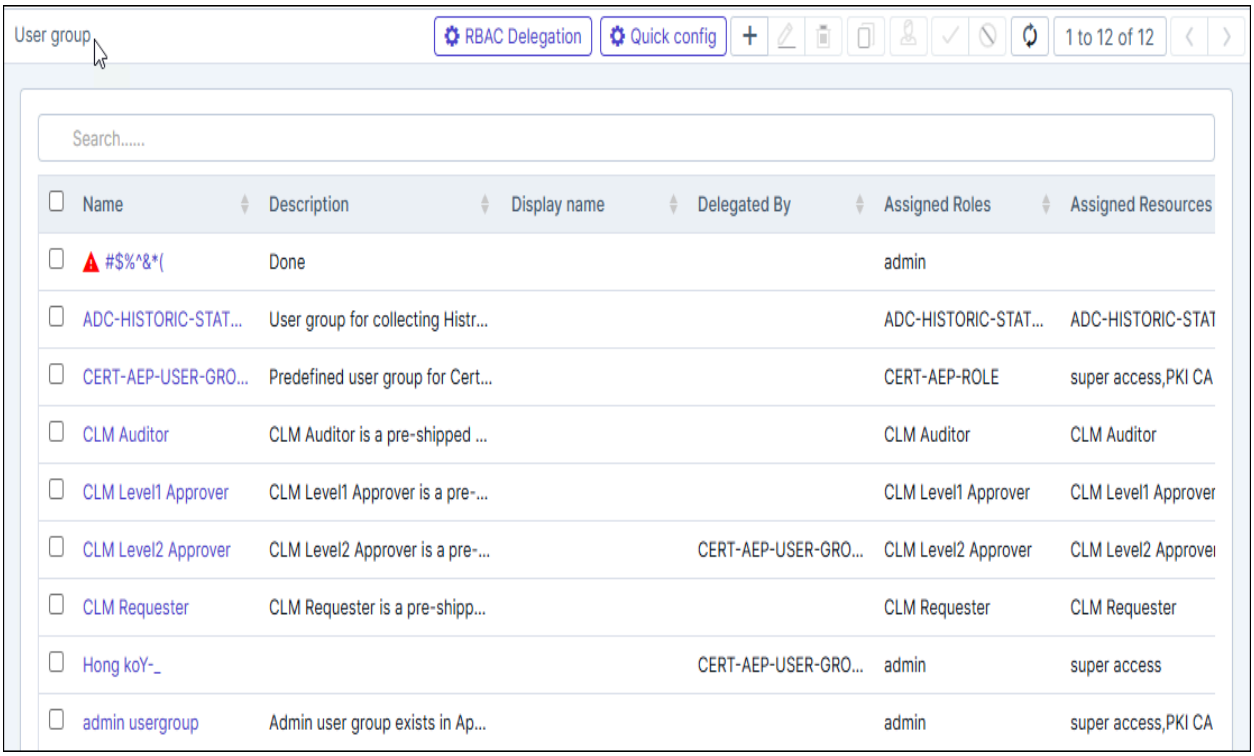
- RBAC Delegation
- Hiding OOB User Groups
- Assign Free Plan Roles and Resources to User Group

Accessing the User group Page

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **IDENTITY**, select **User group**.	From the main navigation menu, select **Account** > **User group**.

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New Menu	Old Menu
The **User Group**page is displayed, with all the user groups listed with their **Name**, **Description**, and other related information.	The **User Group**page is displayed, with all the user groups listed with their **Name**, **Description**, and other related information.
For more information on how to switch between menus, click here.	



Note: In the User Group Inventory:

- Delegated admins can only view or manage user groups they created or that were assigned under them. (the assigned groups can be shown in profile section if not inventory)
- Peer or upper-level user groups are not visible or editable.

For more information, see RBAC Delegation.

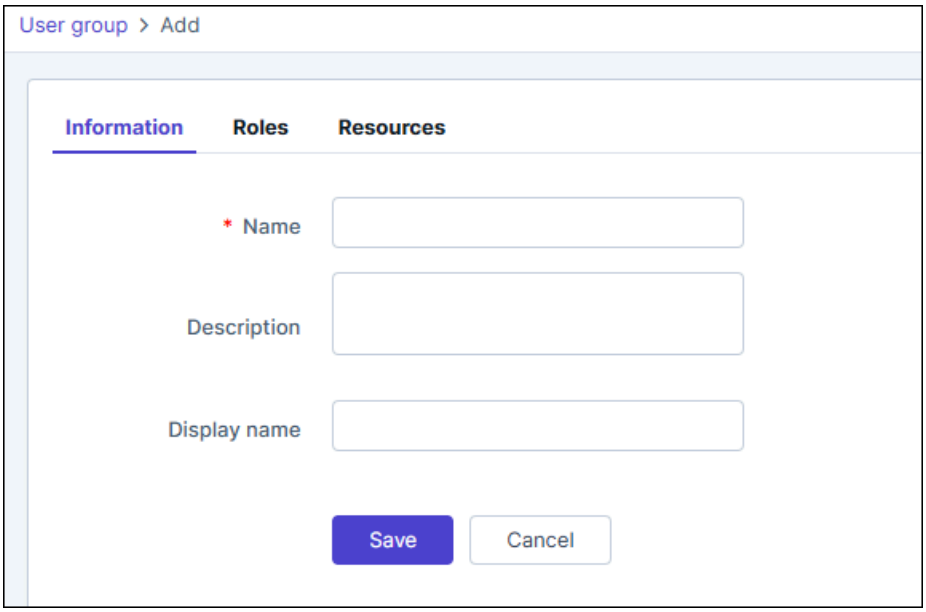
Creating a User Group

To create a user group:

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1. On the **User Group** page, from the top right corner of the screen, click 

(Add) icon.
2. The **Add** page is displayed with the **Information** tab open by default.



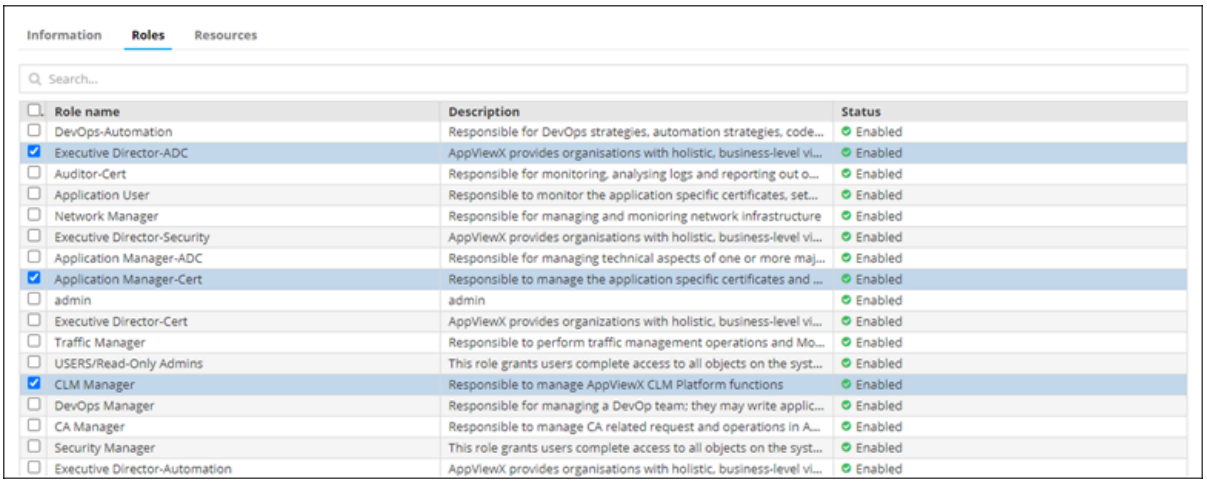
3. Enter the following details:

Field descriptions for Information

Field	Description
***Name**	User group name.
Description	Brief description of the group (which makes it easy for the administrators to decide if a user should be assigned to this group or not).
Display name	Enter a display name for the user group. The display name helps to identify multiple groups under the same name.
*: *Mandatory fields*	

4. Click **Save**.
5. To assign roles to this user group, in the **Roles** tab, select the check boxes against the required roles.

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Note: A user group can be assigned to more than one role and resource in the system. A user assigned to a user group with more than one role or resource has all of the permissions of all of the roles and resources to which he or she is assigned. If one resource has only Read access to a component and another resource has Read/Write access to the same component, the higher-level access permissions (Read/Write) take precedence and the user has Read/Write access.

Note: Admins who associate User Groups to Roles and Resources may skip/forget to associate User Groups to a user. To overcome this, an alert icon has been added to the User Group inventory to notify if the group is not associated with a role, resource, or both.

What to do next: Assign RBAC Delegation for User Groups. For more information, refer RBAC Delegation.

Cloning a User Group

To clone a user group:

1. On the **User Group** page, select the user group you want to clone.
2. From the top right corner of the screen, click 

(Clone) icon.
3. The **Cloning** page is displayed, with the **Information** tab open by default. Update the required details.

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Field descriptions for Information

Field	Description
***Name**	User group name.
Description	Brief description of the group (which makes it easy for the administrators to decide if a user should be assigned to this group or not).
*: *Mandatory fields*	

4. Click **Save**.

Modifying a User Group

To create a user group:

1. On the **User Group** page, select the user group you want to modify.
2. From the top right corner of the screen, click  **(Modify)** icon.
3. The **Modify** page is displayed, with the **Information** tab open by default. Update the required details.



Field descriptions for Information

Field	Description
***Name**	User group name.

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Field	Description
Description	Brief description of the group (which makes it easy for the administrators to decide if a user should be assigned to this group or not).
*: *Mandatory fields*	

4. Click **Save**.
5. To modify the role assignment for this user group, in the **Roles** tab, select/clear the check boxes against the required roles and resources.

Enabling a User Group

To enable a user group:

1. On the **User Group** page, select the user group you want to enable.
2. From the top right corner of the screen, click **(Enable)** icon.
3. In the **Confirmation** dialog box, click **Yes**.

Disabling a User Group

To disable a user group:

1. On the **User Group** page, select the user group you want to disable.
2. From the top right corner of the screen, click **(Disable)** icon.
3. In the **Confirmation** dialog box, click **Yes**.

Deleting a User Group

To delete a user group:

1. On the **User Group** page, select the user group you want to delete.
2. From the top right corner of the screen, click **(Delete)** icon.
3. In the **Confirmation** dialog box, click **Yes**.

RBAC Delegation

• Configuring RBAC Delegation

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Why RBAC Sub-Delegation Matters

Sub-delegation gives users better control over permissions and prevent inefficiencies or security risks. Currently, when an Admin delegates administrator permissions to a sub-admin, the sub-admin gains full access to the entire system and can control both their superiors' and subordinates' setups within the organizational unit. This creates a serious security loophole. Additionally, any internal service account that a user creates becomes visible to all users with application access, without any ownership-based restrictions. This lack of separation raises security and privacy concerns, especially in environments where multiple teams or users share the same tenant but require clear boundaries for responsibilities and data access.

What is RBAC Delegation?

Sub-delegation enables a user to pass on their permissions to others, essentially granting them the authority to assign roles and permissions the original user possessed.

Delegate Admin allows the creation of a hierarchical user group structure where administrators can delegate permissions to second level of administrators, allowing them to manage user groups, users, roles, and resources without having the ability to modify super admin roles or peer roles. The feature is accessible via a toggle button in the user group inventory and is only visible to super admin users.

Delegated admins can create new user groups, roles, and resources, which are then automatically visible to them and the super admin, but not to other users.

Delegation Hierarchy Overview

AppViewX Admin (Pre-shipped Admin / Level 0):

- Has full access across the system.
- Can assign delegated user groups (e.g., PKI Admin Group, CERT Admin Group).
- Can map existing user groups to delegated hierarchies.
- Maintains cross-hierarchy visibility and control.

Delegated Admin (Level 1 – e.g., PKI Admin Group, CERT Admin Group):

- Operates in an isolated environment within their group's boundary.
- Can manage users, groups, roles, and resources that are part of their hierarchy only.
- Delegated users cannot manage or edit users/groups in **peer or parent hierarchies**
  - Visibility of upper/peer levels is read-only
  - Visibility of own permissions is read-only

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Users outside of delegated groups:

- Cannot manage user groups, even if they hold RBAC ACF permissions.
- Receive the error: *"You do not have access to manage User Groups. Contact your Admin."*
- May still manage users, roles, and resources as permitted by ACF, but cannot associate these entities with any user groups.
- Cannot apply any changes to user groups due to lack of group management permissions.

Impact of Sub Delegation

- Disables existing RBAC user groups, shifting permission management to the delegation hierarchy.
- Determines user access based on their position in the delegation tree.
- Blocks users with RBAC ACF but outside delegated groups from managing user groups, showing a UI error to contact the Admin. They can still manage users, roles, and resources as allowed by ACF.
- Fully isolates delegated units, preventing visibility into peer groups or other hierarchies.
- Restricts delegated admins from editing self, upper-level, or peer-level entities; these appear as read-only in the inventory.
- Limits user group association to lower-level entities during mapping.
- Maintains ownership and delegation hierarchy for all entities.

Impacted Use Cases

- Use cases related to modules like **AI**, **Certificate Management**, **Workflow**, **Dashboards**, **Import/Export**.
- Use cases for resource handling across **CERT**, **Devices**, and **Workflows** will follow the delegation boundaries.

Inventory-Level Behavior

User Inventory:

- A delegated admin sees has access to users created by or under their delegated group.
- Users from other delegated groups or higher levels are completely hidden.

User Group Inventory:

- Delegated admins can only view or manage user groups they created or that were assigned under them. (the assigned groups can be shown in profile section if not inventory)
- Peer or upper-level user groups are not visible or editable.

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Role Inventory:

- Delegated admins can only view, assign, or modify roles created under their own delegated group.
- Roles from other delegated groups are completely hidden.
- Role assigned to delegated admin can be shown as read only (to view and understand the permissions)

Resource Inventory (Device, Certificate, Workflow Studio, Workflow Request):

- Delegated admins can view and manage only those resources created within their boundary.
- Resources from other delegated groups or superior levels are not listed or accessible.
- Resources assigned to the delegated admin can be shown as read only (to view and understand the permissions)

Impact on RBAC ACF Users Outside Delegated Groups

Users who have Access Control Filters (ACF) through RBAC but are not part of any delegated user group experience the following behavior when delegation is enabled:

- **User Group Management Blocked:** Cannot create, edit, or delete user groups, even with ACF permissions; UI shows an error message.
- **Limited Access to Entities:** When a user belongs only to non-delegated user groups and delegation is enabled they have the following behaviour:
  - Can create and manage only their own Users, Roles, and Resources (if allowed by ACF)
  - Inventory appears empty by default until entities are created
  - Entities remain hidden from other users, regardless of RBAC ACF.

Impact on Users in Both Delegated and Non-Delegated Groups

When a user is a member of both delegated and non-delegated groups, the delegated hierarchy takes precedence as the active scope. In this scenario:

- Access is limited to the hierarchy of the delegated group.
- Permissions from non-delegated groups are disregarded.
- The user can view, manage, and assign users, roles, user groups, and resources only within the delegated scope.
- Roles and resources from non-delegated groups cannot be created or assigned outside the delegated boundary.

This enforcement ensures strict isolation between hierarchies and prevents privilege escalation or leakage across scopes.

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What to do Next:

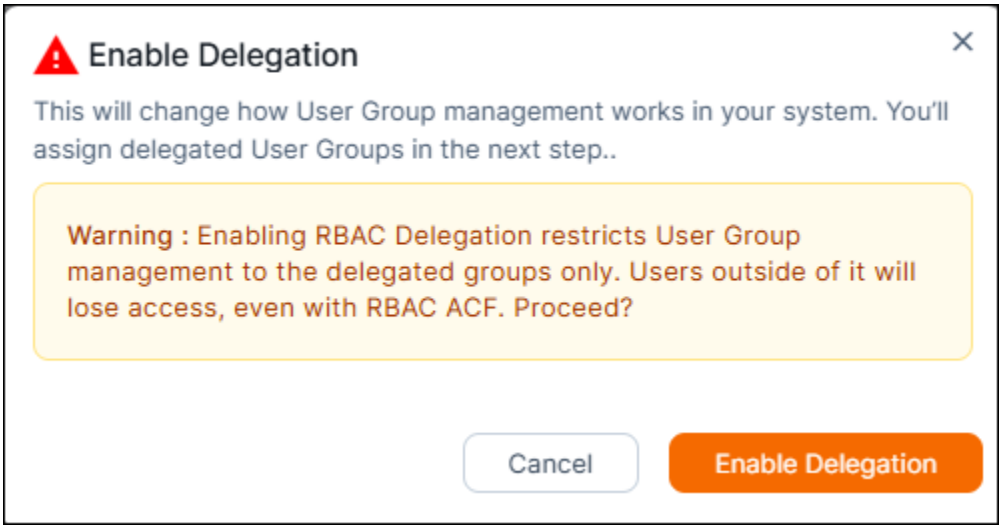
To perform RBAC Delegation, refer to topic Configuring RBAC Delegation.

Configuring RBAC Delegation

Enabling Delegation

To enable delegation,

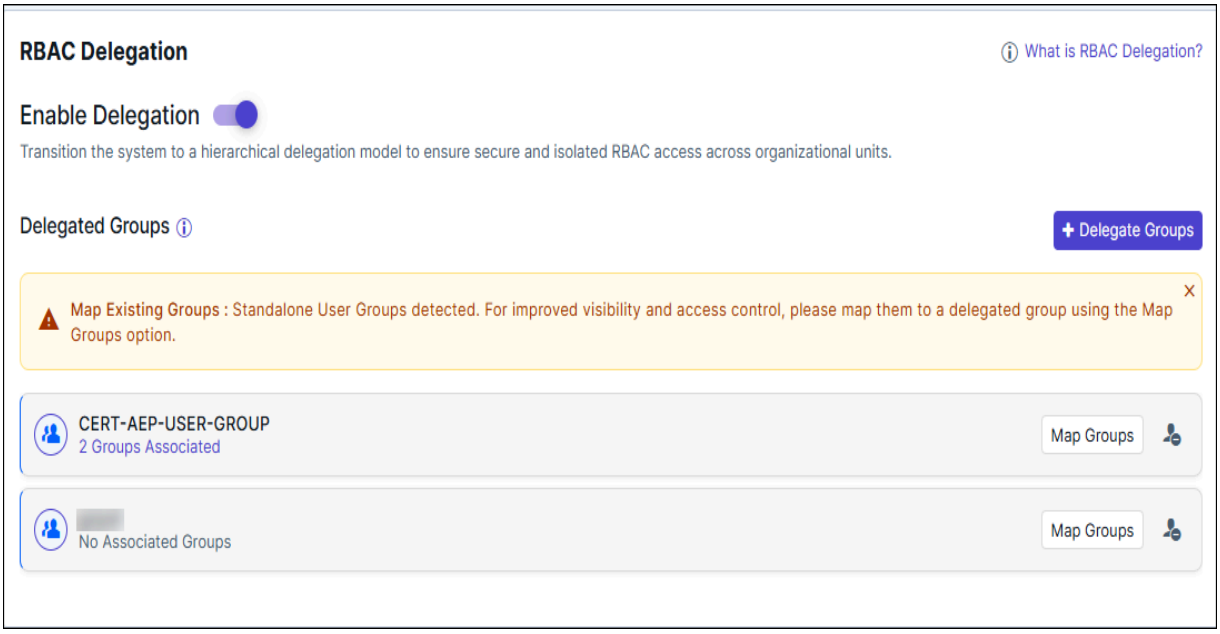
1. On the **User Group** page, click RBAC Delegation.
   The RBAC Delegation page is displayed with the **Enable Delegation** toggle button (the button is in default disabled state).
2. Enable the toggle button.
   The enable Delegation pop-up is displayed with instructions as shown below.



3. On the pop-up, click **Enable Delegation**

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The Delegated Group section is displayed.

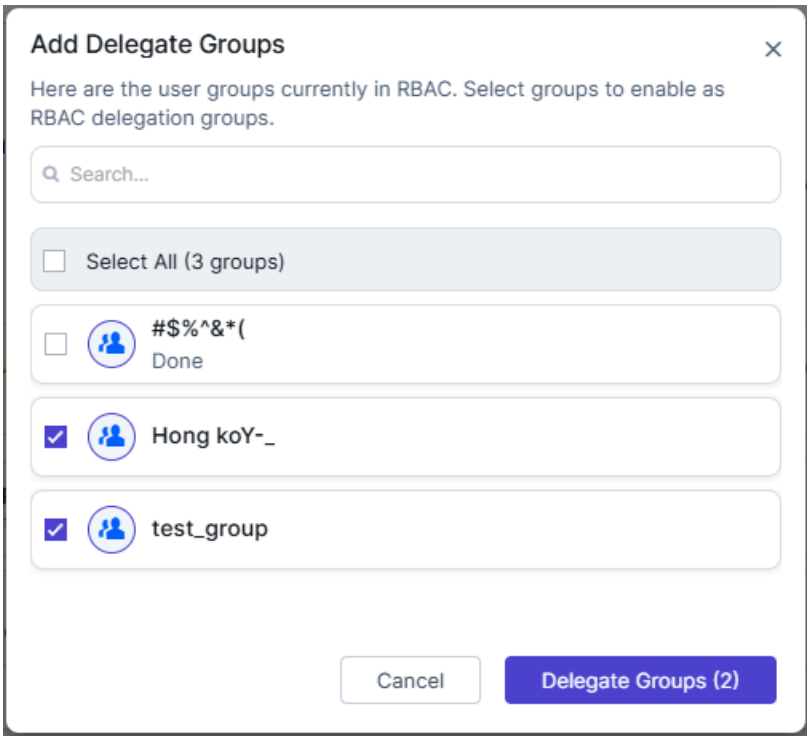


Delegating Groups

To enable delegation,

1. In the **Delegated Group** section, click + Delegate Groups.
   The Add Delegate Groups pop-up is displayed only with user groups with **RBAC ACF permission for User Grop management** (Create/Edit/Delete).

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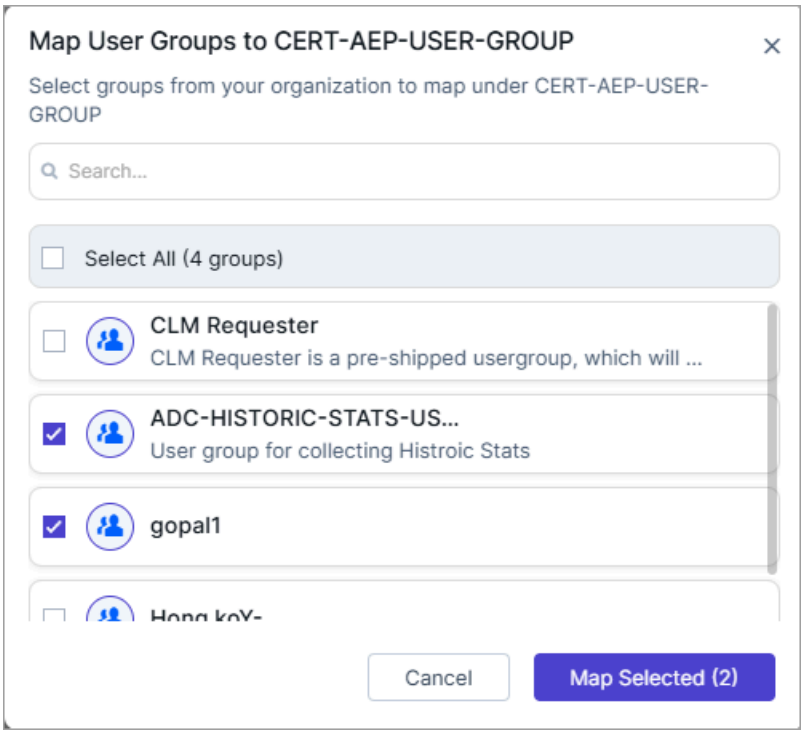


2. Select one or multiple groups to enable as RBAC delegation groups.
   The **Delegate Groups (X)** button is enabled, where X is the number of groups selected.
3. Click **Delegate Groups (X)** on the pop-up.
   The user group is assigned delegation privileges and appears in the Delegated Groups list view:
   • User group name
   • Map Group button
   • Remove RBAC Delegation Access icon
   • Link below the usergroup name denoting the number of mapped groups.
   .

Mapping Existing (Standalone) User Groups

1. In the **Delegated Group** section, for the respective delegated group in the list click Map Groups.
   The Map User Groups window is displayed. All the non delegated standalone user groups with or without RBAC ACF are displayed in the window.

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2. Select one or multiple groups to enable as RBAC delegation groups.
   The **Map Selected (X)** button is enabled, where X is the number of groups selected.
3. Click **Map Selected (X)** on the pop-up.
   The link below the delegated group has a link enabled with the number of associated groups (e.g.: *X Groups Associated*, where X is the number of groups)

> **Note:** User groups that are mapped to a specific delegated group cannot be mapped to another delegated group.

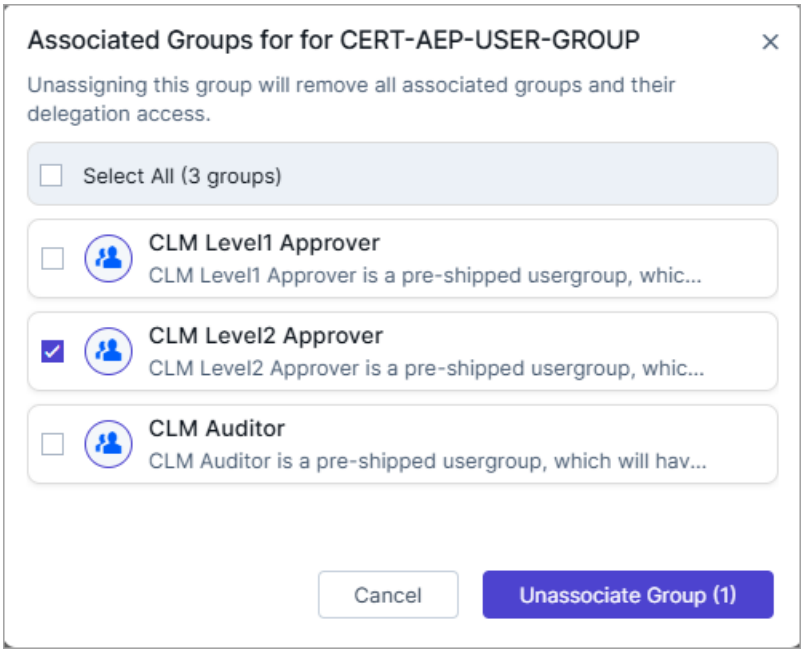
4. Click on the *X Groups Associated* links to view the associated groups.
   The Associated Groups for the delegated user group is displayed in the pop-up.

> **Note:** Once mapped, the group and its users/roles/resources are moved into the respective hierarchy of delegation.

Unassociating User Groups

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1. In the **Delegated Group** section, for the respective delegated group in the list click the link below it, for example, *2 groups associated*.
   The Associated Groups for the delegated user group is displayed in the pop-up.

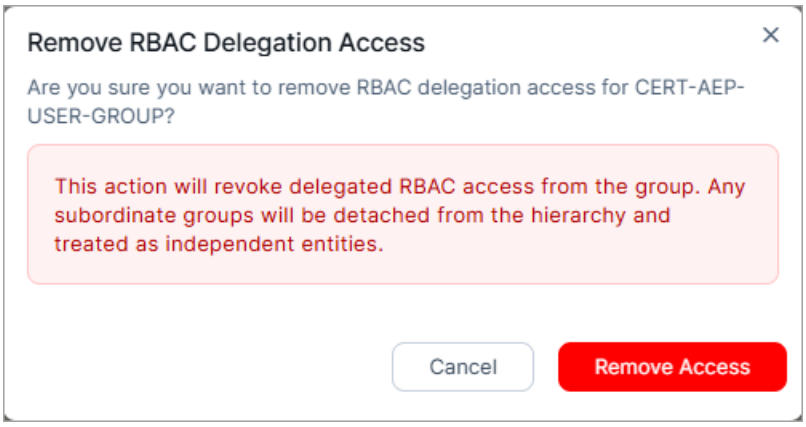


2. Select one or multiple groups to unassociate.
   The **Unassociate Group (X)** button is enabled, where X is the number of groups selected.
3. Click **Unassociate Group (X)** on the pop-up.
   The link below the delegated user group will be updated with the number of associated groups. If all the groups have been unassociated, then *No Associated Groups* is displayed below the delegated group. It is not a link now.

Removing RBAC Delegation Access

1. In the **Delegated Group** section, click  .
   The **Remove RBAC Delegation Access** pop-up is displayed.

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2. Click **Remove Access**.

Hiding OOB User Groups

Users can now hide the Out-Of-Box (OOB) user groups in the user group inventory, by configuring a specific setting in the database. The OOB user groups can be hidden only in the user group inventory but will be visible in the other areas. All the OOB user groups will have the preshipped flag set to true. Admin is also considered as a part of the OOB groups that is shipped.

To update the configuration settings in the **avx_app_metadata**.

1. Since some of the OOB user groups don't have the preShipped flag , execute the query below to set the “preShipped” flag.

```
db.getCollection('usergroup').updateMany({_id:{$in:["CLM Level1 Approver", "CLM Level2 Approver", "CLM Requester",
 "ADC-HISTORIC-STATS-USER-GROUP", "CERT-AEP-USER-GROUP", "CLM Auditor", "admin usergroup", ]}},{$set:{"preShipped":true}})
```

2. To enable the setting that hides OOB user groups, execute the following script:

```
db.getCollection('avx_app_metadata').insertOne({
"_id": "BE_PLATFORM_HIDE_PRESHIPPED_USERGROUPS",
"description": "Hide preshipped usergroups in inventory",
"subsystem": "platform",
"value": "true"
});
```

3. Restart all platform core pod.
   All the usergroups which is set to preshipped - true will be hidden in Platform > Identity > Usergroups inventory and RBAC > Usergroups. However, it will be visible in all other places where usergroups are present.

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To Revert the changes if required run query below.

```
db.getCollection('avx_app_metadata').remove({_id :'BE_PLATFORM_HIDE_PRESHIPPED_USERGROUPS'})
```

Assign Free Plan Roles and Resources to User Group

After product activation, a popup will appear, displaying a list of **user groups**, allowing the admin to select the desired user group(s) from the dropdown and grant access accordingly.

If user groups haven't been selected post-activation, admin can manually assign a free plan role to the user group from **Platform** > **IDENTITY**.

To Assign Free Plan Access to User Group:

1. On the **User Group** page, select the user group you want to grant access to the activated free plan product.

   Note: Free plan Roles will be added in the roles inventory after the product is activated.

2. Click the **Roles** tab, select the checkbox against the activated **Free Plan Role - [Product Name]**.

   The following free plan product roles will be added to the roles inventory upon activation of free plan.
   - **Free Plan Role - ADC**
   - **Free Plan Role - CERT**
   - **Free Plan Role - DDI**
   - **Free Plan Role - KUBE**
   - **Free Plan Role - PKI**
   - **Free Plan Role - SIGN**.
3. Click **Save**.
   The **Free Plan Role** is assigned successfully to the user group.

Managing Roles

A set of permissions to execute specific tasks in the application is termed as Roles in AppViewX. Roles can be assigned only to a user group. Users within user groups will inherit role permissions assigned to that group. User groups can be assigned more than one role. A default set of roles is available within the application as per the industry standards.

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• Managing Roles ACF Permissions

Accessing the Role Page

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **IDENTITY**, select **Role**. The **Role** page is displayed, with all the roles listed with their **Name**, **Description**, and **Status**.	From the main navigation menu, select **Account** > **Role**. The **Role** page is displayed, with all the roles listed with their **Name**, **Description**, and **Status**.
For more information on how to switch between menus, click here.	

Note: In the Roles Inventory:

- Delegated admins can only view, assign, or modify roles created under their own delegated group.
- Roles from other delegated groups are completely hidden.
- Role assigned to delegated admin can be shown as read only (to view and understand the permissions)

For more information, see RBAC Delegation.

Creating a Role

To create a role:

1. On the **Role** page, from the top right corner of the screen, click 

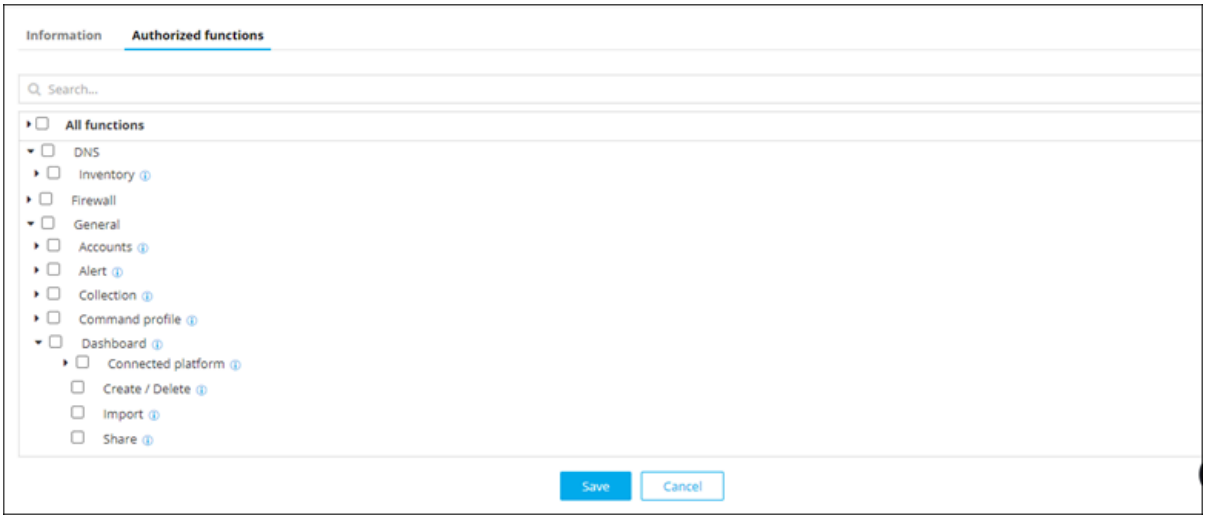
(Add) icon.
   The **Add** page is displayed.
2. Under the **Information** tab, enter the following details:

Field descriptions for Information

Field	Description
***Name**	Name of the role.
Description	Role/features/functionalities associated with the role.
*: *Mandatory fields*	

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3. Click **Save**.
4. In the **Authorized functions** section, select the checkbox beside the functionalities that you want to associate with the role.
5. To assign functions at a granular level, click the icon for the functions' check box and then select individual sub-options within the functions.



6. Click **Save**.
   Details of the new role are displayed in the list on the **Role** page.

Cloning a Role

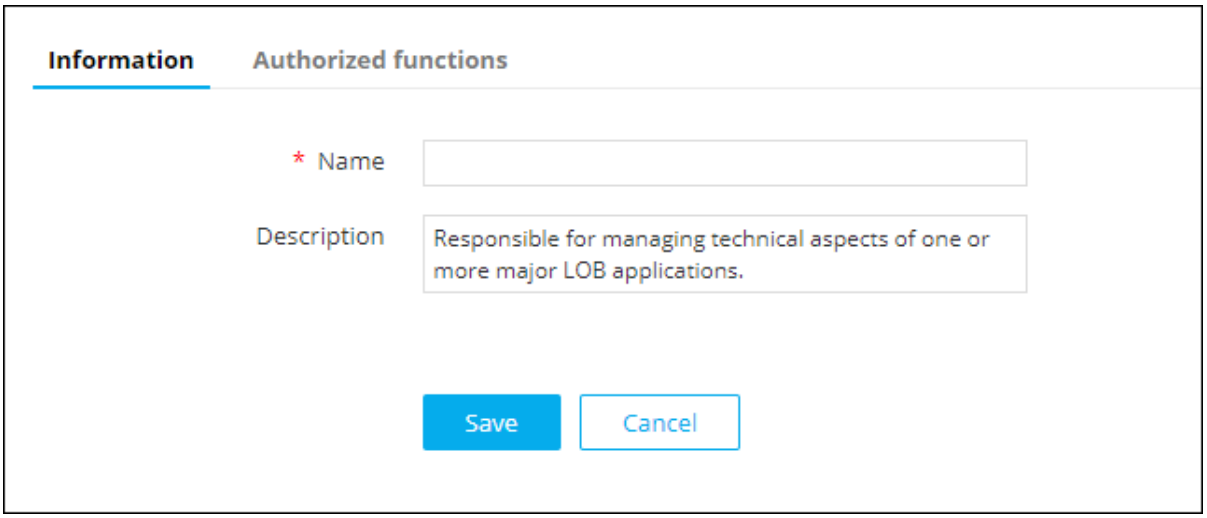
Cloning lets you create a copy of an existing role with a different name. You can modify the permissions and tasks that can be performed while cloning a role.

To clone a role:

1. On the **Role** page, for the role you want to clone, select the corresponding check box.
2. From the top right corner of the screen, click 

(Clone) icon.
3. In the **Information** section, enter a new **Name** for the role.

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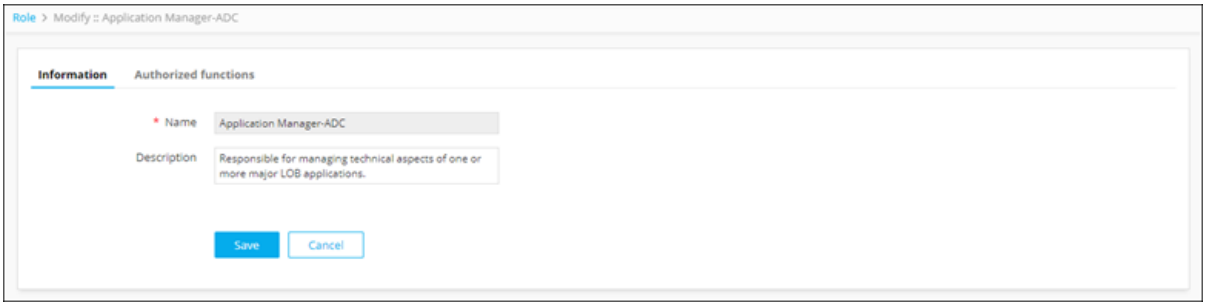


4. Click **Save**.
   The selected role is cloned.

Modifying a Role

To modify a role:

1. On the **Role** page, from the top right corner of the screen, click  **(Modify)** icon.
2. The **Modify :: Application Manager-ADC** page is displayed (because we selected the Application Manager role).
3. Modify the details in the **Information** and **Authorized functions** as required.



4. Click **Save**.
   The selected role is modified.

Enabling a Role

To enable a role:

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1. On the **Role** page, for the role you want to enable, select the corresponding check box.
2. From the top right corner of the screen, click **(Enable)** icon.
3. In the **Confirmation** dialog box, click **Yes**.
   The selected role is enabled.

Disabling a Role

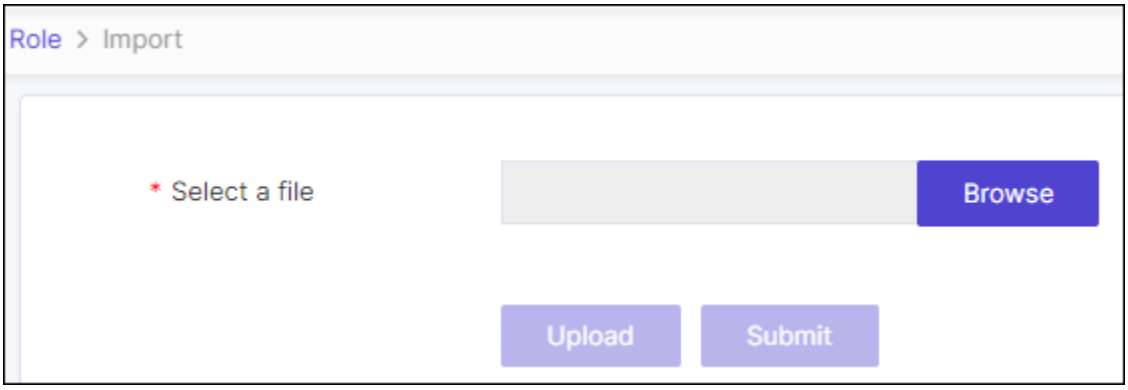
To disable a role:

1. On the **Role** page, for the (enabled) role you want to disable, select the corresponding check box.
2. From the top right corner of the screen, click **(Disable)** icon.
3. In the **Confirmation** dialog box, click **Yes**.
   The selected role is disabled.

Importing Roles

To import a role:

1. On the **Role** page, from the top right corner of the screen, click **(Import)** icon.
   The **Import** page is displayed.



2. Click **Browse**.
   Choose the .csv file for import.
3. Click **Upload**.
   The imported file will be displayed in the list below.
4. Click **Submit**.
   The Role page displays the details of the imported role in the list.

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Exporting Roles

To export a role:

1. On the **Role** page, choose the roles that need to be exported, select the corresponding check box.

   Note: The export roles functionality allows exporting a maximum of ten roles at a time.

2. From the top right corner of the screen, click  **(Export)** icon.
   Selected roles will be exported in .csv format.

Deleting a Role

Note: A role that has active users belonging to it cannot be deleted.

To delete a role:

1. On the **Role** page, for the role you want to delete, select the corresponding check box.
2. From the top right corner of the screen, click  **(Delete)** icon.
3. In the **Confirmation** dialog box, click **Yes**.
   The selected role is deleted.

Managing Roles ACF Permissions

ACF permissions for New users to view Alerts and Logs

.

On the **Authorised Functions** tab page, go to **Platform** > **Observe and Explore** > **Alerts** > **Access** (This Option (Access) has been added to define access levels to view alerts for auditing the user action in AppViewX). Provide the access as follows:

- **All** - Allows the user to view all alerts for the product line, including other users' actions. Recommended for admins or users needing full visibility
- **Group** - Allows the user to view only alerts from their own user group. Used to restrict visibility to group-specific alerts only.
- **Self** - Allows the user to view only their own activity alerts for maximum privacy

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Roles ACF for Service Accounts

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Users can manage client service accounts and can access AppViewX using a unique username and password maintained internally or by an external enterprise server. On the **Authorised Functions** tab page, go to **Platform** > **Identity** > **Service Accounts**. Provide the access as follows:

Role	Description
View	View existing service accounts in the inventory
Import	Import service accounts details as csv.
Regenerate ClientId	Regenerate Client Id for an existing service account.
Show Secret	Show Client Secret for an existing service account.
Add/Modify	Addition or modification of service accounts.
Regenerate Client secret	Regenerate Client secret for an existing service account.
Delete	Delete existing service account.
Enable / Disable	Enable or disable existing service account.

To enforce ownership-based visibility for service accounts, thereby enhancing data isolation and security by restricting service account visibility to only relevant users. On the **Authorised Functions** tab page, go to **Platform** > **Identity** > **Service Accounts** > **Access**.

Role	Description
All Accounts	Allow users to manage all service accounts.
Self Accounts	Allow user to manage self-created service accounts.

ACF permissions for existing users to view Alerts and Logs

.

On the Authorised Functions page, go to **Platform** > **Observe and Explore** > **Alerts** > **Access** (This Option (Access) has been added to define access levels to view alerts for auditing the user action in AppViewX). Provide the access as follows:

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- **All** - Allows the user to view all alerts for the product line, including other users' actions. Recommended for admins or users needing full visibility
- **Group** - Allows the user to view only alerts from their own user group. Used to restrict visibility to group-specific alerts only.
- **Self** - Allows the user to view only their own activity alerts for maximum privacy

For migrated user, default groups will be selected.

Managing Resource

All the devices and objects that are configured within AppViewX are termed as Resources. The resource allows you to specify access at a granular level across all the devices and modules of AppViewX. Resources can be assigned to a user group. Users within a user group will inherit resources assigned to that group. User groups can be assigned more than a resource. To enforce authorization policies on object levels such as for devices, certificates, and sub-objects such as wide-IP, virtual server, and so on users can configure resources and restrict user access to specific resources by mapping the resources to the respective user groups.

Accessing the Resource Page

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **IDENTITY**, select **Resource**. The **Resource** page is displayed, with all the resource listed with their **Name**, **Description**, and **Status**.	From the main navigation menu, select **Account** > **Resource**. The **Resource** page is displayed, with all the resource listed with their **Name**, **Description**, and **Status**.
For more information on how to switch between menus, click here.	

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Note: In the Resource Inventory for Device, Certificate, Workflow Studio, Workflow Request:

- Delegated admins can view and manage only those resources created within their boundary.
- Resources from other delegated groups or superior levels are not listed or accessible.
- Resources assigned to the delegated admin can be shown as read only (to view and understand the permissions)

For more information, see RBAC Delegation.

Create a Resource

To create a resource:

1. On the **Resource** page, from the top right corner of the screen, click 

(Add) icon.
   The **Add** page is displayed.
2. The following table describes the options available on the Add page:

Field	Description
* **Name**	Enter the name of the resource.
Description	Enter a brief description of the resource and granular-level access associated with the resource. (You can enter a maximum of 255 words in the field.)
*: *Mandatory fields*	

3. Click **Save**.
   The pop-up message is displayed as **Resource added successfully**.
4. Click **Access control** to associate the required resources and to provide permission.
   The **Access control** tab lists the categories that can be controlled by RBAC using resources.
5. From the **List** pane, select one of the required resources. The available resources are,
   a. **Device** (to filter and select the devices that need to be assigned to a resource, click the icon.)
   b. **Code Signing**
   c. **Cloud**
   d. **ADC** (to filter the ADC objects that need to be assigned to the resource, click the icon.)
   e. **Workflow Studio**
   f. **Workflow Requests**
   g. **Reports**

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h. **Proxy List**
i. **Application Security Policy**
j. **SSH Infra Access Groups**
k. **Certificate**
l. **SSH Key Groups**
m. **Credential Store**

Note: AppViewX is packaged with default certificate groups (Certificate-Gateway and Default).

Attention: Administrators can create and manage ACLs for each PAM entry and assign the resources to necessary user groups. It allows for the creation of custom user resources with tailored permissions for PAM entries. Existing resources can be modified to include or exclude access to specific PAM entries. Permissions can be added from **Menu** > **Platform** > **IDENTITY** > **Resource** > **+Add**.

The items of the selected resource is displayed on the right with a checkbox for each.

6. To associate the items to the resource and assign permission, first select the checkbox, then
   a. Click **R** (Read-only) to assign read-only permissions.
   b. Click **RW** (Read and Write) to assign read and write permissions.

Note: On clicking R or RW the item is associated with the resource. Provide RW (Read and Write) permission for the resource associate with the root user and R (Read-only) for others.

7. Use regular expression (regex) to identify and associate the items to the resource:
   a. Enter the **regex** in the Search field. For example, enter CA in the search field and click **R or RW** to assign Read-only or Read and Write permission respectively.
   b. Click the **Add as regex** button. All the certificate groups that match the regex will auto associate to the resource with the relevant permission. For example, all the certificate groups with CA in their name, such as CA-Digicert, CA-Entrust, CA-Sectigo will auto associate to the resource with R read permission.

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c. One or more than one regex can be added.

> **Note:** The purpose of the regex is, the search string continues to work in the background and auto-associate all the new certificate groups to the resource when the certificate group matches the regex you created.

8. Click **Save**.

Modify a Resource

To modify Read (R) and Read/Write (R/W) permissions of devices, device objects, certificate groups, provisioning requests, or provisioning templates associated with a resource, modify a resource.

1. In the resource inventory, select the check box against the resource you want to modify.
   The options on the top menu are enabled.
2. Click  **(Modify)** icon.
   The **Information** tab is displayed.
3. Click the **Access control tab** to add/ remove the items from the resource.
4. Click the respective resource in the left pane.
   The list of items is displayed on the right with the checkboxes and the R or RW options enabled/ disabled for the items .

> **Note:** You can also modify Read (R) and Read/Write (RW) permissions associated with a resource.

> **Attention:** Administrators can create and manage ACLs for each PAM entry and assign the resources to necessary user groups. It allows for the creation of custom user resources with tailored permissions for PAM entries. Existing resources can be modified to include or exclude access to specific PAM entries. Permissions can be added from **Menu** > **Platform** > **IDENTITY** > **Resource** > Click the resource name to modify it. .

5. Select the check box against the items you want to add to associate the items to the resource OR if the checkbox is already selected, uncheck the item to remove the association.
   a. Click **R (Read-only)** to assign read-only permissions.
   b. Click **RW (Read and Write)** to assign read and write permissions.
6. Click **Save**.

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Delete a Resource

1. In the resource inventory, select the check box against the resource you want to delete.
   The options on the top menu are enabled.
2. Click the  **(Delete)** icon.
   A confirmation pop-up window is displayed with Are you sure you want to delete? with the **Yes** and **No** buttons.
3. Click **Yes.**
   The resource is deleted and a pop-up message is displayed Operation performed successfully.

Clone a Resource

Clone allows you to create an exact copy of an existing resource with all the access control permissions.

1. In the resource inventory, select the check box against the resource you want to clone.
   The options on the top menu are enabled.
2. Click the  **(Clone)** icon.
   The **Information** tab is displayed.
3. The following table describes the options available on the Cloning page:

Field	Description
***Name**	Enter the name of the resource.
Description	Enter a brief description of the resource and granular-level access associated with the resource. (You can enter a maximum of 255 words in the field.)
Note: The asterisk (*) symbol indicates a mandatory field.	

4. Click **Save**.
   The resource is cloned and a pop-up message is displayed as Resources has been cloned successfully.
5. Click the **Access control tab** to add/remove the items from the resource.
6. Click the respective resource in the left pane.
   The list of items is displayed on the right with the checkboxes and the R or RW options enabled/ disabled for the items .
7. Select the check box against the items you want to add to associate the items to the resource OR if the checkbox is already selected, uncheck the item to remove the association.

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a. Click **R (Read-only)** to assign read-only permissions.
b. Click **RW (Read and Write)** to assign read and write permissions.

8. Click **Save**.

Enable a Resource

1. In the resource inventory, select the check box against the resource with **Status** as **Disabled**.
   The options on the top menu are enabled.
2. Click the  **(Enable)** icon.
   A confirmation pop-up window is displayed with Confirm enable with the **Yes** and **No** buttons.
3. Click **Yes**.
   The resource is enabled and a confirmation message displays as **Operation performed successfully**.

Disable a Resource

1. In the resource inventory, select the check box against the resource with **Status** as **Enabled**.
   The options on the top menu are enabled.
2. Click the  **(Disable)** icon.
   A confirmation pop-up window is displayed with Confirm disable with the **Yes** and **No** buttons.
3. Click **Yes**.
   The resource is disabled and a confirmation message displays as **Operation performed successfully**.

Service Accounts

The service account is a special type of account intended to represent a non-human user. API endpoints will be consumed by non-human users. For example, automated applications are used to perform some operations. So, AppViewX introduced a new account type called Service Account. Using this, API endpoints can be accessed using oAuth based authentication.

- oAuth

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Accessing the Service Account Page

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **IDENTITY**, select **Service Account**. The **Service Account** page is displayed, with all the service accounts listed with their **Name**, **Client Id**, and other related information.	From the main navigation menu, select **Account** > **Service Account**. The **Service Account** page is displayed, with all the service accounts listed with their **Name**, **Client Id**, and other related information.
For more information on how to switch between menus, click here.	

Service Account Inventory

The Service Account inventory page has the following columns:

Columns	Description
Name	Name of the service account. **Note:** Based on the access provided in the Roles ACF for Service Accounts, either all service accounts are displayed or only those created by the specific user.
Client ID	Client id generated after creating the service account.
Description	Description text for the service account.
Authentication mode	Shows the internal or external authentication mode selected.
Last access time	Date and time when the account was last accessed.
Account status	Status of the account (active, inactive, or deleted).
Client Secret Status	Client secret status (active or inactive).
Email address	Email address for notification.
Created time	Date and time when the service account was created.
Client Secret Expiry	Date when the client secret expires.

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Columns	Description
Created by	Username who created the service account.

Service Account User Actions

The Service Account inventory page has the following options:

- **Search** - Enter search text to filter the inventory list.
- **Add Account** - Click the **+ Add Account** to create a new service account.
- **Actions** - Select the check box in the inventory to enable the Actions button. It has the following options:
  - **Delete**
  - **Enable**
  - **Disable**

> **Note:** Actions can be performed only for service accounts based on the access provided in the Roles ACF for Service Accounts.

- **Refresh** - Click (Refresh) to view updates in the inventory list.
- **Show Records** - Click 1 to 5 of 5 to select the number of records to be displayed per page.
- **Page Navigation** - Click the arrow buttons to view next or previous pages in the inventory.

Client Credentials Grant Type

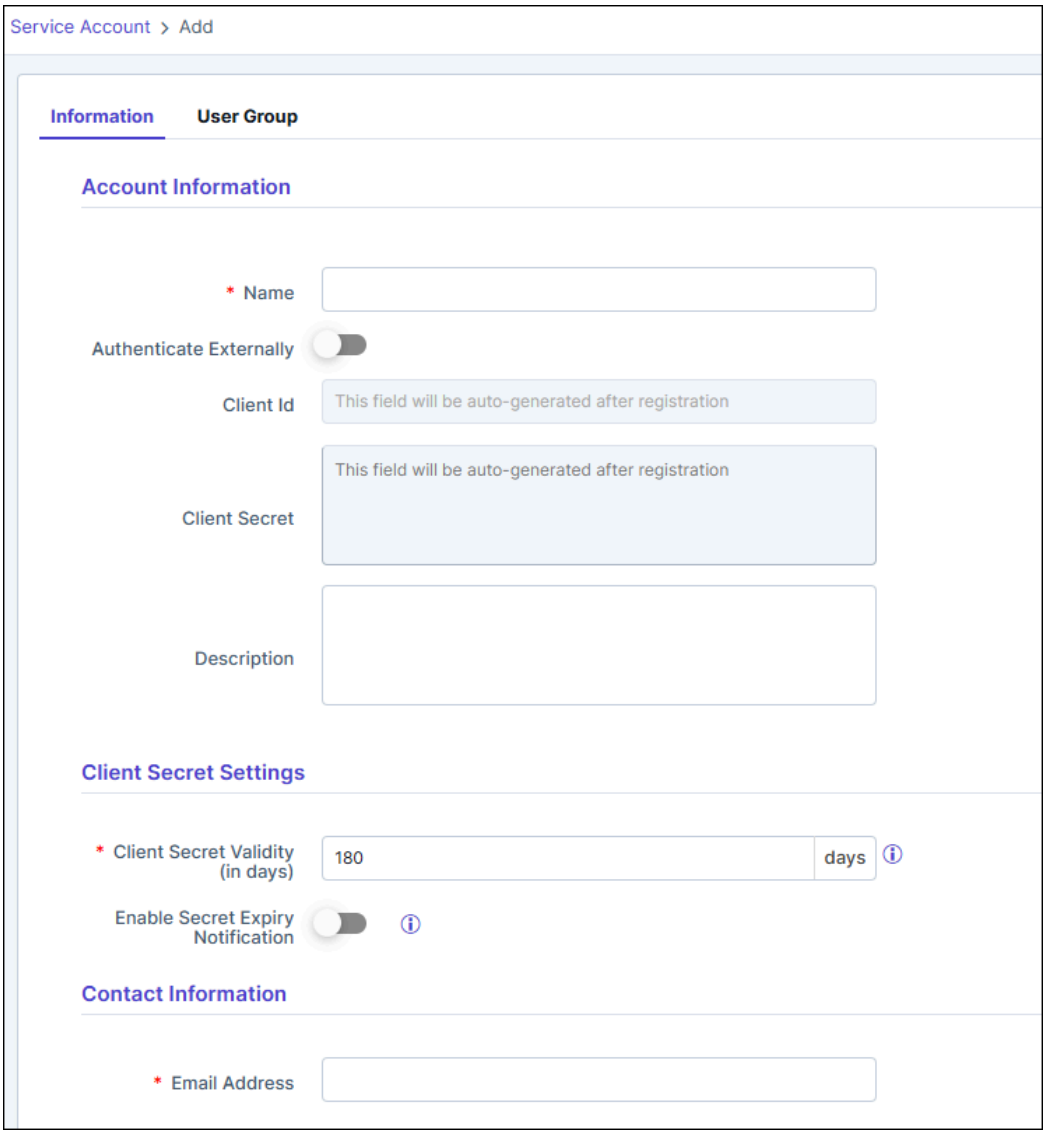
Client Credential Grant type is one of the grant types supported by oAuth 2.0. A Service Account is provided with a Client ID and Client Secret. Then, you can use this Client ID and Client Secret in client applications to get an Access token and perform API actions using the Access Token.

Create Service Account

To add a service account, follow the below steps:

1. Go to the **Service Account** page, click **+ Add Account**.
   The **Service Account > Add** page is displayed.

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2. Enter/Select the following details in the **Account Information** section:

Field descriptions for Account Information

Fields	Description
***Name**	Name of service account.
Authenticate Externally	Enable the toggle to authenticate external service account using client Id.
Client Id	This field is mandatory only when **Authenticate Externally** toggle is enabled. Enter the external Client Id for authentication.

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Fields	Description
	When **Authenticate Externally** is disabled the Client Id field will be auto-generated after registration.
Client Secret	This field is enabled only when **Authenticate Externally** toggle is disabled. The Client Secret field will be auto-generated after registration.
Description	Brief description of the service account.
*: *Mandatory fields*	

3. Enter/Select the following details in the **Client Secret Settings** section. This section is displayed only if the **Authenticate Externally** toggle is disabled.

Field descriptions for Client Secret Settings

Fields	Description
***Client Secret Validity (in days)**	Specifies the number of days for which the generated client secret remains valid.
Enable Secret Expiry Notification	When enabled, the system sends notifications to designated users or admins before a client secret expires. Alerts will be sent at intervals of 90, 60, 30, 7, and 1 day(s) before expiry and 1 day after expiry.
*: *Mandatory fields*	

4. In the **Contact Information** section, enter the **Email Address** details



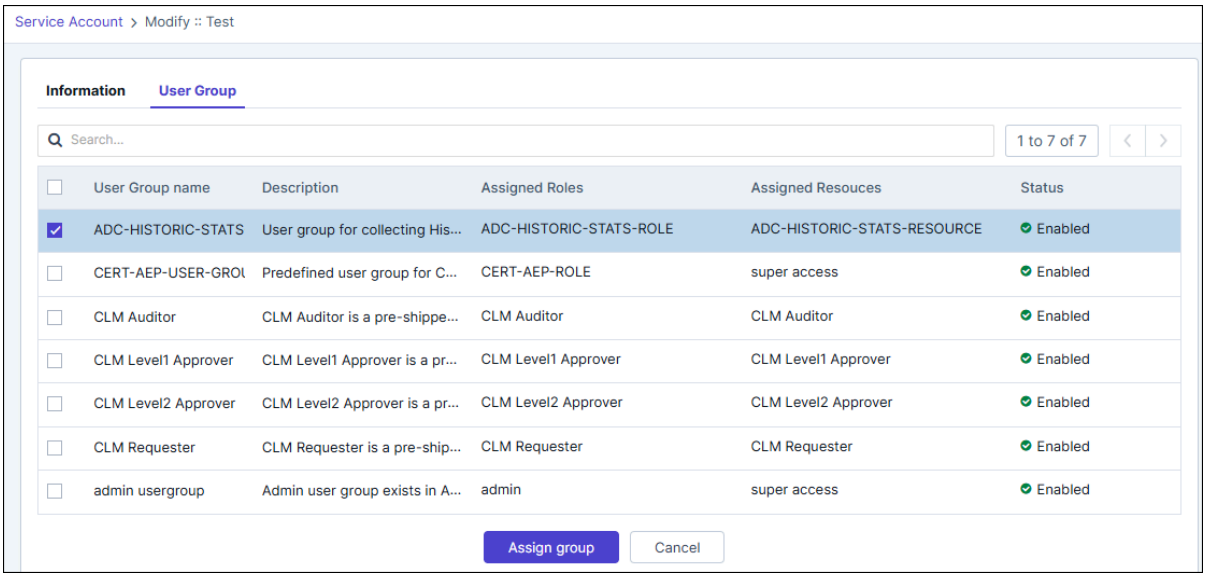
Note: This section is displayed when **Authenticate Externally** toggle is disabled.

5. Click **Save**.
   The service account is created and included in the service account list. The fields **Client Id** and **Client Secret** are populated and masked.

What to do next: Assign the necessary user group to the service account manually. Follow the steps below:

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1. Click the **User Group** tab.
2. From the list of user groups displayed, select one or more user groups using the checkbox.



3. Click **Assign group**.

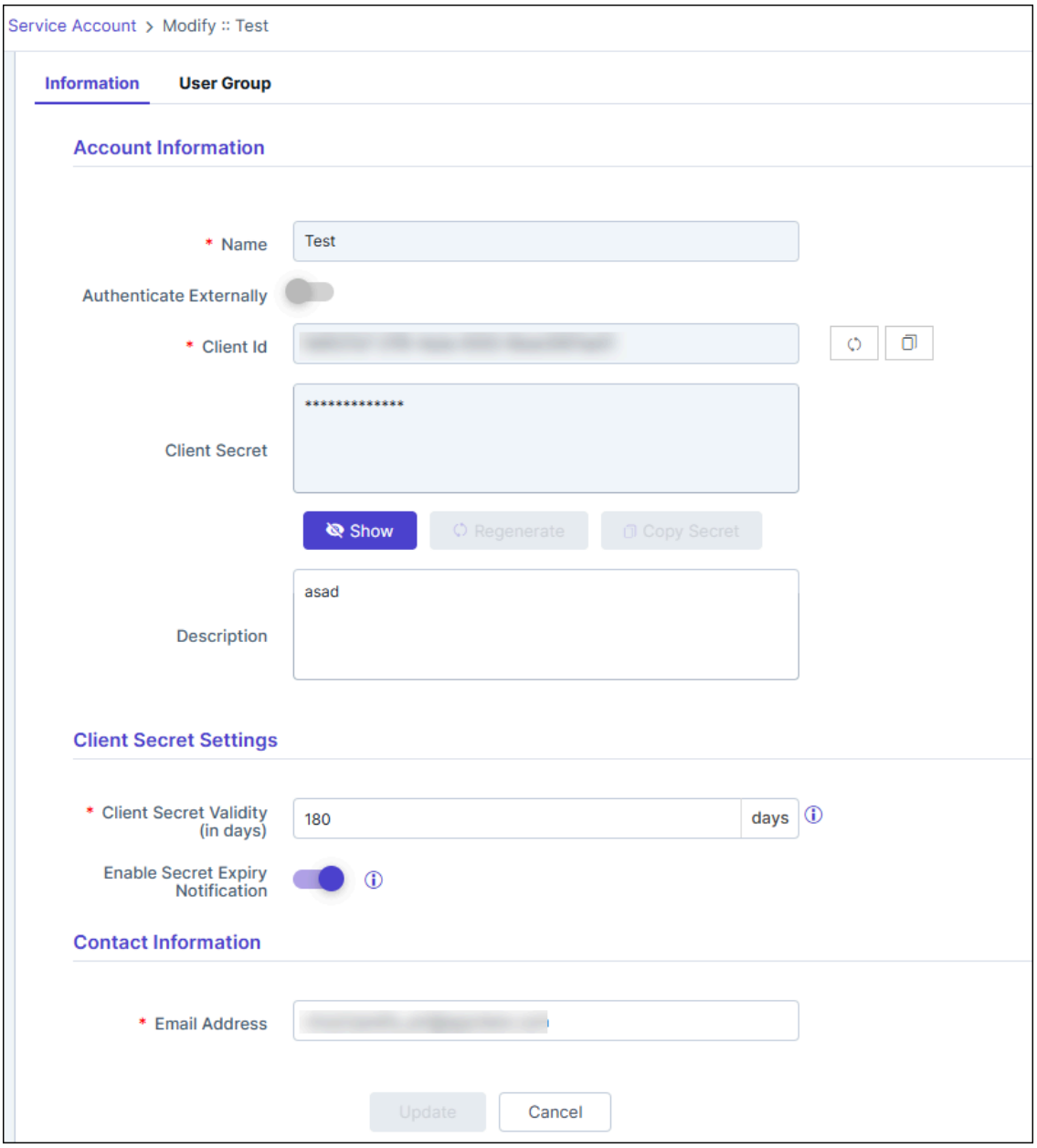
Managing Service Account

To configure managing service accounts, follow the below steps:

1. Go to the **Service Account** page.

   The screenshot below shows an existing Service Account.

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- The client secret is a is a 32 character alphanumeric string with special characters and is hidden by default. Click **Show** button to view the secret.
- The Client ID and Client Secret can be regenerated anytime using the corresponding regenerate buttons. When a Client ID is regenerated, the corresponding Client Secret is also regenerated.
- Post the expiry the Client Secret can be regenerated. (First click **Show** and then **Regenerate**.)
- The client credentials can be copied using the corresponding copy buttons.

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- The Access tokens generated by the previous set of Client ID and Client Secret will still work until the token gets expired.
- In the **Account Information** section, the **Name** and **Authenticate Externally** fields are disabled. The **Description** can be edited.

2. From the **Client Secret Settings** section, edit or update the following fields:

Field descriptions for Client Secret Settings

Field	Description
***Client Secret Validity**	The number of days of validity for the client secret. Enter a value between 1 and 365. By default the value set is 180 days.
Enable Secret Expiry Notification	Enable the toggle button to receive notification of the client secret expiry. Alerts will be sent at an interval of 90, 60, 30, 7, and 1 day(s) before the client expiry and 1 day after it has expired.
*: *Mandatory fields*	

Note: The grace period for the client secret is configurable from the backend. The default is 0 and can be configured for a maximum of 24 hrs (1 day). Kindly contact the AppViewX Support team if you need this updated.

3. In the **Contact Information** section, edit the **Email Address** as required.
4. Click **Update**.

oAuth

OAuth is a standard that applications can use to provide the client applications with **secure delegated access**. Using OAuth, access to client applications is delegated without sharing the password credentials.

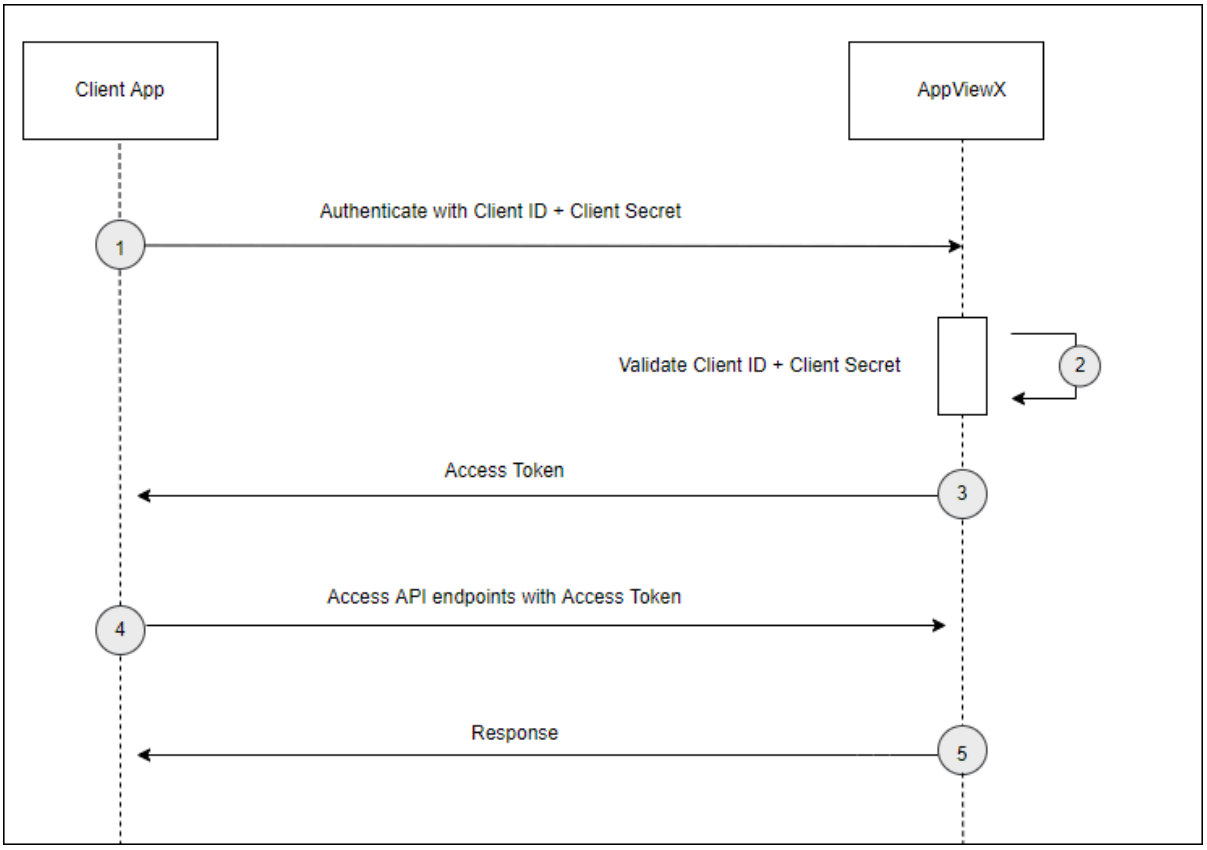
AppViewX can be managed using web console and API endpoints.

To improve the security of the API endpoints access, AppViewX has introduced the oAuth Client Credentials Grant Type.

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oAuth Sequence Diagram

1. Client application sends a request to the AppViewX server with a Client ID and Client Secret to get the Access Token.



API: acctmgmt-get-service-token

URL: http://localhost:5300/avxapi/acctmgmt-get-service-token?gwsource=web&gwkey=f000ca01

Method: POST

Header:

Basic Authentication : (base64(clientId:clientsecret))

Payload:

```
{
  "payload": {
    "grant_type":"client_credentials"
  }
}
```

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2. AppViewX validates the Client ID and the Client Secret.
3. Once the Client ID and the Client Secret are validated by AppViewX, it returns the Access token with the expiry time. This is a JWT token. The client application can decode this JWT token to get all the claims including the expiry time of that token inside the exp claim.

Response:


```
{
"response":
 "eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJzdWIiOiJBcHBsaWNhdGlvbl8xIiwiYXVkIjoiYXZ4IiwiY2xpZW50SWQiOiIwZjM0ZTg0OC1mMDY5LTRjZmItO
DlwZS0zZGM1M2IzMDE5ZmMiLCJpc3MiOiJhdngiLCJleHAiOjE2NDMxMDc3OTQsImdyYW50IHR5cGUiOiJjbGllbnRfY3JlZGVudGlhbHMifQ.EC6my35MCU
sMVC0gsylFqWVzqjgs5Js87Owf1esoano",
"message": null,
"appStatusCode": null,
"tags": null,
"headers": null
}
```


Access Token JWT Claims:

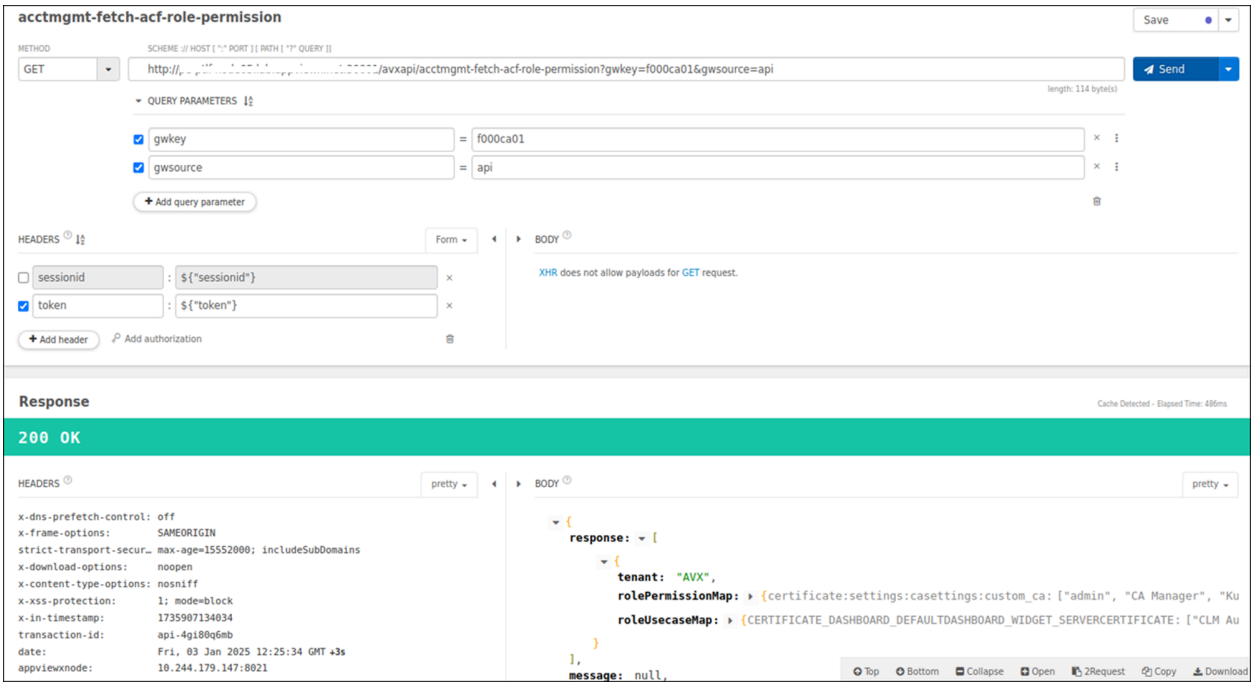

```
 "sub": "Application_1",
 "aud": "avx",
 "clientId": "0f34e848-f069-4cfb-820e-3dc53b3019fc",
 "iss": "avx",
 "exp": 1643107794,
 "grant type": "client_credentials"
}
```


4. The client application then accesses the API endpoints with the access token in the **“token”** header of the API. AppViewX provides the response.

Example

Refer to the below sample screenshot for reference.

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Vault and Security (PAM and HSM)

The Vault and Security module lets you configure Privileged Access Management (PAM), HSM, and perform Key Rotation Settings

- Configuring Privileged Access Management (PAM)
- HSM Integration for AppViewX
- Key Rotation Settings

Configuring Privileged Access Management (PAM)

For a more sophisticated management of critical data and infrastructure, AppViewX allows for Privileged Access Management (PAM). PAM solutions help manage and control the access of privileged accounts (e.g., system administrators, root accounts, service accounts) to critical systems and sensitive data, thus ensuring security and compliance.

To configure PAM settings:

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **VAULT & SECURITY**, select **PAM**.	From the main navigation menu, select **Inventory** > **Device**.

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New Menu	Old Menu
The **PAM** page is displayed with a list of devices/ objects/applications.	The **Device :: ADC** page is displayed with the **ADC** tab open by default.
For more information on how to switch between menus, click here.	

1. From the command bar in the top right corner of the page, click  **(Add Credentials)** icon.
2. From the left pane, select the vendor for whom you want to configure PAM.

   Credential details fields are displayed for the selected vendor.
3. Enter the **Credential details** for the vendor.
   - To enter the credential details for AppViewX, click here.
   - To enter the credential details for CyberArk, click here.
   - To enter the credential details for Thycotic, click here.
   - To enter the credential details for Hashicorp, click here.
   - To enter the credential details for BeyondTrust, click here.
4. Click **Save**.

Note: Administrators can create and manage ACLs for each PAM entry and assign the resources to necessary user groups. It allows for the creation of custom user resources with tailored permissions for PAM entries. Existing resources can be modified to include or exclude access to specific PAM entries. Permissions can be added from **Menu** > **Platform** > **IDENTITY** > **Resource**.

- AppViewX
- CyberArk
- Thycotic
- HashiCorp
- BeyondTrust

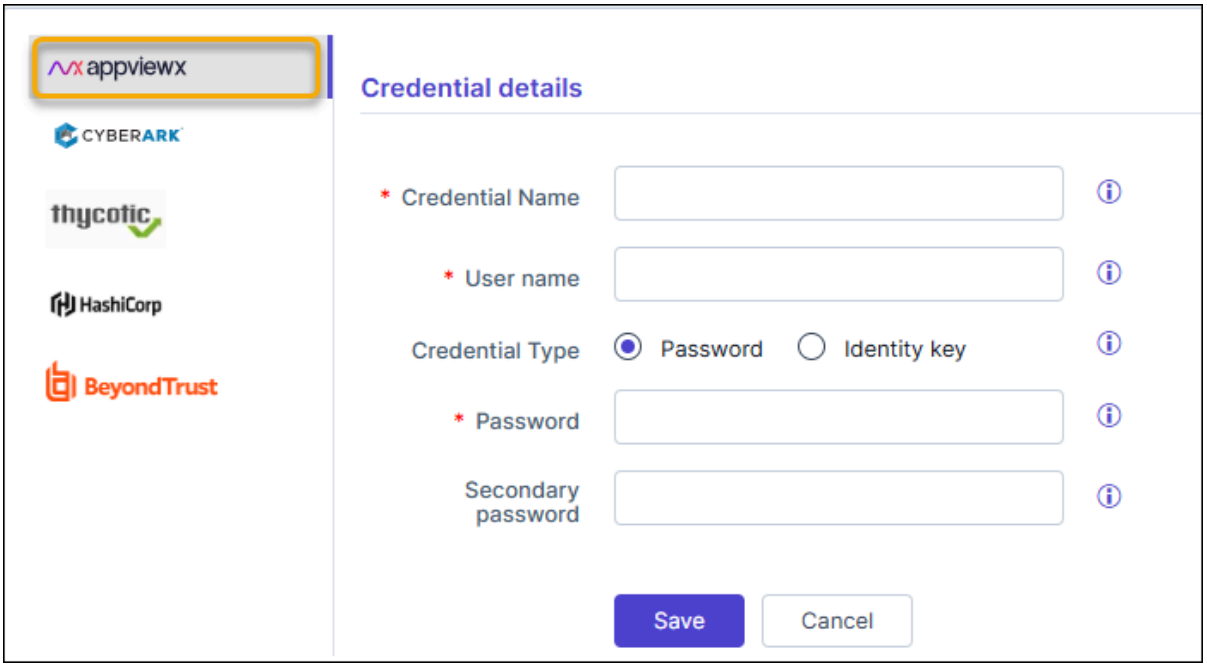
AppViewX

AppViewX is shipped with a built-in integration with HashiCorp Vault for software level security to secure the private keys and device credentials onboarded to the product.

To configure credential details for the AppViewX vault:

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1. Go to **Platform > VAULT & SECURITY > PAM**.
2. The **PAM** page is displayed with a list of devices/objects/applications with Privileged Access Management.
3. On the **+ Add credential** page, select **AppViewX** from the left menu.
4. In the **Credential details** section, enter the required field information.



Field descriptions for Credential details

Field	Description
***Credential name**	Enter a unique name to identify the credential in AppViewX.
***User name**	User name used for device onboarding.
Credential type	Select the type of authentication from one of the following: • **Password** - will authenticate using the account password. • **Identity key** - will authenticate using a private key and a passphrase.
***Password**	Password configured at the time of device onboarding, to communicate with the endpoint. This field is displayed only when the **Credential type** is selected as **Password**
Secondary password	Additional password enabled by vendors for specific operations.

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Field	Description
	This field is displayed only when the **Credential type** is selected as **Password**
***Identity key**	Upload private key in the **.pem** or **.txt** or **.rsa** or **.ppk** format for enabling device communication via SSH. This field is displayed only when the **Credential type** is selected as **Identity key**
Passphrase	Key to protect the private key files. This field is displayed only when the **Credential type** is selected as **Identity key**
*: *Mandatory fields*	

5. Click **Save**.

CyberArk

CyberArk is a well-known PAM solution that focuses on protecting privileged accounts, credentials, and secrets.

Prerequisites for Integrating CyberArk with AppViewX

Ensure all PAM components are correctly installed before proceeding with the integration.

For links to the CyberArk documentation for installing and upgrading the PAM components, see the References section.

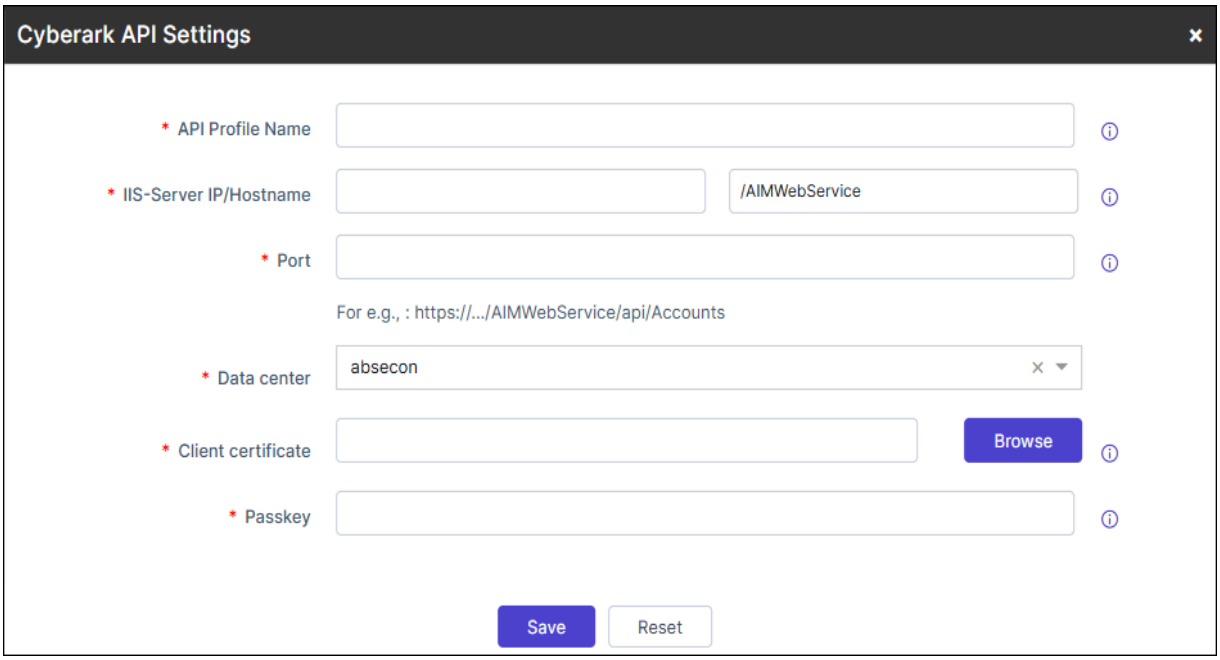
Configuring CyberArk Integration Settings

To configure integration settings for the CyberArk vault:

1. Go to **Platform > VAULT & SECURITY > PAM**.
   The **PAM** page is displayed.
2. Click the **+ (Add credential)** button.
3. On the **Add credential** page, select **CyberArk** from the left menu.

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4. From the top right corner of the page, click **CyberArk API Settings**.
   The **CyberArk API Settings** pop-up window is displayed.



Field descriptions for CyberArk API Settings

Field	Description
***API Profile Name**	Enter a unique name to identify the API profile. Multiple profiles can be created to retrieve credentials securely from environment-specific CyberArk vaults
***IIS-Server IP/Hostname**	Enter the API URL of the cloud machine hosting CyberArk in the format given below. https://<Hostname>:<Port><PathURI>/api/Accounts The default value for <pathURI>, **/AIMWebService**, is displayed in the text field next to the hostname field. Edit this value as needed. If the <pathURI> parameter is not provided, the default value **/AIMWebService** will be used automatically. Aditionally, for each API Profile the hostname can vary.
***Port**	Port number on which CyberArk API's are exposed and servicable.
***Data center**	Select the appropriate data center where the CyberArk components are located or managed. It is used to perform the communication.

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Field	Description
***Client certificate**	Upload the Client Certificate needed to authenticate/allow the CyberArk API service to communicate with AppViewX, this certificate needs to be configured in IIS server of the CCP application and the SN needs to be configured in Cyberark portal as well in the application config., supports only pfx format.
***Passkey**	Enter the passkey for Client Certificates uploaded in the .pfx format.
*: *Mandatory fields*	

5. Once the details are entered, click **Update**.
   The CyberArk **Credential Details** page is displayed.

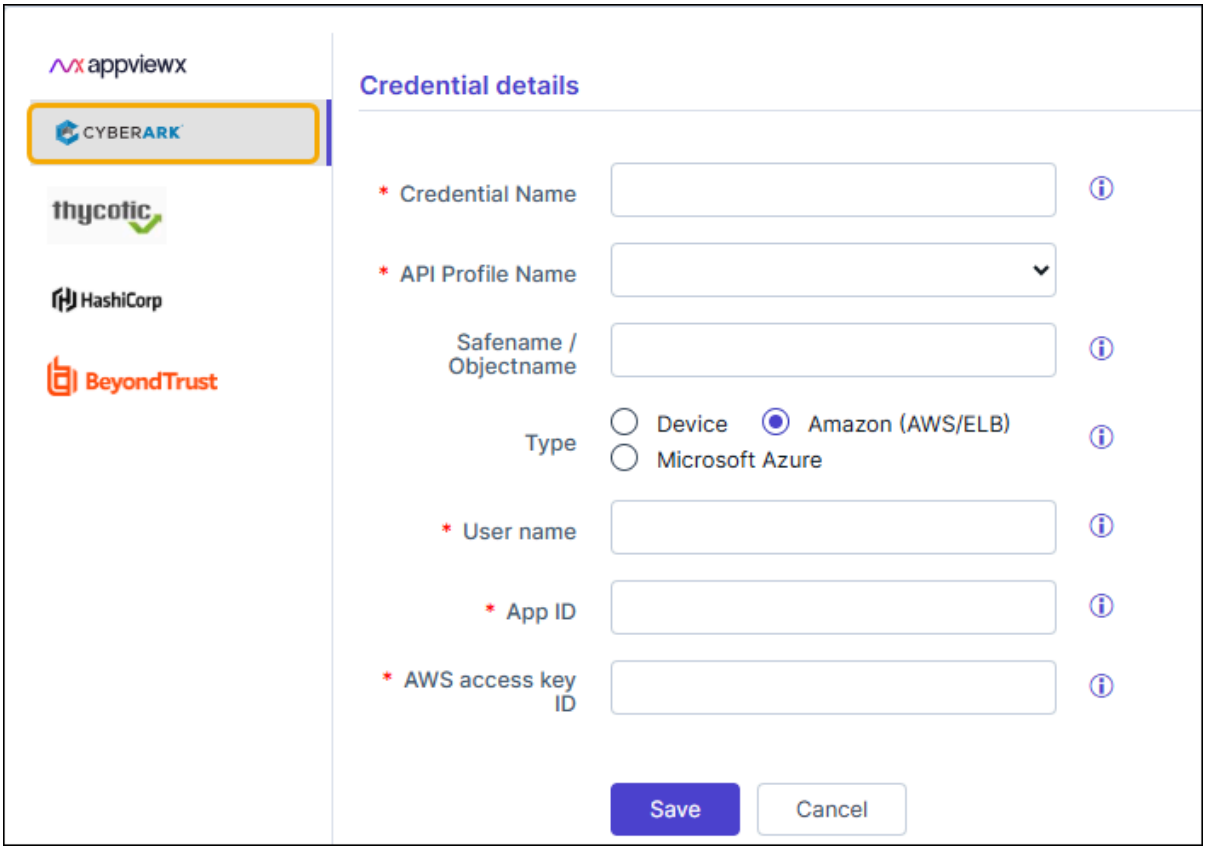
Note: Multiple vaults can not be added by configuring multiple profiles.

Adding CyberArk Credential Details

To configure credential details for the CyberArk vault:

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1. On the **Credential Details** page for **CyberArk**, enter the required field information.



Field descriptions for Credential details

Field	Description
***Credential name**	Enter a unique name to identify the credential in AppViewX
***API Profile name**	Select the specific API profile name.
Safename / Objectname	Name of the safe/object in CyberArk Vault where credentials are stored. This field is not mandatory. If not entered, it will search credentials from all the Safes.
Type	Choose the Account type linked with the Credential, select one of the following options: • **Device** (default) - Use this for device credentials. • **Amazon (AWS/ELB)** - Use this for AWS/ELB credentials. • **Microsoft Azure** - Use this for Microsoft Azure credentials.
***User name**	Enter the User name that has been stored in CyberArk.

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Field	Description
***App ID**	Enter the App ID which is a unique identifier that has been created and authorized to to retrieve credentials from CyberArk.
User type	This field is displayed when **Type** = **Device**. From the drop-down menu, select one of the following: • Internal (Local user account from CyberArk for device management). • External (External User account managed by LDAP/AD in CyberArk). **Note: *Server IP Address** field is displayed when the **User type** is selected **External**.
***Server IP Address**	Enter the LDAP/AD server's IP address/FQDN for external user accounts. The server IP Address has to be entered if the user has been created in an external active directory. It is utilized for integrating service accounts, particularly when external integration is required. By selecting "external," the input of the server's (LDAP/AD) IP address is taken, which manages the service account. **Note:** This field is displayed when the User type is selected as **External**.
***AWS access key ID**	Enter the AWS access key ID generated from the AWS Management Console. **Note:** This field is displayed when the **Amazon** (AWS/ELB) type is selected.
*: *Mandatory fields*	

2. Click **Save**.

References

- Installing and upgrading the PAM - Self-Hosted components

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Thycotic

Thycotic Secret Server is an enterprise-grade Privileged Access Management (PAM) solution designed to secure, manage, and audit privileged accounts, credentials, and secrets.

Prerequisites for Integrating Thycotic with AppViewX

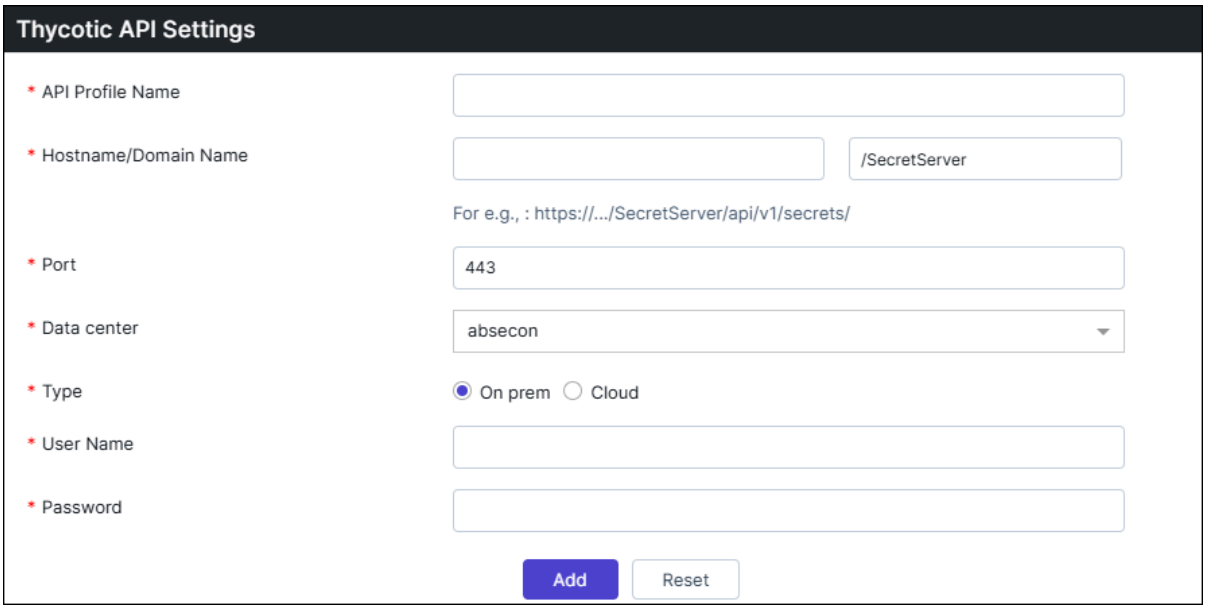
Ensure the Thycotic server is correctly set up before proceeding with the integration.

For links to the Thycotic secret server documentation, see the References section.

Configuring Thycotic Secret Integration Settings

To configure integration settings for the Thycotic Secret vault:

1. Go to **Platform > VAULT & SECURITY > PAM**.
   The **PAM** page is displayed.
2. Click the **+ (Add credential)** button.
3. On the **Add credential** page, select **Thycotic** from the left menu.
4. From the top right corner of the page, click **Thycotic API Settings**.
   The **Thycotic API Settings** pop-up window is displayed.



Field descriptions for Thycotic API Settings

Field	Description
***API Profile Name**	Enter a unique name to identify the API profile in AppViewX.

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Field	Description
***Hostname/Domain Name**	Enter the Hostname of the Thycotic Secret Server if it is hosted in an on-prem environment or the Domain name can be include or exclude in the user name during synchronization of the Thycotic Secret Server if it is the cloud version. https://<Hostname>:<Port><PathURI>/api/v1/secrets The default value for <pathURI>, **/SecretServer**, is displayed in the text field next to the hostname field. Edit this value as needed. If the <pathURI> parameter is not provided, the default value **/SecretServer** will be used automatically.
***Port**	Enter the port number used to connect to the API.
***Type**	Choose the deployment type of the instance: **On-prem** or **Cloud** environment.
***Data center**	Select the appropriate data center where the Thycotic components are located or managed. It will be used to perform the communication.
***Username**	Enter the username required to access the API.
***Password**	Enter the password that pairs with the user name for API authentication.
*: *Mandatory fields*	

Note: You can add multiple Thycotic Secret Servers as different Profiles. Each Thycotic Secret Sever will be added to the Thycotic API settings page.

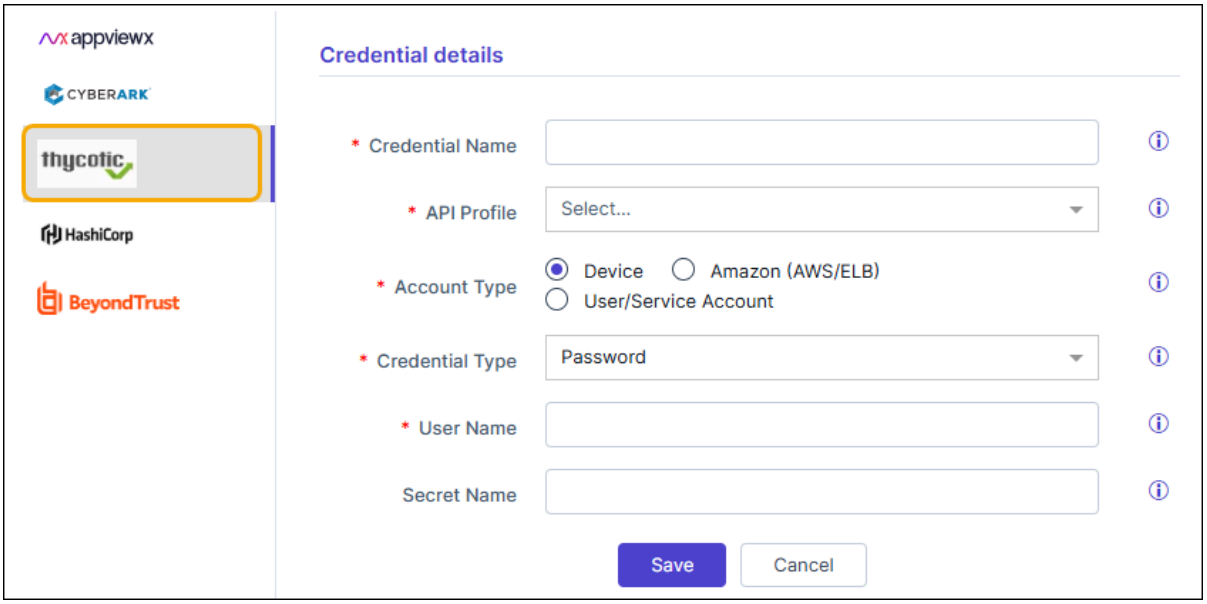
5. Once the details are entered, click **Add.**
6. To modify the details of any profiles, click name of profile, modify the details and click **Modify**.
7. To delete any profile, click **(Delete)** icon in Action column of profiles.
8. Close the **Thycotic API Settings** pop-up window.
   The Thycotic **Credential Details** page is displayed.

Adding Thycotic Secret Credential Details

To configure credential details for the Thycotic vault:

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1. On the **Credential Details** page for **Thycotic**, enter the required field information.



Field descriptions for Credential details

Field	Description
***Credential name**	Enter a unique name to identify the credential in AppViewX.
***API Profile**	Select the appropriate Thycotic Server profile. You can configure multiple profiles in the API settings for managing secrets across environments, regions, or specific use cases.
***Account Type**	The "Secret Type - **Device**" works if the Thycotic secret contains both the username and device name. The Machine field in the Thycotic secret must match the device IP/FQDN in AppViewX. This option is beneficial if you have multiple secrets in your Thycotic vault that share a username but have different device names associated with them. You can add a single secret to AppViewX with the username, and when fetching the credential from the vault, AppViewX will automatically send the corresponding device name or IP along with the username to retrieve the correct credentials. For this option to work, the device name or IP in the secret must match the device name or IP used in AppViewX. If the secret in the Thycotic vault does not have a device name associated with it, this option will not work, and you will need to use the "User/Service Account" service type instead. *For example*, you can use Thycotic secret templates such as "Windows Account" or "Unix Account (SSH)" that require a device name.

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Field	Description
	The "Secret Type - **Amazon (AWS/ELB)**" is useful for adding Amazon credentials to AppViewX. You can use the Thycotic secret template "Amazon IAM Key" with this option. The "Secret Type - **User/Service Account**" is beneficial if you have a common secret in your Thycotic vault that works across multiple devices. This type of Thycotic secret template does not have a device name associated with it because it works across multiple devices. Therefore, when fetching the credential, AppViewX will only send the username of the credential to the Thycotic vault. *For example*, you can use Thycotic secret templates such as "Active Directory Account," "Azure AD Account," or "CISCO Account (SSH)," which do not require a device name in the secret template.
Credential Type	Select the credential type: • **Password**: to authenticate using the account password. • **Private Key**: to authenticate using the private key and passphrase.
User Name	Enter the username associated with the secret in Thycotic, if you selected the Account Type as Device or User/Service Account
AWS IAM Username	Enter the AWS IAM username as added in Thycotic, if you selected the Secret Type as Amazon.
Secret Name	Enter a secret name. It is used to identify credentials when multiple accounts share the same User Name.
*: *Mandatory fields*	

2. Click **Save**.

References

- Getting Started with the Thycotic Server

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HashiCorp

HashiCorp Vault is a secrets management and Privileged Access Management (PAM) solution that helps organizations secure, control, and manage privileged credentials, secrets, and access to critical infrastructure across cloud and on-premises environments.

Prerequisites for Integrating HashiCorp Vault with AppViewX

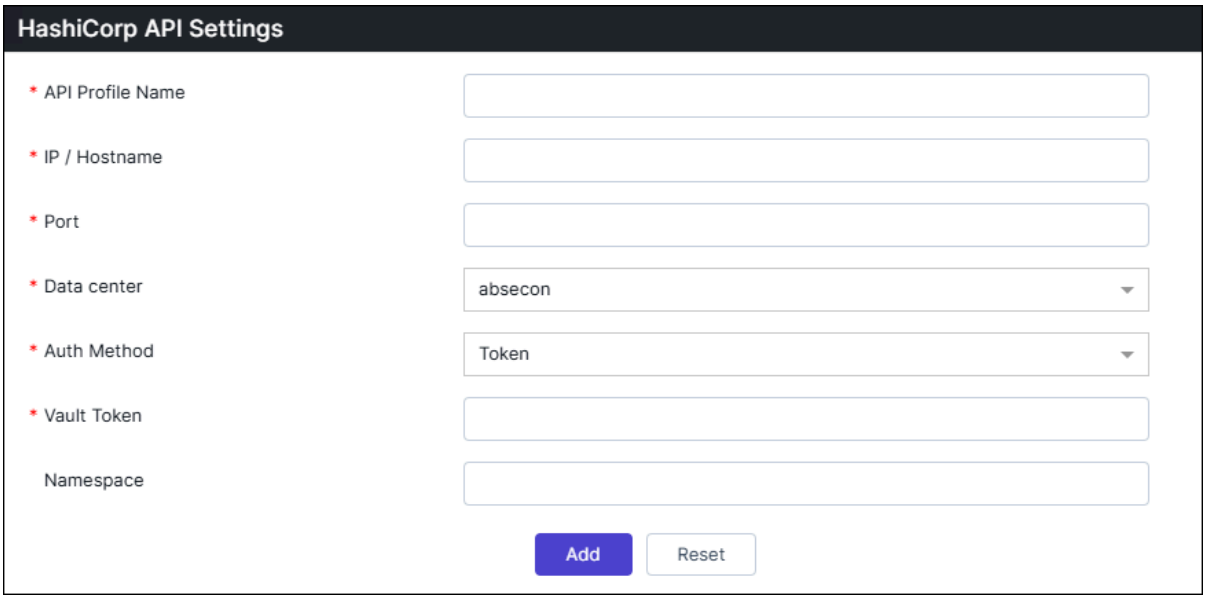
Ensure the HashiCorp Vault is correctly installed and configured before proceeding with the integration.

For links to the corresponding HashiCorp Vault documentation, see to the References section.

Configuring HashiCorp Integration Settings

To configure integration settings for the HashiCorp vault:

1. Go to **Platform > VAULT & SECURITY > PAM**.
   The **PAM** page is displayed.
2. Click the **+ (Add credential)** button.
3. On the **Add credential** page, from the top-right corner of the page, click **HashiCorp API Settings**.
   The **HashiCorp API Settings** window is displayed.



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Field descriptions for HashiCorp API Settings

Field	Description
***API Profile Name**	Enter a unique name to identify the API profile
***IP/Hostname**	Enter the hostname or IP address of the API server.
***Port**	Enter the port number used to connect to the API.
Data center	Choose the data center that will be used to perform the communication.
***Auth Method**	Choose the authentication method to access Vault (**Token** or **AppRole**).
Vault Token	This field is displayed if **Auth Method** = **Token**. Enter the Vault token used for direct authentication.
Role ID	This field is displayed if **Auth Method** = **AppRole**. Enter the Role ID associated with your AppRole authentication.
Secret ID	This field is displayed if **Auth Method** = **AppRole**. Enter the Secret ID that pairs with the Role ID for AppRole authentication.
Namespace	Enter the vault namespace where the authentication and secrets are defined.
*: *Mandatory fields*	

4. Once the details are entered, click **Add.**



Note: Multiple vaults can be added by configuring multiple profiles.

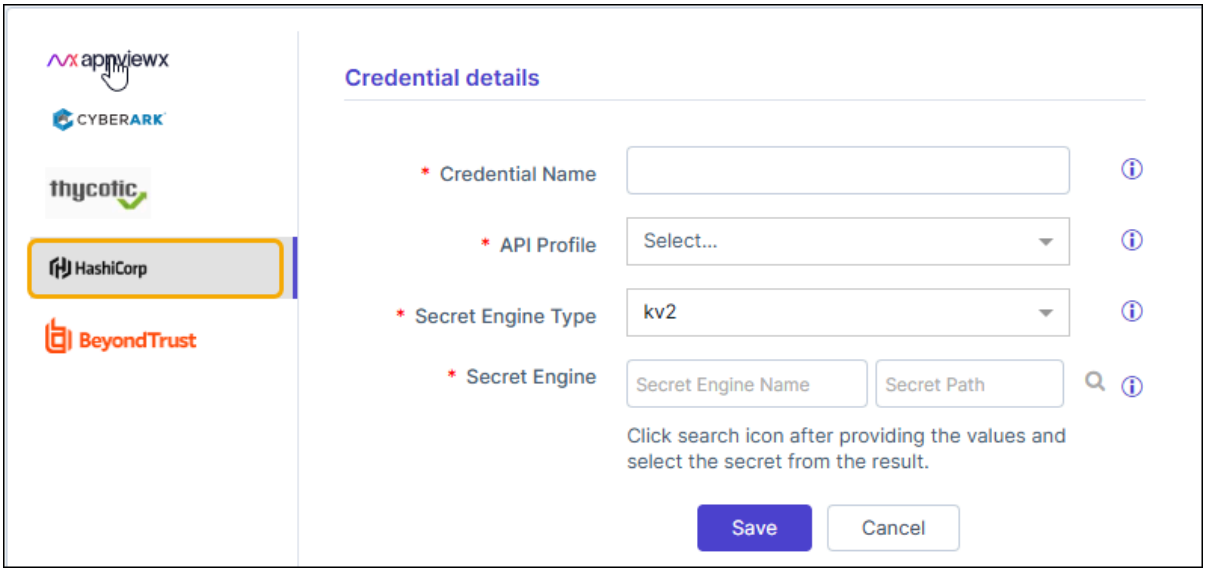
5. Close the **HashiCorp Settings** pop-up window.
   The HashiCorp **Credential Details** page is displayed.

Adding HashiCorp Credential Details

To configure credential details for the HashiCorp vault:

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1. On the **Credential Details** page for **HashiCorp** enter the required field information.



Field descriptions for Credential details

Field	Description
***Credential name**	Enter a unique name to identify the credential in AppViewX.
***API Profile**	Select the appropriate Hashicorp API profile. Multiple profiles can be configured in the API settings for managing credentials across environments, regions, or specific use cases.
***Secret Engine Type**	Select the secret engine type (**Kv2**/**Open LDAP**) where the secrets are stored.
***Secret Engine**	**Secret Engine Name:** Enter the secret engine name and path to search for the secrets. Choose the desired secret from the results. **Secret Path:** The specific location (or path) within the Hashicorp where secrets are stored.
*: *Mandatory fields*	

2. Click **Save**.

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References

- Vault installation documentation
- Vault product documentation
- Cloud access management documentation

BeyondTrust

BeyondTrust is a leading Privileged Access Management (PAM) solution that helps organizations secure and manage privileged accounts, credentials, and remote access across the IT environments.

Prerequisites for Integrating BeyondTrust with AppViewX

Ensure that the BeyondTrust vault is correctly installed and configured before proceeding with the integration.

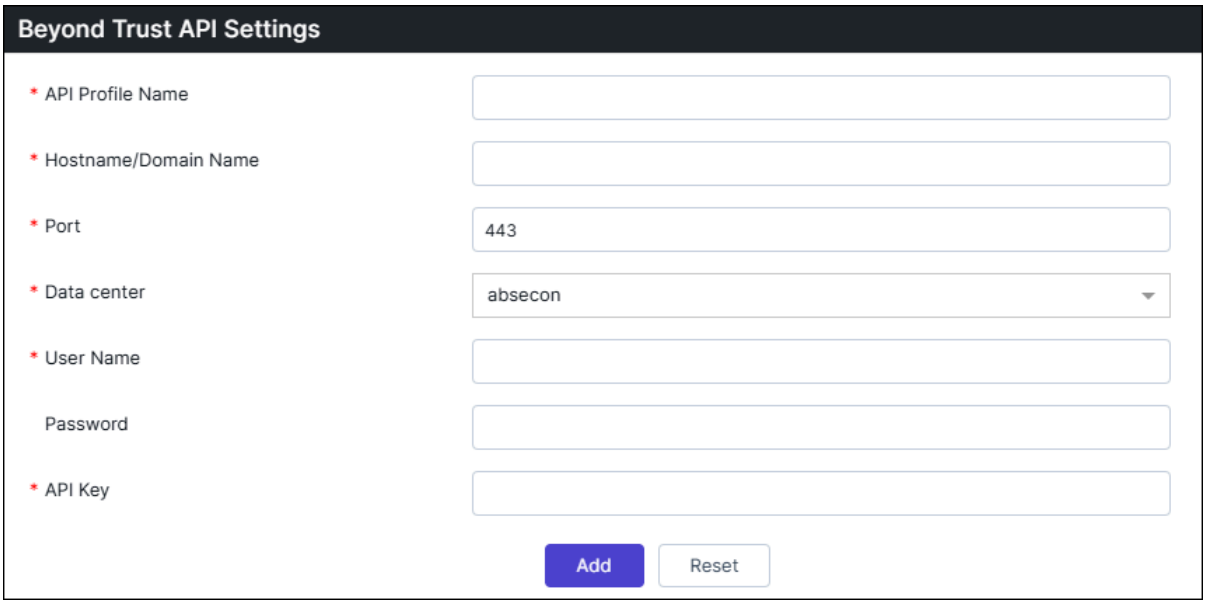
For links to the corresponding BeyondTrust vault documentation, see to the References section.

Configuring BeyondTrust Integration Settings

To configure credential details for the BeyondTrust vault:

1. Go to **Platform > VAULT & SECURITY > PAM**.
   The **PAM** page is displayed.
2. Click the **+ (Add credential)** button.
3. On the **Add credential** page, select **BeyondTrust** from the left menu.
4. From the top right corner of the page, click **BeyondTrust API Settings**.
   The **BeyondTrust API Settings** pop-up window is displayed.

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Field descriptions for BeyondTrust API Settings

Field	Description
***API Profile Name**	Enter a unique name to identify the API profile.
***Hostname/ Domain Name**	Enter the Hostname of the BeyondTrust Secret Server if it is hosted in an on-prem environment or the Domain name of the BeyondTrust Secret Server if it is the cloud version.
***Port**	Enter the port number used to connect to the API.
***Data center**	Select the appropriate data center where the BeyondTrust components are located or managed. It will be used to perform the communication.
***Username**	Enter the username required to access the API.
Password	Enter the password that pairs with the user name for api authentication.
***API Key**	Enter the API key obtained from the BeyondTrust API registration process. It is the security key provided for authentication.
*: *Mandatory fields*	

Note: You can add multiple BeyondTrust Secret Servers as different Profiles. Each BeyondTrust Secret Server will be added to the BeyondTrust API settings page.

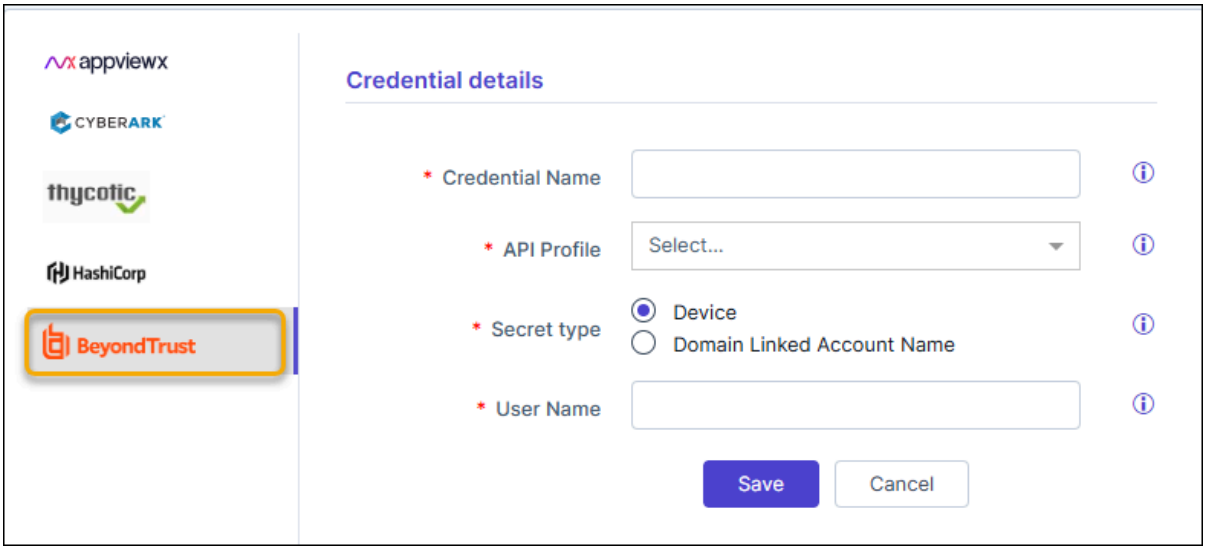
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5. Once the details are entered, click **Add**.
6. To modify the details of any profile, click on the name of the profile, modify the details and click **Modify**.
7. To delete any profile, click **(Delete)** icon in the **Action** column of the profiles.
8. Close the **BeyondTrust API Settings** pop-up window.
   The BeyondTrust **Credential Details** page is displayed.

Adding BeyondTrust Credential Details

To configure credential details for the BeyondTrust vault:

1. On the **Credential Details** page for **BeyondTrust**, enter the required field information.



Field descriptions for Credential details

Field	Description
***Credential name**	Enter a unique name to identify the credential in AppViewX.
***API Profile**	Select the appropriate BeyondTrust API profile. Multiple profiles can be configured in the API settings for managing credentials across environments (e.g., production, staging), regions, or specific use cases.
***Secret Type**	Select the Secret Type linked with the Credential: • **Device**: Use this for Device Credentials. The Managed System name in the BeyondTrust secret must match the device IP/FQDN in AppViewX. • **Domain Linked Account Name**: Use this for domain-linked accounts.

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Field	Description
***Username**	Enter the user name (Managed Accounts name) stored in BeyondTrust . When this secret is used in any device, respective device name will be automatically send as one of the argument when AppViewX fetches credential from Vault.
*: *Mandatory fields*	

2. Click **Save**.

References

- BeyondTrust Privileged Remote Access documentation

HSM Integration for AppViewX

An HSM (Hardware Security Module) is a piece of hardware and associated software or firmware that usually resides in a PC or server and provides at least the minimal cryptographic functions. These functions include encryption, decryption, key generation, and hashing. The physical device offers physical tamper-resistance and has a user interface and a programmable interface. Other names for an HSM include Personal Computer Security Module (PCSM), Secure Application Module (SAM), Hardware Cryptographic Device, or Cryptographic Module.

For the deployment, AppViewX enables support for integrating all HSMs that support the PKCS11 library, an interface that facilitates interaction between the HSM and AppViewX. This eliminates the need to deploy vendor-specific SDKs and JAR files, thus significantly reducing the time it takes for integrating and installing an HSM.

The deployment currently supports the following four HSM vendors:

- Utimaco
- Fortanix
- Entrust
- Thales TCT
- Thales - DPoD
- Thales - GPN.

- HSM Architecture for the SaaS Deployment
- HSM Inventory and Encryption Settings

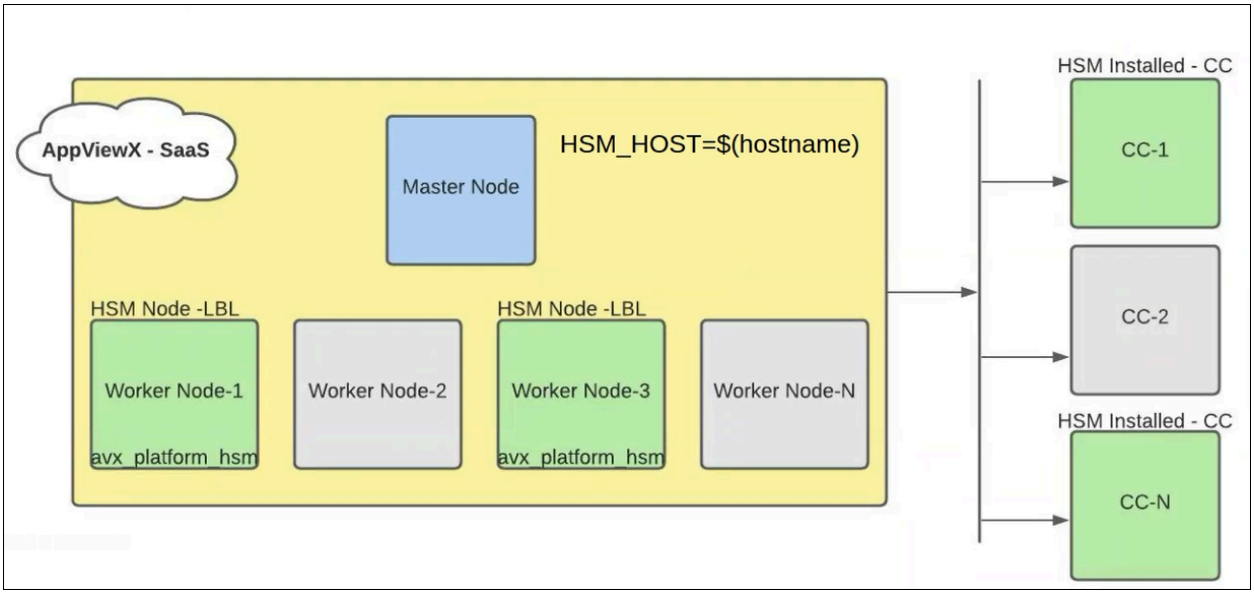
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- HSM Installation and Configuration
- Managing Master Encryption Key

Accessing HSM

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **VAULT & SECURITY**, select **HSM**. The **HSM** page is displayed.	1. From the main navigation menu, select **Inventory** > **HSM**. 2. The **HSM** page is displayed.
For more information on how to switch between menus, click here.	

HSM Architecture for the SaaS Deployment



In the SaaS deployment, all necessary configuration files enabling integration and communication with HSM are installed on the AppViewX Cloud Connector.

In a SaaS deployment, the chosen cloud connector used for HSM communication should have strict routing enabled.

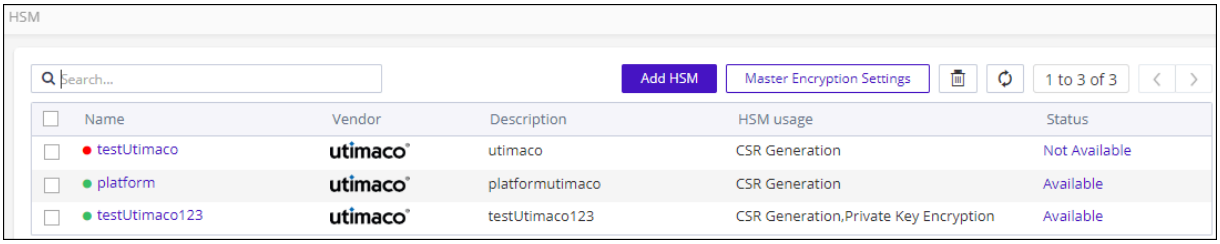
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HSM Inventory and Encryption Settings

The Inventory section allows you to add and configure HSM vendors such Utimaco, Fortanix, Thales TCT, Thales DPoD, and Thales GPN. By default the Inventory displays the HSM vendors that have already been configured. However, you can add and configure a vendor of your choice.

To configure HSM for a vendor:

1. On the **HSM** page, the inventory of all added HSMs, displays details such as name, vendor, description, HSM Usage, and status.



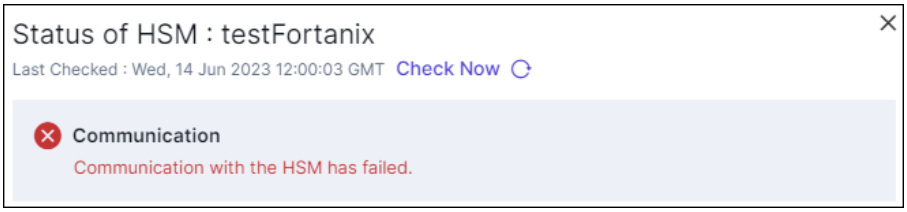
   You can use the search bar.

   The inventory table provides essential details about the integrated HSM.

   Field descriptions for HSM Inventory

Field	Description
Name	Displays the name of integrated HSM.
Vendor	Displays the vendor name of integrated HSM.
Description	Displays the description of integrated HSM.
HSM usage	It displays the usage of HSM. **Note:** If you opt to use the HSM for Master Key Encryption in SaaS, its reflection in the HSM Usage column will occur only after the Account Owner has selected that HSM in the Master Encryption Settings Page.
Status	Displays the current status of the HSM. • **Available** - To know the details about the communication and last checked date and time, click on the "Available" status. • **Not Available** - To know the details about the reason for communication failure and last checked date and time, click on the "Not Available" status.

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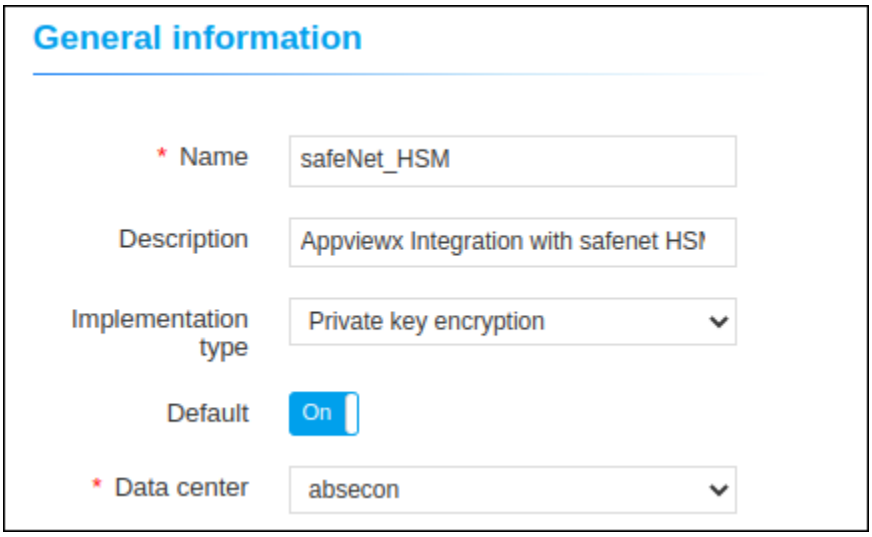
Field	Description
	 • **In Progress** - To know the details about the communication In progress, click on the "In-progress" status.

2. On the **HSM** page, from the top-right corner of the screen, click Add HSM.
3. From the left pane, select the vendor for whom you want to integrate HSM.
   HSM integration details fields are displayed for the selected vendor.
4. Enter the **HSM details** for the vendor.
   - To enter the HSM details for Utimaco, click here.
   - To enter the HSM details for Fortanix, click here.
   - To enter the credential details for Thales TCT, click here.
   - To enter the credential details for Thales DPoD, click here.
   - To enter the credential details for Thales GPN, click here.
   - To enter the credential details for Entrust, click here.
5. Click **Save**.

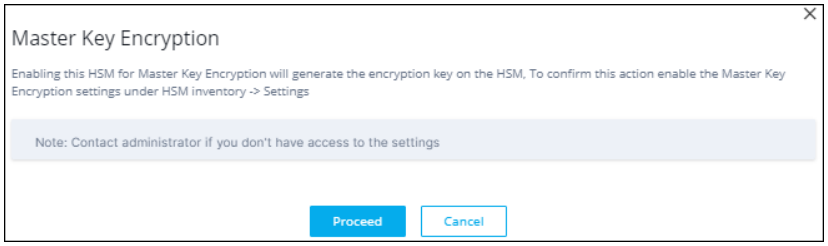
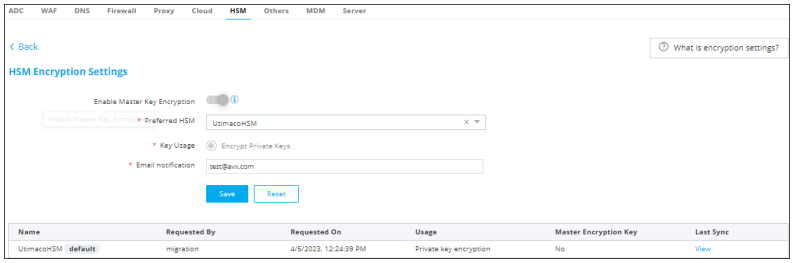
Adding HSM in the inventory

1. Login to the AppViewX UI using valid credentials.
   The **Dashboard** page is displayed by default.
2. On **HSM** page, click **Add HSM**, from the navigation pane on the left, select **Thales TCT**.
   The **HSM > Add** page is updated to display the fields required to integrate Thales TCT with the AppViewX.
3. In the **General Information** section, enter/select the required field information.

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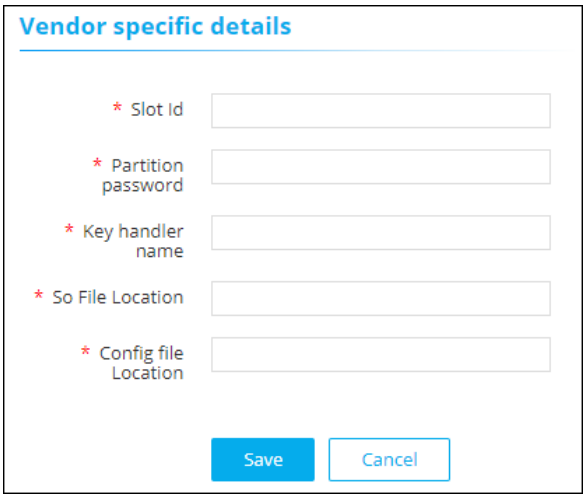
Field descriptions for General Information

Field	Description
***Name**	Enter a name for this integration.
Description	Enter a description for the integration.
Implementation type	Select an implementation type from the following options: • CSR generation • Master key encryption • Both  a. Click **Proceed**. b. To confirm this action enable the **Master Key Encryption settings** under **HSM inventory** > **Settings**. 

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Field	Description
***Data center**	From the dropdown list, from the list of applicable values, select the required data center. **Note:** The data center selected here is used to map the AppViewX Cloud Connector for this integration.
** : Mandatory fields*	

4. In the **Vendor specific details** section, enter/select the required field information.



Field descriptions for Vendor specific details

Field	Description
***Slot Id**	Unique identification number of the slot in the HSM will be used to communicate with the end HSM device.
***Partition password**	Password of the HSM partition for the specific slot mentioned above.
***Key handler name**	A reference name to create a Master Encryption key in HSM. This enables us to pick the right MEK for crypto operations over KEK.
***So File**	The SO file is used to facilitate the communication between the HSM and AppViewX. Enter the .so file location hsm/safenet/lunaclient/lib/libCryptoki2_64.so. So File Location:

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Field	Description
***Config file**	The Config file is used to facilitate the communication between the HSM and AppViewX. Enter the .conf file location hsm/Chrystoki.conf.
** : Mandatory fields*	

5. Click **Save**.
6. Scroll to the end of this page to view the table/navigate to HSM inventory to view the HSM status. If the HSM has been configured correctly, the Status for the HSM will be set to **Available** (after checking the encryption and decryption logic). If the Status is **Not Available**:
   a. Check the installation path for the HSM.
   b. Ensure that all required permissions have been enabled.
   c. Go to **Logs** > **Logging :: All**. Search with HSM and see the **Log message**.
7. If the implementation type is CSR Generation, refer to the Cert+ User Guide for steps on how to generate a CSR.

HSM Encryption Settings

To secure certificates with a private key, enable private key encryption in the Master Encryption Settings page. Follow the steps below to enable private key encryption.

1. Add a new HSM to the HSM inventory by selecting Master Key Encryption as the HSM usage.
2. In the top-right corner of the HSM inventory page, select the Master Encryption Settings button.
3. Enable the Master Key Encryption Toggle under the HSM Settings.
4. Select the added HSM from the preferred HSM dropdown and set the key usage to encrypt private keys.
5. Provide notification emails or email distro, in the case of HSM connectivity or key not accessible failures to the administrators.

> **Note:** To receive default HSM health status emails, set up the email address in the settings page. Ensure SMTP settings are configured in **Platform** > **System Administration** > **SMTP** for email functionality.

6. Save the Settings for the HSM to be marked as default HSM for storing encryption keys.

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HSM Installation and Configuration

This process involves setting up and integrating supported Hardware Security Modules (HSMs) with AppViewX for secure key storage and cryptographic operations. Each HSM vendor (Utimaco, Fortanix, Thales TCT/DPoD/GPN, Entrust) requires specific drivers, client libraries, and configuration steps to establish connectivity. Once configured, the HSM ensures FIPS-compliant protection of private keys and supports encryption, signing, and certificate lifecycle operations.

- Utimaco
- Fortanix
- Thales TCT
- Thales DPoD
- Thales GPN
- Entrust HSM

Utimaco

Prerequisites

1. The Utimaco HSM device setup should be available.
2. HSM slot initialization and crypto user credential creation should be done.
3. Communication to the HSM and AppViewX nodes in the case of  and the cloud connector in the case of  should be available to integrate with AppViewX. The port details are as follows:
   - **Port 443**: HTTPS access for secure web-based management interfaces.
   - **Port 9004**: Typically used for the Utimaco SecurityServer Se50/Se100 for administration and key management.
   - **Port 9006**: Used for key management operations and cryptographic service access.
4. Slot id and partition password from the Utimaco device should be available to use in the AppViewX.

   ```
   pkcs11_Utimaco.so
   ```

   and

   ```
   cs_pkcs11_R2.cfg
   ```

   file should be available; a sample format of a cfg file is available here.

For references to the Utimaco documentation, see the References section.

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Integrating the Utimaco HSM with AppViewX Onprem

To integrate the Utimaco HSM with the AppViewX:

1. Login to the AppViewX server on which the AppViewX is installed.
2. From the command line interface, navigate to the properties folder path:
   {APPVIEWX_INSTALLATION_PATH}/appviewx_dependencies/properties
3. Open the **hsm** file using the following command:

```
vi hsm
```

4. Check and confirm if the HSM file has the following lines. If not, uncomment the following lines:

```
export CS_PKCS11_R2_CFG=/appviewx/dependencies/hsm/utimaco/cs_pkcs11_R2.cfg
```

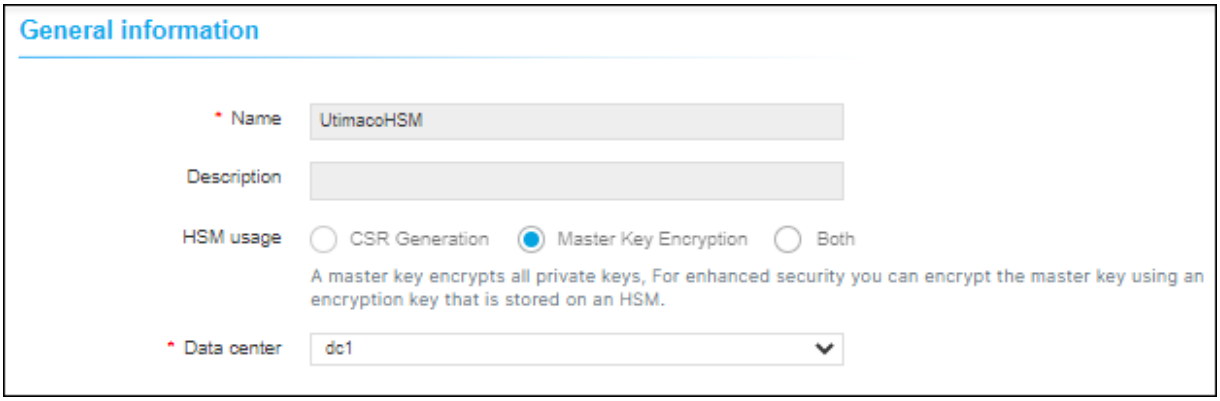
```
echo "UTIMACO Config Path : $CS_PKCS11_R2_CFG"
```

5. If the file is edited, you have to restart the avx-platform-hsm pod, using the following commands:

```
kubectl get pods -n <namespace>
```

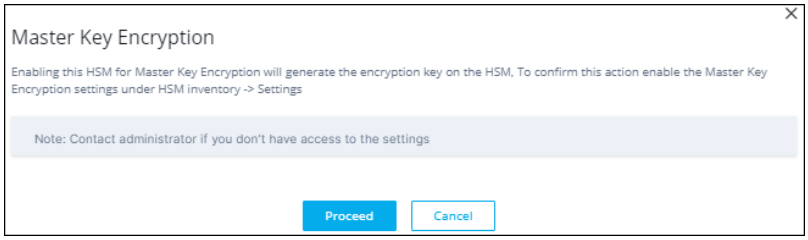
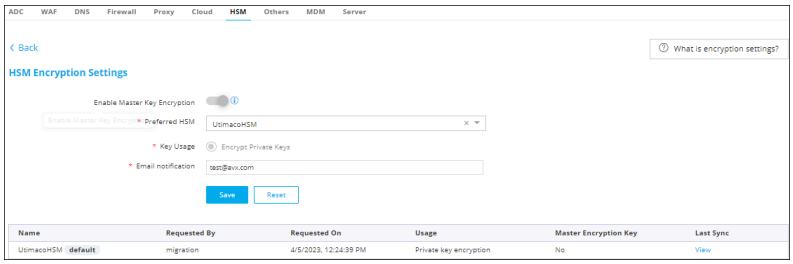
```
kubectl delete pods -n <namespace> <PodName>
```

6. Login to the AppViewX UI using valid credentials.
   The **Dashboard** page is displayed by default.
7. On **HSM** page, click **Add HSM**, from the navigation pane on the left, select **Utimaco**.
   The **HSM > Add** page is updated to display the fields required to integrate Utimaco with the AppViewX.
8. To integrate the utimaco hsm device with appviewx, please get the following details from the hsm device.
9. In the **General Information** section, enter/select the required field information.



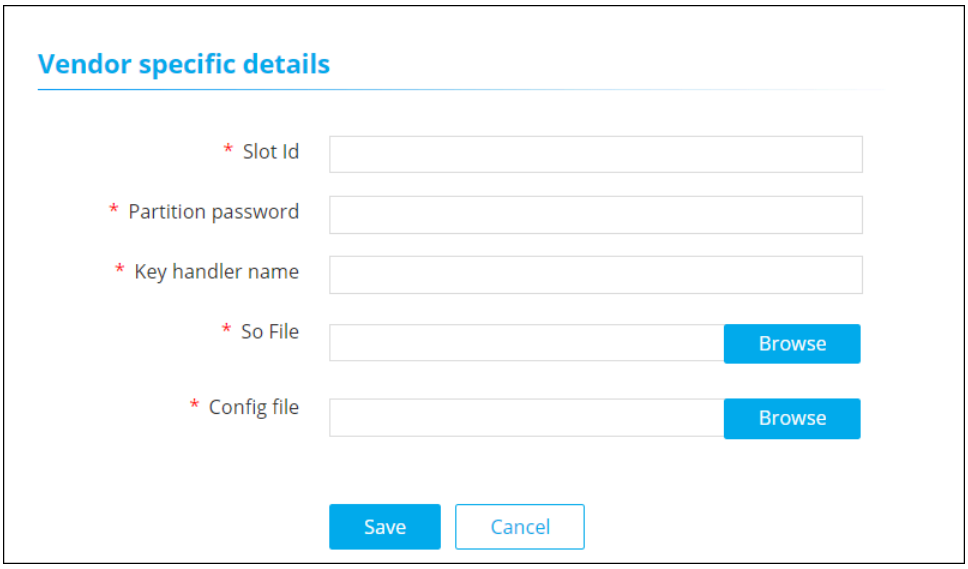
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Field descriptions for General Information

Field	Description
***Name**	Enter a name for this integration.
Description	Enter a description for the integration.
Implementation type	Select an implementation type from the following options: • CSR generation • Master key encryption  a. Click **Proceed**. b. To confirm this action enable the **Master Key Encryption settings** under **HSM inventory** > **Settings**.  • Both
***Data center**	From the dropdown list, from the list of applicable values, select the required data center. **Note:** The data center selected here is used to map the AppViewX Cloud Connector for this integration.
** : Mandatory fields*	

10. In the **Vendor specific details** section, enter/select the required field information.

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Field descriptions for Vendor specific details

Field	Description
***Slot Id**	Unique identification number of the slot in the HSM will be used to communicate with the end HSM device.
***Partition password**	Password of the HSM partition for the specific slot mentioned above.
***Key handler name**	A reference name to create a Master Encryption key in HSM. This enables us to pick the right MEK for crypto operations over KEK.
***So File**	The SO file is used to facilitate the communication between the HSM and AppViewX. To upload the .so file: a. Click **Browse**. b. Navigate to the location of the .so file. c. Select the .so file, and click **Open**.
***Config file**	The Config file is used to facilitate the communication between the HSM and AppViewX. To upload the .conf file: a. Click **Browse**. b. Navigate to the location of the .conf file. c. Select the .conf file, and click **Open**.
** : Mandatory fields*	

11. Click **Save**.

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12. Scroll to the end of this page to view the table or navigate to HSM inventory to view the HSM status. If the HSM has been configured correctly, the status for the HSM will be set to **Available** after checking the encryption and decryption logic. If the Status is **Not Available**:
    a. Check the installation path for the HSM.
    b. Ensure that all required permissions have been enabled.
    c. Go to **Logs** > **Logging :: All**. Search with HSM and see the **Log message**.
13. If the implementation type is CSR Generation, refer to the Cert+ User Guide for steps on how to generate a CSR.

Integrating the Utimaco HSM with AppViewX SaaS

To integrate the Utimaco HSM with the AppViewX:

1. Login to the AppViewX server on which the Cloud Connector is installed.
2. From the command line interface, navigate to the properties folder path: {CC_INSTALLATION_PATH}/deps/properties
3. Open the **hsm** file using the following command:

```
vi hsm
```

4. Check and confirm if the HSM file has the following lines. If not, uncomment the following lines:

```
export CS_PKCS11_R2_CFG= /appviewx/dependencies/external_libs/hsm/utimaco/cs_pkcs11_R2.cfg
```

```
echo "UTIMACO Config Path : $CS_PKCS11_R2_CFG"
```

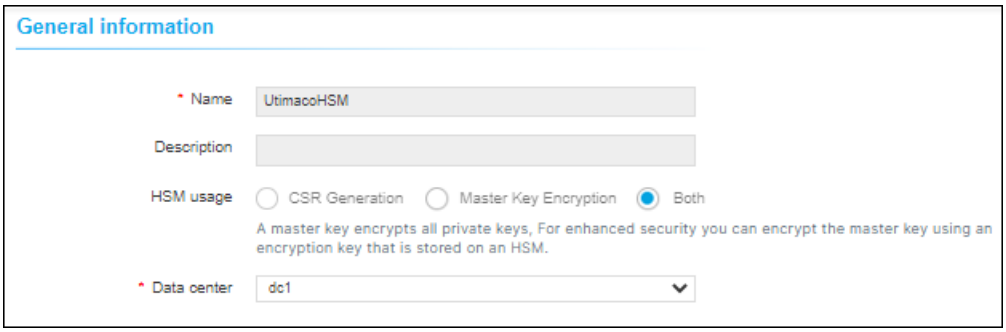
5. If the file is edited, you have to restart the avx-mid-server-platform pod, using the following commands:

```
kubectl get pods -n <namespace>
```

```
kubectl delete pods -n <namespace> <PodName>
```

6. Login to the AppViewX UI using valid credentials.
   The **Dashboard** page is displayed by default.
7. On **HSM** page, click **Add HSM**, from the navigation pane on the left, select **Utimaco**.
   The **HSM > Add** page is updated to display the fields required to integrate Utimaco with the AppViewX.
8. To integrate the utimaco hsm device with appviewx, please get the following details from the hsm device.
9. In the **General Information** section, enter/select the required field information.

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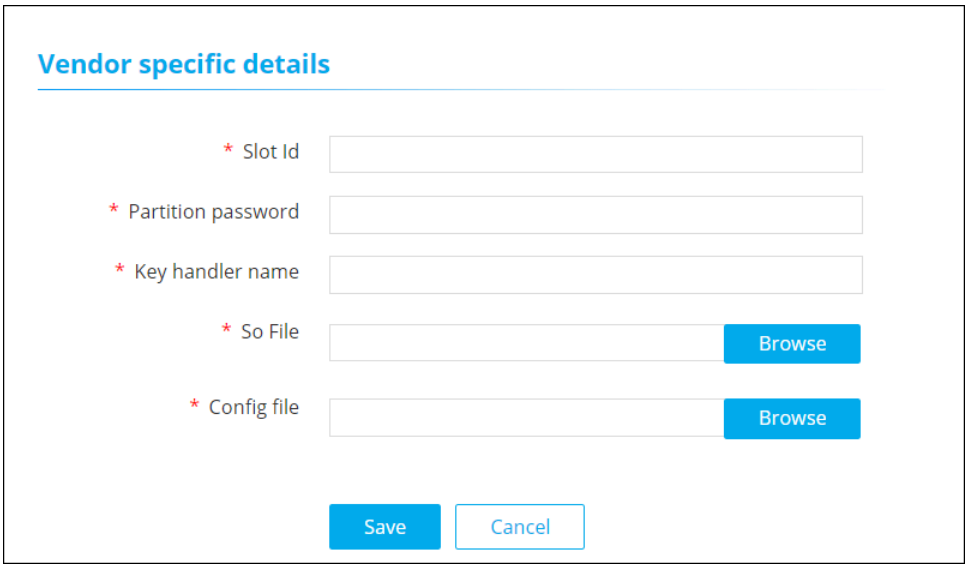


Field descriptions for General Information

Field	Description
***Name**	Enter a name for this integration.
Description	Enter a description for the integration.
Implementation type	Select an implementation type from the following options: • CSR generation • Master key encryption • Both
***Data center**	From the dropdown list, from the list of applicable values, select the required data center. **Note:** The data center selected here is used to map the AppViewX Cloud Connector for this integration.
** : Mandatory fields*	

10. In the **Vendor specific details** section, enter/select the required field information.

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Field descriptions for Vendor specific details

Field	Description
***Slot Id**	Unique identification number of the slot in the HSM will be used to communicate with the end HSM device.
***Partition password**	Password of the HSM partition for the specific slot mentioned above.
***Key handler name**	A reference name to create a Master Encryption key in HSM. This enables us to pick the right MEK for crypto operations over KEK.
***So File**	The SO file is used to facilitate the communication between the HSM and AppViewX. To upload the .so file: a. Click **Browse**. b. Navigate to the location of the .so file. c. Select the .so file, and click **Open**.
***Config file**	The Config file is used to facilitate the communication between the HSM and AppViewX. To upload the .conf file: a. Click **Browse**. b. Navigate to the location of the .conf file. c. Select the .conf file, and click **Open**.
** : Mandatory fields*	

11. Click **Save**.

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12. Scroll to the end of this page to view the table or navigate to HSM inventory to view the HSM status. If the HSM has been configured correctly, the status for the HSM will be set to **Available** after checking the encryption and decryption logic. If the Status is **Not Available**:
    a. Check the installation path for the HSM.
    b. Ensure that all required permissions have been enabled.
    c. Go to **Logs** > **Logging :: All**. Search with HSM and see the **Log message**.
13. If the implementation type is CSR Generation, refer to the Cert+ User Guide for steps on how to generate a CSR.

References

- Utimaco documentation resources

Fortanix

- Managing Fortanix HSM without Internet Connectivity
- Troubleshooting

Prerequisites

1. The Fortanix HSM device setup should be available.
2. HSM slot initialization and crypto user credential creation should be done.
3. Communication to the HSM and AppViewX nodes in the case of  and the cloud connector in the case of  should be available to integrate with AppViewX. The port details are as follows:
    - **Port 443**: This is the primary port used for HTTPS communication with the Fortanix DSM.
    - **Port 8443**: This is used for administrative access to the DSM.
    - **Port 9443**: This port is used for API access.
4. The slot id and partition password from the Fortanix device should be available to use in the AppViewX.

For references to the Fortanix documentation, see the References section.

Integrating the Fortanix HSM with the AppViewX Onprem

To integrate the Fortanix HSM with the AppViewX:

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1. Login to the AppViewX server on which the AppViewX is installed.
2. From the command line interface, navigate to the properties folder path:
   {APPVIEWX_INSTALLATION_PATH}/appviewx_dependencies/properties
3. Open the **hsm** file using the following command:

```
vi hsm
```

4. Check and confirm if the HSM file has the following lines. If not, uncomment the following lines:

```
export FORTANIX_PKCS11_CONFIG_PATH= /appviewx/dependencies/hsm/fortanix/pkcs11.conf
```

```
echo "FORTANIX Config Path : $FORTANIX_PKCS11_CONFIG_PATH"
```

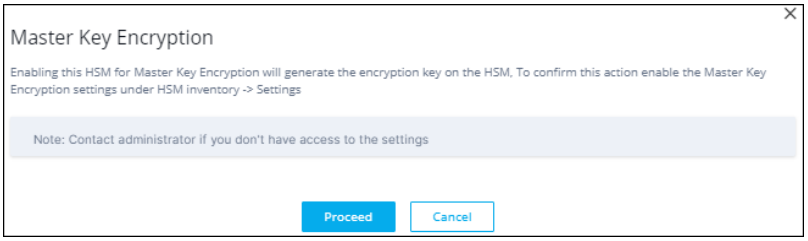
5. If the file is edited, you have to restart the avx-platform-hsm pod, using the following commands:

```
kubectl get pods -n <namespace>
```

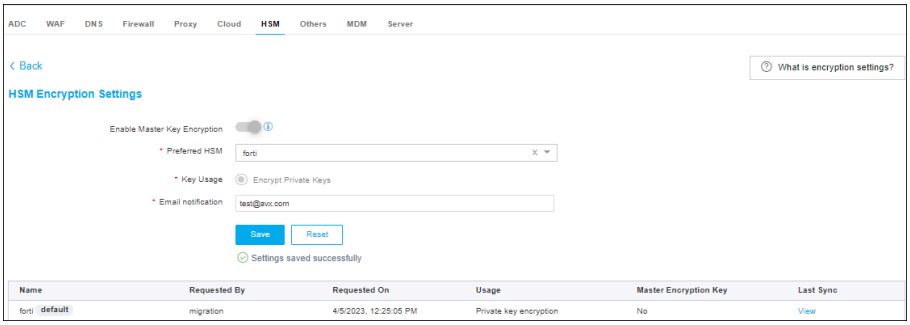
```
kubectl delete pods -n <namespace> <PodName>
```

6. Login to the AppViewX UI using valid credentials.
   The **Dashboard** page is displayed by default.
7. On **HSM** page, click **Add HSM**, from the navigation pane on the left, select **Fortanix**.
   The **HSM > Add** page is updated to display the fields required to integrate Fortanix with the AppViewX.
8. In the **General Information** section, enter/select the following details:

Field descriptions for General Information

Field	Description
***Name**	Enter a name for this integration.
Description	Enter a description for this integration.
HSM usage	Select an HSM usage from the following options: • CSR generation • Master key encryption  Click **Proceed**. To confirm this action enable the **Master Key Encryption settings** under **HSM inventory** > **Settings**

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Field	Description
	 • Code Signing • All
***Data center**	Select the required data center from the list of applicable values in the dropdown menu.
** : Mandatory fields*	

9. In the **Vendor specific details** section, enter/select the following details:

Field descriptions for Vendor specific details

Field	Description
FIPS Mode	Enable the toggle to switch On for FIPS mode.
***API Key**	Unique identification number of the slot in the HSM will be used to communicate with the end HSM device. Enter the API key.
***Key handler name**	A reference name to create a Master Encryption key in HSM. This enables us to pick the right MEK for crypto operations over KEK.
***So file**	The SO file is used to facilitate the communication between the HSM and AppViewX. To upload the .so file: a. Click **Browse**. b. Navigate to the location of the .so file. c. Select the .so file, and click **Open**.
***Config file**	The Config file is used to facilitate the communication between the HSM and AppViewX. To upload the .conf file: a. Click **Browse**. b. Navigate to the location of the .conf file. c. Select the .conf file, and click **Open**.

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Field	Description
** : Mandatory fields*	

10. Click **Save**.
11. Scroll to the end of this page to view the table or navigate to HSM inventory to view the HSM status. If the HSM has been configured correctly, the status for the HSM will be set to **Available** after checking the encryption and decryption logic. If the Status is **Not Available**:
    a. Check the installation path for the HSM.
    b. Ensure that all required permissions have been enabled.
    c. Go to **Logs** > **Logging :: All**. Search with HSM and see the **Log message**.
12. If the implementation type is CSR Generation, refer to the Cert+ User Guide for steps on how to generate a CSR.

Integrating the Fortanix HSM with the AppViewX SaaS

To integrate the Fortanix HSM with the AppViewX:

1. Login to the AppViewX server on which the Cloud Connector is installed.
2. From the command line interface, navigate to the properties folder path:
   {CC_INSTALLATION_PATH}/deps/properties
3. Open the **hsm** file using the following command:

```
vi hsm
```

4. Check and confirm if the HSM file has the following lines. If not, uncomment the following lines:

```
export FORTANIX_PKCS11_CONFIG_PATH= /appviewx/dependencies/external_libs/hsm/fortanix/pkcs11.conf
```

```
echo "FORTANIX Config Path : $FORTANIX_PKCS11_CONFIG_PATH"
```

5. If the file is edited, you have to restart the avx-mid-server-platform pod, using the following commands:

```
kubectl get pods -n <namespace>
```

```
kubectl delete pods -n <namespace> <PodName>
```

6. Login to the AppViewX UI using valid credentials.
   The **Dashboard** page is displayed by default.
7. On **HSM** page, click **Add HSM**, from the navigation pane on the left, select **Fortanix**.
   The **HSM > Add** page is updated to display the fields required to integrate Fortanix with the AppViewX.
8. In the **General Information** section, enter/select the following details:

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Field descriptions for General Information

Field	Description
***Name**	Enter a name for this integration.
Description	Enter a description for this integration.
HSM usage	Select an HSM usage from the following options: • CSR generation • Master key encryption • Code Signing • All
***Data center**	Select the required data center from the list of applicable values in the dropdown menu.
** : Mandatory fields*	

9. In the **Vendor specific details** section, enter/select the following details:

Field descriptions for Vendor specific details

Field	Description
FIPS Mode	Enable the toggle to switch On for FIPS mode.
***API Key**	Unique identification number of the slot in the HSM will be used to communicate with the end HSM device. Enter the API key.
***Key handler name**	A reference name to create a Master Encryption key in HSM. This enables us to pick the right MEK for crypto operations over KEK.
***So file**	The SO file is used to facilitate the communication between the HSM and AppViewX. To upload the .so file: a. Click **Browse**. b. Navigate to the location of the .so file. c. Select the .so file, and click **Open**.
***Config file**	The Config file is used to facilitate the communication between the HSM and AppViewX. To upload the .conf file: a. Click **Browse**. b. Navigate to the location of the .conf file. c. Select the .conf file, and click **Open**.

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Field	Description
** : Mandatory fields*	

10. Click **Save**.
11. Scroll to the end of this page to view the table or navigate to HSM inventory to view the HSM status. If the HSM has been configured correctly, the status for the HSM will be set to **Available** after checking the encryption and decryption logic. If the Status is **Not Available**:
    a. Check the installation path for the HSM.
    b. Ensure that all required permissions have been enabled.
    c. Go to **Logs** > **Logging :: All**. Search with HSM and see the **Log message**.
12. If the implementation type is CSR Generation, refer to the Cert+ User Guide for steps on how to generate a CSR.

Configuring Fortanix HSM using Proxy

Format for the environment variable

To configure a proxy for Fortanix HSM, the following environment variable has to be added to the HSM properties file. Use the below format to form the environment variable.

1. If the proxy is **http**

```
export FORTANIX_PROXY=http://<username>:<password>@<proxy_server_ip>:<proxy_server_port>
```

2. If the proxy is **https**

```
export FORTANIX_PROXY=https://<username>:<password>@<proxy_server_ip>:<proxy_server_port>
```

Example

Consider the following proxy details:

Proxy IP: 199.199.199.199

Proxy Port: 9999

Username: testuser

Password: Testuser@123

```
export FORTANIX_PROXY=http://testuser:Testuser%40123@999.999.999.999:9999
```

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Where the special characters have to be encoded. The encoding for the following special characters is as follows:

Special Character	Encoding
@	%40
:	%3A
#	%23
?	%3F
/	%2F
&	%26
=	%3D
+	%2B
Space ( )	%20

These encodings are required as all the linux distros considers

- @ separates **credentials** from the **host**
- : separates **username** and **password**
- # denotes a **fragment**, which is ignored
- &, ?, and others have special meanings in query strings

If the password contains these characters and are left un-encoded, such characters may cause the URL parser to misinterpret the proxy string, leading to authentication failures or incorrect proxy behavior. Percent-encoding ensures that the credentials are correctly parsed and securely transmitted.

OnPrem Proxy Configurations

For OnPrem proxy configurations, steps are as follows:

1. Execute the command below. Provide the datacentre in the <namespace>.

   ```
   kubectl get pods -n <namespace>
   ```

2. Login into the HSM pod using the command below.

   ```
   kubectl exec -it <hsm_pod_name>-n <namespace> -- bash
   ```

3. Go to this location **/appviewx/dependencies/properties/** and execute the command below.

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```
vi hsm
```

4. Now, add the following environmental variable which has been formed using the above format.

```
export FORTANIX_PROXY=http://testuser:Testuser%40123@999.999.999.999:9999
```

5. Once added, exit the pod and restart the HSM pod.
6. After the pod has restarted, update the HSM in the AppViewX application.

SaaS Proxy Configurations

For SaaS proxy configurations, steps are as follows:

1. Login into the cloud connector server.
2. Login into the pod using the command below.

```
./k3s kubectl exec -it <mid-server-platform-pod-name> -n cc -- bash
```

3. Go to this location **/appviewx/dependencies/properties/** and execute the command below.

```
vi hsm
```

4. Now, add the following environmental variable which has been formed using the above format.

```
export FORTANIX_PROXY=http://testuser:Testuser%40123@999.999.999.999:9999
```

5. Once added, exit the pod and restart the platform midserver pod.
6. After the pod has restarted, update the HSM in the AppViewX application.

References

- Fortanix HSM Gateway User's Guide

Managing Fortanix HSM without Internet Connectivity

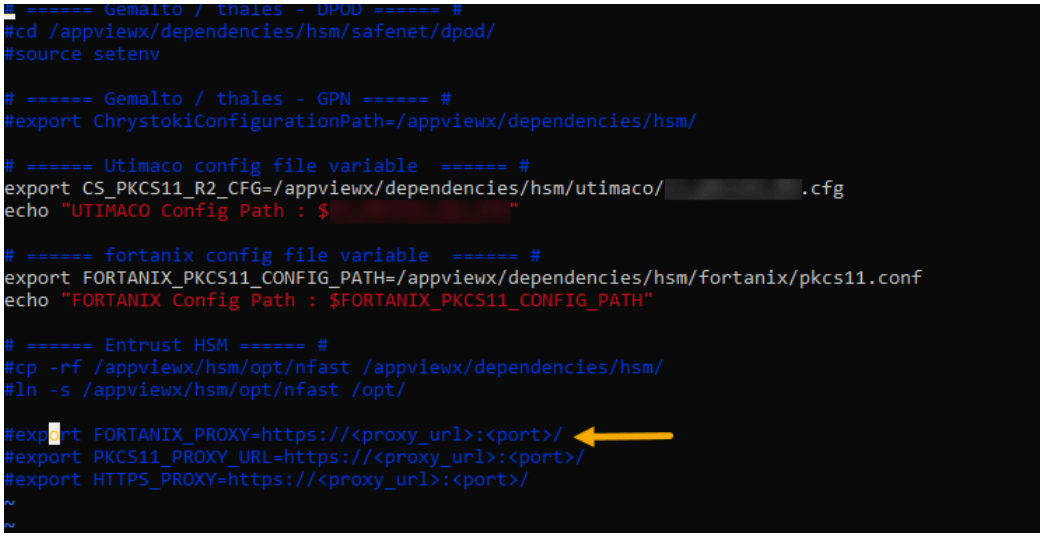
When the user lacks direct internet connectivity from the AppViewX HSM node in an on-prem environment but still needs to manage the HSM device, a **proxy URL** must be configured in the HSM configuration file. This configuration should be **pre-shipped**.

To enable proxy-based communication, the following lines are be **added** and **commented** in the `hsm` configuration file available in the properties directory:

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- **For On-Prem**

```
#export FORTANIX_PROXY=https://<proxy_url>:<port>/
```



To edit the HSM configuration file,

1. Go to the **properties** folder in the installation directory

   ```
   cd <appviewx_installation_path>/appviewx_dependencies/properties
   ```

2. To edit the configuration file, execute the command below.

   ```
   vi hsm
   ```

3. To enable the proxy URL for managing HSM when there is no internet connectivity, uncomment the below parameters in the config file and add the information as follows:

   - **For On-Prem**

     ```
     export FORTANIX_PROXY="http://username:%XY%99XX3x%99%99%99XX%3F8m-k@192.XXX.XXX.XXX:1234"
     ```

     where,

     - *username* - proxy's username.
     - *%XY%99XX9x%99%99%99XX%9X9x-x* - URL encoded password.
     - *192.XXX.XXX.XXX* - proxy IP.
     - *1234* - port number.

4. Save the file changes.
5. Restart the platform HSM pod (*avx-platform-hsm*) using the command below:

   ```
   kubectl delete pods <podname> -n <datacenter> --force
   ```

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Troubleshooting

To troubleshoot and resolve the **domain/name not resolved** error, refer the steps below.

1. Log in to the **mid-server-platform-core** container and open the Fortanix log file using the command:

```
vi /tmp/fortanix.log
```

2. Check the log file for the error thrown by Fortanix. If the error is **domain/name not resolved**, proceed with the next steps.
3. Export the proxy URL using the command:

```
export FORTANIX_PROXY=<proxy_url>
```

4. To manage the keys, run the command:

```
pkcs11-tool --module <cc_installation>/deps/external_libs/hsm/fortanix/fortanix_pkcs11.so --pin "PIN" -k --label test-key-avx --key-type rsa:2048 --login
 --login-type user
```

5. Navigate to the properties folder using the command

```
cd {CC_INSTALLATION_PATH}/deps/properties
```

6. Open the **hsm** file to edit:

```
vi hsm
```

7. Set the Fortanix proxy and config path in the hsm file by adding the lines below.

```
export FORTANIX_PROXY=<proxy_url>
export FORTANIX_PKCS11_CONFIG_PATH=/appviewx/dependencies/external_libs/hsm/fortanix/pkcs11.conf
echo "FORTANIX Config Path: $FORTANIX_PKCS11_CONFIG_PATH"
```

8. To apply the changes are made in the file, restart the **avx-mid-server-platform** pod uging the commands below.

```
kubectl get pods -n <namespace>
```

```
kubectl delete pods -n <namespace> <PodName>
```

Thales TCT

Prerequisites

- Ensure the HSM service/pod is up and running before integrating HSM with AppViewX.
  - If on-prem, use avx_platform_hsm as plugin.
  - If SaaS, use avx_platform_hsm & all Cloud Connector instances for HSM DC.

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- Communication to the HSM and AppViewX nodes in the case of  and the cloud connector in the case of  should be available to integrate with AppViewX. The port details are as follows:
  - **Port 1792**: This port is used for the Secure Trusted Device Communication (STDC) protocol.
  - **Port 9002**: This port is typically used for data encryption/decryption and key management services.
- Users need to provide both the client and Thales server certificates for agent installation. The installation of the agent and verification of the connection should be carried out by the customer with the assistance of HSM vendors.
- Add server and client certificates to establish a connection between AppViewX and HSM.
- From the AppViewX perspective, AppViewX has prepared a sample agent installation guide for Thales. Please refer to it for guidance.

Sample agent installation

To establish communication between the HSM and AppViewX, the installation of the Thales Luna agent is required. The following steps outline the process followed in our lab setup using LunaClient-7.12.0-18.zip.

1. Copy the LunaClient.zip file to the appviewx server and unzip it.
2. Go to LunaClient location

   ```
   cd /LunaClient-7.12.0-18/linux/64
   ```

3. Execute the chmod command as shown below:

   ```
   sudo chmod 755 install.sh
   ```

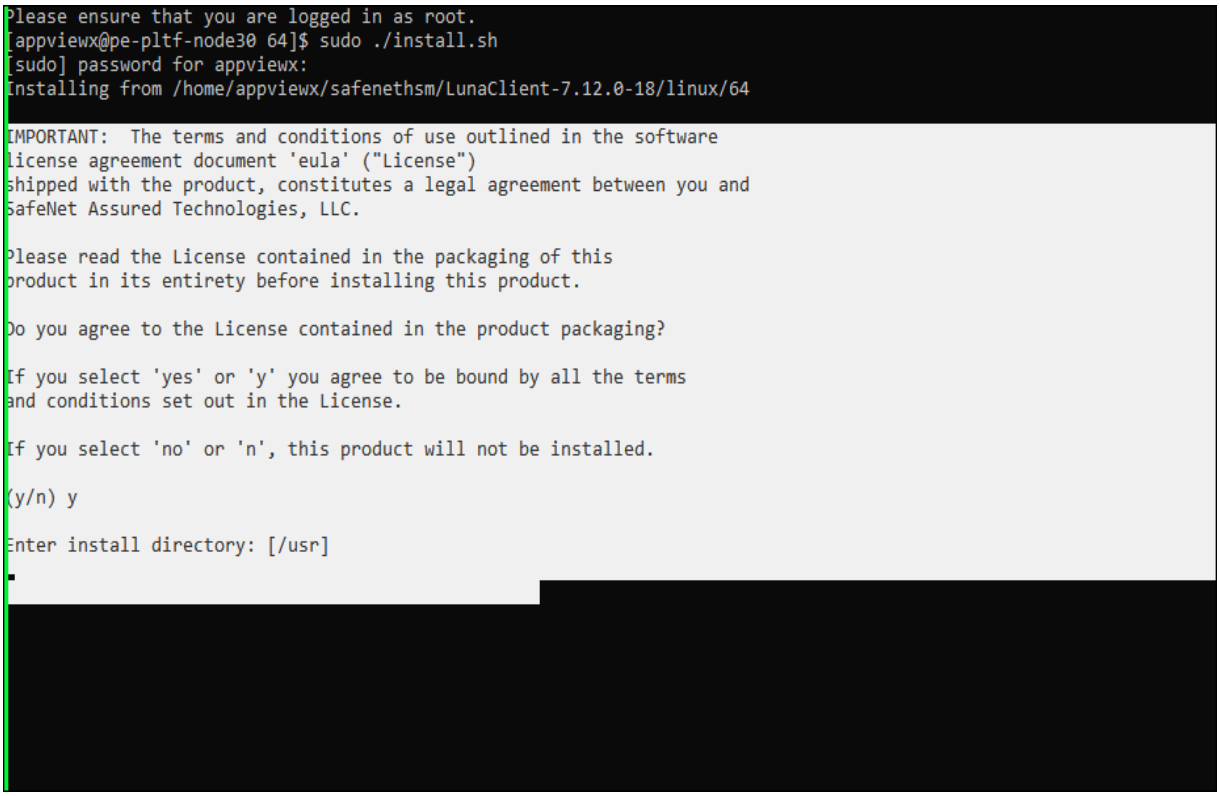
   ```
   sudo chmod 755 common
   ```

4. Run the install.sh file using the command given below:

   ```
   sudo ./install.sh
   ```

5. User will be prompted with the following:

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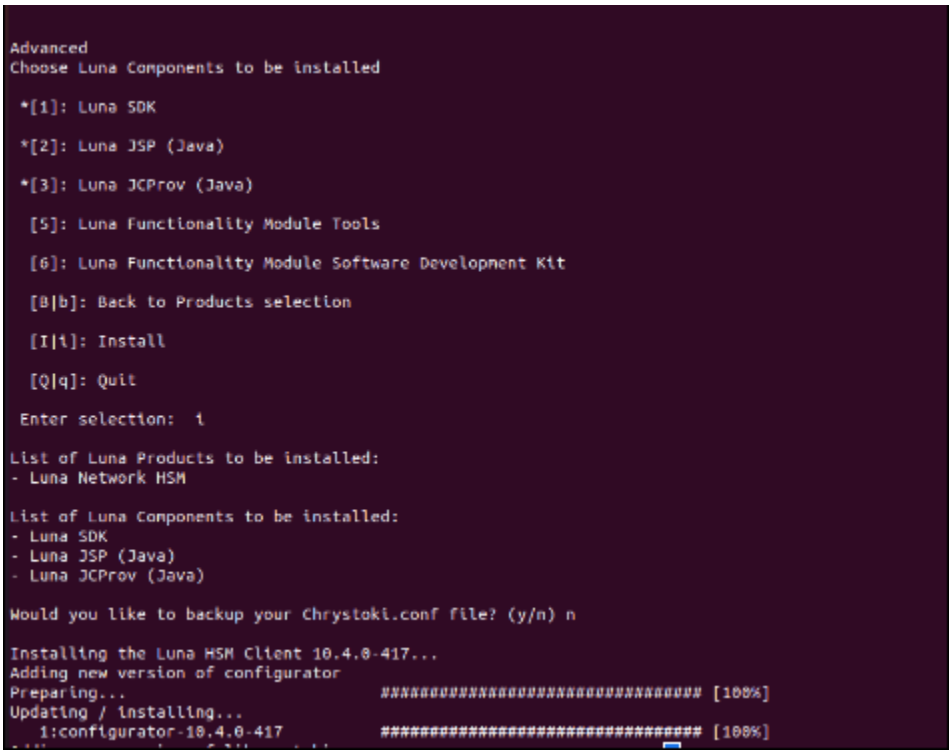
Select Y in the prompt

Enter the install directory as - "/usr"

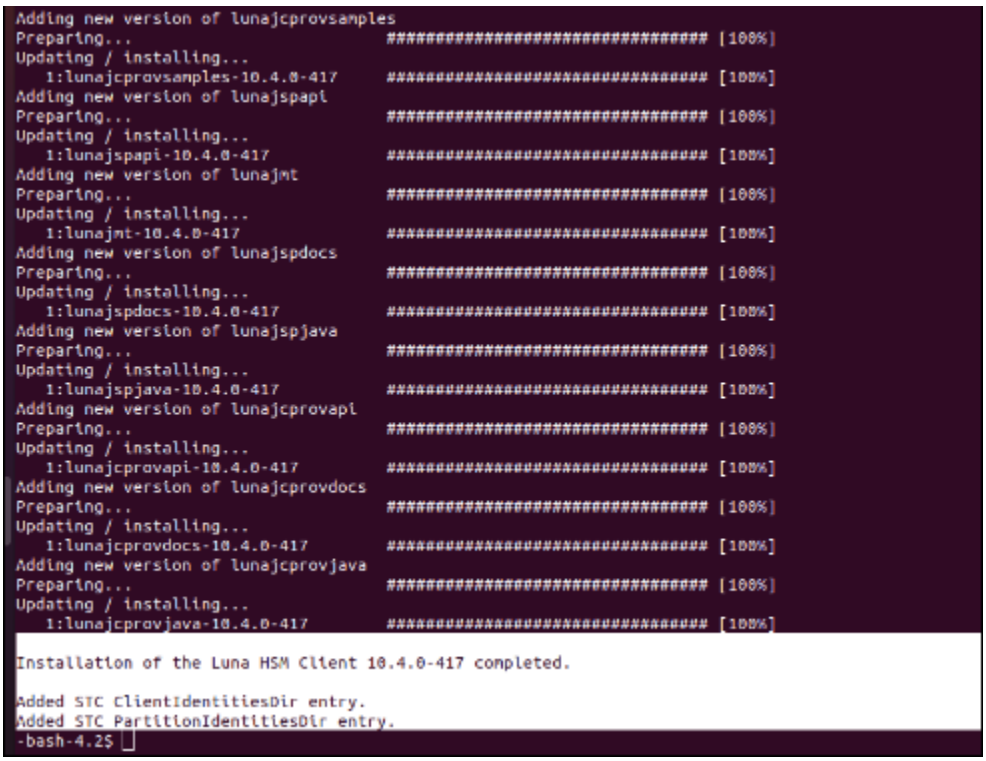
6. When prompted to choose the Luna components to be installed, choose the following packages:
   a. Luna Software Development Kit (SDK)
   b. Luna JSP (Java)
   c. Luna JCProv (Java)
   d. Crypto Command Center Provisioning Client (Not applicable for Luna client v7.2)

   To select a Luna component, Enter the number marked against it and press **Enter**. To select multiple Luna components, repeat the above step. Once the required components are selected, enter (I/i) and press enter to initiate the installation process.

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Once the Luna client is installed successfully, you will get the following message in the terminal:



Installation of the Luna HSM Client 7.12.0-18 completed message should be displayed.

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7. **Note:** Customer will have to generate the server certificate and the client certificate. Please check with the HSM vendor for support.

   Copy server.pem file and place it in the bin directory of the luna client installed path.

   ```
   sudo cp server.pem /usr/safenet/lunaclient/bin
   ```

8. Register the HSM server certificate with the client using the following command:

   ```
   sudo /usr/safenet/lunaclient/bin/vtl addServer -n <safenet hsm ip> -c server.pem
   ```

9. Copy the client certificate created to the path.

   ```
   sudo cp <Generated certname>Key.pem <Generated certname>.pem /usr/safenet/lunaclient/cert/client/
   ```

HSM Integration with AppViewX - Manual

To establish communication between the HSM and AppViewX, it is necessary to follow the installation steps provided below.

Installation for Onprem

1. After successful installation, copy the Chrystoki.conf to the below directory from /etc folder

   ```
   On-prem : "cp /etc/Chrystoki.conf  {APPVIEWX_INSTALLATION_PATH}/hsm/"
   ```

   Update the permissions for the Chrystoki.conf file using the command given below:

   ```
   chown appviewx:appviewx Chrystoki.conf
   ```

   ```
   chmown 755 Chrystoki.conf
   ```

2. Edit Chrystoki.conf file and replace all custom to mount path.

   Note: You have to change in all the places wherever we see local path to mount path.

3. Change local path to mount path

   ```
   LibUNIX =/home/appviewx/hsm/safenet/lunaclient/lib/libCryptoki2.so;
   ```

   to

   ```
   LibUNIX = /appviewx/dependencies/hsm/safenet/lunaclient/lib/libCryptoki2.so;
   ```

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- Verify the certificate names in the Chrystoki.conf file to the ones that were copied manually.
- Update if the names are incorrect and replace them with mount path in all places.
- Save the Chrystoki.conf file.

4. Copy the safenet folder from /usr to the below directory as follows:

```
sudo cp safenet -R {APPVIEWX_INSTALLATION_PATH}/hsm
```

5. Navigate to **{APPVIEWX_INSTALLATION_PATH}/hsm/** and execute the command below.

```
chown -R appviewx:appviewx safenet
```

6. Validate the availability of the .so files (libCryptoki2_64.so) in the specified path <APPVIEWX_INSTALLATION_PATH>/appviewx/hsm/safenet/lunaclient/lib/
7. Navigate to <APPVIEWX_INSTALLATION_PATH>/appviewx/hsm/safenet/lunaclient/bin and execute the command below.

```
sudo ./vtl verify
```

The vtl verify should be successfully executed.

Installation for SaaS

1. After successful installation, copy the Chrystoki.conf to the below directory from /etc folder

```
cp /etc/Chrystoki.conf {CC Installed Path}/deps/external_libs/hsm
```

Update the permissions for the Chrystoki.conf file using the command given below:

```
chown appviewx:appviewx Chrystoki.conf
```

```
chmown 755 Chrystoki.conf
```

2. Edit Chrystoki.conf file and replace all custom to mount path.



Note: You have to change in all the places wherever we see local path to mount path.

3. Change local path to mount path

```
LibUNIX =/home/appviewx/cc/deps/external_libs/hsm/safenet/lunaclient/lib/libCryptoki2.so;
```

to

```
LibUNIX = /appviewx/dependencies/external_libs/hsm/safenet/lunaclient/lib/libCryptoki2.so;
```

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- Verify the certificate names in the Chrystoki.conf file to the ones that were copied manually.
- Update if the names are incorrect and replace them with mount path in all places.
- Save the Chrystoki.conf file.

4. Copy the safenet folder from /usr to the below directory as follows:

```
sudo cp safenet -R {CC Installed Path}/deps/external_libs/hsm
```

5. Navigate to **{APPVIEWX_INSTALLATION_PATH}/hsm/** and execute the command below.

```
chown -R appviewx:appviewx safenet
```

6. Validate the availability of the .so files (libCryptoki2_64.so) in the specified path <CC_INSTALLATION_PATH>/deps/external_libs/hsm/safenet/lunaclient/lib/
7. Navigate to <APPVIEWX_INSTALLATION_PATH>/appviewx/hsm/safenet/lunaclient/bin and execute the command below.

```
sudo ./vtl verify
```

The vtl verify should be successfully executed.

Integrating the Thales TCT HSM with the AppViewX onprem

To integrate the Thales TCT HSM with the AppViewX:

1. Login to the AppViewX server on which the AppViewX is installed.
2. From the command line interface, navigate to the properties folder path: **{APPVIEWX_INSTALLATION_PATH}/appviewx_dependencies/properties**
3. Open the hsm file using the following command:

```
vi hsm
```

4. Check and confirm if the HSM file has the following lines. If not, uncomment the following lines:

```
export ChrystokiConfigurationPath=/appviewx/dependencies/hsm/
```

5. If the file is edited, you have to restart the avx-platform-hsm pod, using the following commands:

```
kubectl get pods -n <namespace>
```

```
kubectl delete pods -n <namespace> <PodName>
```

6. AppViewX can now communicate with HSM devices.

Integrating the Thales TCT HSM with the AppViewX SaaS

To integrate the Thales TCT HSM with the AppViewX:

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1. Login to the AppViewX server on which the Cloud Connector is installed.
2. From the command line interface, navigate to the properties folder path:
   {CC_INSTALLATION_PATH}/deps/properties
3. Open the **hsm** file using the following command:

```
vi hsm
```

4. Check and confirm if the HSM file has the following lines. If not, uncomment the following lines:

```
export ChrystokiConfigurationPath=/appviewx/dependencies/external_libs/hsm/
```

5. If the file is edited, you have to restart the avx-mid-server-platform pod, using the following commands:

```
kubectl get pods -n <namespace>
```

```
kubectl delete pods -n <namespace> <PodName>
```

6. AppViewX can now communicate with HSM devices.

HSM Agent Installation and Configuration in AppViewX - Automation

To avoid above steps of "Sample Agent Installation - Manual" section, appviewx has introduced an automation script that streamlines the installation of the Thales agent and its configuration with AppViewX.

Automation script for onprem

1. Go to the path /home/appviewx/appviewx_kubernetes/yaml/appviewx_plugins/avx_platform_hsm/hsm.
2. Ensure the availability of the following files:
   - avx_hsm_integration.sh
   - thales_safenet_hsm_configuration.sh
3. Run the command "chmod 777 *" or apply "chmod" specifically for avx_hsm-integration.sh and the required HSM agent.
4. Execute "sudo ./avx_hsm_integration.sh".
5. Choose the required HSM to configure and select the "Configure" option.
6. Proceed with the subsequent steps using the script.

Automation script for SaaS

1. Go to the path <cloud connector installed path>/deps/utils/avx-platform-hsm.
2. Ensure the availability of the following files:
   - hsm-integration.sh
   - safenet_config.sh

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3. Run the command "chmod 777 *" or apply "chmod" specifically for hsm-integration.sh and the required HSM agent.
4. Execute "sudo ./hsm-integration.sh".
5. Choose the required HSM to configure and select the "Configure" option.
6. Proceed with the subsequent steps using the script.

Thales DPoD

Prerequisites

- Ensure the HSM service/pod is up and running before integrating HSM with AppViewX.
  - If on-prem, use avx_platform_hsm as plugin
  - If SaaS, use avx_platform_hsm & all Cloud Connector instances for HSM DC.
- Communication to the HSM and AppViewX nodes in the case of  and the cloud connector in the case of  should be available to integrate with AppViewX. The port details are as follows:
  - **Port 443**: HTTPS access for secure communication between the client and the DPoD service.
- DPOD client package to be downloaded and copied in the AppViewX node where HSM connection is to be established.
- Connectivity for the DPOD URL to be established.
- HSM slot and PIN should be available for communication.

For references to the Thales DPOD documentation, see the References section.

Sample Agent Installation

The following steps outline the process followed in installing the DPOD Client Package.

1. Go to the hsm folder for  Path: **{APPVIEWX_INSTALLATION_PATH}/hsm/** and for  Path: **{CC_INSTALLATION_PATH}/deps/external_libs/hsm/**.
2. Create a new folder as a safenet.
3. Untar the **DPoD** tar file inside safenet folder.
4. Once extracted inside the safenet, make sure a new folder, dpod, is created and all the extracted files are present.

> **Note:** From the extracted client package, if the dpod folder is not present, please create a folder named dpod inside the safenet and then extract the files.

5. Untar the **cvclient-min.tar** file.

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HSM Integration with AppViewX - Manual

To establish communication between the HSM and AppViewX, it is necessary to follow the installation steps provided below.

1. Go to the hsm folder for path : **{APPVIEWX_INSTALLATION_PATH}/hsm/safenet/dpod/** and : **{CC_INSTALLATION_PATH}/deps/external_libs/hsm/safenet/dpod**.
2. Provide chmod 755 permission to the Chrystoki.conf file.
3. Edit the Chrystoki.conf file to replace the custom path with the above specified mount path.
4. Change the path value in the Chrystoki.conf file to match the mount.

   Check the .so file location mentioned in Chrystoki.conf file LibUNIX64 = ./libs/64/libCryptoki2.so

   Replace the dot with mount path for as **/appviewx/dependencies/hsm/safenet/dpod/**

   Sample: /appviewx/dependencies/hsm/safenet/dpod/libs/64/libCryptoki2.so

   Replace the dot with mount path for as **/appviewx/dependencies/external_libs/hsm/safenet/dpod/**

   Sample: /appviewx/dependencies/external_libs/hsm/safenet/dpod/libs/64/libCryptoki2.so
5. Update the **Chrystoki.conf** file by modifying all instances where the path is specified.
6. From the command line interface, navigate to the properties folder path.
   - For : **{AppViewX_INSTALLATION_PATH}/appviewx_dependencies/properties**
   - For : **<Cloud connector installed path >/deps/properties**.
7. Open the **hsm** file, using the following command:

   ```
   vi hsm
   ```

8. Check and confirm if the HSM file has the following lines.
   - For :

     ```
     cd /appviewx/dependencies/hsm/safenet/dpod/

     source setenv
     ```

   - For :

     ```
     cd /appviewx/dependencies/external_libs/hsm/safenet/dpod/

     source setenv
     ```

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9. Uncommment all the above lines if commented, and save the file for .
10. Add the below command for and then save the file.

```
export ChrystokiConfigurationPath=/appviewx/dependencies/external_libs/hsm/safenet/dpod/
```

```
# ====== Gemalto / thales - DPOD ====== #
cd /appviewx/dependencies/external_libs/hsm/safenet/dpod/
source setenv
export ChrystokiConfigurationPath=/appviewx/dependencies/hsm/safenet/dpod/

# ====== Gemalto / thales - GPN ====== #
#export ChrystokiConfigurationPath=/appviewx/dependencies/external_libs/hsm/

# ====== Utimaco config file variable  ====== #
export CS_PKCS11_R2_CFG=/appviewx/dependencies/external_libs/hsm/utimaco/cs_pkcs11_R2.cfg
echo "UTIMACO Config Path : $CS_PKCS11_R2_CFG"

# ====== fortanix config file variable  ====== #
export FORTANIX_PKCS11_CONFIG_PATH=/appviewx/dependencies/external_libs/hsm/fortanix/pkcs11.conf
echo "FORTANIX Config Path : $FORTANIX_PKCS11_CONFIG_PATH"
```

11. Restart the **avx-platform-hsm** pod for , and **avx-mid-server-platform** pod for , using the following commands:

```
kubectl get pods -n <namespace>
```

```
kubectl delete pods -n <namespace> <PodName>
```

12. AppViewX can now communicate with HSM devices.

HSM Agent Installation and Configuration in AppViewX - Automation

To avoid above steps of "Sample Agent Installation - Manual" section, we have introduced an automation script that streamlines the installation of the Thales agent and its configuration with AppViewX.

Automation script for onprem

1. Go to the path /home/appviewx/appviewx_kubernetes/yaml/appviewx_plugins/avx_platform_hsm/hsm.
2. Ensure the availability of the following files:
   - avx_hsm_integration.sh
   - thales_dpod_hsm_configuration.sh
3. Run the command "chmod 777 *" or apply "chmod" specifically for avx_hsm-integration.sh and the required HSM agent.
4. Execute "sudo ./avx_hsm_integration.sh".
5. Choose the required HSM to configure and select the "Configure" option.
6. Proceed with the subsequent steps using the script.

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Automation script for SaaS

1. Go to the path <cloud connector installed path>/deps/utils/avx-platform-hsm.
2. Ensure the availability of the following files:
   - hsm-integration.sh
   - dpod_config.sh
3. Run the command "chmod 777 *" or apply "chmod" specifically for hsm-integration.sh and the required HSM agent.
4. Execute "sudo ./hsm-integration.sh".
5. Choose the required HSM to configure and select the "Configure" option.
6. Proceed with the subsequent steps using the script.

References

- Thales documentation portal

Thales GPN

Prerequisites

- Ensure the HSM service/pod is up and running before integrating HSM with AppViewX.
  - If on-prem, use avx_platform_hsm as plugin
  - If SaaS, use avx_platform_hsm & all Cloud Connector instances for HSM DC.
- The Alien and RPM packages should be installed in the environment.
- Communication to the HSM and AppViewX nodes in the case of  and the cloud connector in the case of  should be available to integrate with AppViewX. The port details are as follows:
  - **Port 443**: HTTPS access for secure web-based management interfaces.
  - **Port 1792**: Used for key management and cryptographic operations via the Key Management Utility (KMU).
  - **Port 9001**: Additional port used for HSM management and operations.
- Users should have either root access or sudo access.
- HSM slot and PIN should be available to establish a connection between AppViewX and HSM.
- From the AppViewX perspective, AppViewX has prepared a sample agent installation guide for Thales. Please refer to it for guidance.

For references to the Thales GPN documentation, see the References section.

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Sample Agent Installation

To establish communication between the HSM and AppViewX, the installation of the Thales Luna agent is required. The following steps outline the process followed in our lab setup using LunaClient_10.4.0-417_Linux.zip.

1. Copy the LunaClient.zip file to the appviewx server and unzip it.
2. Go to LunaClient location

```
cd <untarred Luna-client-path>/64/
```

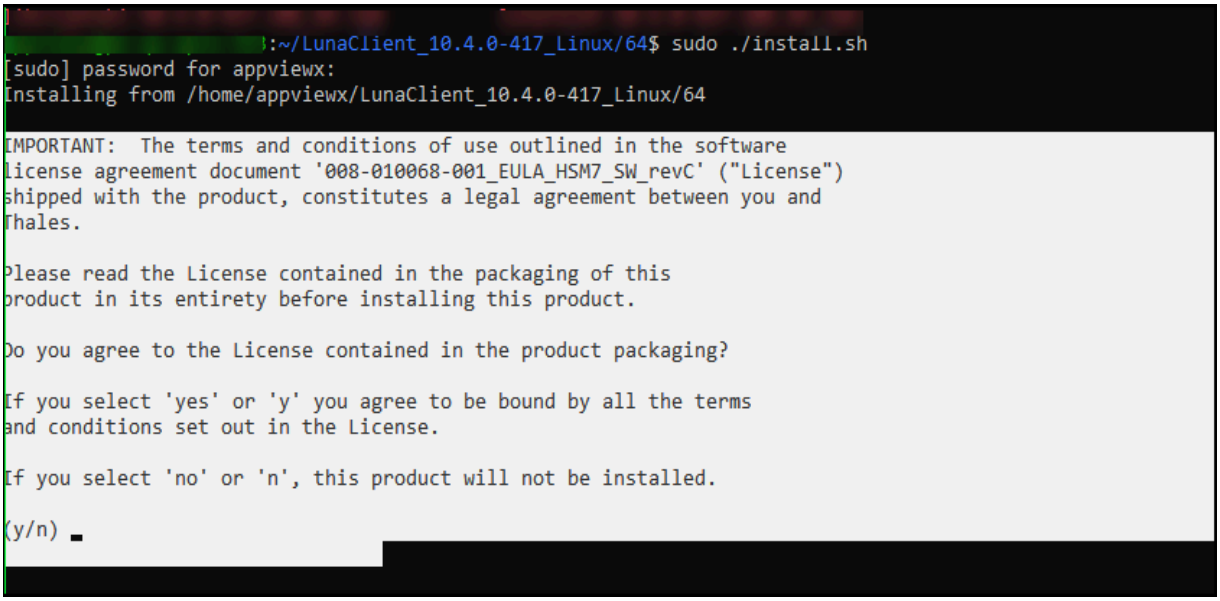
3. Execute the chmod command as shown below:

```
sudo chmod 755 install.sh
```

```
sudo chmod 755 common
```

4. Run the install.sh file using the command given below:

```
sudo ./install.sh
```

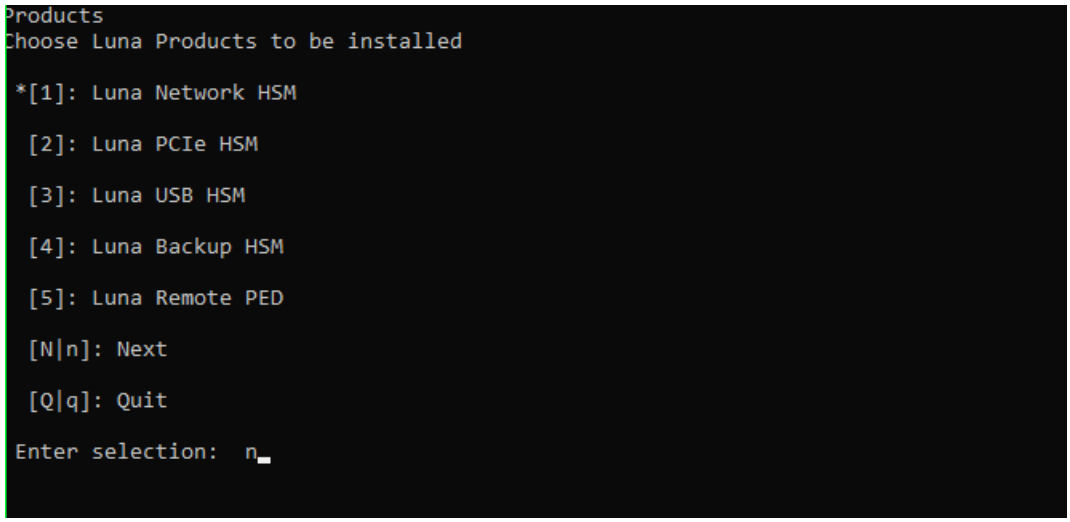


You will be prompted with the question "*Do you agree to the License contained in the product packaging?*", enter **Y** or **Yes** to proceed further.

(Optional step) In some Luna packages you may also be prompted with "*Enter the install directory as - "/usr"*", enter **usr** to proceed further.

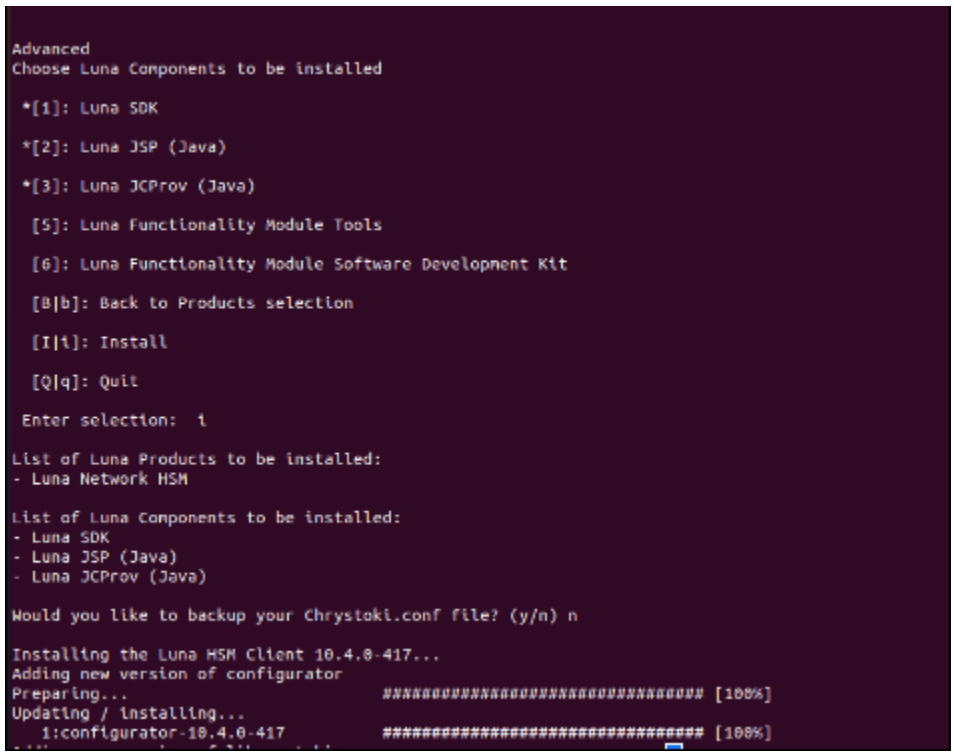
5. When prompted to "*Choose the Luna products to be installed*", select **Luna Network HSM**, i.e. Enter the number **1**, then enter **n** (next).

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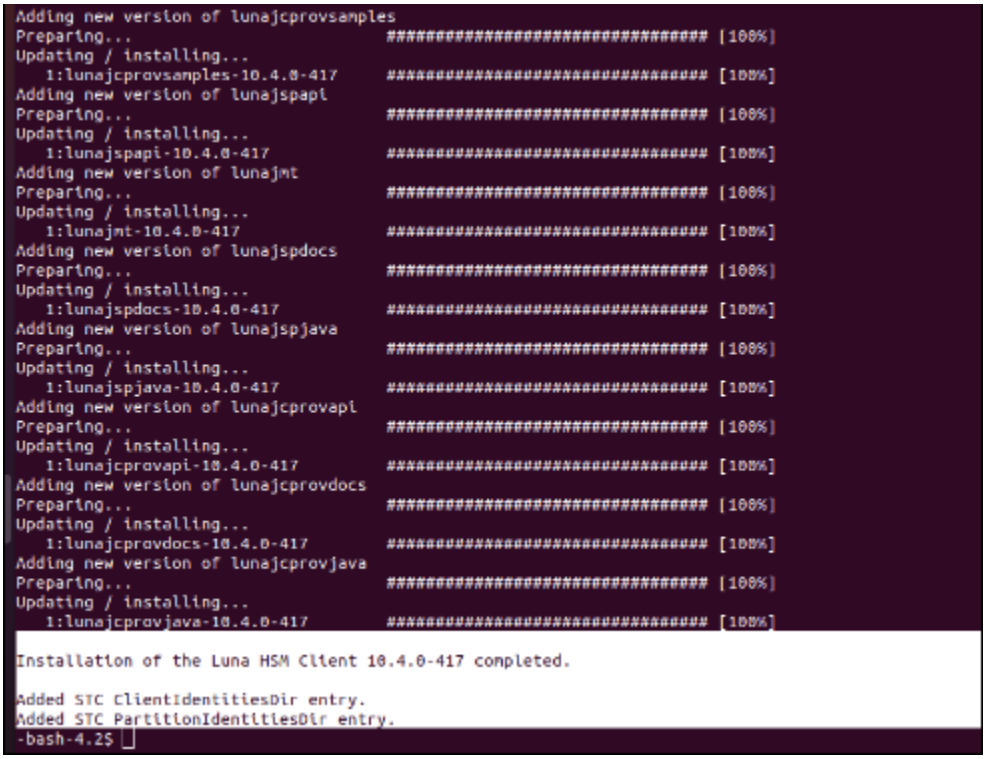
6. When prompted to choose the Luna components to be installed, choose the following packages:
   a. Luna Software Development Kit (SDK)
   b. Luna JSP (Java)
   c. Luna JCProv (Java)
   d. Crypto Command Center Provisioning Client (Not applicable for Luna client v7.2)

   To select a Luna component, Enter the number marked against it and press **Enter**. To select multiple Luna components, repeat the above step. Once the required components are selected, enter (I/i) and press enter to initiate the installation process.



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Once the Luna client is installed successfully, you will get the following message in the terminal:



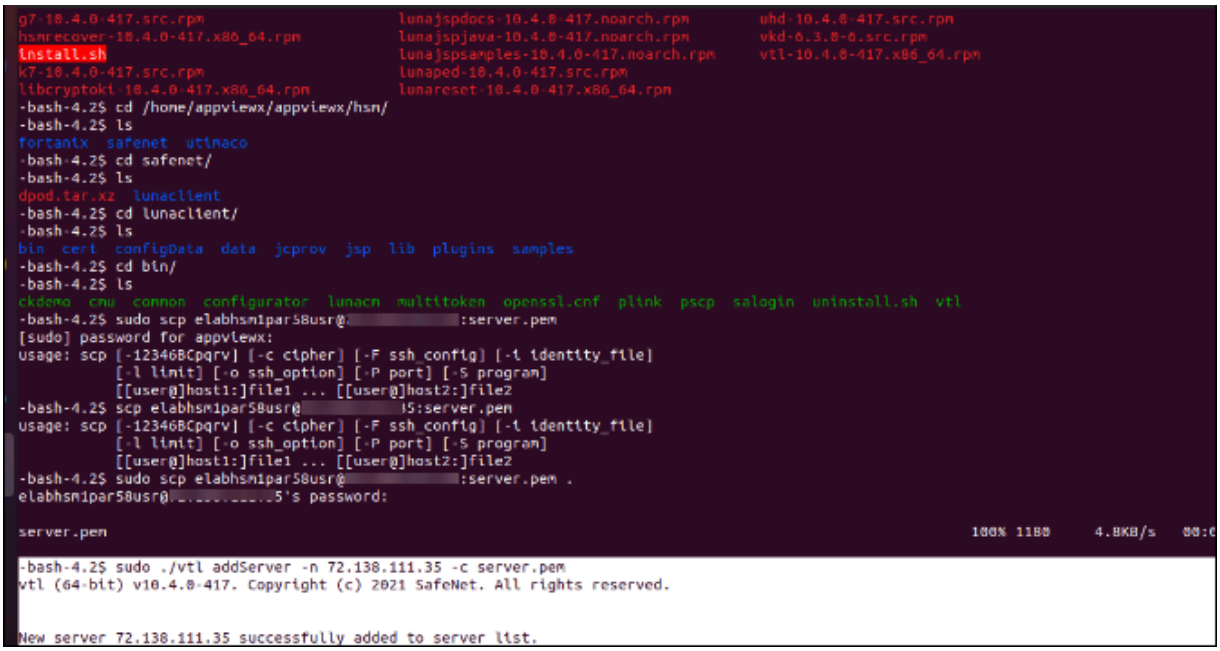
7. Navigate to **usr/safenet/lunaclient/bin**.
8. Import the server certificate of the HSM device to the Luna client using the following command:

```
sudo scp <username>@<HSM device IP>:server.pem .
```

Note: In the command above replace **<username>** with client credentials of HSM device, **<HSM device IP>** with the Host IP

After successfully adding the server, you will get the message as follows:

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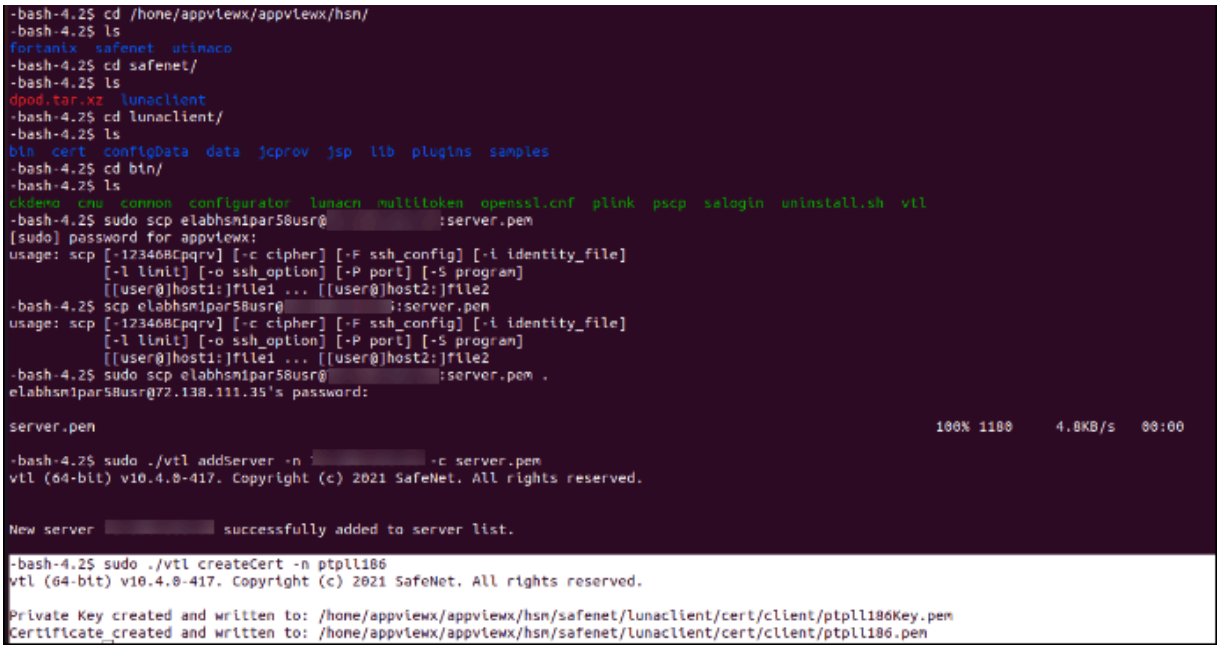
9. Register the HSM server certificate with the client using the following command:

```
sudo ./vtl addServer -n <HSM Device IP> -c server.pem
```

10. Create a client certificate in the node from which we are trying to communicate with the HSM from AppViewX:

```
sudo ./vtl createCert -n <Client_Certificate_Name>
```

After the certificates are created, you will get the output as follows:

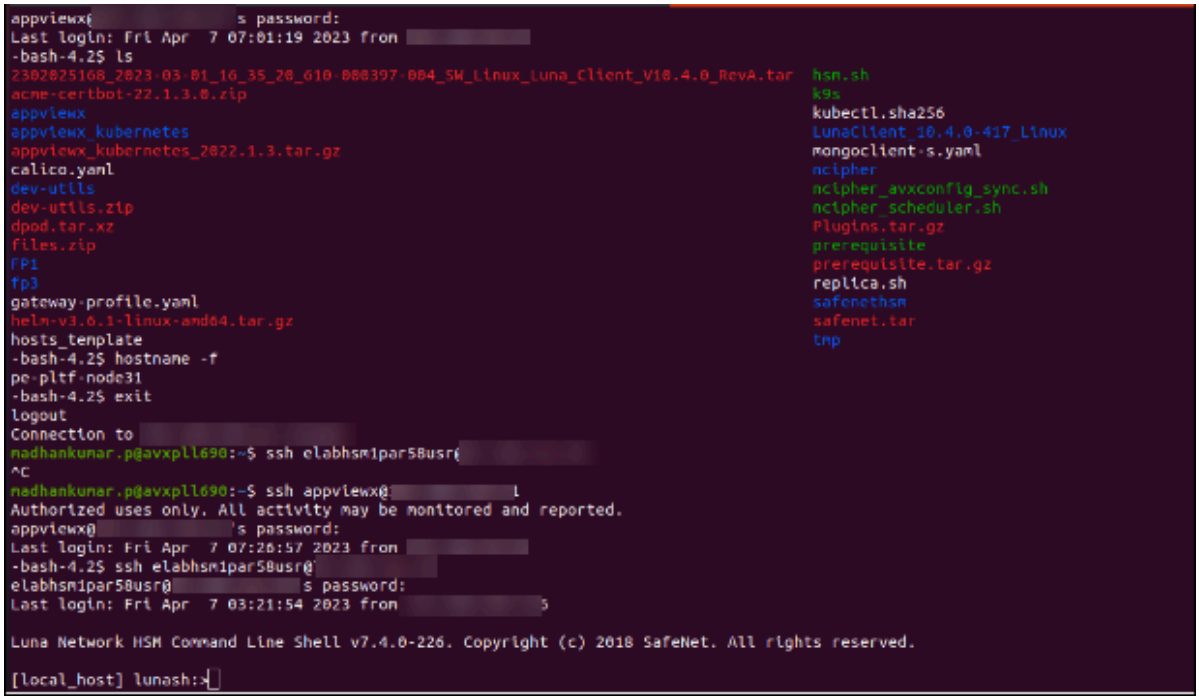


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11. Export the Client certificate to the node where the HSM is to be configured:

```
sudo scp /usr/safenet/lunaclient/cert/client/<Client_Certificate_Name>.pem <username>@<HSM device IP>:
```

- Use the certificate created and written to the path obtained from the previous step.
- To register the client certificate to HSM machine, login to HSM machine in CLI using the SSH command as shown below.



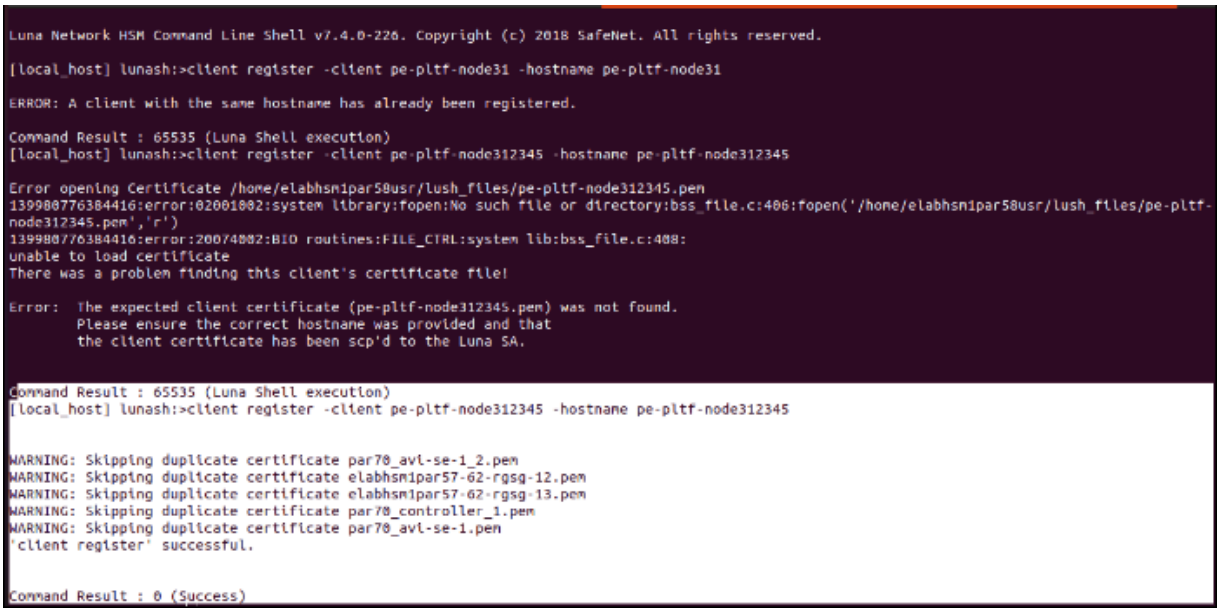
12. Register the client certificate on the HSM Machine.

    (This command to be run in HSM device using SSH login.)

```
client register -client <Client_Certificate_Name> -hostname <Client_Certificate_Name>
```

After registering the client certificate, you will get the following output at the command prompt:

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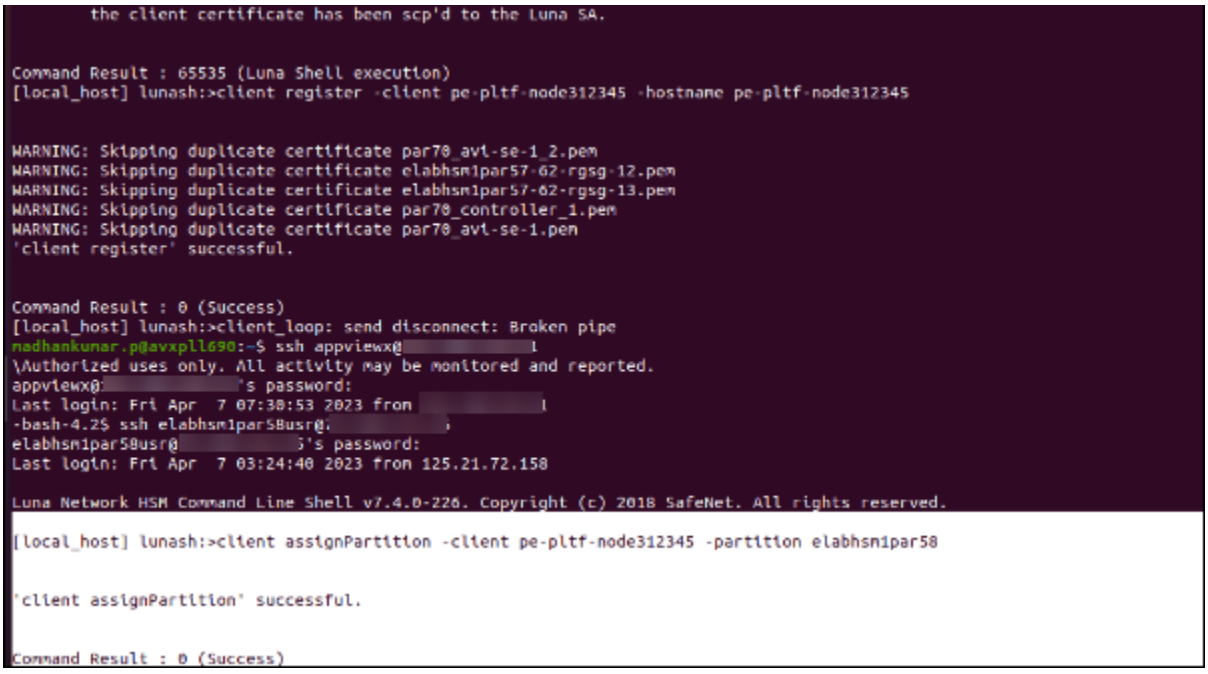


13. Assign the client to a partition using the following command:

    (This command to be run in HSM device using SSH login.)

```
client assignPartition -client <Client_Certificate_Name> -partition <Partition name of the hsm device>
```

    After assigning the client partition, the output will be as follows:



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HSM Configuration in AppViewX - Manual

To establish communication between the HSM and AppViewX, it is necessary to follow the installation steps provided below.

Installation for Onprem

1. After successful installation, copy the Chrystoki.conf to the below directory from /etc folder

   ```
   cp /etc/Chrystoki.conf  {APPVIEWX_INSTALLATION_PATH}/hsm/
   ```

2. Update the permissions for the Chrystoki.conf file using the command given below:

   ```
   chown appviewx:appviewx Chrystoki.conf
   ```

   ```
   chmod 755 Chrystoki.conf
   ```

3. Edit Chrystoki.conf file and replace all custom to mount path.

   Note: You have to change it in all the places wherever we see local path to mount path.

   Change local path to mount path:

   ```
   LibUNIX = /usr/safenet/lunaclient/lib/libCryptoki2.so;
   ```

   to

   ```
   LibUNIX = /appviewx/dependencies/hsm/safenet/lunaclient/lib/libCryptoki2.so;
   ```

   Now, Save the Chrystoki.conf file.

4. Copy the safenet folder from /usr to the below directory as follows:

   ```
   sudo cp safenet -R {APPVIEWX_INSTALLATION_PATH}/hsm
   ```

5. Navigate to {APPVIEWX_INSTALLATION_PATH}/hsm/ and execute the command below.

   ```
   chown -R appviewx:appviewx safenet
   ```

6. Navigate to <APPVIEWX_INSTALLATION_PATH>/appviewx/hsm/safenet/lunaclient/bin and execute the command below.

   ```
   sudo ./vtl verify
   ```

   The vtl verify should be successfully executed.

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Installation for SaaS

1. After successful installation, copy the Chrystoki.conf to the below directory from /etc folder

   ```
   cp /etc/Chrystoki.conf {CC Installed Path}/deps/external_libs/hsm
   ```

2. Update the permissions for the Chrystoki.conf file using the command given below:

   ```
   chown appviewx:appviewx Chrystoki.conf
   ```

   ```
   chmod 755 Chrystoki.conf
   ```

3. Edit Chrystoki.conf file and replace all custom to mount path.

   Note: You have to change it in all the places wherever we see local path to mount path.

   Change local path to mount path:

   ```
   LibUNIX =/home/appviewx/cc/deps/external_libs/hsm/safenet/lunaclient/lib/libCryptoki2.so;
   ```

   to

   ```
   LibUNIX = /appviewx/dependencies/external_libs/hsm/safenet/lunaclient/lib/libCryptoki2.so;
   ```

   Now, Save the Chrystoki.conf file.

4. Copy the safenet folder from /usr to the below directory as follows:

   ```
   sudo cp safenet -R {CC Installed Path}/deps/external_libs/hsm
   ```

5. Navigate to {APPVIEWX_INSTALLATION_PATH}/hsm/ and execute the command below.

   ```
   chown -R appviewx:appviewx safenet
   ```

6. Navigate to <APPVIEWX_INSTALLATION_PATH>/appviewx/hsm/safenet/lunaclient/bin and execute the command below.

   ```
   sudo ./vtl verify
   ```

   The vtl verify should be successfully executed.

HSM Configuration in AppViewX - Automation

To streamline the integration of HSM with AppViewX, we've introduced an automation script for configuration. (Make sure that the Thales agent is manually installed).

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Automation script for onprem

1. Go to the path /home/appviewx/appviewx_kubernetes/yaml/appviewx_plugins/avx_platform_hsm/hsm.
2. Ensure the availability of the following files:
   - avx_hsm_integration.sh
   - thales_gpn_hsm_configuration.sh
3. Run the command `chmod 777 *` or apply `chmod` specifically for **avx_hsm-integration.sh** and the required HSM agent.
4. Execute the command:

```
sudo ./avx_hsm_integration.sh
```

5. Choose the required HSM to configure and select the **Configure** option.
6. Proceed with the subsequent steps using the script.

Automation script for SaaS

1. Go to the path <cloud connector installed path>/deps/utils/avx-platform-hsm.
2. Ensure the availability of the following files:
   - hsm-integration.sh
   - gpn_config.sh
3. Run the command `chmod 777 *` or apply `chmod` specifically for **hsm-integration.sh** and the required HSM agent.
4. Execute the command:

```
sudo ./hsm-integration.sh
```

5. Choose the required HSM to configure and select the **Configure** option.
6. Proceed with the subsequent steps using the script.

References

- Thales and Microsoft NDES Integration Guide

Entrust HSM

An HSM (Hardware Security Module) is a piece of hardware and associated software or firmware that usually resides in a PC or server and provides at least the minimal cryptographic functions.

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Prerequisites

1. The Ncipher client must be installed at the default location (/opt/) on the host machine. After installation, the Ncipher client and its utility scripts must be present under /opt/nfast/. For a sample installation steps refer to the section Sample Ncipher Client Installation Steps.
2. After installing the Ncipher client in /opt/nfast/, ensure that all permissions are granted for the /opt/nfast/kmdata directory by executing the following command:

   ```
   sudo chmod -R 777 /opt/nfast/kmdata/
   ```

   Keys are generated within the same directory and will require permissions to read/write.
3. The Ncipher client must be installed on all the nodes where the avx-platform-hsm for and avx-midserver-platform in cloud connector for plugin is up and running.
4. The RFS server must be set up, and the clients must be registered on the RFS server.
5. The RFS server must be configured for all the clients.

> **Note:** Steps 3 and 4 are required only in cases of multi-node deployment.

For references to the Entrust HSM documentation, see the References section.

Why is Key Synchronization required?

In a multi-node setup, after ensuring the prerequisites are met, execute the following steps on all the nodes:

1. Execute the command:

   ```
   sudo crontab -e
   ```

   Add the below line to the file:

   ```
   * * * * * for i in {1..6}; do sh {APPVIEWX_INSTALLATION_PATH}/appviewx_dependencies/properties/avx_key_sync.sh > /tmp/avx_keys_sync.logs & sleep 10; done
   ```

> **Note:** The above line executes the key sync script every 10 seconds.

2. Restart cron by executing the following command:
   For Centos:

   ```
   systemctl restart crond.service
   ```

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For Ubuntu:

```
sudo service cron restart
```

3. After completing all the steps, restart the avx-platform-hsm pod for  and avx-midserver-platform in cloud connector for  in all DC nodes.

Sample Ncipher Client Installation Steps

1. Navigate to the directory containing the installation ISOs.

```
cd /home/appviewx/ncipher/
```

2. Mount the SecWorld ISO to access installation packages.

```
sudo mount -o loop SecWorld_Lin64-12.80.4.iso /mnt/software/
```

If u get a message `mount: mount point /mnt/software/ does not exist`, create folder **software** under **mnt** (`/mnt/software/`)

3. Navigate to the directory containing tar files for 64-bit Linux.

```
cd /mnt/software/
```

```
cd /linux/amd64/
```

4. Extract nCipher Core Components - hardware support, core tools, Java libraries, and remote admin services - into the root directory.

```
sudo tar -xvf hwsp.tar.gz -C /
```

```
sudo tar -xvf ctls.tar.gz -C /
```

```
sudo tar -xvf javasp.tar.gz -C /
```

```
sudo tar -xvf raserv.tar.gz -C /
```

5. Mount and extract the Remote Admin Client components required for secure remote HSM access.

```
cd /home/appviewx/ncipher/
```

```
sudo mount -o loop RemoteAdmin-Common-12.80.4.iso /mnt/software/
```

```
cd /mnt/software/
```

```
cd /lin64/amd64/
```

```
sudo tar -xvf rac.tar.gz -C /
```

6. Run the nCipher installation script.

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```
cd /opt/nfast/
```

```
cd sbin/
```

```
sudo ./install
```

7. Verify installation and HSM connectivity using the enquiry tool.

```
cd ../bin/
```

```
./enquiry
```

8. Copy key material (KNETI data, config files) and set correct ownership.

```
cd /opt/nfast/kmdata/local/
```

```
sudo cp /home/appviewx/ncipher/latest/* .
```

```
sudo chown -R nfast:nfast *
```

9. Register the client with the HSM using anonymous KNETI and HSM enrollment command.

```
cd ../../bin/
```

```
./anonkneti --port 9014 <IP-App>
```

```
sudo ./nethsmenroll --port 9014 93.93.131.226 F013-03E0-D947 fe0343f3fc7930f9d75d312cd68cda1cee8004c4
```

10. Edit the **cardlist** file and uncomment the * entry to allow access.

```
cd ../kmdata/config/
```

```
sudo vi cardlist [uncomment *]
```

11. Create the **cknfastrc** configuration file with environment settings:

```
cd ../../
```

```
sudo vi cknfastrc
```

Add the following parameters:

```
CKNFAST_LOADSHARING=1

CKNFAST_DEBUG=7

CKNFAST_DEBUGFILE=/opt/nfast/log/pkcs11.log
```

12. Set appropriate permissions for the **cknfastrc** config file.

```
sudo chown -R nfast:nfast cknfastrc
```

13. Enable TCP interfaces for secure communication with the HSM.

```
cd bin/
```

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```
sudo ./config-serverstartup --enable-tcp --enable-privileged-tcp
```

14. Restart the nCipher services to apply changes.

```
cd ../sbin/
```

```
sudo ./init.d-ncipher restart
```

15. Run various diagnostic commands to confirm key module setup.

```
cd ../bin/
```

```
./enquiry
```

```
./nfkminfo
```

```
./nfkmcheck
```

```
./nfkminfo -w
```

16. Generate a new key named **AppViewX_QA** for use with the application.

```
sudo ./ppmk --new AppViewX_QA
```

Troubleshooting

If a `CKR_FUNCTION_FAILED` error is encountered, login to the HSM pod and run the following command to adjust the directory permissions:

```
sudo chmod -R 777 /appviewx/hsm/opt/nfast
```

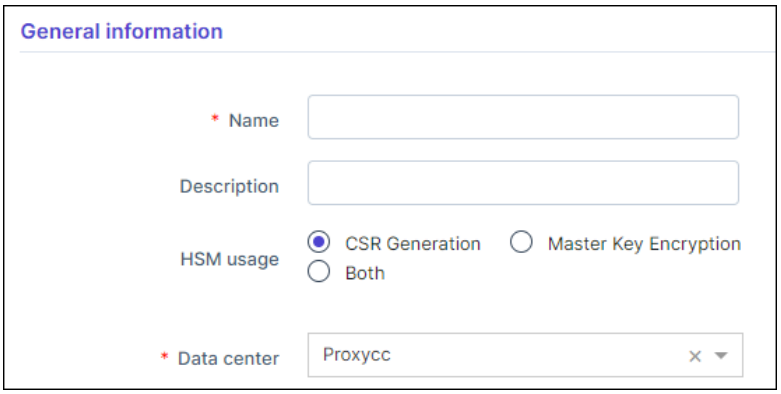
This ensures the necessary read/write/execute permissions are granted for HSM operations.

Integrating Entrust HSM with AppViewX

Support for Entrust HSM is currently available exclusively in the Onprem deployment for Hudson FP3.

1. Login to the AppViewX UI using valid credentials.
   The **Dashboard** page is displayed by default.
2. On **HSM** page, click **Add HSM**, from the navigation pane on the left, select **Entrust**.
   The **HSM > Add** page is updated to display the fields required to integrate Entrust with AppViewX.
3. In the **General Information** section, enter/select the required field information.

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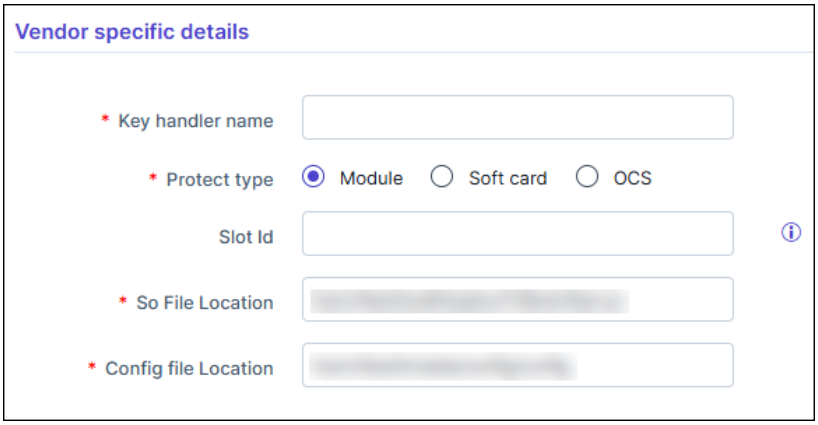
Field descriptions for General Information

Field	Description
***Name**	Enter a name of the HSM. This is a unique field.
Description	Enter a description of the HSM.
HSM usage	For Entrust, private key encryption purposes the HSM usage is applicable to • **CSR Generation** • **Master Key Encryption** • **Both** On selecting, Master Key Encryption or Both, the following pop-up is displayed:  Read the details and click **Proceed**.
***Data center**	Select the required datacenter to which all HSM calls are directed.
*: *Mandatory fields*	

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4. To integrate the **Entrust** HSM device with AppViewX, please get the following details from the HSM device.

   In the **Vendor specific details** section, enter/select the required field information.



Field descriptions for Vendor specific details

Field	Description
***Key handler name**	Enter the name of the Key which will be created in the HSM.
***Protect type**	Select the appropriate **Protect type**. • **Module** is supported. • **Soft card** is supported. • **OCS** is supported.
Slot Id	Enter the Slot Id; it denotes the slot that is allocated for the Module. By default the slot will be taken as Zero and is as non mandatory field.
***Card name**	This field is displayed only if **Protect type** = **Soft card** or **OCS** Enter the name of the Soft card/OCS created in HSM. This field is not case sensitive.
***Partition password**	This field is displayed only if **Protect type** = **Soft card** or **OCS** Enter the password for that Soft card/OCS. **Note:** This field is not mandatory when the **Protect type** is selected as **OCS**.
***So File Location**	The SO file is used to facilitate the communication between the HSM and AppViewX. Location of the so file. This should not be **changed**.

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Field	Description
	Custom so file path is **not supported** currently. The default location is: /opt/hsm/nfast/toolkits/pkcs11/libcknfast.so.
***Config File Location**	The Config file is used to facilitate the communication between the HSM and AppViewX. Location of the config file should not be **changed**. Custom config file path is **not supported** currently. The default location is: /opt/nfast/kmdata/config/config.
*: *Mandatory fields*	

5. Click **Save**.

   Scroll to the end of this page to view the table/navigate to HSM inventory to view the HSM status. If the HSM has been configured correctly, the status for the HSM will be set to **Available** else the status will be **Not Available**.

Why is Key Synchronization required?

In a multi-node setup with Ncipher clients installed on various nodes, it is essential to synchronize keys generated on one node with others. Without key synchronization, HSM encryption/decryption calls on different nodes may fail. To address this, Entrust offers utility scripts, but manual execution is required each time a new key is generated. AppViewX simplifies this process by including a script that runs every 10 seconds, automatically synchronizing keys across all nodes. This script internally invokes Entrust's utility scripts, particularly the rfs-sync utility.

References

- Install and Configure the nShield Entrust HSM

Managing Master Encryption Key

AppViewX employs an envelope encryption technique to protect all sensitive information, using the AWS Key Management Service (KMS) keys. This process involves encrypting plaintext data using an encryption key, called the AppViewX Master Encryption Key (MEK). The AppViewX MEK is encrypted with a Master Encryption Key (KMS-MEK) maintained in the AWS KMS when storing it at rest or during transit. User's can choose to encrypt the AppViewX MEK with an encryption key stored in their HSM. This encryption key is the user’s Master Encryption Key. As a result, the AppViewX MEK used to encrypt secure materials is encrypted twice; first, using the Master Key stored in KMS, and then using the user’s

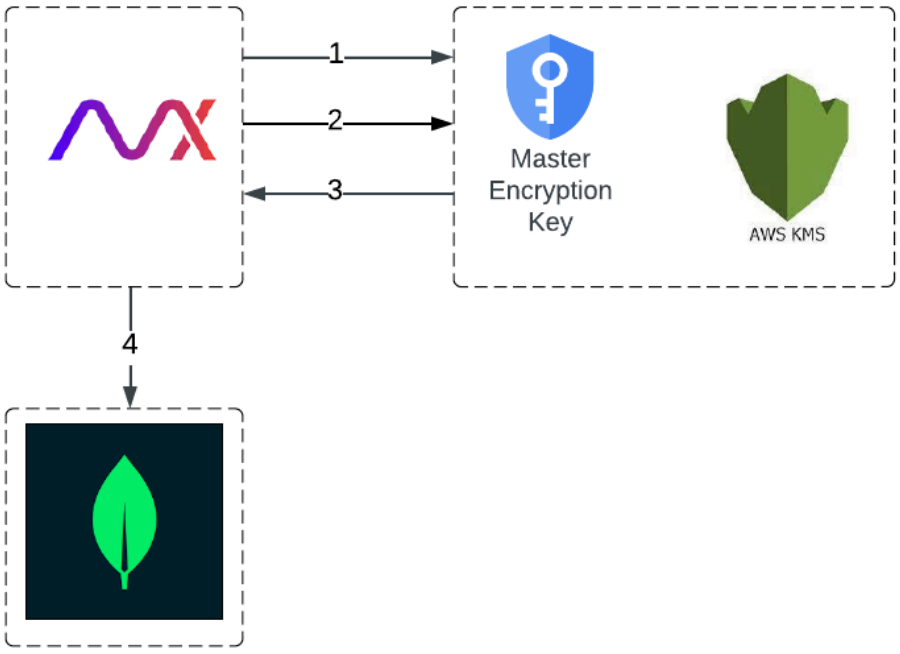
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Master Key stored in the HSM. If the user's Master Key is removed from the HSM, the AppViewX MEK cannot be used to access the data, making it inaccessible and irrecoverable.

- Generating the User's Master Encryption Key
- Encrypting Data Using the AppViewX MEK
- Decrypting Data Using the AppViewX MEK
- Setting up the HSM to Facilitate using the AppViewX MEK
- Enabling AppViewX Master Key Encryption
- Understanding the HSM Health Check and Sync Status Functionalities
- Switching between HSMs
- Viewing Audit Logs for Encryption Operations
- Impacted Use Cases if the Customer's Master Key is Removed
- FAQs-Supporting User Master Key

Generating the User's Master Encryption Key

The user's Master Encryption key generation process is initiated after they have been successfully onboarded. The following is a graphical representation of the key generation process is outlined in the image:



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1. Upon the onboarding of a tenant, AppViewX initiates a request to AWS KMS to generate a Master Encryption Key (KMS-MEK) and a Data Encryption Key for the tenant.

   AppViewX refers to this Data Encryption Key as its internal Master Encryption Key and utilizes it to encrypt all sensitive information.

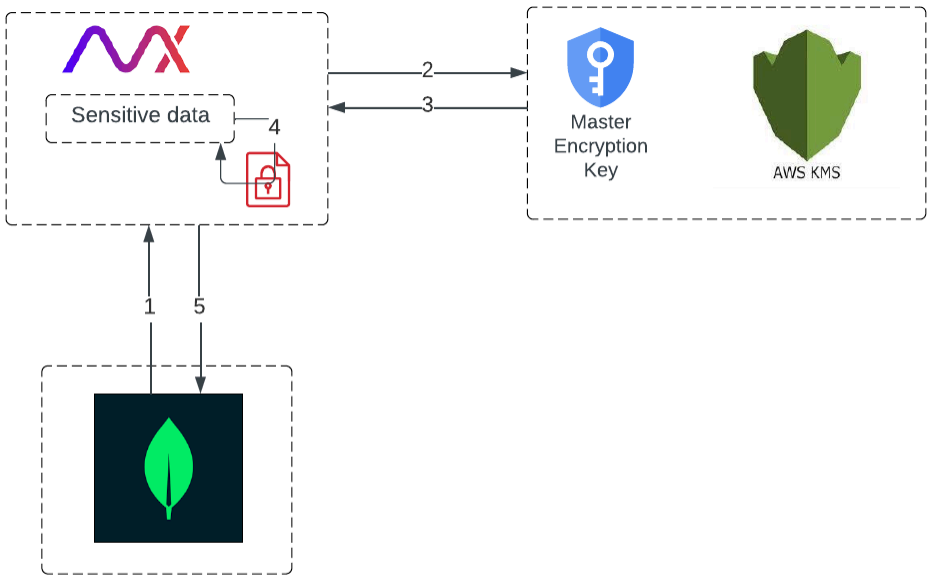
2. AWS KMS generates the AppViewX MEK and encrypts it using the KMS-MEK stored in KMS.
3. AWS KMS returns the encrypted AppViewX MEK.
4. The encrypted AppViewX MEK is stored in the tenant's database.

   All encryption and decryption processes take place within AppViewX, and the key used for these operations is supplied by AWS KMS.

> **Note:** It is important to note that the AWS KMS generates the Master Encryption Keys (KMS-MEK, AppViewX MEK) for each tenant. The tenant's database (in which the encrypted AppViewX MEK is securely stored) is encrypted at rest for added security.

Encrypting Data Using the AppViewX MEK

To ensure the protection of sensitive data, it should be encrypted. To securely encrypt the data, AppViewX executes the following steps:



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1. Retrieve the encrypted MEK from the in-memory cache.

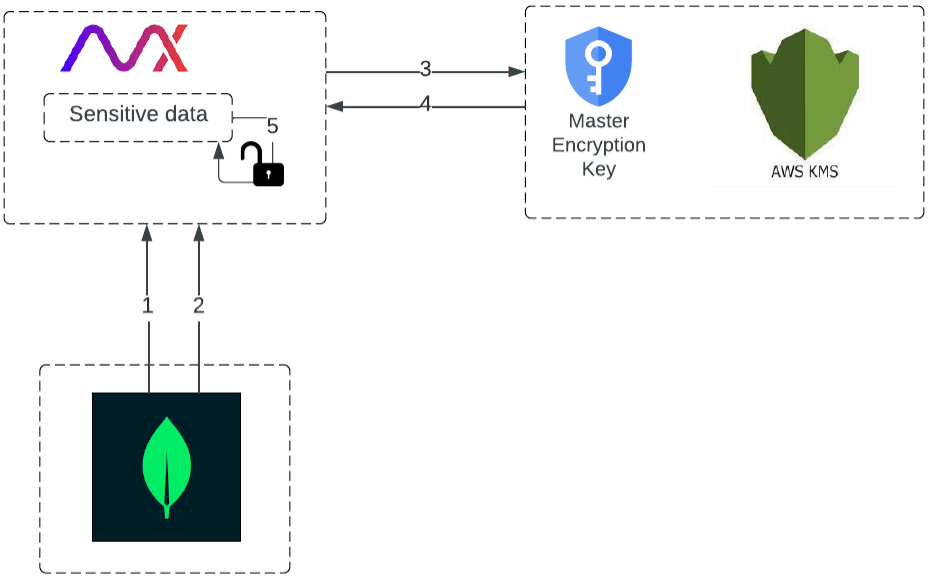
   If the AppViewX Master Encryption Key (MEK) necessary for encryption is not yet available in the in-memory cache, it is retrieved from the tenant's database.

2. Send a request to the AWS KMS to decrypt the MEK.
3. Retrieve the decrypted plaintext AppViewX MEK and cache it in memory.
4. Encrypt sensitive data using AppViewX MEK.
5. Once the plaintext MEK has been retrieved, store it in memory for future sensitive data encryptions.

   This helps to improve performance by reducing the number of calls to AWS KMS for each encryption/ decryption request.

Decrypting Data Using the AppViewX MEK

To decrypt the sensitive information stored in the tenant database, AppViewX executes the following steps:



1. Retrieve the encrypted sensitive data (ciphertext).

   This ciphertext can only be decrypted using the AppViewX Master Encryption Key (MEK).

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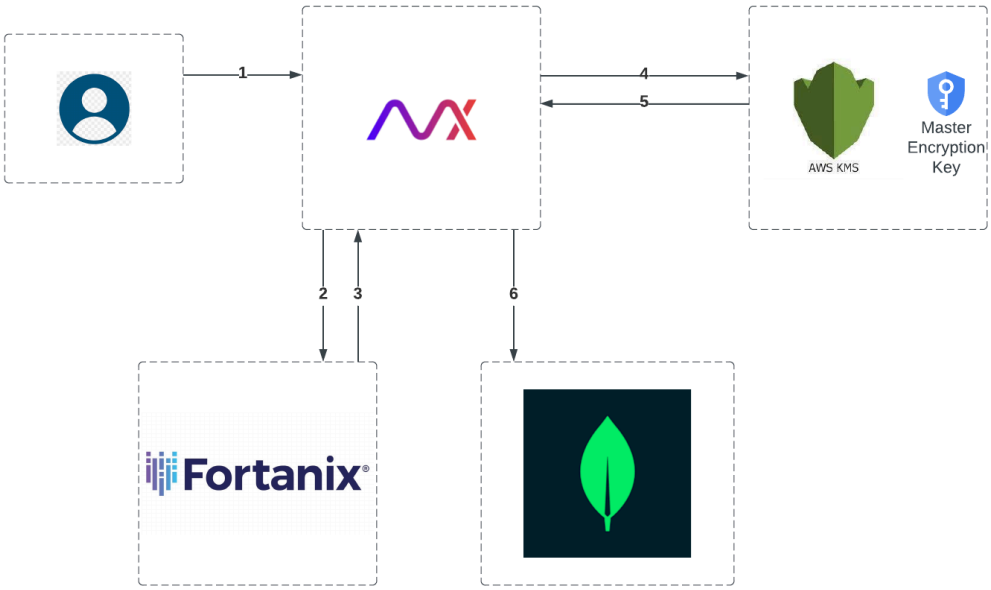
2. Retrieve the encrypted AppViewX MEK from the in-memory cache.

   If the plaintext AppViewX MEK is unavailable in memory, it is retrieved from the tenant database.

3. Initiate a request to AWS KMS to decrypt the encrypted MEK.
4. Retrieve the plaintext MEK from the AWS KMS.
5. Decrypt the sensitive data using this plaintext MEK.

Setting up the HSM to Facilitate using the AppViewX MEK

To facilitate the encryption of the AppViewX Master Key with the User's Master Key, AppViewX executes the following steps:



1. Set up an HSM.

   Note: For instructions on setting up the HSM, click here.

2. After successful configuration of the HSM in AppViewX, conduct a health check on the HSM through the Cloud Connector to verify the configuration's validity.
3. If the configuration is valid, add the HSM to AppViewX.

   AppViewX receives success response from the HSM.

4. Encrypt the secure material required for communication with HSM (API Key, partition password, and so on.) using the KMS-MEK instead of the standard AppViewX MEK.

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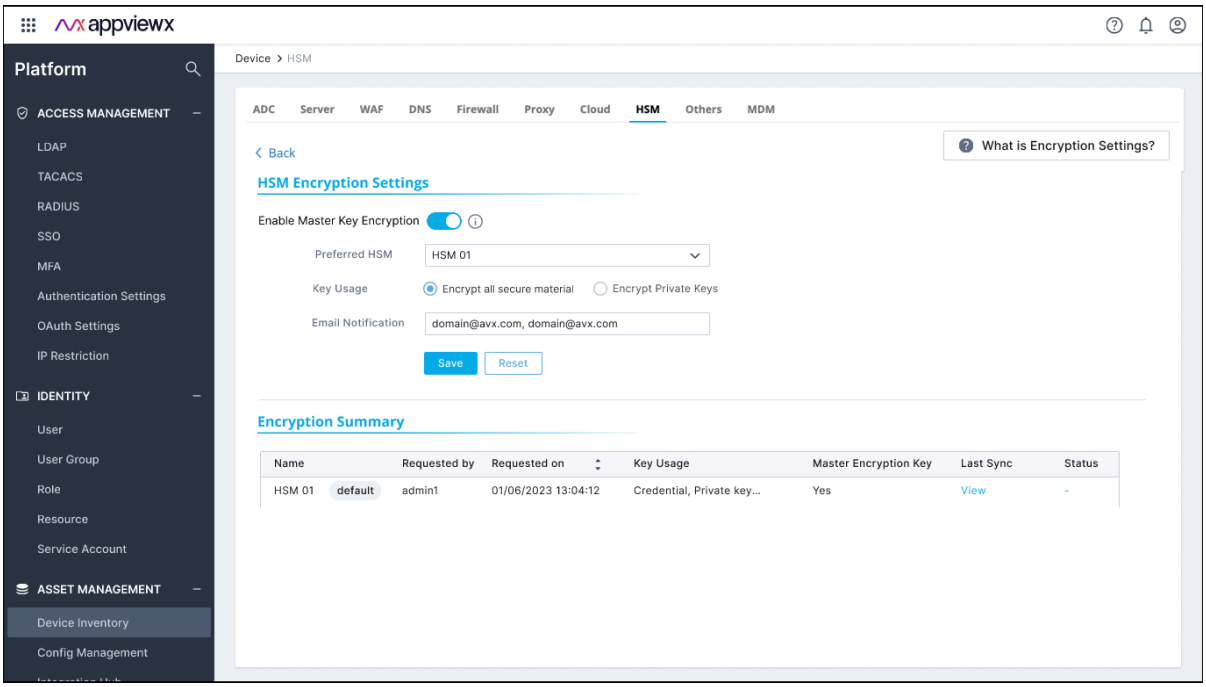
This deviation is to allow for the encryption of the AppViewX MEK using the User's Master Key stored in the HSM.

5. Retrieve the Encrypted HSM Password/API Key from AWS KMS.
6. Persist the HSM Settings in the tenant's database.

Enabling AppViewX Master Key Encryption

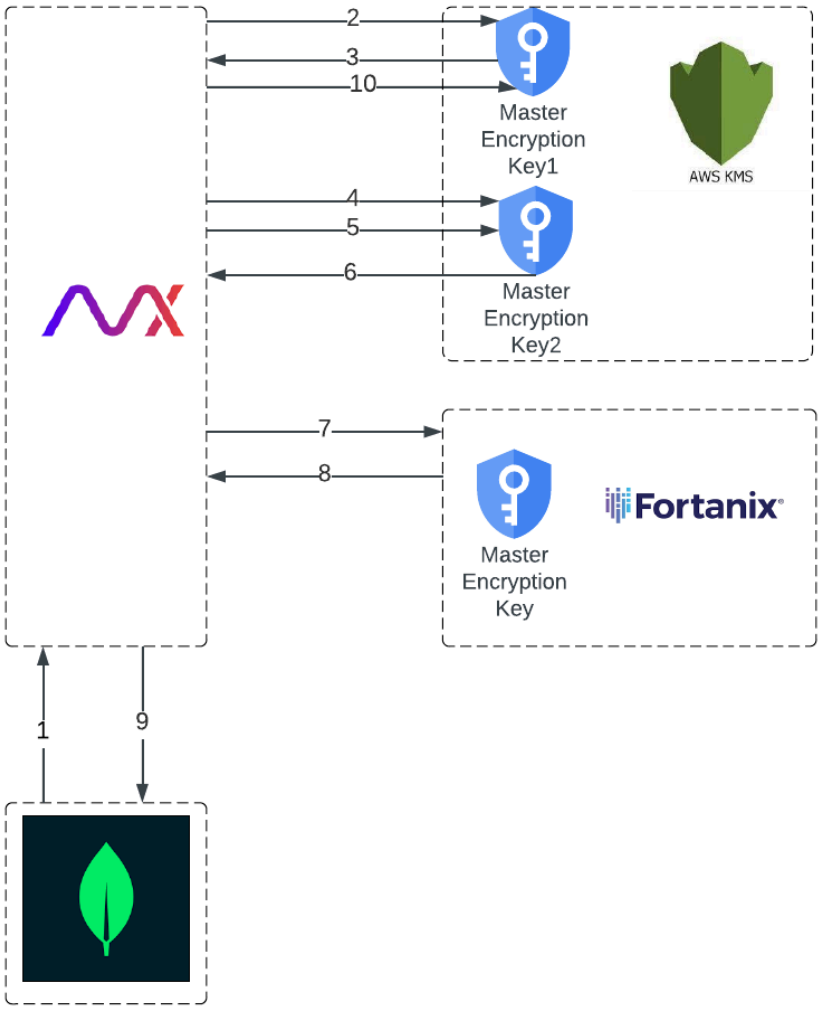
Encrypting the AppViewX Master Key using the User's Master Key

AppViewX offers the ability to encrypt the AppViewX Master Key using the User's Master Key stored in the User's Hardware Security Module (HSM). This delegation of control over all data to the user enhances the confidentiality and security of sensitive information. With this option enabled, AppViewX can only access sensitive data if the User's Master Key is available and valid.



When the user chooses to encrypt the AppViewX Master Key using the User's Master Key stored in the HSM, AppViewX executes the following steps:

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1. Retrieve the existing KMS-encrypted Master Encryption Key (MEK) from the tenant's database.
2. Decrypt the AppViewX MEK using the MEK (Master Encryption Key 1) created during tenant onboarding in the KMS.
3. Retrieve the plaintext AppViewX MEK.
4. Generate a new **MEK (Master Encryption Key 2)** in the KMS.
5. Encrypt the AppViewX MEK using the MEK 2 in the KMS.
6. Retrieve the KMS-encrypted AppViewX MEK.
7. Encrypt the KMS-encrypted AppViewX MEK using the User’s Master Key in the HSM.
8. Retrieve the double-encrypted AppViewX MEK.

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9. Update the new double-encrypted AppViewX MEK in the database, replacing the previous KMS MEK encrypted ciphertext in the tenant's database.
10. Schedule the **Master Encryption Key 1** for deletion to ensure that any previous data backups are invalidated.

Note: It is important to note that the AppViewX Master Encryption Key is stored only in its encrypted form within the tenant's database and is not paged or stored elsewhere.

Why is there a dependency on AWS KMS?

AppViewX uses the AWS KMS for two main purposes:

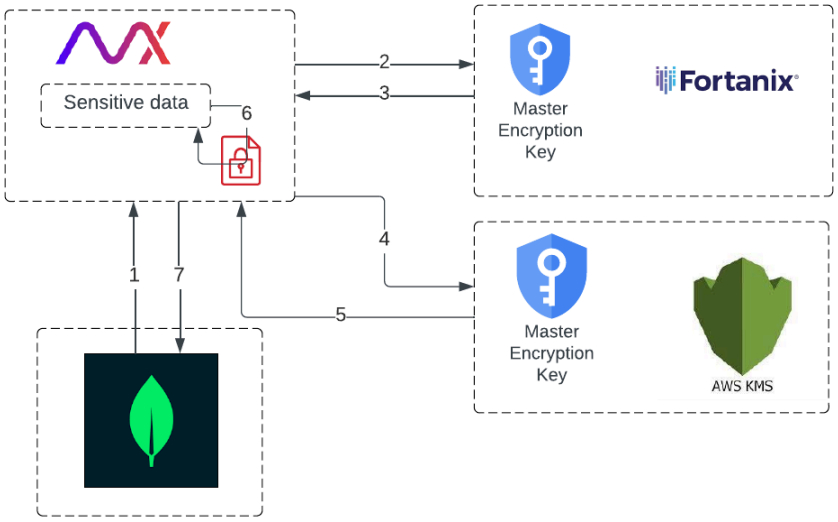
- To retain a key for encrypting the AppViewX Master Encryption Key (MEK) when it is sent to the user's HSM through the AppViewX Cloud Connector
- To encrypt sensitive information related to the HSM.

Although the AWS KMS continues to be utilized, the AppViewX MEK is encrypted using the user's Master Key stored in the HSM. This means that if the Master Key is removed from the HSM, the data will become inaccessible.

New Encryption/Decryption Flow

When sensitive data is fed into AppViewX after enabling AppViewX MEK encryption via the HSM, to ensure data security, AppViewX executes the following steps:

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Note: The AppViewX Master Encryption Key (MEK) is required to encrypt/decrypt the sensitive data, but it is not readily available. The process of retrieving the AppViewX MEK involves two steps, with the HSM initially in control.

1. Retrieve the encrypted AppViewX MEK from the tenant's database.
2. Send a request to the HSM, which decrypts the encrypted MEK and sends back a response. This response is a ciphertext encrypted using the KMS MEK.
3. Retrieve the decrypted value (KMS encrypted).
4. Send a request to the AWS KMS to decrypt the KMS-encrypted AppViewX MEK using the KMS's MEK.
5. Retrieve the plaintext AppViewX MEK.
6. Encrypt/Decrypt sensitive data using the plaintext AppViewX MEK.
7. Persist the encrypted sensitive data in the tenant database.

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Warning:

- After enabling AppViewX Master Key encryption, if the User’s Master Key is removed from the HSM, all data becomes inaccessible and irrecoverable. There is no way for the recovery of this data.
- Once AppViewX Master Key encryption is enabled, there is no option to roll back to the default approach of using AWS-KMS.

Understanding the HSM Health Check and Sync Status Functionalities

To ensure the proper functioning of the HSM, a health check of the HSM is scheduled to occur every hour after the encryption of AppViewX's MEK is enabled. If the HSM is deemed unhealthy for three consecutive checks, the plaintext MEK will be purged from AppViewX's in-memory cache, failing most system functions. The affected use cases are listed here .

The HSM is considered unhealthy:

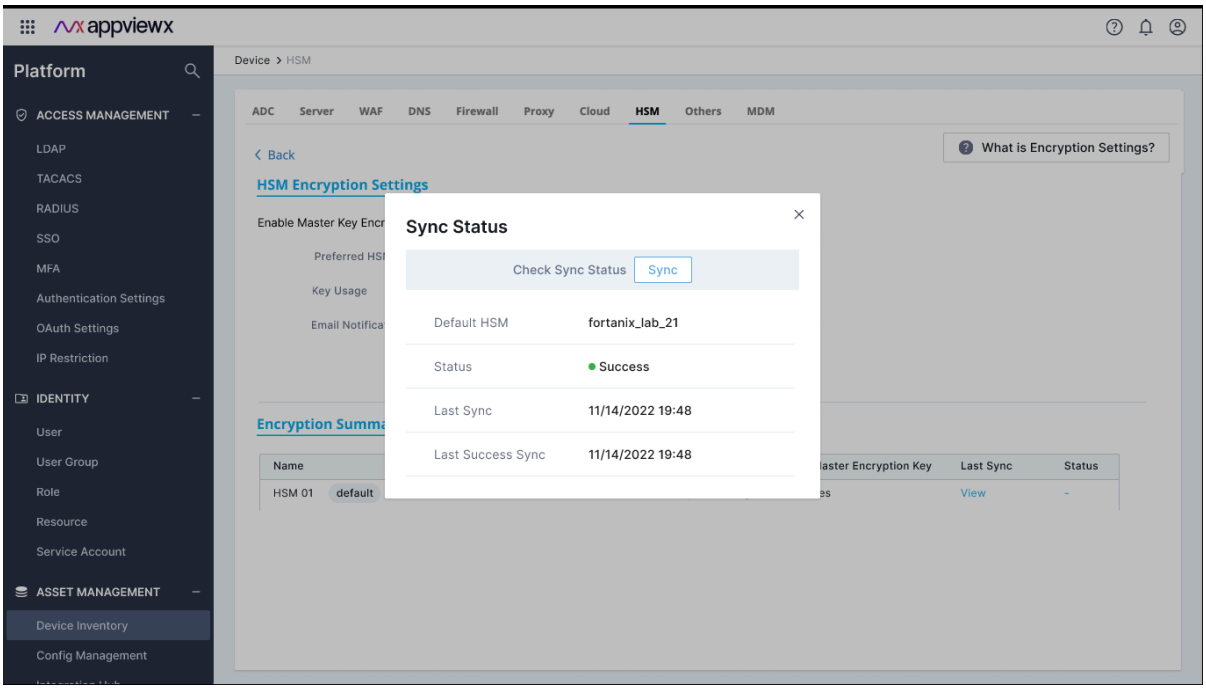
- If the Master Encryption Key has been removed

or

- The HSM credentials have been changed and not updated in AppViewX.

In addition to the regular health checks, AppViewX provides an option in the GUI to manually initiate a health check. If the user selects to sync their HSM and the HSM is found to be unhealthy, the MEK stored in AppViewX's cache will be immediately purged.

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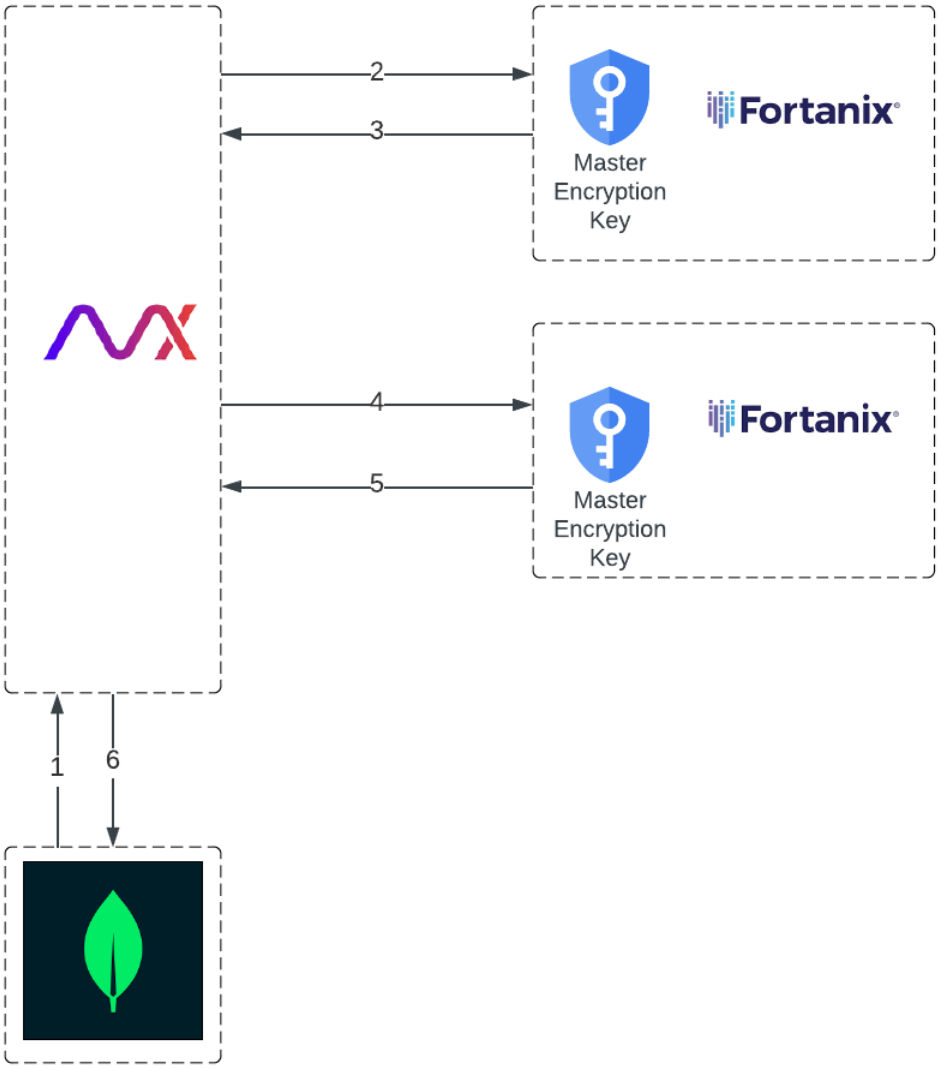


Note: The in-memory cache functionalities will start to fail, even without flushing, if the key is not available in the cache. This is because the key retrieval will not succeed when the HSM is unhealthy.

Switching between HSMs

Once the encryption of the AppViewX MEK has been enabled, it cannot be disabled. However, it is possible to switch between the HSMs used for encryption. The process involves decrypting the MEK using the current HSM and then re-encrypting it using the new HSM. To switch between HSMs, AppViewX executes the following steps:

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1. Retrieve the encrypted AppViewX MEK from the tenant database.
2. Decrypt the AppViewX MEK using the current HSM.
3. Retrieve the KMS-encrypted AppViewX MEK.
4. Encrypt the AppViewX MEK using the new HSM.
5. Retrieve the double-encrypted AppViewX MEK.
6. Persist the encrypted AppViewX MEK in the tenant database.

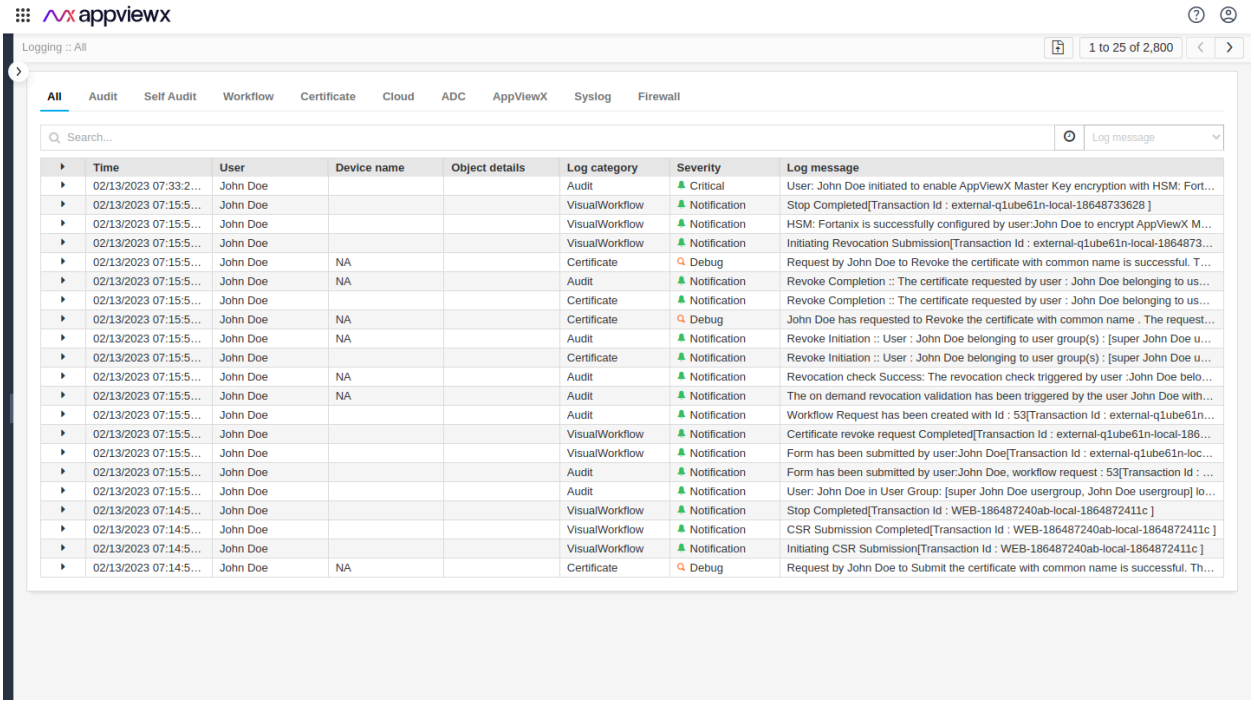
Warning: When switching between HSMs, the User's Master Key in the existing HSM should be retained till the process is complete, failing which can result in a failure in the switch operation.

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Viewing Audit Logs for Encryption Operations

The AppViewX audit logs provide a comprehensive view of system activity, allowing users to track and monitor various events. Whenever the tenant administrator enables the encryption of the AppViewX Master Key, all subsequent operations are also recorded in the logs.

Note: For instructions on viewing and reading the audit logs, click here.



The following table lists the log events recorded in the context of the AppViewX Master Key Encryption:

Actions with Log Message

Action	Log Message
Tenant Admin initiates encryption of AppViewX Master Key.	User:<User Name> initiated to enable AppViewX Master Key encryption with HSM:<HSM Name>
AppViewX Master Key encryption is successful	HSM:<HSM Name> is successfully configured by user:<User Name> to encrypt sensitive data.
AppViewX Master Key encryption has failed	HSM:<HSM Name> configuration to encrypt sensitive data failed due to <reason>.

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Actions with Log Message (continued)

Action	Log Message
AppViewX retrieved the plaintext AppViewX MEK successfully.	Connected with HSM:<HSM Name> for decrypting AppViewX MEK and it is a success.
AppViewX failed to retrieve the plaintext AppViewX MEK.	Connected with HSM:<HSM Name> for decrypting AppViewX MEK and it failed.
KMS Key created during onboarding is scheduled for deletion after enabling AppViewX MEK encryption.	KMS Key will be deleted within seven days as AppViewX Master Key encryption through HSM is enabled.
Scheduled health check of HSM is successful.	Scheduled validation of Master Key with HSM:<HSM Name> is successful.
Scheduled health check of HSM failed.	Scheduled validation of Master Key with HSM:<HSM Name> is failed due to <reason>.
Scheduled health check of the HSM failed due to removal of the User's Master Key.	Scheduled validation of Master Key with HSM:<HSM Name> is failed because MEK is not available. So, AppViewX MEK is flushed from memory.
Scheduled health check of the HSM failed due to three continuous failures.	Scheduled validation of Master Key with HSM:<HSM Name> is failed continuously for the third time. So, AppViewX MEK is flushed from memory.
The user initiated a health check from the GUI and it succeeded.	User:<User Name> initiated validation of Master Key with HSM:<HSM Name> and it is a success.
The user initiated a health check from the GUI and it failed.	User:<User Name> initiated validation of Master Key with HSM:<HSM Name> and it failed due to <reason>.
The user initiated a health check from the GUI and it failed due to removal of the User's Master Key.	User:<User Name> initiated validation of Master Key with HSM:<HSM Name> and it is failed because MEK not available. So, AppViewX MEK is flushed from memory.

Impacted Use Cases if the Customer's Master Key is Removed

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Overview

If the customer's Master Key in the HSM is removed and the AppViewX MEK is purged from AppViewX's in-memory cache, logging into AppViewX using LDAP/SSO and local accounts with multi-factor authentication (MFA) will be disabled.

Note: Multi-factor authentication (MFA) is planned for a future release.

For users currently logged/users logged in using a local account without MFA, the functions listed in the following sections will become unavailable. Additionally, personally identifiable information such as the user's first and last name, email address, and phone number will be displayed as ciphertext in the product's user interface.

User Management

- Login as local user when MFA is enabled
- Change Password for local account
- Create service account
- Authorize service account
- Change Client ID/ Secret for service account
- Configure LDAP
- Login with AD
- Configure TACACS
- Login with TACACS
- Configure RADIUS
- Login with RADIUS
- Configure SAML
- Login with SAML
- Configure OIDC
- Login with OIDC

Vault

- Add credential in AppViewX vault
- Add credential with Other vaults
- Integrate vaults
- Add device using credential in vault
- Perform other operations in device with credential in vault

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- Perform operations in cloud account using credential in vault
- Perform operations in CA using credential in vault

HSM

- Add HSM
- Delete HSM
- Configure Private KEY in HSM
- Configure All encryption in HSM
- Change default HSM
- Enable CSR in HSM
- Rotate HSM key

Log Forwarding

- Configure log forwarding with Splunk HEC
- Forward logs using Splunk

Alerts

- Configure alerts
- Send alerts

License

- Apply License

Mail Server

- Configure mail server using SMTP
- Configure mail server using oAuth
- Send email using SMTP credentials
- Send email using oAuth credentials

Certificate Management

- Upload CA certificate
- Generate custom CA certificate
- Add MDM devices to inventory
- Update MDM device(s)

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- Import MDM Devices
- Save intermediate and root cert in DB if new certificate
- Create client certificate
- Upload client authentication json into CA settings
- Symantec CA: Challenge password functionality
- API to persist credentials of certificates in the Vault
- Update CA connector info with challenge password during revoke
- Auto enrollment: Create/Update agent settings
- Encrypt the intune client secret: update agent setting
- Auto enrollment create certificate: Perform Client Authentication
- Save external vault details in inventory
- Save HSM settings
- Update CA settings: secret access key in VendorSpecific Settings
- Retrieve CA specific values from certificate authority
- Authenticate vendor for server
- Update GCP cloud connector
- Cloud vendor details in view device
- Get vendor details for AWS, Azure, GCP
- Misc: Fetch credentials from credential store
- Encrypt device password or get access details from the credential store for device
- API to encrypt plain text using HSM Utimaco
- HSM Thales encryption service
- HSM SafeNet encryption service
- Upload certificate via holistic view
- Upload client authentication certificate
- Upload server certificate
- Discovery via upload
- Bulk upload
- Application connector: Profile and user preference properties
- Discovery: Password protected certificate parsing

AppViewX Cloud Connector

- Add a cloud connector

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FAQs-Supporting User Master Key

- **How does AppViewX connect with the HSM?**

  The cloud connector facilitates all communication and interactions between AppViewX and the User's resources, which includes the Hardware Security Module (HSM).

- **Is the data that is sent to the Cloud Connector encrypted during transit?**

  Yes. The communication between AppViewX and the AppViewX cloud connector is through a TLS-encrypted channel.

- **What is the impact after enabling AppViewX Master Key Encryption if the virtual machine or server hosting the AppViewX Cloud Connector experience health issues?**

  The AppViewX cloud connector is required for any communication with the HSM. If there are issues between AppViewX and the AppViewX cloud connector, it can result in a service disruption. To ensure high availability, it is recommended to deploy multiple cloud connectors across various data centers and also ensure that all deployed cloud connectors can interact with the HSM.

- **Can you explain the reason for not rotating the AppViewX Master Key when the User opts to utilize a User Master Key?**

  AppViewX uses envelope encryption to enhance the security of confidential data. This technique involves encrypting the AppViewX Master Key with the User's Master Key, thus allowing the User to retain control over their data. To ensure the security of the AppViewX Master Key, AppViewX never stores it in plain text format and instead uses AWS KMS to encrypt it. When the user opts to encrypt the AppViewX Master Key, all existing keys of that tenant in the KMS are discarded, rendering any previous data backups useless. The tight security measures in place eliminate the need for rotating the AppViewX Master Key, saving the cost and effort of re-encrypting all secure materials.

- **Can you provide an overview of the actions that an MFA-disabled local user can carry out if the User Master Key is removed from the HSM?**

  In the event that the Master Key is removed, AppViewX will be in a near-read-only state, where only non-sensitive data, such as audit logs, can be viewed. Any actions requiring access to sensitive information will be disabled, even for a local user without multi-factor authentication. This added layer of security ensures the protection of confidential data and reinforces AppViewX's commitment to data privacy and security.

- **What are the consequences if the password for the HSM is modified and not updated within AppViewX?**

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AppViewX conducts regular health checks on the HSM where the User Master Key is stored. In the event that the HSM is deemed unhealthy after three consecutive failures, AppViewX will flush the plain text AppViewX MEK from its cache. This measure is necessary to protect the confidentiality of the data, but it may result in a temporary service disruption.

- **Are there any notifications to alert us in the event that the HSM is not functioning optimally or if the Master Key is removed?**

  When enabling the AppViewX MEK encryption, users can set up notifications for the health of the Hardware Security Module (HSM). By configuring a list of email addresses, users can stay informed about the status of the HSM.

- **Since there is a dependency on the AWS KMS, is the service highly available?**

  Yes AWS KMS is highly available within an AWS region.

- **After enabling AppViewX Master Key encryption by User Master Key do we have the option to revert back?**

  No. After enabling AppViewX MEK encryption there is no option to revert back to using the AWS KMS. We can switch the HSM that stores the User's Master Key.

- **Does AppViewX support rotating the User Master Key stored in the HSM?**

  Currently, we do not support the rotation of the User Master Key.

- **Does AppViewX rotate the Master Key stored in the AWS KMS?**

  Yes, the Master Key stored in the AWS KMS is rotated every 90 days.

- **Can you provide details regarding the algorithm and size of the AppViewX Master Key?**

  Algorithm: AES

  Size: 256-Bit Key

Key Rotation Settings

HSM key rotation involves the regular replacement of cryptographic keys used by a Hardware Security Module (HSM) to bolster security and safeguard sensitive data. This process includes generating new keys and securely substituting the current ones.

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Accessing Rotation Settings

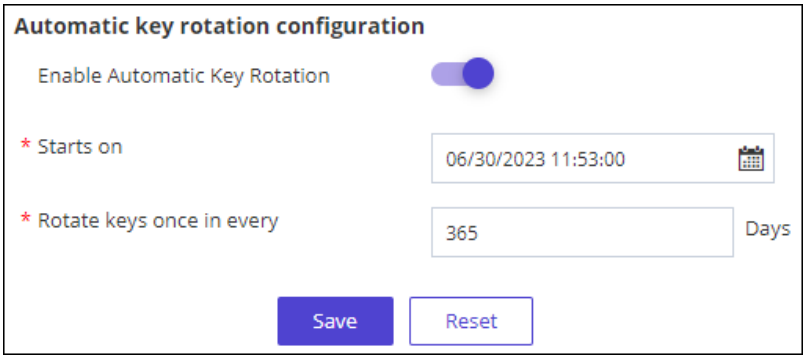
New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **VAULT & SECURITY**, select **Rotation Settings**. The **Settings :: Key Rotation** page is displayed.	1. From the main navigation menu, select **Settings** > **General** > **Key Rotation**. 2. The **Settings :: Key Rotation** page is displayed.
For more information on how to switch between menus, click here.	

Automatic Key Rotation Configuration

"Automatic key rotation" configuration involves the automatic rotation of cryptographic keys at predefined intervals, ensuring the automatic replacement of encryption keys without manual intervention.

To configure the Automatic key rotation settings:

1. On the **Settings :: Key Rotation** page, from the left corner of the screen, navigate to the **Automatic key rotation configuration**.



2. Enable the toggle to **Enable Automatic Key Rotation**.

> **Note:** On selecting **Enable Automatic Key Rotation**, the ***Starts on** and ***Rotate keys once in every** attribute appears.

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Field descriptions for Automatic Key rotation configuration

Field	Description
*** Starts on**	This field provides a calendar option to specify the start date and time of the key rotation.
*** Rotate keys once in every**	This field enables you to define the rotation frequency of keys in terms of the number of days.
** : Mandatory fields*	

3. Click **Save**.

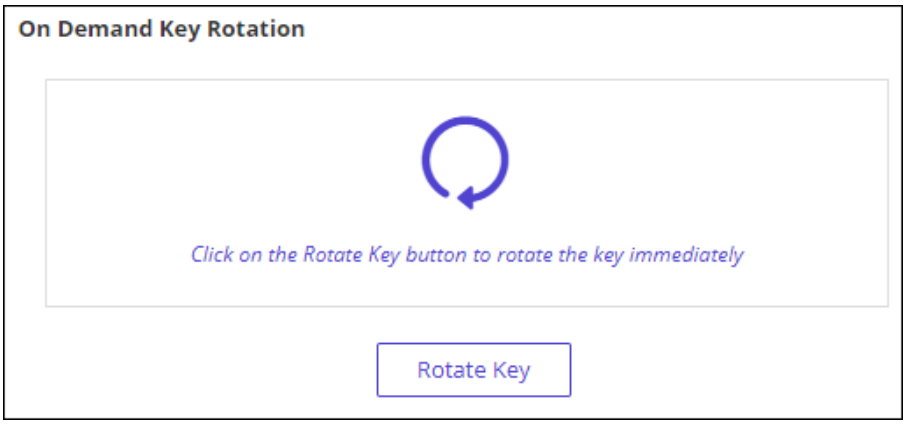
   A Confirmation message indicating 

is displayed on the screen.

On Demand Key Rotation

"On Demand Key Rotation" is a process of manually rotating cryptographic keys as necessary, providing flexibility in key management based on specific requirements. This approach empowers organizations to initiate key rotation at any time to meet their needs.

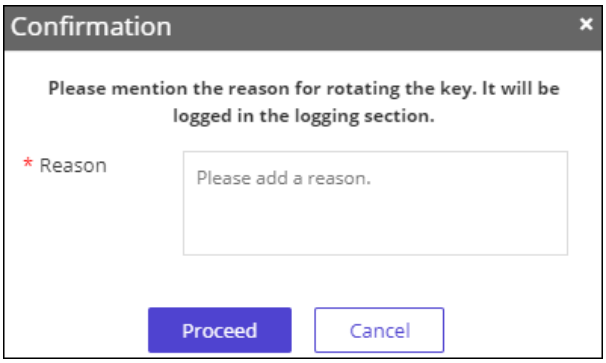
1. On the **Settings :: Key Rotation** page, from the right corner of the screen, navigate to the **On Demand Key Rotation**.



2. Click **Rotate Key** to rotate the key immediately.

   A pop-up window of **Confirmation** is displayed.

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3. Enter the **Reason** for rotating the key. It will be logged in the logging section.
4. Click **Proceed**.

   A Confirmation message indicating **Key rotation triggered successfully** is displayed on the screen.

Observe and Explore (Alerts, Logs, Log Forwarding)

The Observe and Explore modules lets you manage alerts, logs, log forwarding, perform data retention configurations.

- Managing Alerts
- Managing Logs
- Log Forwarding
- Data Retention/Purging Alerts
- Syslog Reception Settings

Managing Alerts

Alert management is important for an organization to monitor and respond to security concerns before they become a threat to the organization's security.

As part of its alert management, AppViewX enables you to identify complications that may occur within an application. Alerts can then be configured, to notify the users of these complications, and send a predetermined date and time using email and SNMP configurations.

AppViewX enables managing alerts in the following categories

Alert type	Description
Certificate	Alerts triggered when a certificate is invalid, about to expire, or out of sync

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AppViewX enables managing alerts in the following categories (continued)

Alert type	Description
SSH	Alerts related to SSH components
ADC	ADC alerts for changes that are triggered through AppViewX
AppViewX	Alerts related to AppViewX-specific components
Syslog	Syslog alerts of critical applications and devices for changes that are executed on the device and execute workflow as an action

For each alert type, AppViewX defines the following severity levels

Severity level	Description
Critical	Alerts for issues that can disastrously impact functionality are marked as critical alerts. These are top priority and must be resolved immediately.
Fatal	Alerts for issues that can disastrously impact functionality are marked as fatal alerts. These are top priority and must be resolved immediately.
Major	Alerts for issues that are important and require a resolution, but are not a top priority, are marked as major alerts.
Minor	Alerts for issues that are low priority are marked as minor alerts.
Notification	Alerts for issues that users have to only be notified/warned of are marked as notifications.

For these alerts, AppViewX lets you:

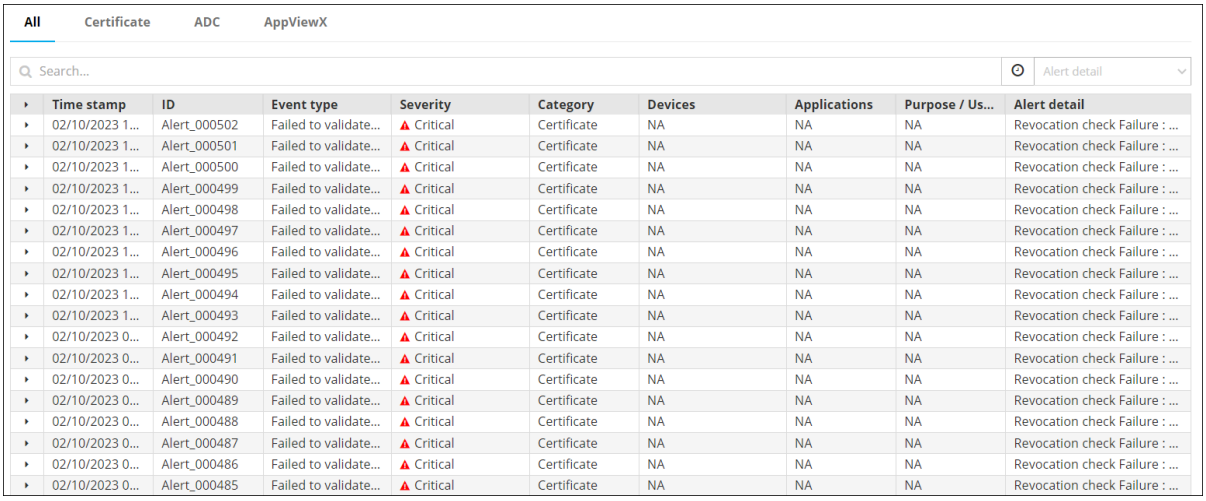
- View alerts
- Configure alerts
- Search for alerts
- Purge alerts
- Delete alerts.

- Configuring Alerts

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Accessing the Alerts Page

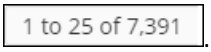
New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **OBSERVE & EXPLORE**, select **Alerts**. The **Alerts :: All** page is displayed with the **All** tab open by default.	From the main navigation menu, select **Alert**. The **Alert :: All** page is displayed with the **All** tab open by default.
For more information on how to switch between menus, click here.	



Setting the Record Count Preference for Viewing Alerts

For easier viewing of records, AppViewX lets you set the record count preference, which is the number of alert records that will be displayed on one page.

To set the record count preference:

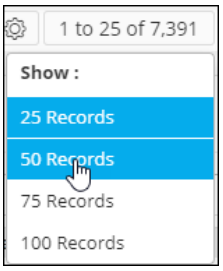
1. On the **Alert :: All** page, from the top-right corner of the screen, click 

.

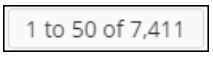
> **Note:** By default, 25 alert records are displayed on one page (which is why the control reads 1 to 25).

2. From the **Show** menu displayed, select your record count preference (for example, 50 records).

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3. The Alert page is updated according to the record count preference selected. A message, **Record count preference saved successfully**, is displayed. The UI control is also updated to display the current selection, as shown in the following image:



Configuring Alerts

AppViewX lets you configure alerts to define when the event type that will trigger an alert, the severity of the alert, the message to describe the alert, settings for sending alert notifications, and so on. The subsequent sections outline the instructions for configuring the following types of alerts—Certificate, Syslog, SSH, AppViewX, ADC.

ACF permissions for New users to view Alerts

.

Users can now view alerts based on the ACF permissions assigned to them as follows:

- **All** - Allows the user to view all alerts for the product line, including other users' actions. Recommended for admins or users needing full visibility
- **Group** - Allows the user to view only alerts from their own user group. Used to restrict visibility to group-specific alerts only.
- **Self** - Allows the user to view only their own activity alerts for maximum privacy

Go to **Menu** > **Platform** > **IDENTITY** > **Role** > Add or Modify a Role. On the **Authorised Functions** tab page, go to **Platform** > **Observe and Explore** > **Alerts** > **Access**

Configuring Certificate Alerts

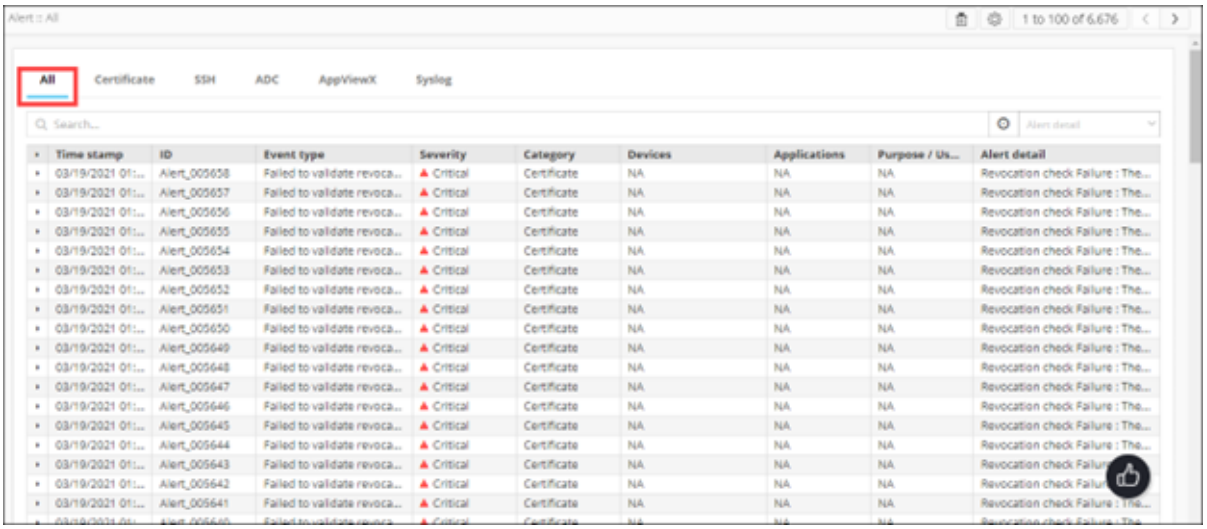
Certificate alerts are generated to notify users of certificate events that require the user to take a remedial action. Certificate alerts are sent when:

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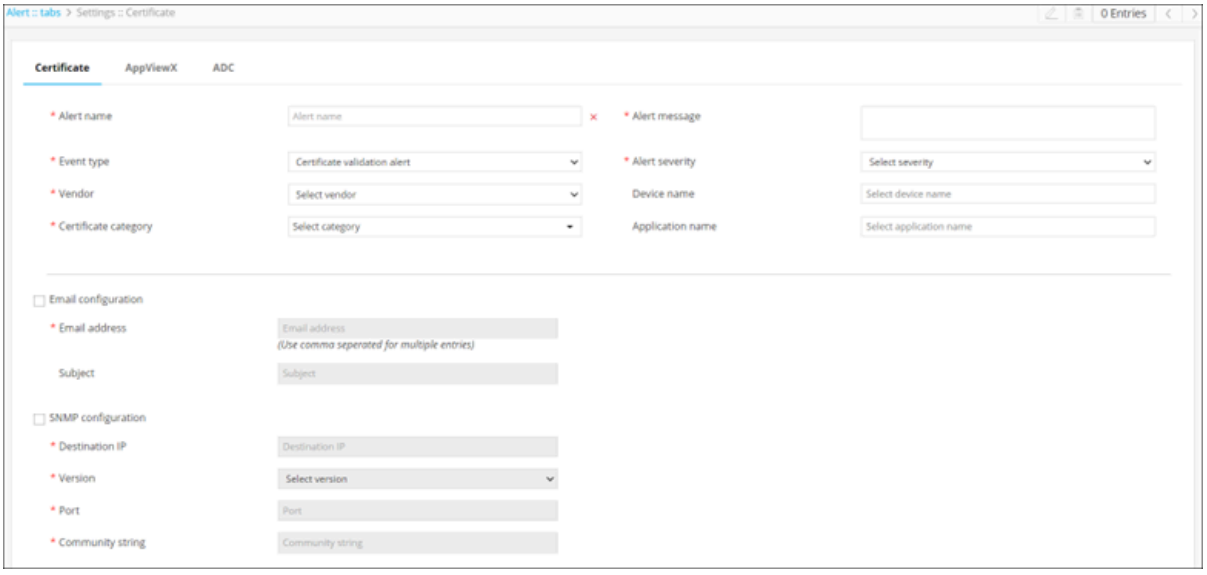
- Certificates need to be validated
- Certificates are set to expire
- Certificates cannot be synchronized.

To configure certificate alerts:

1. To access the navigation pane, in the top-left corner of the screen, hover the mouse pointer over the **(Menu)** icon.
2. From the menu displayed, click **Alert**.
   The **Alert :: All** page is displayed (by default).



3. From the top-right corner of the screen, click **(Settings)** icon.
4. The **Settings :: Certificate** page is displayed, with the **Certificate** tab open by default.



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5. To configure certificate alerts, enter the following details:

Field descriptions for Certificate Alerts

Field	Description
***Alert name**	Enter the name you want to give this alert.
***Alert message**	Enter the message that will be displayed with the alert, to describe the alert. The alert message cannot be longer than 64 words. This field is not displayed when configuring the certificate expiry alert.
***Event type**	From the drop-down menu, select the event type that will trigger this alert from the following options: • Certificate validation alert (default) • Certificate expiry alert • Certificate sync alert.
***Alert severity**	From the drop-down menu, select a severity for the alert from the following options: • Critical • Major • Notification.
Vendor	From the drop-down menu, select the vendor name for whose device/ application you are creating the alert. This field is not displayed when configuring the certificate expiry alert.
Device name	Enter the name of the device associated with the certificate you are creating the alert for. This field is not displayed when configuring the certificate expiry alert.
***Certificate category**	From the drop-down menu, select a certificate category from the following options: • Server • Client • Device • Code Signing.
***Expires in (days)**	Enter the number of days till the certificate expires.

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Field	Description
	This field is displayed only when configuring certificate expiry alerts.
Email configuration	To send the certificate alert as an email, select this check box.
***Email address**	To send the certificate alert as an email, enter the email address to which this specific certificate alert will be sent. **Note:** Separate multiple email addresses with a comma.
Subject	To send the certificate alert as an email, enter a subject line.
SNMP configuration	To use the Simple Network Management Protocol for sending the alert, select this check box.
***Destination IP**	Enter the destination IP address for the alert.
***Version**	From the drop-down menu, from the following options, select the SNMP version to be used: • V1 • V2.
***Port**	Enter the port number to be used for the alert.
***Community string**	Enter the community string for the alert. The community string is similar to a user ID or password that allows users access to the requested information on the device.
** : Mandatory fields*	

6. To save the certificate alerts configuration details, click **Add**.
   The saved details are displayed in the table shown at the bottom of the screen.

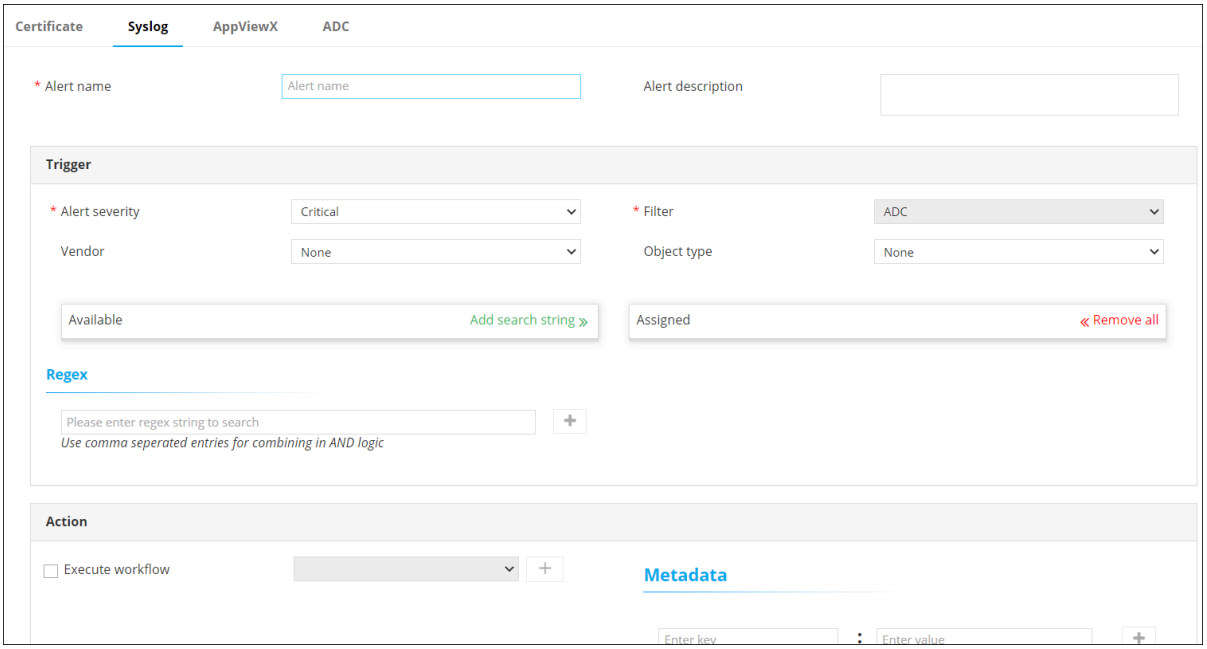
Configuring Syslog Alerts

AppViewX subscribes to all device-level alerts, where it acts as a syslog listener. Logs of any device added in AppViewX can be viewed as syslogs. However, devices tend to generate a huge amount of data. To resolve this, a Syslog Alert is a convenient way to notify about specific syslog information that is of importance to you.

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To configure syslog alerts:

1. On the **Alert :: All** page, from the top-right corner of the screen, click **(Settings)** icon.
   The **Settings :: Certificate** page is displayed with the **Certificate** tab open by default.
2. To configure Syslog alerts, click **Syslog**.
   The **Settings :: Syslog** page is displayed.



3. Enter the following details:

Field descriptions for Syslog

Field	Description
***Alert name**	Enter the name you want to give this alert.
Alert description	Enter a description for the alert.
** : Mandatory fields*	

4. In the **Trigger** section, enter the following details:

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Field descriptions for Trigger

Field	Description
***Alert severity**	From the drop-down, from the options given below, select a severity for the alert: • Critical • Fatal • Major • Minor • Notification.
Filter	For syslog alerts, the filter is set to ADC, because syslog alerts are parsed only through ADC devices.
Vendor	ADC module vendor (**A10**, **Citrix**, or **F5**)
Object type	Object type for ADC (**FQDN**, **Service IP**, **VirtualService**, **ServiceGroup**, **Server**, **VirtualServer**, or **Device**)
Available	Depending on the **Object type** and **Vendor** selected, a list of all available ADC objects or devices is displayed here.
Add search string	Instead of adding devices manually, AppViewX lets you automatically assign all existing devices or objects that match your criteria. To do this: a. In the **Available** section, in the **Search** field, enter the search criteria. b. Click **Add search string**. **Note:** The benefit of using a search string rather than selecting devices manually is that the search string continues to work in the background and auto-assigns all new devices that match the search criteria.
Assigned	To add an object to the Assigned column, click the check box corresponding to that object.
Regex	Enter single/multiple regex patterns/strings.

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Field	Description
	Note: When entering multiple regex patterns/strings, separate the regex strings using commas. The comma works as the **BOOLEAN AND** operator.
** : Mandatory fields*	

5. In the **Action** section, enter the following details:

Field descriptions for Action

Field	Description
Execute workflow	To select the workflow to trigger: a. Select the **Execute workflow** check box. b. From the drop-down menu, select the workflow to trigger.
Metadata	AppViewX lets you define a metadata condition based on which the workflow will be triggered. To define a metadata key-value pair for this condition: a. In the **Enter key** field, enter the key. b. In the **Enter value** field, enter the key value. To add another key-value pair: a. Click **(Add)** icon. b. In the **Enter key** field, enter the key. c. In the **Enter value** field, enter the key value. To delete a key-value pair: For the key-value pair you want to delete, click **(Delete)** icon.

6. To send the Syslog alert as an email, execute the steps for configuring SMTP for email alerting.
7. Enter the following details:

Field descriptions for SMTP email alerting

Field	Description
Email configuration	To send the syslog alert as an email, select this check box.

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Field	Description
Email configuration	To send the syslog alert as an email, enter the email address to which this specific syslog alert will be sent. **Note:** Separate multiple email addresses with a comma.
Email configuration	To send the syslog alert as an email, enter a subject line.
** : Mandatory fields*	

8. To use the Simple Network Management Protocol (SNMP) to send the alert, enter the following details:

Field descriptions for Simple Network Management Protocol

Field	Description
SNMP configuration	To use the Simple Network Management Protocol for sending the alert, select this check box.
***Destination IP**	Enter the destination IP address for the alert.
***Version**	From the drop-down menu, from the following options, select the SNMP version to be used: • V1 • V2.
***Port**	Enter the port number to be used for the alert.
***Community string**	Enter the community string for the alert. The community string is similar to a user ID or password that allows users access to the requested information on the device.
** : Mandatory fields*	

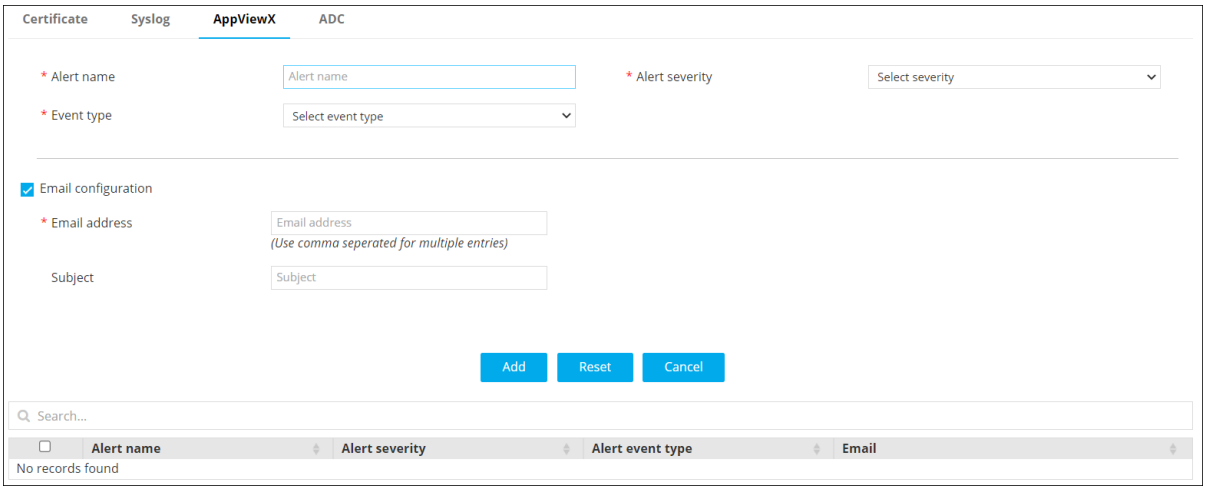
9. To save the Syslog alerts configuration details, click **Add**.
   The saved details are displayed in the table shown at the bottom of the screen.

Configuring AppViewX Alerts

To configure AppViewX alerts:

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1. On the **Alert :: All** page, from the top-right corner of the screen, click **(Settings)** icon.
   The **Settings :: Certificate** page is displayed with the **Certificate** tab open by default.
2. To configure AppViewX alerts, click **AppViewX**.
   The **Settings :: AppViewX** page is displayed.



3. Enter the following details:

Field descriptions for AppViewX Alerts

Field	Description
***Alert name**	Enter the name you want to give this alert.
***Alert severity**	From the drop-down menu, select a severity for the alert from the following options: • Critical • Fatal • Major • Minor • Notification.
***Event type**	From the drop-down menu, from the following options, select the event type that will trigger this alert: • Infrastructure • Application Discovery.
Email configuration	To send the certificate alert as an email, select this check box. **Note:** For AppViewX alerts, this feature is enabled by default.

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Field	Description
***Email address**	To send the certificate alert as an email, enter the email address to which this specific certificate alert will be sent. **Note:** Separate multiple email addresses with a comma.
Subject	To send the certificate alert as an email, enter a subject line.
** : Mandatory fields*	

4. To save the alert to the AppViewX system, click **Add**.
   The saved details are displayed in the table shown at the bottom of the screen.

Configuring ADC Alerts

To configure ADC alerts:

1. On the **Alert :: All** page, from the top-right corner of the screen, click **(Settings)** icon.
   The **Settings :: Certificate** page is displayed with the **Certificate** tab open by default.
2. To configure ADC alerts, click **ADC**.
   The **Settings :: ADC** page is displayed.
3. Enter the following details:

Field descriptions for ADC alerts

Field	Description
***Alert name**	Enter the name you want to give this alert.
***Alert message**	Enter the message that will be displayed with this alert.
** : Mandatory fields*	

4. In the **Trigger** section, enter the following details:

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Field descriptions for Trigger

Field	Description
***Alert category**	From the drop-down menu, select one of the following alert categories: • Threshold alert • Application alert • Device alert.
***Alert severity**	From the drop-down, from the options given below, select a severity for the alert: • Critical • Fatal • Major • Minor • Notification.
Vendor	From the drop-down menu, select the vendor whose device or devices you want to set an alert for.
Object type	From the drop-down menu, select the vendor object that you want to set an alert for. The contents of this field will vary depending on the vendor selected.
Detail contains	This field is applicable only for the **Device Alert** category.
Available	Depending on the **Object type** and **Vendor** selected, a list of all available ADC objects or devices is displayed here. To add an object/device to the alert, click » for that object/device.
Add search string	Instead of adding devices manually, AppViewX lets you automatically assign all existing devices or objects that match your criteria. To do this: a. In the **Available** section, in the **Search** field, enter the search criteria. b. Click **Add search string**.

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Field	Description
	Note: The benefit of using a search string rather than selecting devices manually is that the search string continues to work in the background and auto-assigns all new devices that match the search criteria.
Assigned	To add an object to the Assigned column, click the check box corresponding to that object.

5. In the **Alert condition** section, enter the following details:

Field descriptions for Alert condition

Field	Description
***Alert interval**	From the drop-down menu, from the following options, select how often you want the system to check for breaches of the threshold levels that you are about to define: • 10 seconds • 20 seconds • 30 seconds • 40 seconds • 50 seconds • 60 seconds.
***Cool off period**	From the drop-down menu, from the following options, select how much time the system should wait before sending another alert about a continuing threshold breach: • 10 minutes • 20 minutes • 30 minutes.
** : Mandatory fields*	

Note: This section is applicable only for the Threshold Alert category.

6. In the **Statistics** section, define the conditions that will generate an alert by selecting values in the Statistics, Operator, and Value fields.

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- To add more than one Statistics conditions, click **(Add)** icon.
- To delete a condition, click **(Delete)** icon.

7. In the **Action** section, to send the syslog alert as an email, execute the steps for configuring SMTP for email alerting.
8. Enter the following details:

Field descriptions for Action

Field	Description
Email configuration	To send the syslog alert as an email, select this check box.
***Email address**	To send the syslog alert as an email, enter the email address to which this specific syslog alert will be sent. **Note:** Separate multiple email addresses with a comma.
Subject	To send the syslog alert as an email, enter a subject line.
** : Mandatory fields*	

9. To use the Simple Network Management Protocol (SNMP) to send the alert, enter the following details:

Field descriptions for Simple Network Management Protocol

Field	Description
SNMP configuration	To use the Simple Network Management Protocol for sending the alert, select this check box.
***Destination IP**	Enter the destination IP address for the alert.
***Version**	From the drop-down menu, from the following options, select the SNMP version to be used: • V1 • V2
***Port**	Enter the port number to be used for the alert.
***Community string**	Enter the community string for the alert. The community string is similar to a user ID or password that allows users access to the requested information on the device.
** : Mandatory fields*	

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10. To save the ADC alert configure above, click **Add**.
    The saved details are displayed in the table shown at the bottom of the screen.

Editing Alerts

To edit an alert:

1. Go to the **Alert :: All** page and select the relevant tab for the alert you want to edit.
2. Scroll to the bottom of the page for the table that records all the alerts that have been configured for that category.
3. From the table, to select the alert you want to edit, select the check box corresponding to that alert.
4. From the top-right corner of the screen, click  **(Edit)** icon.
5. The fields are populated with the details of the alert.
6. Update the required fields and click **Update**.

Deleting Alerts

To delete an alert:

1. Go to the **Alert :: All** page and select the relevant tab for the alert you want to delete.
2. Scroll to the bottom of the page for the table that records all the alerts that have been configured for that category.
3. From the table, to select the alert you want to delete, select the check box corresponding to that alert.
4. From the top-right corner of the screen, click  **(Delete)** icon.
5. In the **Confirmation** dialog box, click **Yes**.

Searching for Alerts

AppViewX lets you search for alerts in two ways:

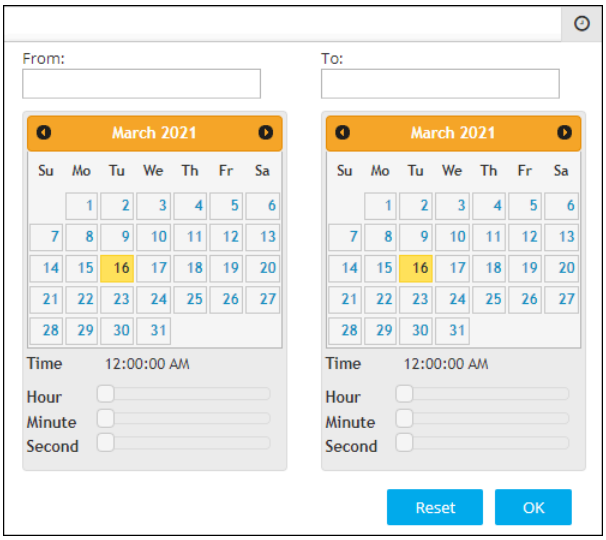
- Based on a timestamp
- Based on the values recorded for each alert.

Based on a Timestamp

To search for alerts based on a timestamp:

1. From the **Search** field on the **Alert** page, click  **(Clock)** icon.
   Widgets to select the date and time are displayed.

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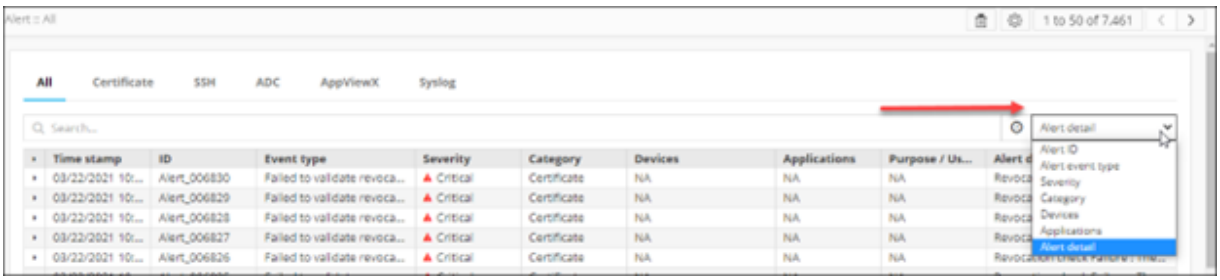


2. To select a date range, in the **From** and **To** fields, select the required dates.
3. To set a time, use the **Hour**, **Minute**, and **Second** slider controls.
4. Click **OK**.
5. The page is updated to display alerts from the selected timestamp.

> **Note:** To view alerts from a specific date to the current date, select only the From date. When the To field is left blank, by default, it is set to the current date.

Based on the Values Recorded for each Alert

1. From the drop-down menu in the **Search** field, select the category for searching alerts. For example, to search for alerts with a specific alert ID, from the drop-down menu, select **Alert ID**.



2. In the **Search** field , enter the search value. For our example, in the Search field, enter the required alert ID.
   The page is updated to display alerts that fulfil the search criteria.

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Managing Logs

Log management is an integral part of any customer-serving application. Monitoring and analyzing user activity logs helps in preventing security breaches, provides an insight into the performance of the applications, and contributes to troubleshooting.

As a part of log management, AppViewX tracks user activities and creates device and object level logs. For all recorded logs, it lets you:

- View logs
- Filter logs
- Forward logs
- Export logs
- Purge logs.

AppViewX lets you view all logs in one place as well as groups them under the following types for a segregated viewing:

- All
- Audit
- Self Audit
- Certificate
- ADC
- AppViewX
- Syslog
- SSH.

Accessing the Logs

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **OBSERVE & EXPLORE**, select **Logs**. The **Logging :: All** page is displayed with the **All** tab open by default.	From the main navigation menu, select **Logging**. The **Logging :: All** page is displayed with the **All** tab open by default.
For more information on how to switch between menus, click here.	

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Viewing Audit Logs

To view the audit logs:

1. Go to the **Logging :: All** page.
2. From the **Logging :: All** page, from the log categories, click **Audit**.
   The **Logging :: Audit** page is displayed. This page displays the following details:

Field descriptions for Audit Logs

Fields	Description
Time	Date and time at which the activity was carried out
User	Username of the user who performed the activity.
Device name	Name of the device, if the log is of a device-related activity
Object details	Name of the object, if the log is of a object-related activity
Source IP	IP address of the system that was the source of the activity.
AppViewX node	IP address of the installed AppViewX node.
Method of login	The method used for logging in to the AppViewX node, from one of the following: • UI • AppViewX (used for cronjob-related activities).
Comments	Comments related to the activity logged.
Log Message	Description of the activity logged

ACF permissions for New users to view Logs.

Users can now view alerts based on the ACF permissions assigned to them as follows:

- **All** - Allows the user to view all alerts for the product line, including other users' actions. Recommended for admins or users needing full visibility
- **Group** - Allows the user to view only alerts from their own user group. Used to restrict visibility to group-specific alerts only.
- **Self** - Allows the user to view only their own activity alerts for maximum privacy

Go to **Menu** > **Platform** > **IDENTITY** > **Role** > Add or Modify a Role. On the **Authorised Functions** tab page, go to **Platform** > **Observe and Explore** > **Alerts** > **Access**

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Viewing Self-Audit Logs

To view the self-audit logs:

1. Go to the **Logging :: All** page.
2. From the **Logging :: All** page, from the log categories, click **Self Audit**.
   The **Logging :: Self Audit** page is displayed. This page displays the following details:

Field descriptions for Self-Audit Logs

Fields	Description
Time	Date and time at which the activity was carried out
User	Username of the user who performed the activity.
Device name	Name of the device, if the log is of a device-related activity
Object details	Name of the object, if the log is of a object-related activity
Source IP	IP address of the system that was the source of the activity.
AppViewX node	IP address of the installed AppViewX node.
Method of login	The method used for logging in to the AppViewX node, from one of the following: • UI • AppViewX (used for cronjob-related activities)
Comments	Comments related to the activity logged.
Log Message	Description of the activity logged

Viewing Workflow Logs

To view the workflow logs:

1. Go to the **Logging :: All** page.
2. From the **Logging :: All** page, from the log categories, click **Workflow**.
   The **Logging** page is displayed. This page displays the following details:

Field descriptions for Workflow Logs

Fields	Description
Time	Date and time at which the activity was carried out.

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Fields	Description
Request ID	Workflow Request ID
User	Username of the user who performed the activity.
Work order stage	The stage at which an action is performed on the workflow.
Alert severity	Severity of the workflow.
Log Message	Description of the activity logged.

Viewing Certificate Logs

To view the certificate logs:

1. Go to the **Logging :: All** page.
2. From the **Logging :: All** page, from the log categories, click **Certificate**.
   The **Logging :: Certificate** page is displayed. This page displays the following details:

Field descriptions for Certificate Logs

Fields	Description
Time	Date and time at which the activity was carried out
User	Username of the user who performed the activity.
Device name	Name of the device, if the log is of a device-related activity.
Object details	Name of the object, if the log is of a object-related activity.
Purpose/Usage	Certificate type (server, client, device, code signing) associated with the logged activity.
severity	Severity of the activity logged (Notification, Debug, Warn, Error, Fatal, Critical).
Log Message	Description of the activity logged.

Viewing Cloud Logs

To view the cloud logs:

1. Go to the **Logging :: All** page.
2. From the **Logging :: All** page, from the log categories, click **Cloud**.
   The **Logging :: Cloud** page is displayed. This page displays the following details:

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Field descriptions for Cloud Logs

Fields	Description
Time	Timestamp of the event logged
User	Login name of the user that triggered the event
Source IP	IP address of the system from which the event was triggered
Cloud Account	Cloud device name for the event that is being logged
Cloud Vendor	Cloud device vendor
Cloud Service	Cloud service associated with the event **Note:** This field displays the name of the service(s) associated with the event that is being logged. However, there can be instances where events are independent of services. For example, credential validation for the master account is not related to any one service. If an event is independent of services, then all the services associated with the cloud account are listed for ease of searching the logs based on service name.
Cloud Region	Cloud region associated with the event **Note:** This field displays the name of the region(s) associated with the event that is being logged. However, there can be instances where events are independent of regions. For example, credential validation for the master account may not be related to any one region. If an event is independent of regions, then all the regions associated with the cloud account are listed for ease of searching the logs based on region name.
Event Source	Source (AppViewX UI or API) from where the event was triggered
Event Type	Type of the event being logged
Severity	Severity of the event triggered

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Fields	Description
	This field can have one of the following values: • **Critical** • **Warning** • **Notification** • **Debug**.
Log Message	Details of the event outcome
Log Statement	Additional details related to the event outcome (optional)

Viewing ADC Logs

To view the ADC logs:

1. Go to the **Logging :: All** page.
2. From the **Logging :: All** page, from the log categories, click **ADC**.
   The **Logging :: ADC** page is displayed. This page displays the following details:

Field descriptions for ADC Logs

Fields	Description
Time	Date and time at which the activity was carried out
User	Username of the user who performed the activity
Device name	Name of the device, if the log is of a device-related activity
Object details	Name of the object, if the log is of a object-related activity
Alert severity	Severity of the activity logged (Notification, Debug, Warn, Error, Fatal, Critical)
Log Message	Description of the activity logged

Viewing AppViewX Logs

To view the AppViewX logs:

1. Go to the **Logging :: All** page.
2. From the **Logging :: All** page, from the log categories, click **AppViewX**.
   The **Logging :: AppViewX** page is displayed. This page displays the following details:

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Field descriptions for AppViewX Logs

Fields	Description
Time	Date and time at which the activity was carried out
Device name	Name of the device, if the log is of a device-related activity
Object details	Name of the object, if the log is of a object-related activity
Severity	Severity of the activity logged (Notification, Debug, Warn, Error, Fatal, Critical)
Log Message	Description of the activity logged

Viewing Syslog Logs

To view the syslog logs:

1. Go to the **Logging :: All** page.
2. From the **Logging :: All** page, from the log categories, click **Syslog**.
   The **Logging :: Syslog** page is displayed. This page displays the following details:

Field descriptions for Syslog

Fields	Description
Time	Date and time at which the activity was carried out.
Host name	Host name of the Syslog server.
Log Message	Description of the activity logged.

Viewing Firewall Logs

To view the firewall logs:

1. Go to the **Logging :: All** page.
2. From the **Logging :: All** page, from the log categories, click **Firewall**.
   The **Logging :: Firewall** page is displayed. This page displays the following details:

Field descriptions for Firewall Logs

Category	Description
Time	Date and time at which the activity was carried out.

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Category	Description
User	Username of the user who performed the activity.
Device name	Name of the device, if the log is of a device-related activity
Object details	Name of the object, if the log is of a object-related activity
Log Message	Description of the activity logged.

Viewing Sign Logs

1. Go to **Logging :: All** page.
2. From the **Logging :: All** page, from the log categories, click **Sign**.
   The **Logging :: Sign** page is displayed.
3. Use the following filters to display limited data:
   - Search by text field
   - Search by time icon (date and time)
   - Search by **Method of Login** dropdown.

   This page displays the following details:

Field descriptions for Sign Logs

Fields	Description
Time	Date and time at which the activity was carried out.
User	Username of the user who performed the activity.
Severity	Severity of the activity logged (Notification, Debug, Warn, Error, Fatal, Critical).
Category	Name of the module. In this case - Sign.
Method of login	Indicates the type of signing. UI is for a file-based signing (File upload and sign) and API is for a hash-based signing.
Log message	Description of the activity logged.
Source IP	IP of the device from where the action was performed.
AppViewX node	IP:node of the AppViewX server from where the action was performed.

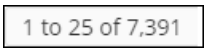
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Setting the Record Count Preference for Logs

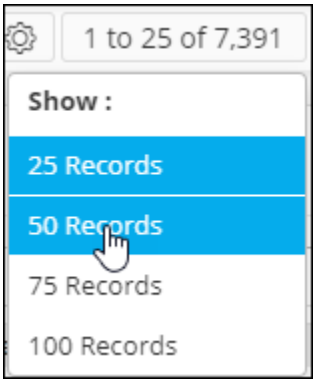
For easier viewing of records, AppViewX lets you set the record count preference, which is the number of log records that will be displayed on one page.

Note: By default, 100 records are shown on one page (which is why the control reads 1 to 100).

To set the record count preference:

1. On the **Logging :: All** page, from the top-right corner of the screen, click 

.
2. From the **Show** menu displayed, select your record count preference (for example, 25 records).



3. The Logging page is updated according to the record count preference selected. A message, **Record count preference saved successfully**, is displayed. The UI control is also updated to display the current selection, as shown in the following image:



Searching for Logs

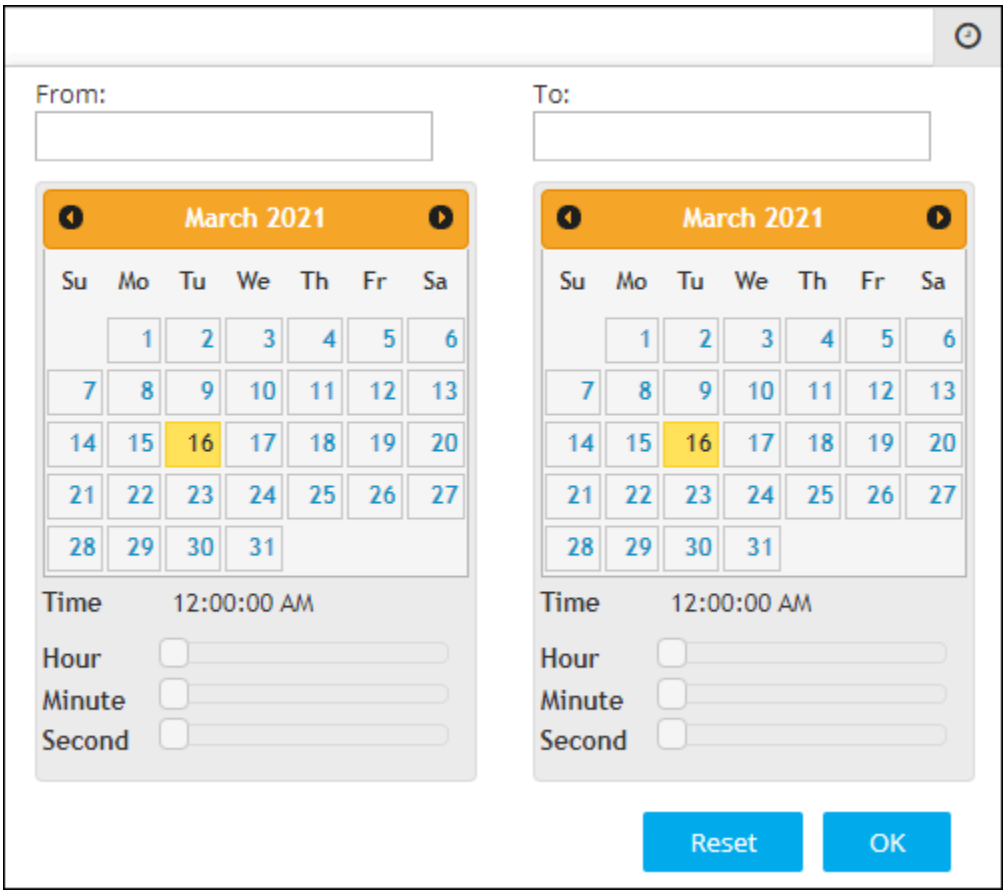
AppViewX lets you search for logs in two ways— based on timestamp and the values recorded in each log.

Based on a Timestamp

To search for logs based on a timestamp:

1. From the **Search** field on the **Logging** page, click  **(Clock)** icon.
2. Widgets to select the date and time are displayed.

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3. To select a date range, in the **From** and **To** fields, select the required dates.
4. To set a time, use the **Hour**, **Minute**, and **Second** slider controls.
5. Click **OK**.

   The page is updated to display log records from the selected timestamp.

> **Note:** To view records from a specific date to the current date, select only the From date. When the To field is left blank, by default, it is set to the current date.

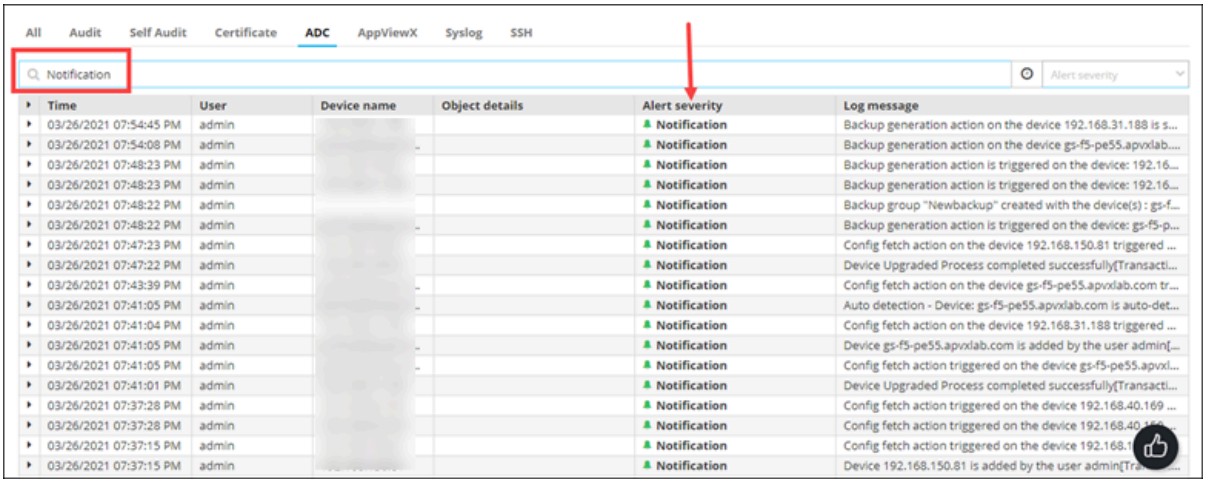
Based on the Values Recorded for each Log

To search for logs based on a value for one of the categories, for example, to search for ADC logs with the severity Notification:

1. Go to the **Logging :: All** page and click the **ADC** tab.
2. From the drop-down menu in the **Search** field, select a category, for example, **Alert Severity**, for searching the required logs.
3. In the **Search** field, enter a search value. for example, **Notification**.

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The page is updated to display logs that fulfill the search criteria.



Exporting Logs

AppViewX lets you export logs as Excel sheets.

1. Go to the **Logging :: All** page for the log type you want to export.
2. From the top right corner of the page, click  **(Export)** icon.
3. Navigate to the location to save the log file, and click **Save**.
   All logs of the selected log type are downloaded and saved.

Log Forwarding

Before logs are purged, AppViewX enables forwarding logs to external servers, like SIEM, that allows for a detailed analysis and, therefore, better identification of problem areas. This gives an advantage when configuring alerts; new alerts can be created to target and resolve the problem areas identified.

Before enabling log forwarding in AppViewX, ensure that all necessary configurations are completed on the vendor side.

For references to the full documentation of the log forwarding vendors supported in AppViewX, see the References section.

References

- Configure the universal forwarder using configuration files (Splunk)
- Quickstart: Onboard Microsoft Sentinel

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• Configuring Server Inventory Settings
• Configuring Forwarding Settings

Configuring Server Inventory Settings

• Configuring Splunk HEC

Setting the Integration for Log Forwarding

Server inventory settings are used to configure settings for forwarding logs to a specific external server.

To configure server inventory settings:

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **OBSERVE & EXPLORE**, select **Log Forwarding**. The **Settings :: Log Forwarding** page is displayed with the **Server inventory** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, select **General** > **Log Forwarding** The **Settings :: Log Forwarding** page is displayed with the **Server inventory** tab open by default.
For more information on how to switch between menus, click here.	

1. On the **Settings :: Log Forwarding** page, in the **Server inventory** tab, enter the Server Name and select a Protocol as described below.

Field descriptions for Server inventory

Field	Description
***Server name**	Name of the external server to which the logs will be forwarded
***Protocol**	Select a protocol from the following options: • UDP (default) • TCP • Splunk HEC • MS Sentinel.
** : Mandatory fields*	

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If the **Protocol** = **UDP** and **Protocol** = **TCP** click here to enter field details.

If the **Protocol** = **Splunk HEC** click here to enter field details.

If the **Protocol** = **MS Sentinel** click here to enter field details.

2. To check the connections with the respecive protocols, click **Test Connection**.
3. Configure the **Log type & severity** as follows:

Field description for Log type & severity

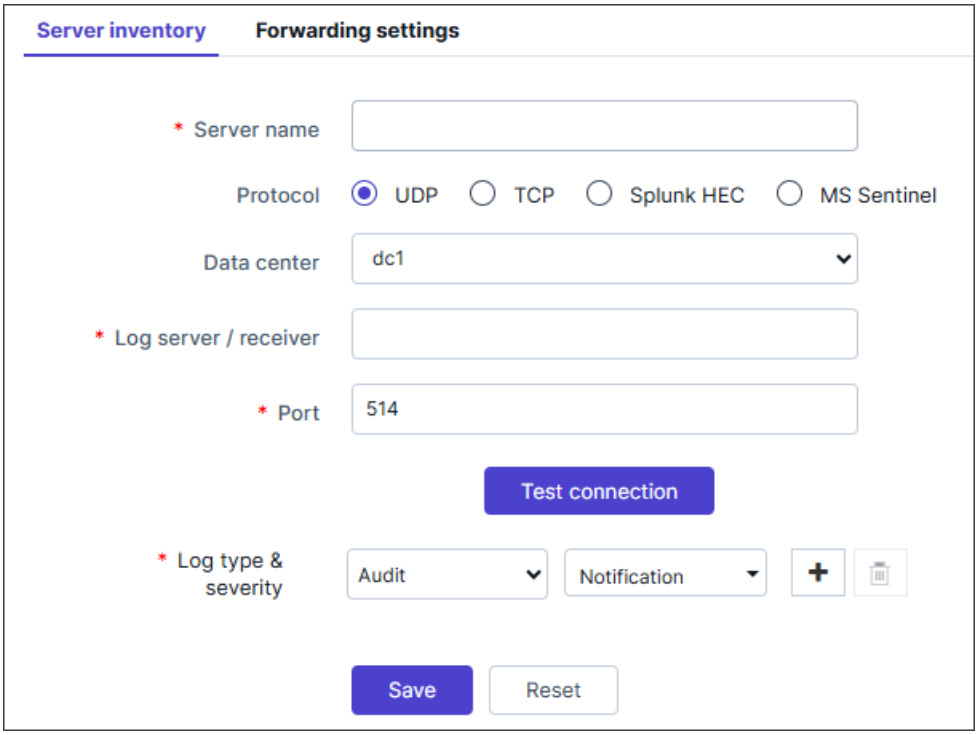
Field	Description
***Log type & severity**	You can choose to forward logs of a specific type and a specific severity to an external server. **To add a log type and severity entry:** a. From the first drop-down menu, select a log type from the following: • Audit (default) • Certificate • ADC • SSH • AppViewX • VisualWorkflow. b. From the second drop-down menu, select the severity of the log type from the following: • Notification (default) • Debug • Warning • Error • Fatal • Critical. **Note:** You can select more than one severity value for a log type. **To add multiple log types and severity entries:** a. From the **Log type & severity** field, click **(Add)** icon. b. From the first drop-down menu, select a log type. c. From the second drop-down menu, select a severity for the log type. d. To add another log type and severity entry, repeat steps **a** to **c**.

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Field	Description
	To delete a log type and severity entry, from the **Log type & severity** field, click **(Delete)** icon. **Note:** It is mandatory to have at least one log type and severity entry.
** : Mandatory fields*	

4. To save the server inventory settings, click **Save**.
   The settings configured in the fields above are displayed in the table shown at the end of the page.

UDP and TCP



Field descriptions for Server inventory when Protocol is UDP and TCP

Field	Description
Data center	From the options available in the dropdown, select the data center.
***Log server / receiver**	The IP address of the external server to which the logs will be forwarded

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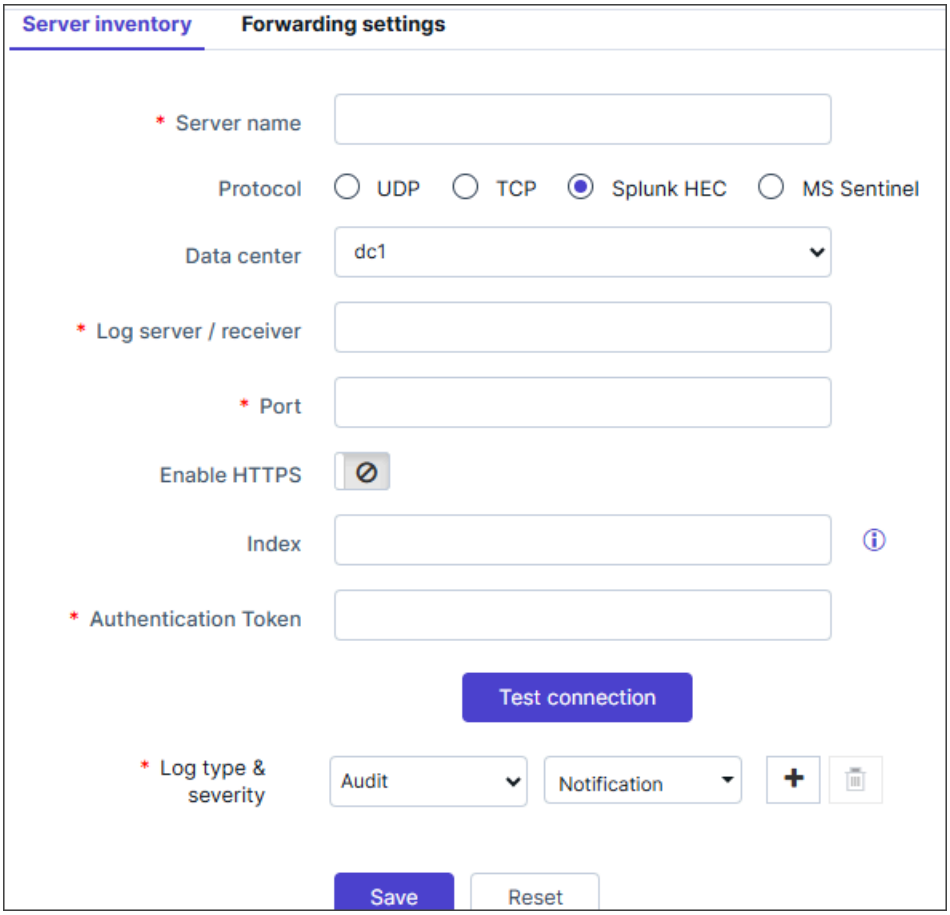
Field descriptions for Server inventory when Protocol is UDP and TCP (continued)

Field	Description
***Port**	Enter the port number to be used for the server.
** : Mandatory fields*	

Proceed with the integration from **step 2** in the section Setting the Integration for Log Forwarding.

Splunk HEC

Before you begin: Configure the Splunk HEC client using the steps mentioned here.



Enter the fields as follows:

Field descriptions for Server inventory when Protocol is Splunk HEC

Field	Description
Data center	From the options available in the dropdown, select the data center.

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Field descriptions for Server inventory when Protocol is Splunk HEC (continued)

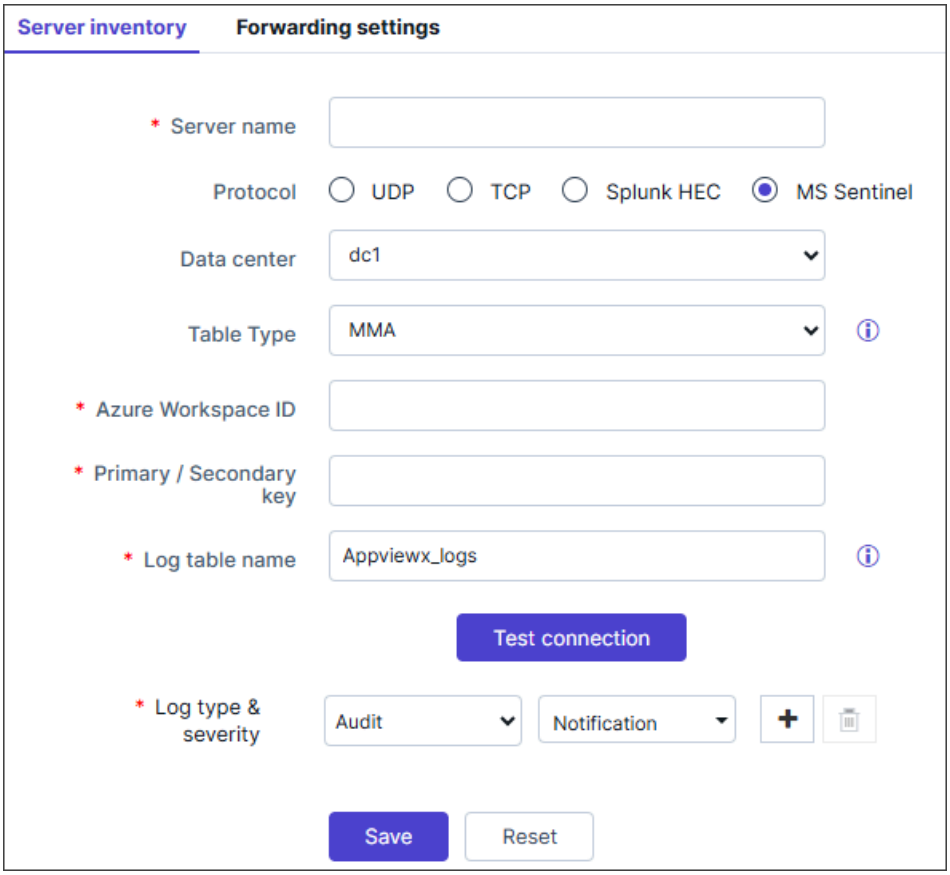
Field	Description
***Log server / receiver**	The IP address of the external server to which the logs will be forwarded
***Port**	Enter the port number to be used for the server.
Enable HTTPS	Enable the HTTPS toggle button if the exposed hostname needs SSL verification. Refer Configuring Splunk HEC for more details on the configuration steps.
Validate Certificate	This field is enabled if you enable the **HTTPS toggle** button. • If you select **Global Root CA's** as **Validate Certificate** type there is no additional validation required. • If you select **Custom CA Certificate** as **Validate Certificate** type there is an additional validation of Uploading certificate is required.
***Upload certificate**	Click on **Browse** to Upload the certificate created from the **HTTP Event Collector** URL. **Note:** Certificate has to be uploaded in the **.pem** format.
Index	Enter the indexer created while creating the HTTP Event Collector token on Splunk Enterprise for log forwarding on the server. If Indexer is not created and set to default, then it can be left blank.
***Authentication Token**	Enter the HTTP Event Collector token value generated while creating the HTTP Event Collector token on Splunk Enterprise for log forwarding on the server.
** : Mandatory fields*	

Proceed with the integration from **step 2** in the section Setting the Integration for Log Forwarding.

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MS Sentinel

MMA



Field descriptions for Server inventory when Protocol is MS Sentinel & Table Type is MMA

Field	Description
Data center	From the options available in the dropdown, select the data center.
Table Type	Select **MMA** - for legacy Microsoft Monitoring Agent ingestion
***Azure Workspace ID**	The unique identifier for the Log Analytics workspace. For more details on steps for Configuring MS Sentinel. For more detailed steps on Creating a resource group during the configuration of MS Sentinel.

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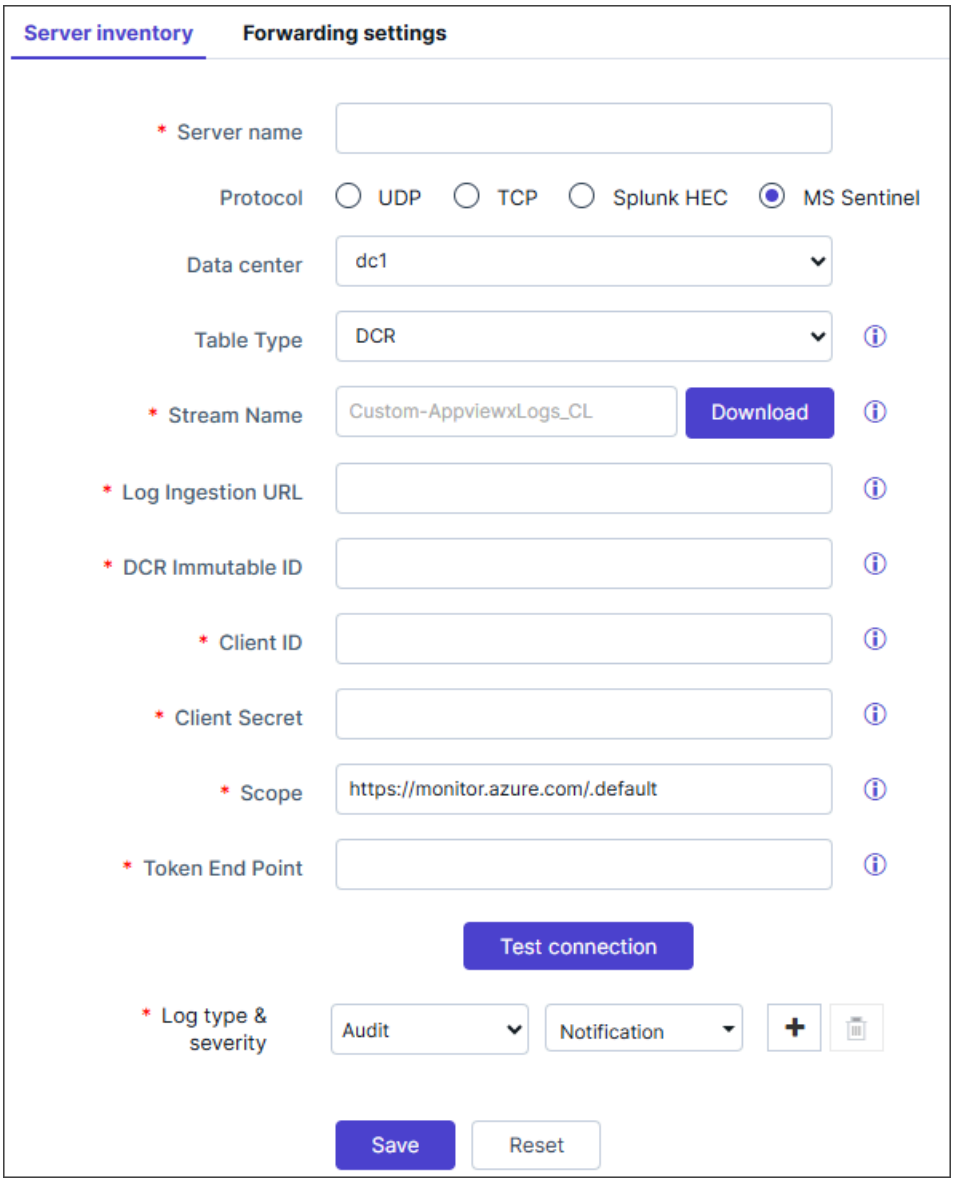
Field descriptions for Server inventory when Protocol is MS Sentinel & Table Type is MMA (continued)

Field	Description
***Primary / Secondary key**	A security key providing access to a range of management and data operations.
***Log table name**	The default name of the log table is “Appviewx_logs”, which can be changed as per user requirements. The table name will be generated using this specified name within the designated workspace in MS Sentinel for storing logs.
** : Mandatory fields*	

Proceed with the integration from **step 2** in the section Setting the Integration for Log Forwarding.

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DCR



Prerequisites:

- On the AppViewX UI
  - Click the **Download** button next to the **Stream Name** field to download the log files (*cefFormatSampleLog.json* and *syslogFormatSampleLog.json*.
  - Go to the Forwarding Settings page and set the **Log format** as required.
- *Azure AD Application*: Ensure that the application is registered in Azure AD (service account creation) with the necessary API permissions.

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- *Data Collection Endpoints (DCE)*: A configured DCE to receive log data. Refer to the Azure DCE creation steps in Create a data collection endpoint.
  - Once created note the **Log Ingestion URL**. To obtain the Log Ingestion URL associated with a DCE, navigate to Data Collection Endpoints on the UI. Once you've opened the DCE's overview page, locate the **Overview** section on the left. The **Logs Ingestion** will be displayed as part of the DCE's details.
- *Log Analytics Workspace*: A workspace where logs will be stored and queried. Refer to custom log tables creation steps in the Create a custom table.
- *Data Collection Rule (DCR)*: A DCR with a defined schema and transformation rules for log ingestion. (A DCR can be created while creating the custom table above).
  - Navigate to the created DCR and from the **Overview** secion, note the **Immutable ID**.
  - Assign the **Monitoring Metrics Publisher** role to the created DCR. Navigate to the created DCR and refer to the Role-based access control page for assigning roles.
  - *Stream Name in DCR*: Categorizes logs and routes them to the correct log analytics workspace. It must match a valid stream defined in the DCR. An incorrect stream name may still return HTTP 200 but the logs will not be ingested. Navigate to the created DCR and from the **Configuration > Data Sources** section, note the **Data Source**. The data source name is in the format **Custom-<name>_CL**.
  - Navigate to the created DCR and from the **Configuration > Data Sources** select the respective Data Source. Click the three-dot menu and select **Edit Configuration**. Upload the sample file (syslog or cef), once uploaded, click **Transformation Editor**; provide suitable filters in the editor to capture logs and click **Save transformation**. A sample KQL query filter is given below.

```
source
| extend User          = extract(@'\[ User\s*:\s*([^\]]+)\]', 1, event)
| extend ObjectDetails = extract(@'\[ ObjectDetails\s*:\s*([^\]]+)\]', 1, event)
| extend Devices       = extract(@'\[ Devices\s*:\s*([^\]]+)\]', 1, event)
| extend SourceIp      = extract(@'\[ Source Ip\s*:\s*([^\]]+)\]', 1, event)
| extend LoginMethod   = extract(@'\[ Login Method\s*:\s*([^\]]+)\]', 1, event)
| extend Comments      = extract(@'\[ Comments\s*:\s*([^\]]+)\]', 1, event)
| extend ActivityTime  = extract(@'\[ Activity Time\s*:\s*([^\]]+)\]', 1, event)
| extend Message = extract(@'\[ Message\s*:\s*(.*)\s*\]$', 1, event)
| project
    TimeGenerated,
    User,
    ObjectDetails,
    Devices,
    SourceIp,
```

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```
LoginMethod,

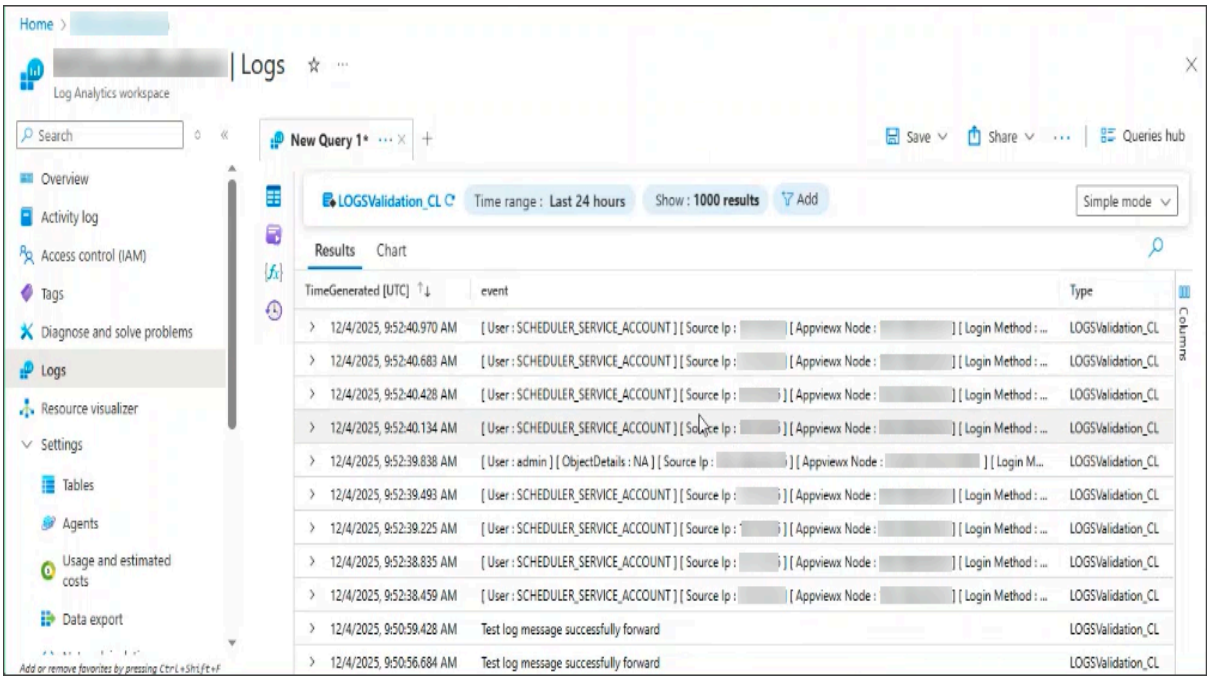
Comments,

ActivityTime,

Message,

event
```

The logs collected using the filter are shown below:



- *Register the client app and create a client secret for API Access*: Generate an authorization token based on a client ID and secret. The token is then passed in the REST API request. Refer to the app registration steps in Register an App to request authorization tokens and work with APIs. Note the **Application (client) ID** and copy and save the client secret **Value**.

> **Note:** Client secret values can only be viewed immediately after creation. Be sure to save the secret before leaving the page.

- *Endpoint URL for Azure*: Navigate to the **Home > App Registrations** page, click the **Endpoints** tab and from the Endpoints window, note the **OAuth 2.0 token endpoint (v1)**.

Enter the fields as follows:

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Field descriptions for Server inventory when Protocol is MS Sentinel & Table Type is DCR

Field	Description
Data center	From the options available in the dropdown, select the data center.
Table Type	Select **DCR** for Data Collection Rule ingestion.
***Stream Name**	Name of the data stream configured in the DCR, used to route data to the right table. (It is the *Data Source* name available in the DCR.)
***Log Ingestion URL**	The endpoint URL of the Data Collection Endpoint (DCE) associated with the DCR. Typically, the logs are sent to this endpoint. Typically it is *https://{dce-name}.{region}.ingest.monitor.azure.com*.
***DCR Immutable ID**	Unique identifier of the data collection rule the processes logs. (As created in the DCR in Azure).
***Client ID**	The client ID of the registered application in Azure AD. (It is the **Application (client) ID** generated during App Registration in Azure.)
***Client Secret**	The secret key associated with the registered application. (It is the client secret **Value** generate during the App Registration in Azure.)
***Scope**	Specify the scope that defines the permission required for the application to send the logs to MS Sentinel.Typically it is *https://monitor.azure.azure.com/default*
***Token End Point**	URL for obtaining the access token. Typically it is *https://login.microsoftonline.com/{tenant_id}/oautn2/v.2.0/token*. (Is is the **OAuth 2.0 token endpoint (v1)** noted from the **App Registration > Endpoint** page.)
** : Mandatory fields*	

Proceed with the integration from **step 2** in the section Setting the Integration for Log Forwarding.

Enabling Server Inventory Settings

To enable a server inventory setting:

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1. From the table at the bottom of the **Server inventory** page, select the server inventory setting you want to enable.
2. From the top right corner of the screen, click  **(Enable)** icon.

> **Note:** You can enable multiple server inventory settings by selecting the check box against all the settings you want to enable.

Disabling Server Inventory Settings

To disable a server inventory setting:

1. From the table at the bottom of the **Server inventory** page, select the server inventory setting you want to disable.
2. From the top right corner of the screen, click  **(Disable)** icon.

> **Note:** You can disable multiple server inventory settings by selecting the check box against all the settings you want to disable.

Deleting Server Inventory Settings

To delete a server inventory setting:

1. From the table at the bottom of the **Server inventory** page, select the server inventory setting you want to delete.
2. From the top right corner of the screen, click  **(Delete)** icon.

> **Note:** You can delete multiple server inventory settings by selecting the check box against all the settings you want to delete.

Configuring Splunk HEC

You can perform most common configuration tasks on Splunk Web. Splunk Web runs by default on port of the host on which it is installed.

- If you're running Splunk on your local machine, the URL to access Splunk Web is `http://localhost:`.
- If you're running Splunk on a remote machine, the URL to access Splunk Web is `http://<hostname>:`, where `<hostname>` is the name of the machine Splunk is running on.

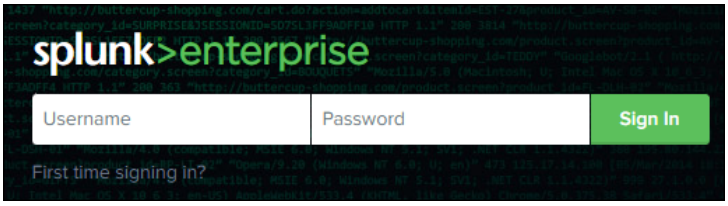
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Administration menus can be found under **Settings** in the Splunk Web menu bar. Most tasks in the Splunk documentation set are described for Splunk Web.

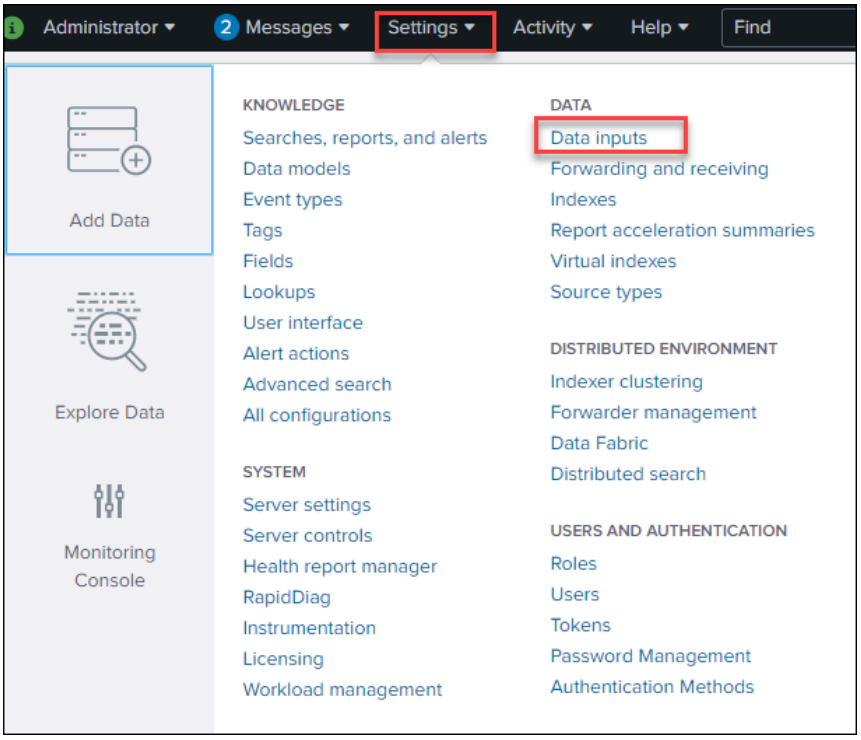
Create an HTTP Event Collector token on Splunk Enterprise

To use Spunk HEC, you must configure at least one token.

1. Log into **Splunk** with valid credentials.

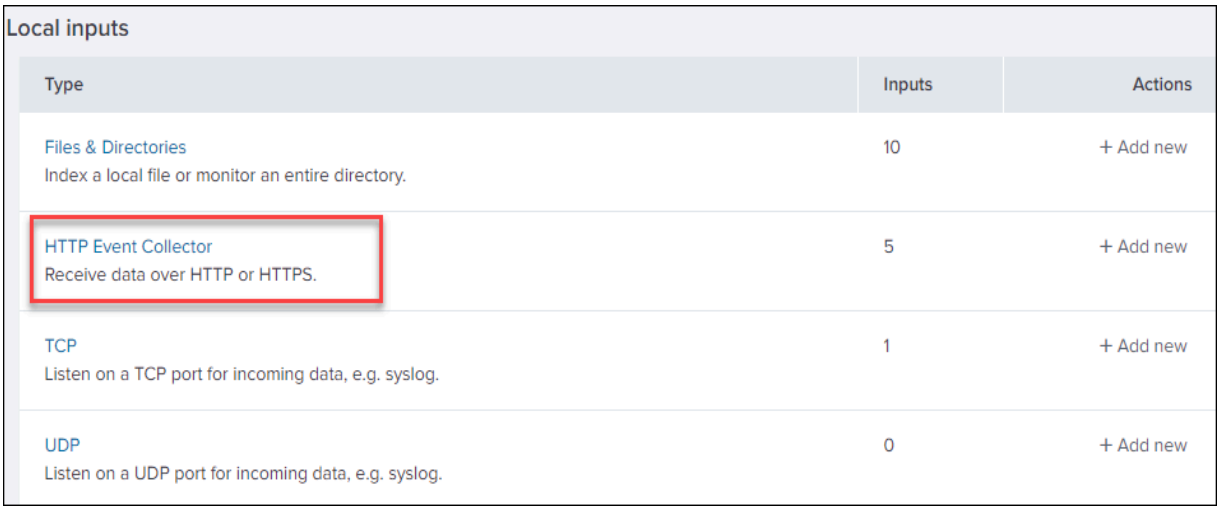


2. Click **Settings > Data inputs**.

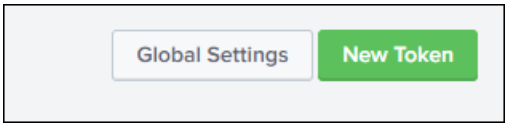


3. Click **HTTP Event Collector**.

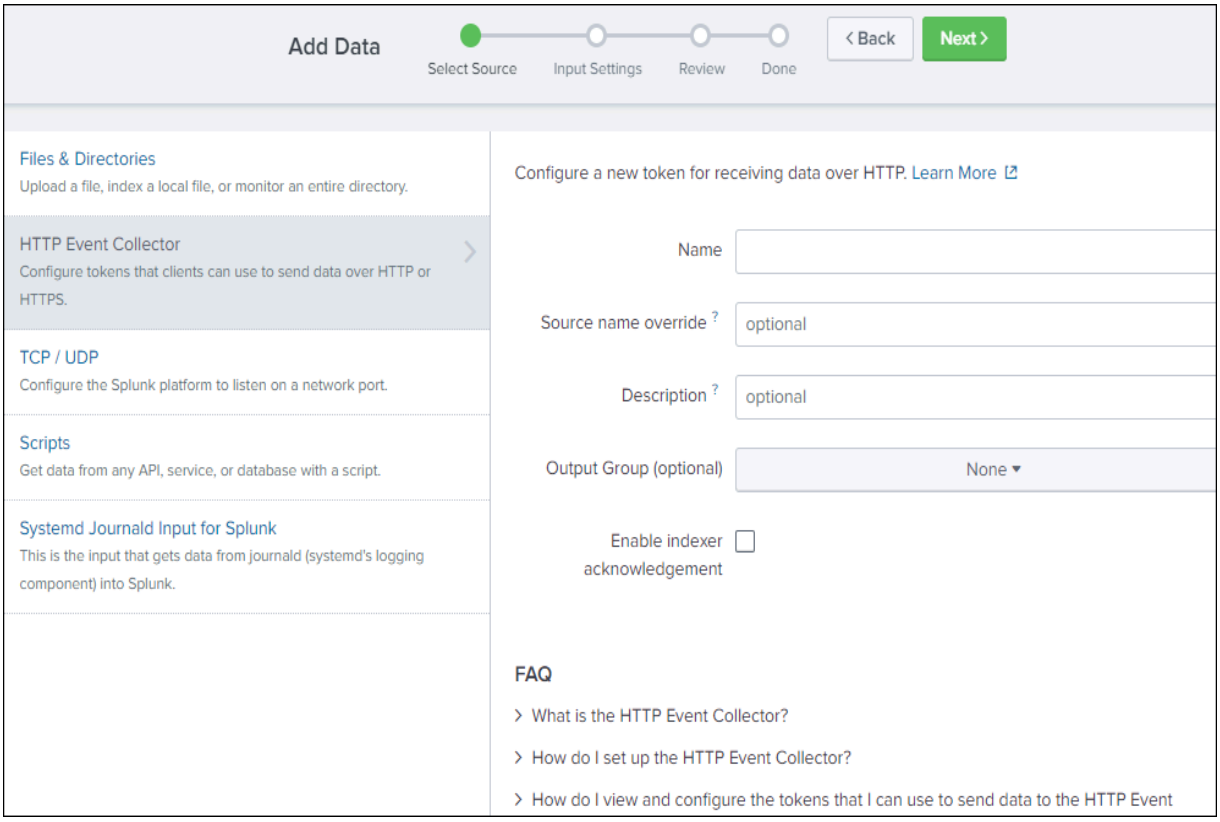
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4. Click **New Token**.



The **New Token** Page is displayed.

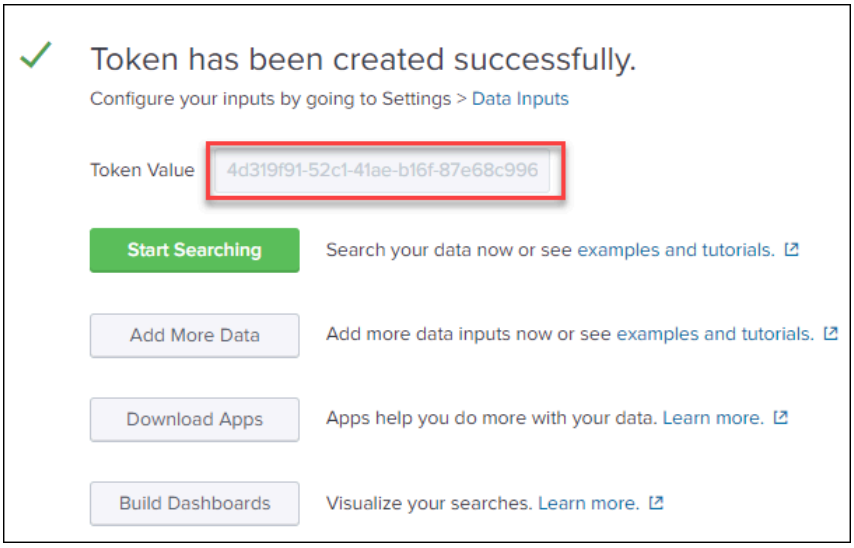


5. In the **Name** field, enter a name for the token.

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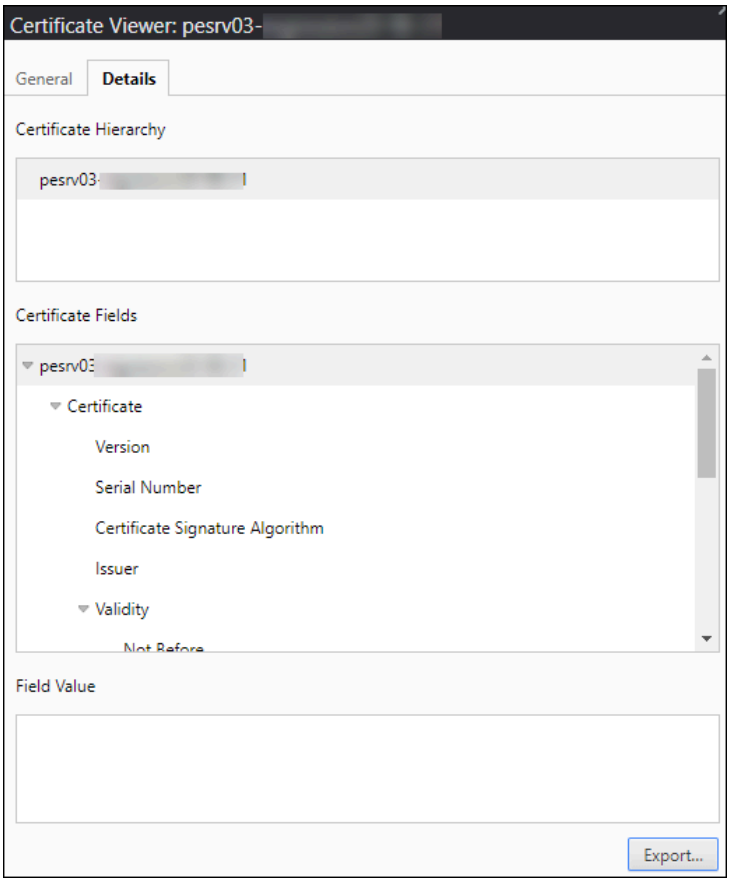
6. (Optional) In the **Source name override** field, enter a source name for events that this input generates.
7. (Optional) In the **Description** field, enter a description for the input.
8. (Optional) In the **Output Group** field, select an existing forwarder output group.
9. (Optional) If you want to enable indexer acknowledgment for this token, click the **Enable indexer acknowledgment** checkbox.
10. Click **Next**.
11. (Optional) Confirm the source type and the index for HEC events.
12. Click **Review**.
13. Confirm that all settings for the endpoint are what you want.
14. If all settings are what you want, click **Submit**. Otherwise, click **<** to make changes.

    Token has been created successfully is displayed with token value.



15. (Optional) Copy the token value that Splunk Web displays and paste it into another document for reference later.
16. The HTTPS Event controller token is created and displayed in the list.
17. Click **Global Settings** and check all the parameters. Also note the HTTP Port Number.
18. There is an additional validation of uploading the certificate required for **Custom CA Certificate** as Validate Certificate type, so create the certificate for validation from the **HTTP Event Collector** URL.

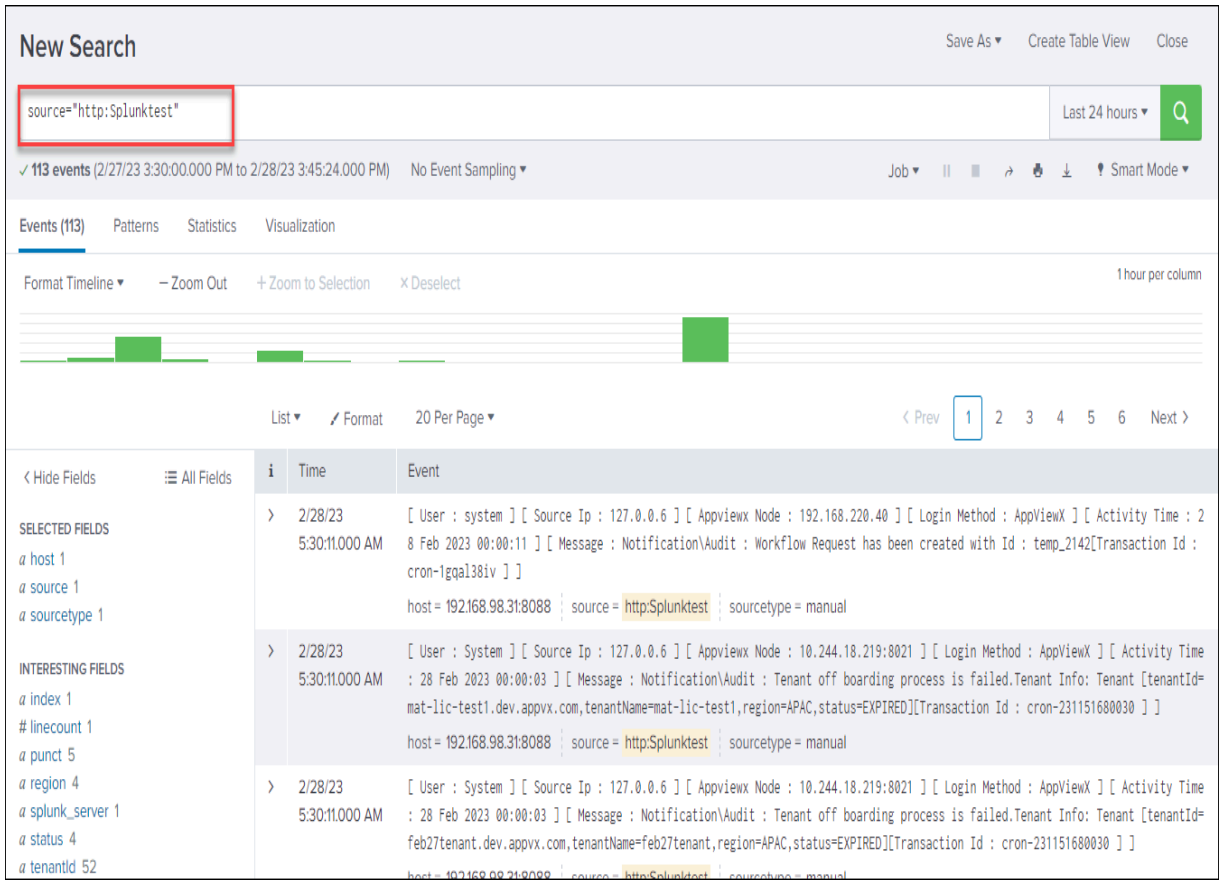
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Note: Certificate has to be downloaded/Exported in the **.pem** format only for validation.

19. Log type and severity after creating a role and audit log can be found in Splunk by using a text search like the one below.



Configuring Forwarding Settings

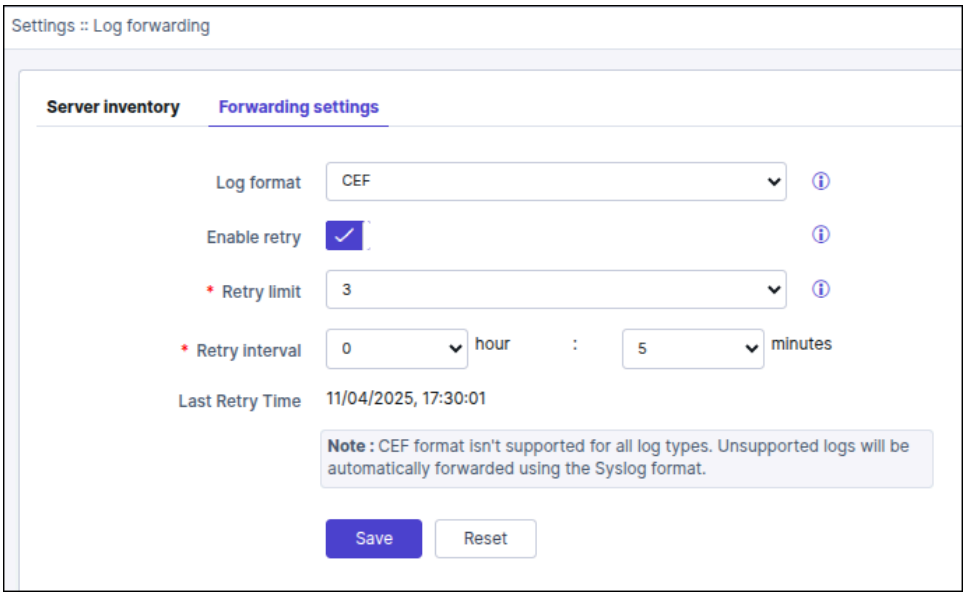
To configure the forwarding settings follow the below steps:

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **OBSERVE & EXPLORE**, select **Log Forwarding**.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, select **General** > **Log Forwarding**

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New Menu	Old Menu
The **Settings :: Log Forwarding** page is displayed with the **Server inventory** tab open by default.	The **Settings :: Log Forwarding** page is displayed with the **Server inventory** tab open by default.
For more information on how to switch between menus, click here.	

1. On the **Settings :: Log Forwarding** page, under the **Forwarding settings** tab, enter the following details:



Field descriptions for Forwarding settings

Field	Description
Log format	To select the format in which logs should be forwarded to the external server, from the drop-down menu, select one of the following options: • Syslog • CEF **Note:** CEF is the most recent industry standard for forwarding logs. When the CEF format is selected the following note is displayed "***CEF format isn't supported for all log types. Unsupported logs will be automatically forwarded using the Syslog format.***"

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Field	Description
Enable retry	If an attempt to forward logs fails because of server unavailability, AppViewX lets you set a retry interval the duration after which logs will be forwarded again. To enable this retry, turn on the **Enable retry** toggle.
***Retry limit**	Configure this value to provide maximum retry attempts for forwarding the logs when server(s) are down/unreachable.
***Retry interval**	To set a retry interval, from the **hour** and **minutes** drop-down menus, select the required values. This field is displayed when the **Enable retry** toggle is turned on.
Last Retry Time	Displays the date and time of the previous attempt of log forwarded.
** : Mandatory fields*	

2. To set a retry interval, from the hour and minutes drop-down menus, select the required values.
3. Click **Save**.

Data Retention/Purging Alerts

Accessing Data Retention/Purging Settings

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **OBSERVE & EXPLORE**, select **Data Retention**. The **Settings :: Purging** page is displayed with the **Alert** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Purging**. The **Settings :: Purging** page is displayed with the **Alert** tab open by default.
For more information on how to switch between menus, click here.	

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Purging Alerts

With a large number of alerts being recorded each day, a system can soon become vulnerable to threats like compromise of confidential information, a surplus of outdated information, and so on. For security reasons, regular purging of old data comes as a highly recommended practice.

To enable purging of alert records:

1. On the **Settings :: Purging** page, enter the following details:

Field descriptions for Purging alert

Field	Description
***Alert Purge Duration (in Days)**	Enter the number of days, the interval, after which the alerts will be purged.
***Maximum Alert count**	Enter the maximum number of the most recent alerts that have to be retained. For example, if you set this value to 10,000, all alerts after the most recent 10,000 alerts will be purged.
** : Mandatory fields*	

Note: Excess alerts will be purged even if the maximum alert count is exceeded before the next purging cycle is scheduled.

2. Click **Save**.

Syslog Reception Settings

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Accessing Syslog Reception Settings

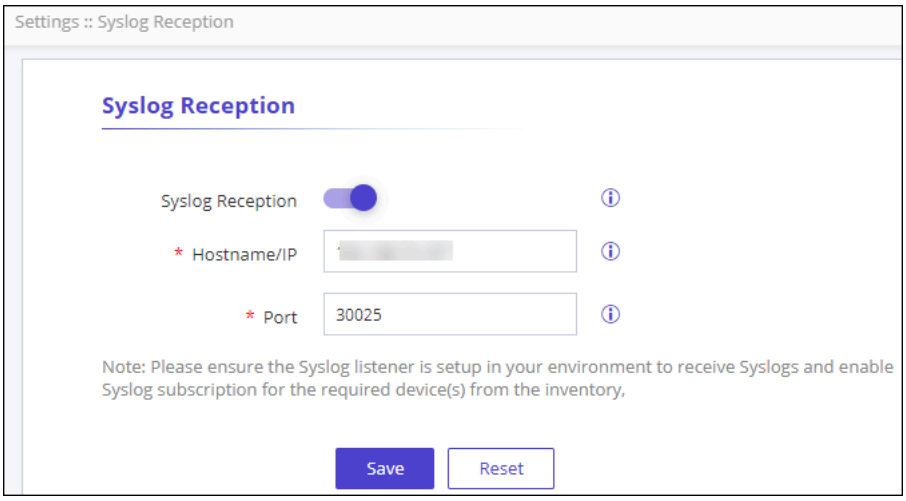
New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **OBSERVE & EXPLORE**, select **Syslog Reception**. The **Settings :: Syslog Reception** page is displayed by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Syslog Reception**. The **Settings :: Syslog Reception** page is displayed by default.
For more information on how to switch between menus, click here.	

Syslog Reception

With Syslog reception, changes in ADC devices are dynamically updated in AppViewX, which supports Syslog in ADC.

Note: Please ensure the Syslog listener is setup in your environment to receive Syslogs and enable Syslog subscription for the required device(s) from the inventory.

1. On the **Settings :: Syslog Reception** page, enter the following details:

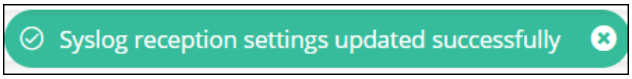


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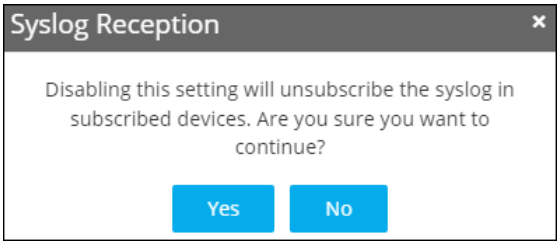
Field descriptions for Syslog Reception

Field	Description
Syslog Reception	Enable the toggle to enable Syslog reception for real time configuration updates from the subscribed devices.
***Hostname/IP**	Enter the Hostname or IP address of the Syslog listner. In case of a multi node or multi cloud connector setup, provide virtual IP(VIP). This field is displayed when the **Syslog Reception** toggle is enabled.
***Port**	The default port value is set to 30025. However, if a virtual IP or host is used, the port can be customized. This field is displayed when the **Syslog Reception** toggle is enabled.
** : Mandatory fields*	

2. Click **Save**.
   If the Syslog reception is enabled, the following header notification is displayed on the top of your screen in green.



3. To disable **Syslog reception**, disable the toggle and click **Save**.
   The **Syslog Reception** pop-up is displayed.



4. Click **Yes** to continue.
   If the Syslog reception is disabled, the following header notification is displayed on the top of your screen in green.



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System Administration

The system administration module lets you perform a host of function to configure the platform application, such as, configure SMTP setting, manage licenses and proxy settings, customise the AppViewX UI and many more.

- Configuring the SMTP Settings
- Managing Proxy Settings
- Managing Licenses
- Themes and Personalization
- Managing the Login Policy
- User Survey
- Setting the Cryptographic Policy
- Enabling Dashboard View for the User

Configuring the SMTP Settings

- Configuring the SMTP Settings for Google
- Configuring the SMTP Settings for Microsoft

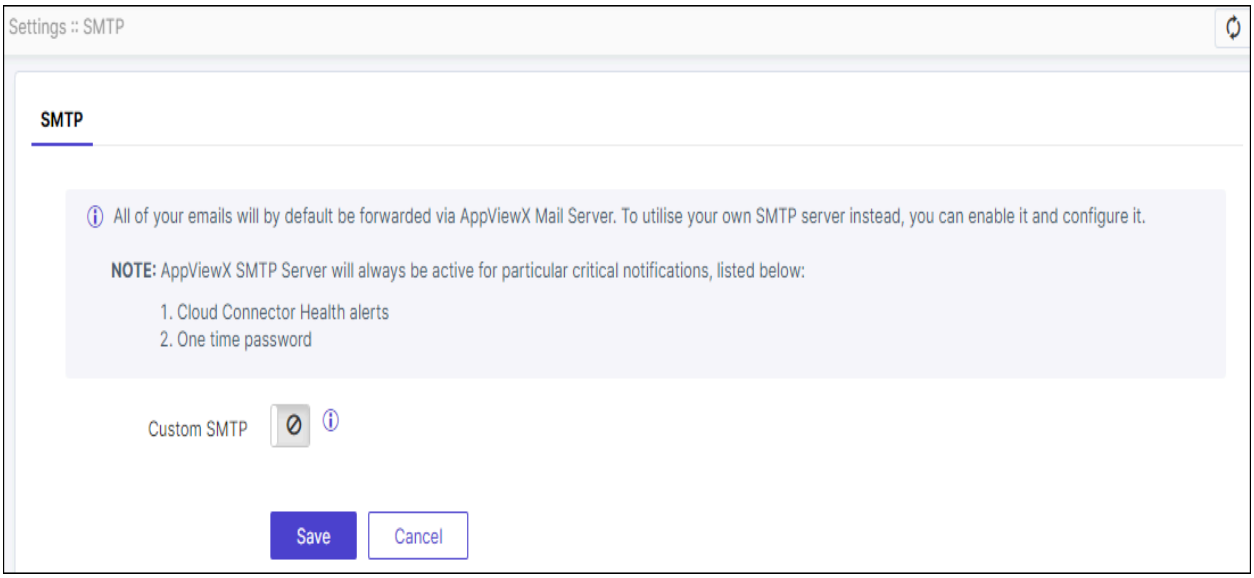
Accessing SMTP Settings Page

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **SYSTEM ADMINISTRATION**, select **SMTP**. The **Settings :: SMTP** page is displayed.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **SMTP**. The **Settings :: SMTP** page is displayed.
Note: For more information on how to switch between menus, click here.	

Configuring the SMTP Settings

When accessing the **Settings :: SMTP** page in SAAS, the following screen will be displayed.

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1. Enable the **Custom SMTP** toggle to use your own SMTP server.
2. Configure **Custom SMTP** settings if the toggle is enabled; otherwise, emails will be sent through the AppViewX mail server by default.

> **Note:** AppViewX SMTP server will remain active for specific critical notifications, such as cloud connector health alerts and one-time passwords.

3. Click **Save**.

Configuring the SMTP Settings for Google

The SMTP configuration is required for AppViewX to be able to send logs and alerts via email and for other email related activities such as sending and receiving notifications and so on.

The SMTP oAuth uses an access token instead of a password to send email. The access token works as a temporary password with fixed validity and has permissions delegated by the user.

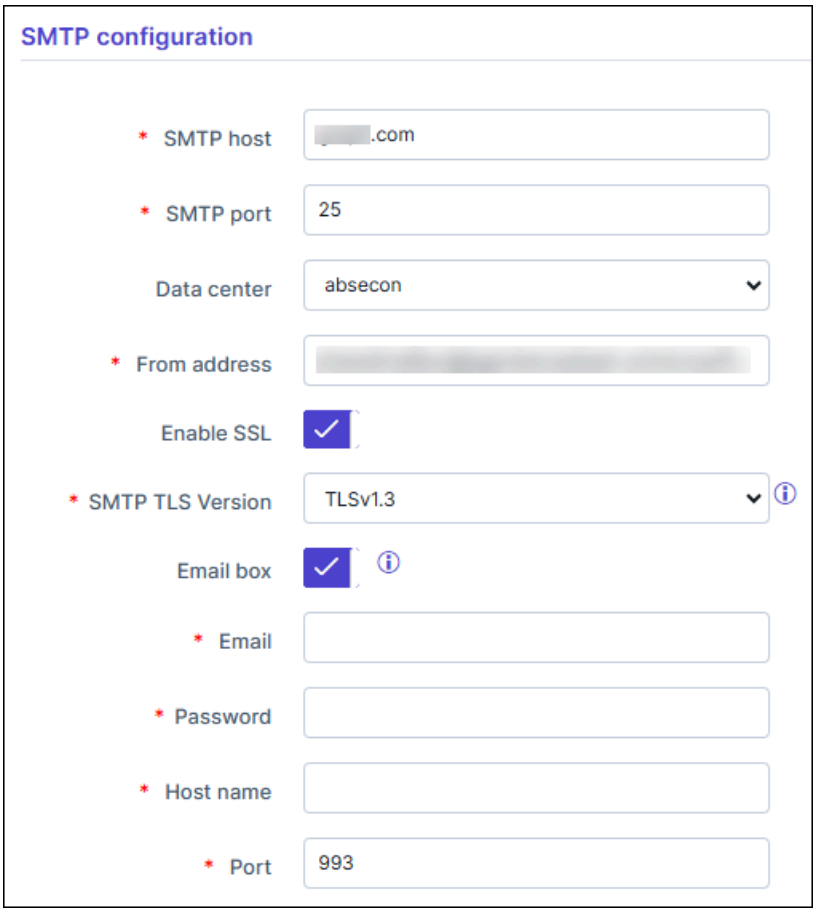
To get the access token you must provide details such as username, client-id, secret, Authorization endpoint, token Endpoint and scope. Once these details are submitted, you will be redirected to the oAuth server login page. Once the user authorization is done here, the oAuth server returns the Auth code.

The Auth code is exchanged with the access token and refresh token in the backend and saved in DB.

To configure the SMTP server:

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1. On the **Settings :: SMTP** page, in the **SMTP configuration** section, enter the required field information.



Field descriptions for SMTP configuration

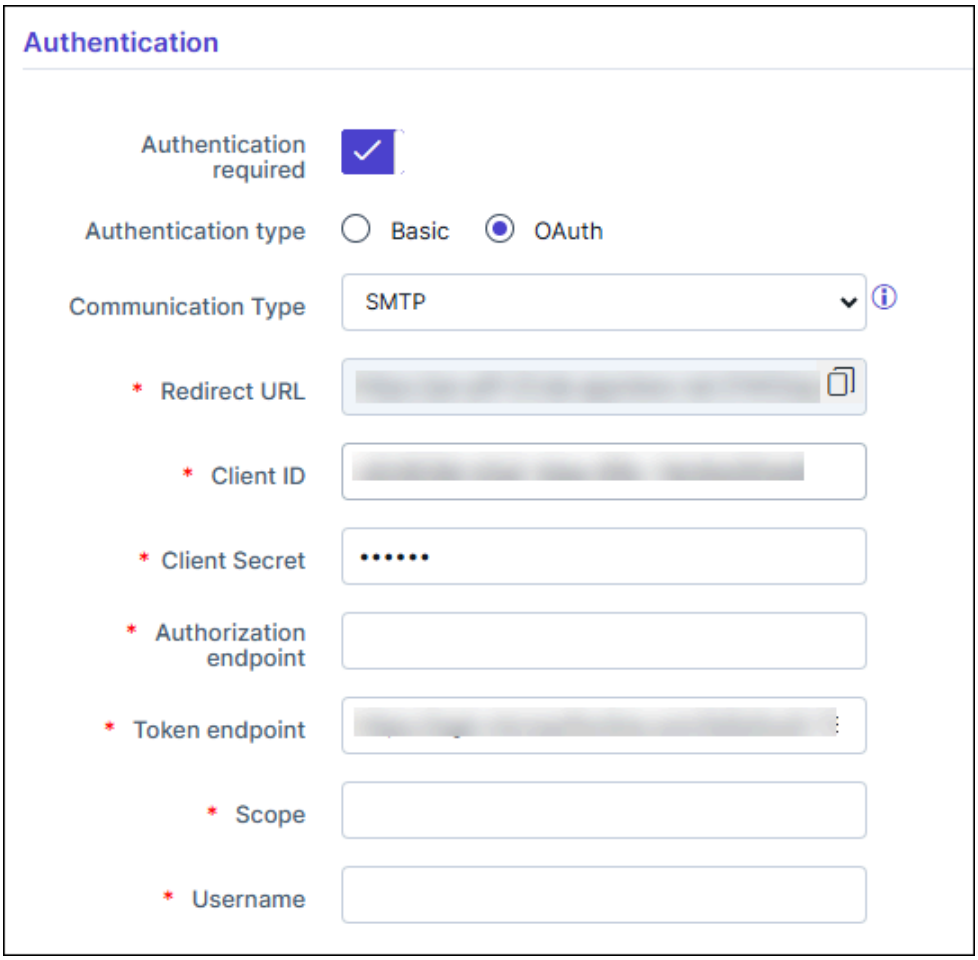
Field	Description
***SMTP host**	Host name of the SMTP server.
***SMTP port**	Port number of the SMTP server.
Data center	From the options available in the dropdown, select the data center.
***From address**	Enter the email address that will be used to email the logs and alerts.
Enable SSL	To allow SSL encryption, enable this toggle key.
***SMTP TLS Version**	From the options available in the dropdown, select the TLS version of the SMTP server.

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Field	Description
	Note: Versions 1.2 and higher are recommended.
Email box	To use the mailbox feature to read emails in Visual Workflow, enable this toggle key.
***Email**	This field is displayed only if the **Email box** key is enabled. Email address of the IMAP server used for the mailbox feature.
***Password**	This field is displayed only if the **Email box** key is enabled. Password of the IMAP server used for the mailbox feature.
***Host name**	This field is displayed only if the **Email box** key is enabled. Host name of the IMAP server used for the mailbox feature.
***Port**	This field is displayed only if the **Email box** key is enabled. Enter the Port number.
**: Mandatory fields*	

2. In the **Authentication** section, enter the required field information.

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Field descriptions for Authentication (oAuth)

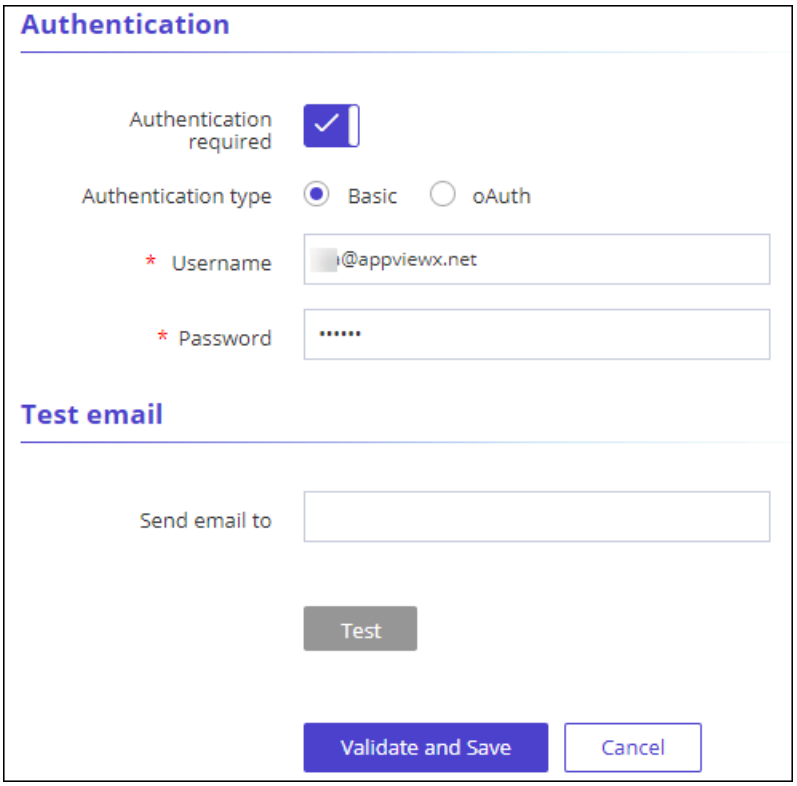
Field	Description
Authentication required	To enable authenticated mail server communication, enable this toggle.
Authentication type	Select the Authentication type as **Basic** or **oAuth**. **Note:** Selecting Basic displays the Username and Password fields. Selecting oAuth displays the fields that are described below.
Communication type	Select the Communication type as follows: • **SMTP:** email communication via SMTP. • **API:** email communication via Graph API (Outlook).

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Field	Description
	Note: Communication type API will not work for Google configurations.
***Redirect URL**	This field is auto-populated from the address bar of the browser.
***Client ID**	Enter the Client ID that is generated in the oAuth server when the oAuth client is created. **Note:** The steps to create an oAuth client are different for Google and Microsoft. For more information on steps for Google, click here. For more information on steps for Microsoft click here.
***Client Secret**	Enter the Client Secret that is generated in the oAuth server when the oAuth client is created.
***Authorization endpoint**	Enter the authorization endpoint where the user authorizes and gives permission to the oAuth client to send email on behalf of the user.
***Token endpoint**	Enter the token endpoint to get Access Token and Refresh Token. You can get the endpoint by providing Client ID, Secret, and other relevant values based on oAuth 2.0 specifications.
***Scope**	The permission required to send email. **Note:** For Google, enter **https://mail.google.com/**.
***Username**	This field is enabled only if the **Authentication required** key is enabled. Username for the authenticated mail server
***Password**	This field is enabled if you select **Basic** as your **Authentication type**. Enter the valid password associated with the username.
**: Mandatory fields*	

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3. If the **Authentication type** is selected as **Basic**, displays the username and password attributes.
4. In the **Test email** section, enter the email address to which a test email should be sent and click **Test**.



5. To save the SMTP configuration settings, click **Validate and Save**.
   Upon clicking "Validate and Save," an email will be sent to the user's email address for validation.

> **Note:**
> - If the user does not have an email ID configured, an error will be displayed, prompting them to set up an email address.
> - In case of validation failure, the SMTP settings will not be saved.

6. If the **Authentication type** is selected as **oAuth**, To save the SMTP configuration settings, click **Save & Authorize**.
   Displays confirmation of SMTP Settings Authorized.
   - A new tab will open, prompting for sign-in.
   - Once authorization is done the user receives an access token and a refresh token from the token endpoint. The access token is used for sending email and the refresh token is used for renewing the access token upon its expiry.

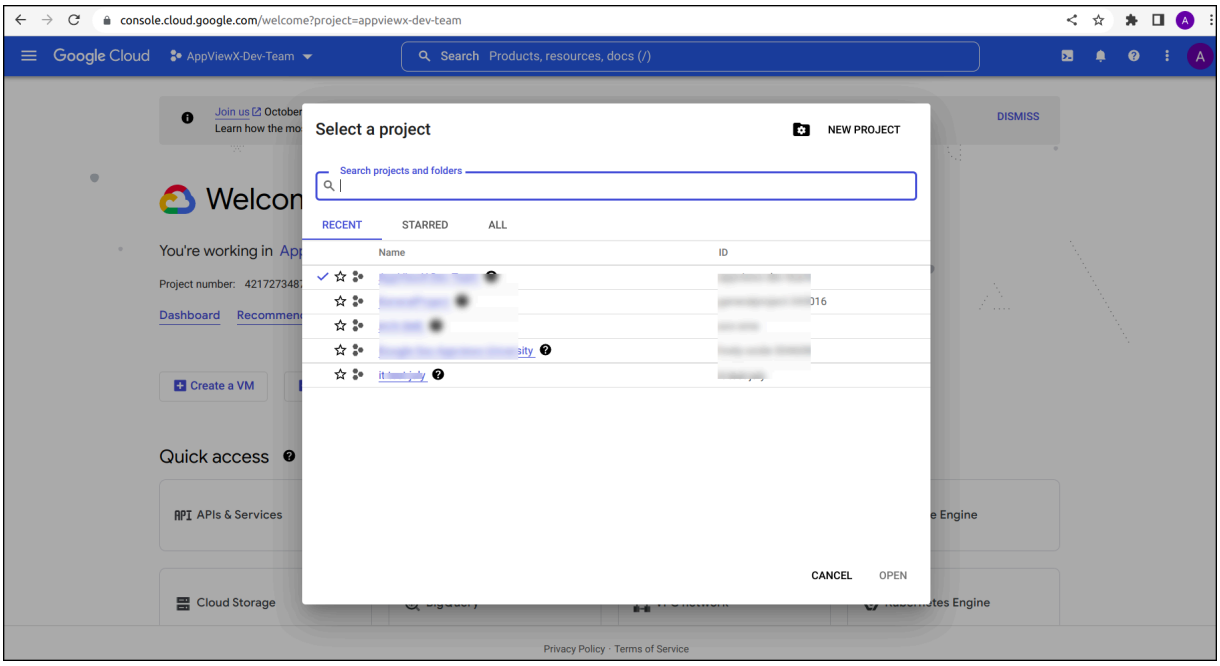
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Authentication for Google SMTP Settings

Create authorization credentials

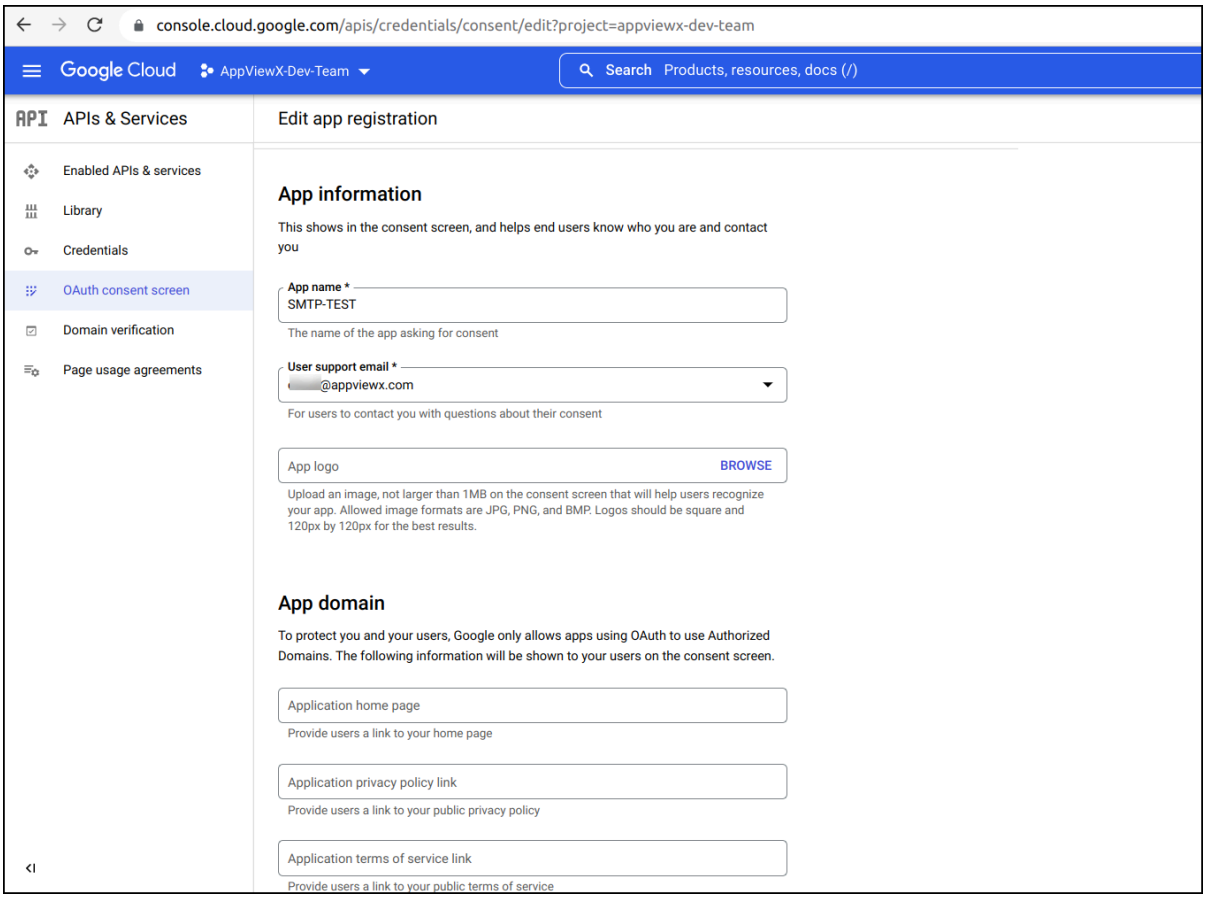
Any application that uses OAuth 2.0 to access Google APIs must have authorization credentials that identify the application to Google's OAuth 2.0 server. The following steps explain how to create credentials for your project. Your applications can then use the credentials to access APIs that you have enabled for that project.

1. Sign in to Google using valid credentials for **App Registration** using the following URL: https://console.cloud.google.com/.



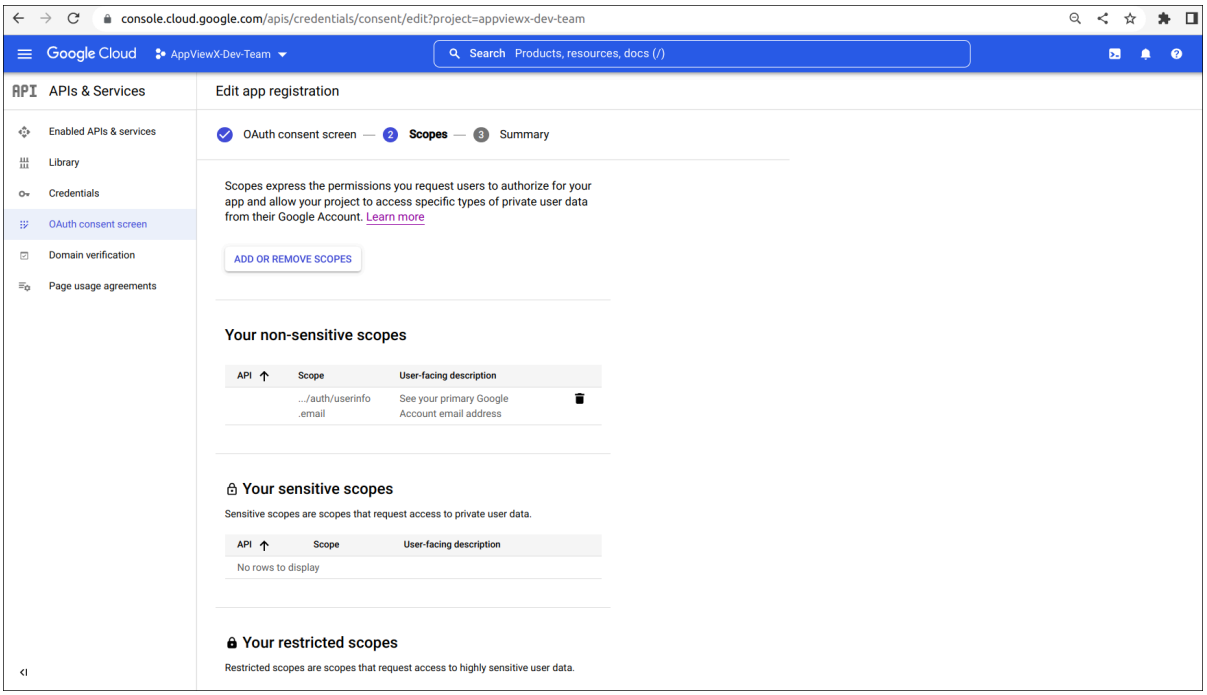
2. From the project drop-down, select an existing project, or create a new one by clicking on **NEW PROJECT**.
3. In the sidebar hover the mouse pointer over the "APIs & Services", click **OAuth consent screen**. The **OAuth consent screen:: App information** page is displayed.

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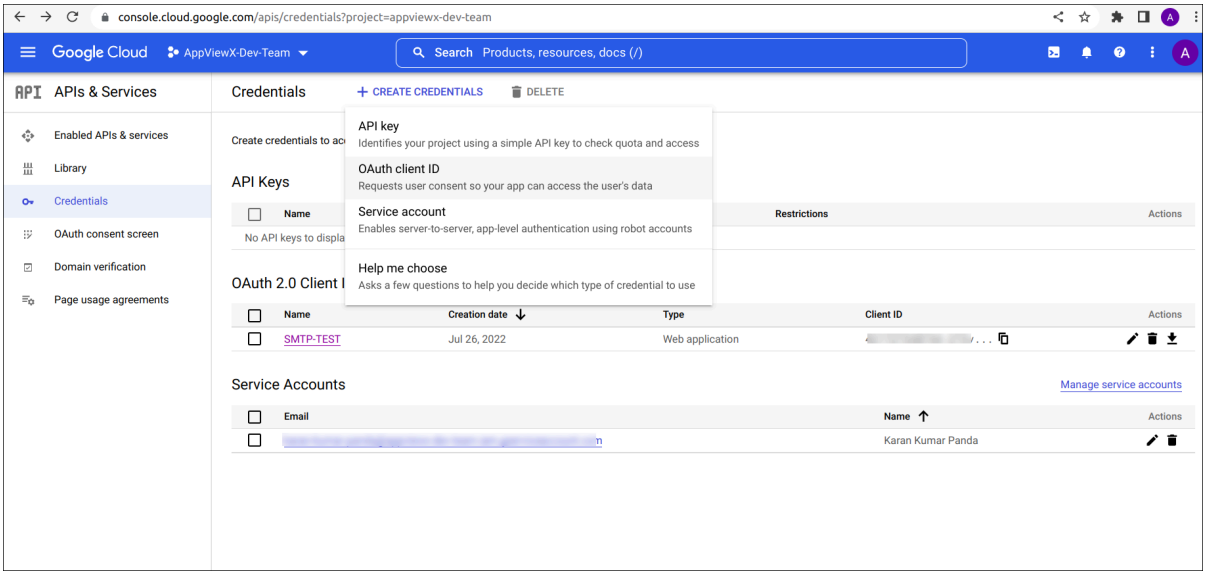
4. In the **App information** section, enter the required field information. **App name***, **User support email***, **Authorized domains**, **and Developer contact information**, then click **Save & Continue**. The **Save & Continue :: Scopes** page is displayed.

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5. Under **Scopes** section, **ADD SCOPES** required information.
6. In the sidebar hover the mouse pointer over the "APIs & Services", click **Credentials**.

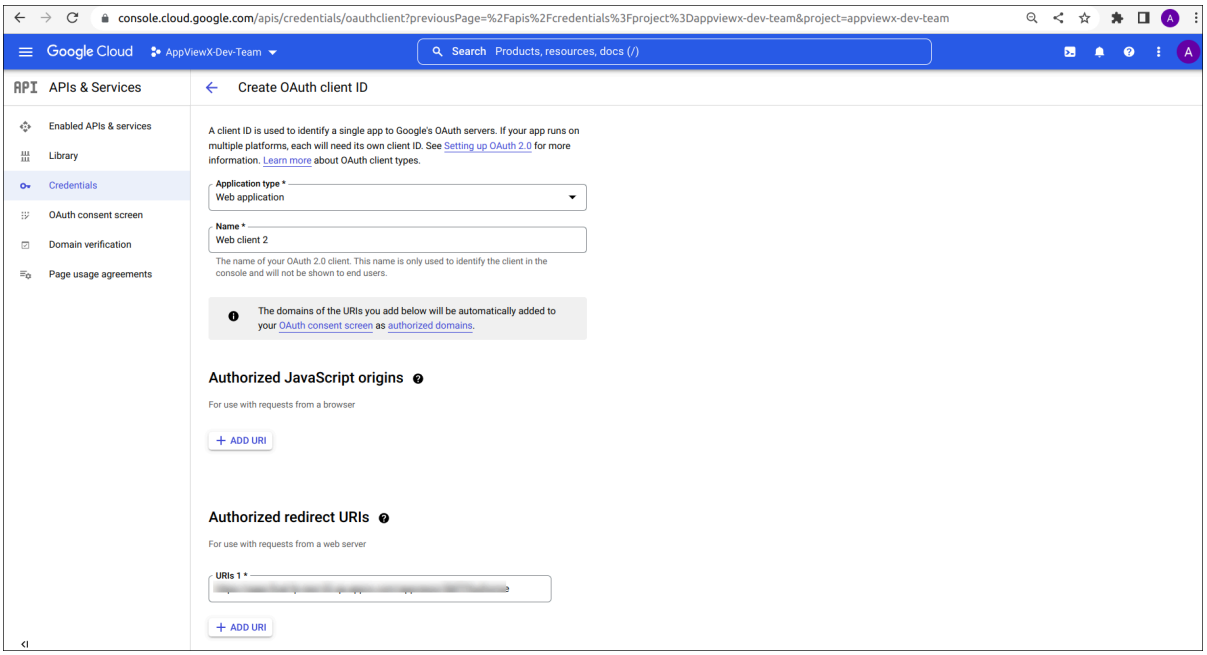
   The **APIs & Services :: Credentials** page is displayed.



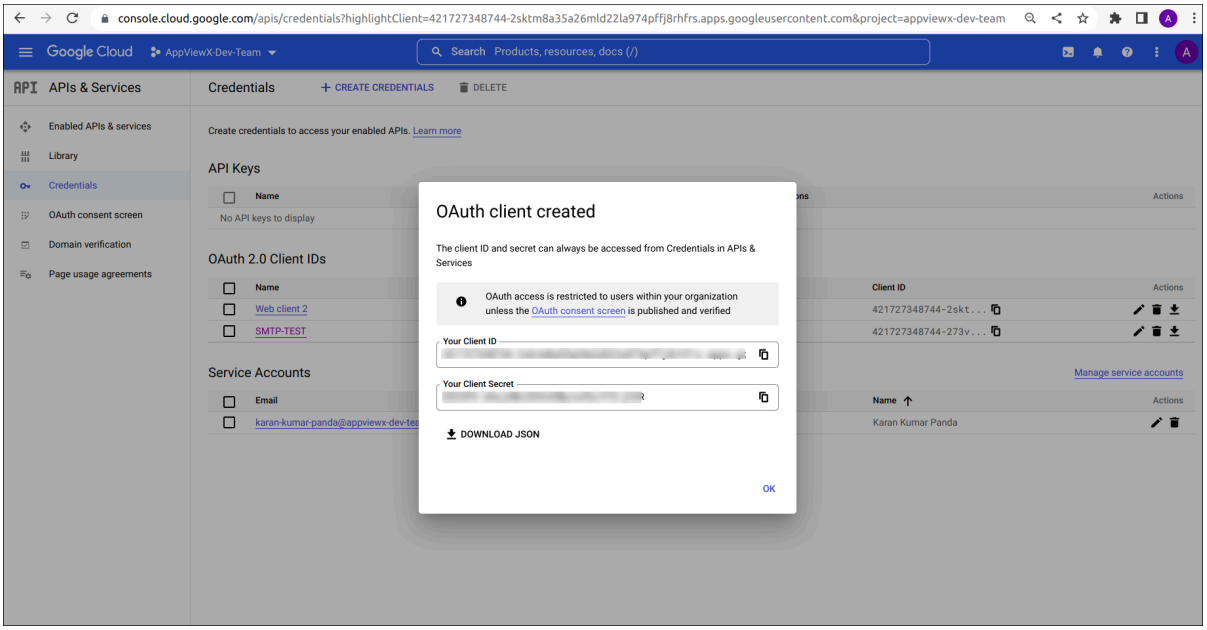
7. In the **Credentials** tab, click the **+CREATE CREDENTIALS**, from the drop-down list, choose **OAuth client ID**.

   The **CREATE CREDENTIALS :: Create OAuth client ID** page is displayed.

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8. Enter the required field information, for **Application type*** select **Web application** and specify **Name*** then click **Save**.
9. Displays confirmation of **OAuth client Created**, with Your Client ID and Your Client Secret.



10. Copy the **Client ID** and **Client Secret** for authentication of SMTP server settings.
    - Authorization endpoint URL: https://accounts.google.com/o/oauth2/v2/auth.
    - Token endpoint URL: https://oauth2.googleapis.com/token.

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Configuring the SMTP Settings for Microsoft

Prerequisites

- Ensure connectivity of the SMTP Server from the selected Data Center.
- Verify unrestricted connectivity between the Data Center and SMTP Server by checking for any firewall restrictions.
- For Microsoft SMTP OAuth.
  - Ensure the SMTP OAuth is enabled. For more details, refer to "Enable or Disable SMTP AUTH in Exchange Online" to enable it.
  - Ensure that a valid license is available for the mailbox.
- Validate the accuracy of the configuration details provided on the settings page.
- Prior to saving the configuration, verify the functionality of the Test Mail feature.

The SMTP configuration is required for AppViewX to be able to send logs and alerts via email and for other email related activities such as sending and receiving notifications and so on.

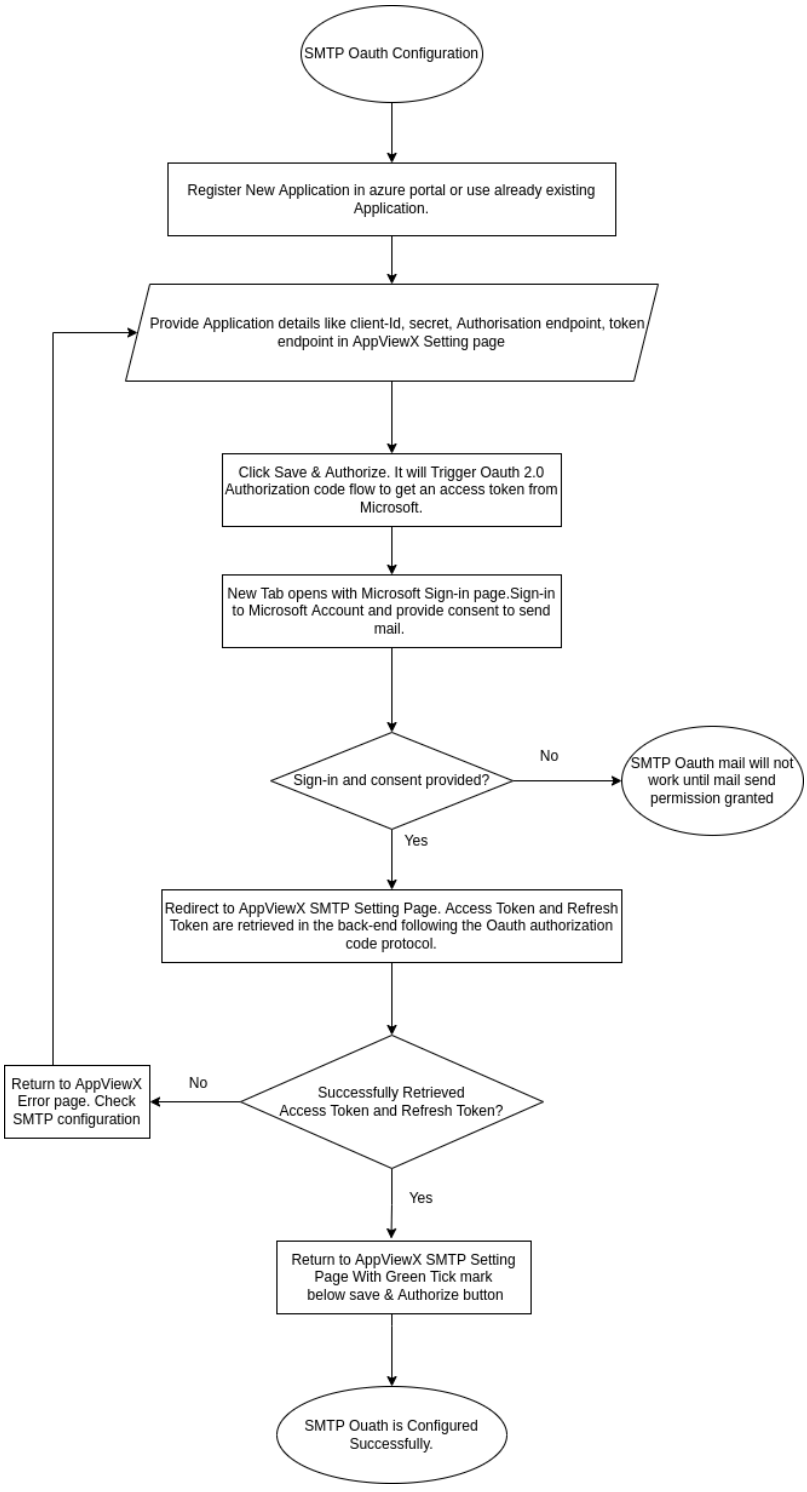
The SMTP oAuth uses an access token instead of a password to send email. The access token works as a temporary password with fixed validity and has permissions delegated by the user.

To get the access token you must provide details such as username, client-id, secret, Authorization endpoint, token Endpoint and scope. Once these details are submitted, you will be redirected to the oAuth server login page. Once the user authorization is done here, the oAuth server returns the Auth code.

The Auth code is exchanged with the access token and refresh token in the backend and saved in DB.

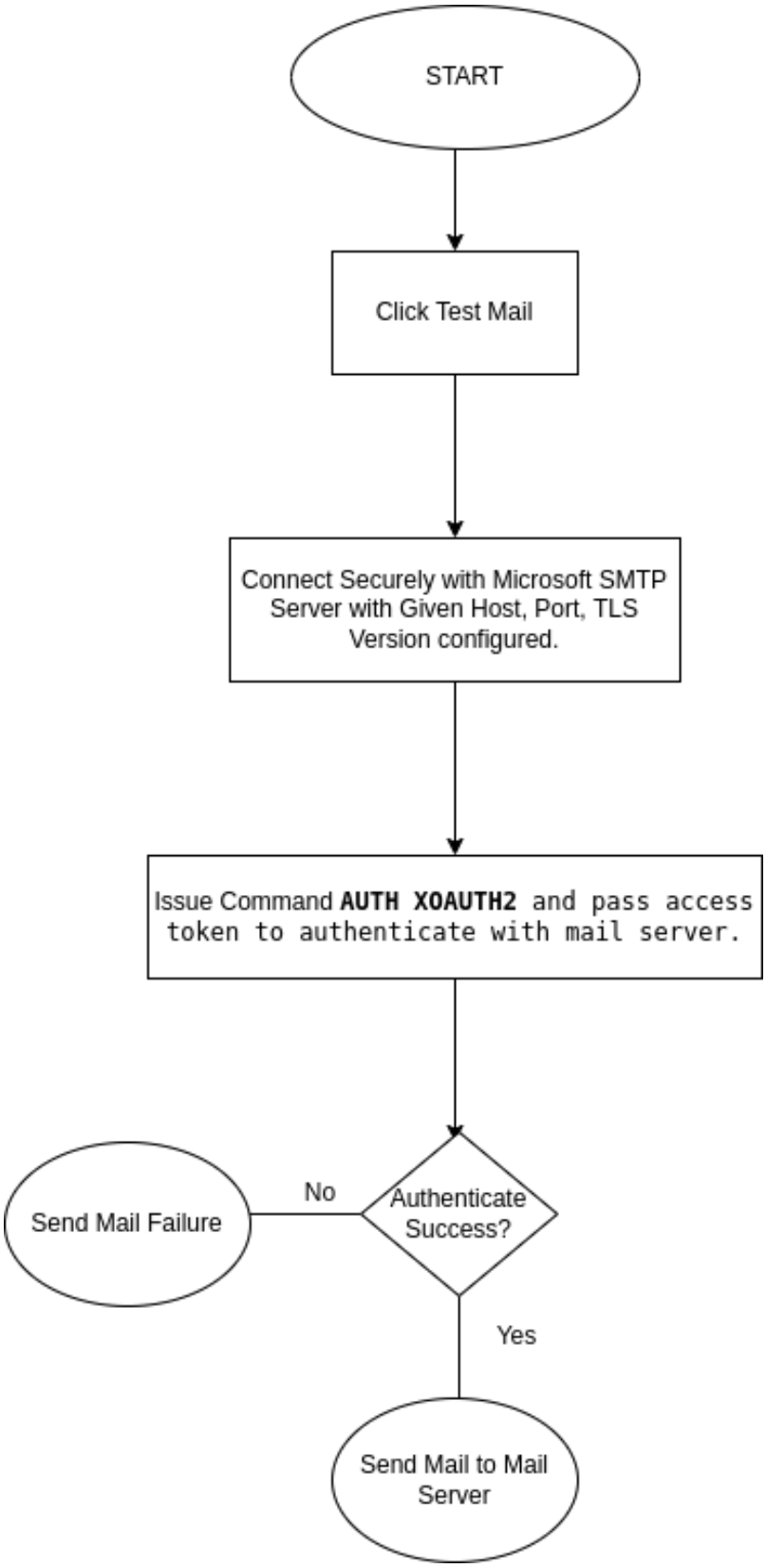
Flow Chart for SMTP Oauth Configuration.

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Flow Chart for Test Mail.

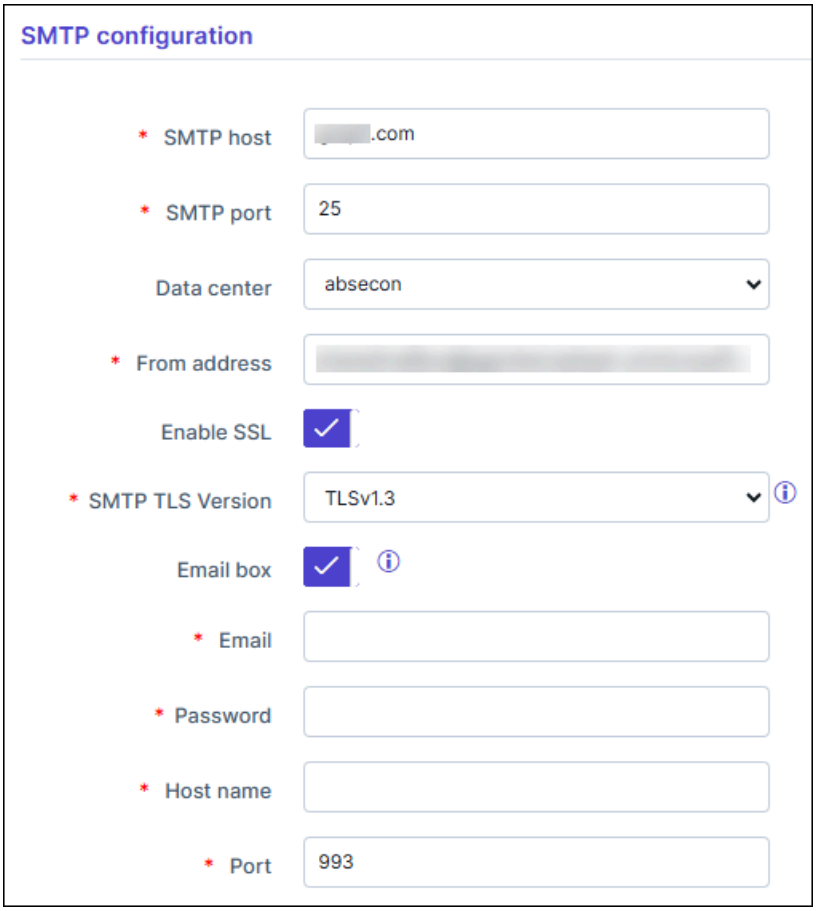
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To configure the SMTP server:

1. On the **Settings :: SMTP** page, in the **SMTP configuration** section, enter the required field information.



Field descriptions for SMTP configuration

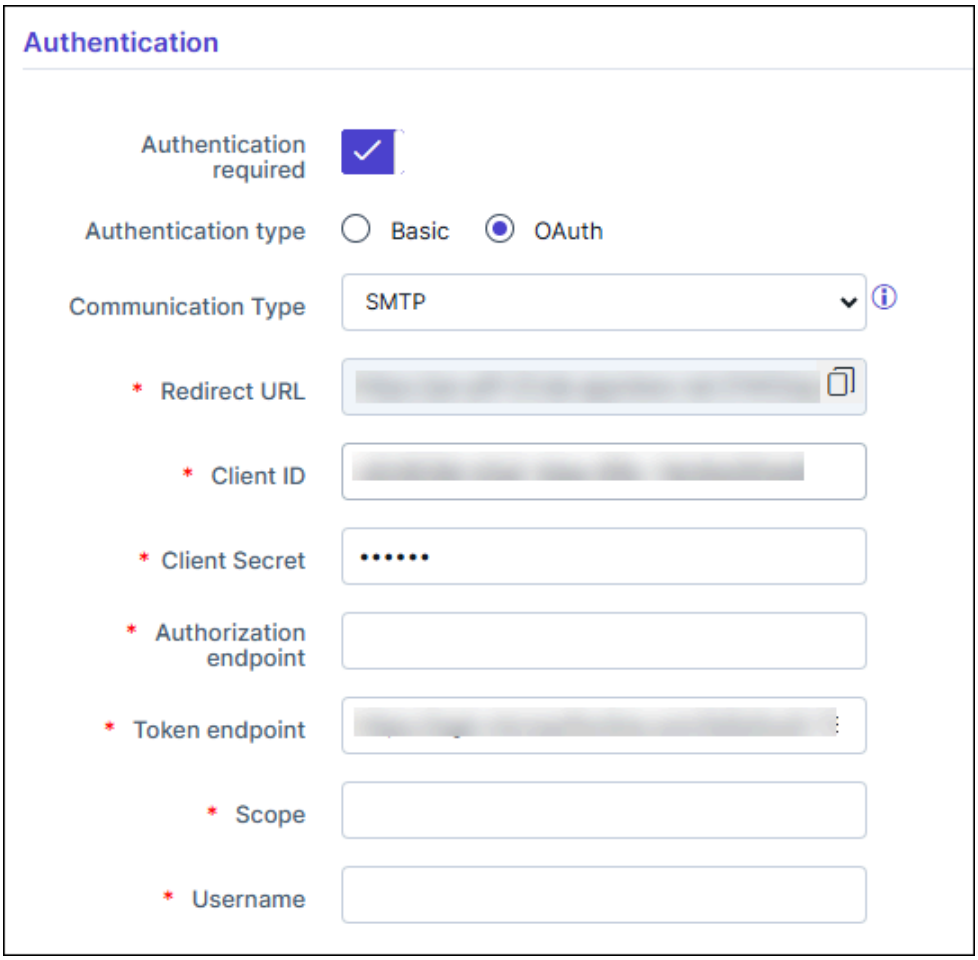
Field	Description
***SMTP host**	Host name of the SMTP server.
***SMTP port**	Port number of the SMTP server.
Data center	From the options available in the dropdown, select the data center.
***From address**	Enter the email address that will be used to email the logs and alerts.
Enable SSL	To allow SSL encryption, enable this toggle key.
***SMTP TLS Version**	From the options available in the dropdown, select the TLS version of the SMTP server.

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Field	Description
	Note: Versions 1.2 and higher are recommended.
Email box	To use the mailbox feature to read emails in Visual Workflow, enable this toggle key.
***Email**	This field is displayed only if the **Email box** key is enabled. Email address of the IMAP server used for the mailbox feature.
***Password**	This field is displayed only if the **Email box** key is enabled. Password of the IMAP server used for the mailbox feature.
***Host name**	This field is displayed only if the **Email box** key is enabled. Host name of the IMAP server used for the mailbox feature.
***Port**	This field is displayed only if the **Email box** key is enabled. Enter the Port number.
** : Mandatory fields*	

2. In the **Authentication** section, enter the required field information.

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Field descriptions for Authentication (oAuth)

Field	Description
Authentication required	To enable authenticated mail server communication, enable this toggle.
Authentication type	Select the Authentication type as Basic or oAuth. **Note:** Selecting Basic displays the Username and Password fields. Selecting oAuth displays the fields that are described below. SMTP oAuth method to send email, we can't use a different address in From field. The sending address must be the same with the authenticated account.

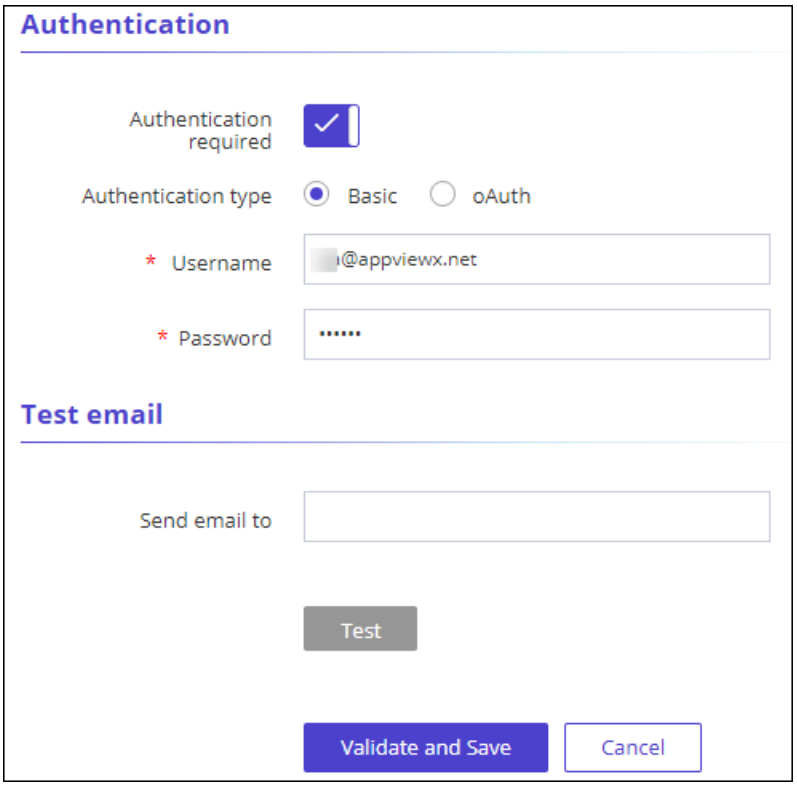
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Field	Description
Communication type	Select the Communication type as follows: • **SMTP:** email communication via SMTP. • **API:** email communication via Graph API (Outlook). **Note:** When using **Communication type** = **API**, In the **Azure**, for **API Permission**, set the **Application** level permissions to *Mail.Read* and *Mail.Send*. Refer
***Redirect URL**	This field is displayed only when **Communication type** = **SMTP**. This field is auto-populated from the address bar of the browser.
***Client ID**	Enter the Client ID that is generated in the oAuth server when the oAuth client is created. **Note:** The steps to create an oAuth client are different for Google and Microsoft. For more information on steps for Google, click here. For more information on steps for Microsoft click here.
***Client Secret**	Enter the Client Secret that is generated in the oAuth server when the oAuth client is created.
***Authorization endpoint**	This field is displayed only when **Communication type** = **SMTP**. Enter the authorization endpoint where the user authorizes and gives permission to the oAuth client to send email on behalf of the user.
***Token endpoint**	Enter the token endpoint to get Access Token and Refresh Token. You can get the endpoint by providing Client ID, Secret, and other relevant values based on oAuth 2.0 specifications.
***Scope**	This field is displayed only when **Communication type** = **SMTP**. The permission required to send email.

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Field	Description
	Note: For Microsoft, enter https://outlook.office.com/SMTP.Send.
***Username**	This field is displayed only when **Communication type** = **SMTP** or when **Authentication type** = **oAuth**. Username for the authenticated mail server If the Authentication is chosen as oAuth the **Username** and **From address** should be the same.
***Password**	This field is enabled if you select **Basic** as your **Authentication type**. Enter the valid password associated with the username.
** : Mandatory fields*	

3. If the **Authentication type** is selected as **Basic**, displays the Username and Password attributes.
4. In the **Test email** section, enter the email address to which a test email should be sent and click **Test**.

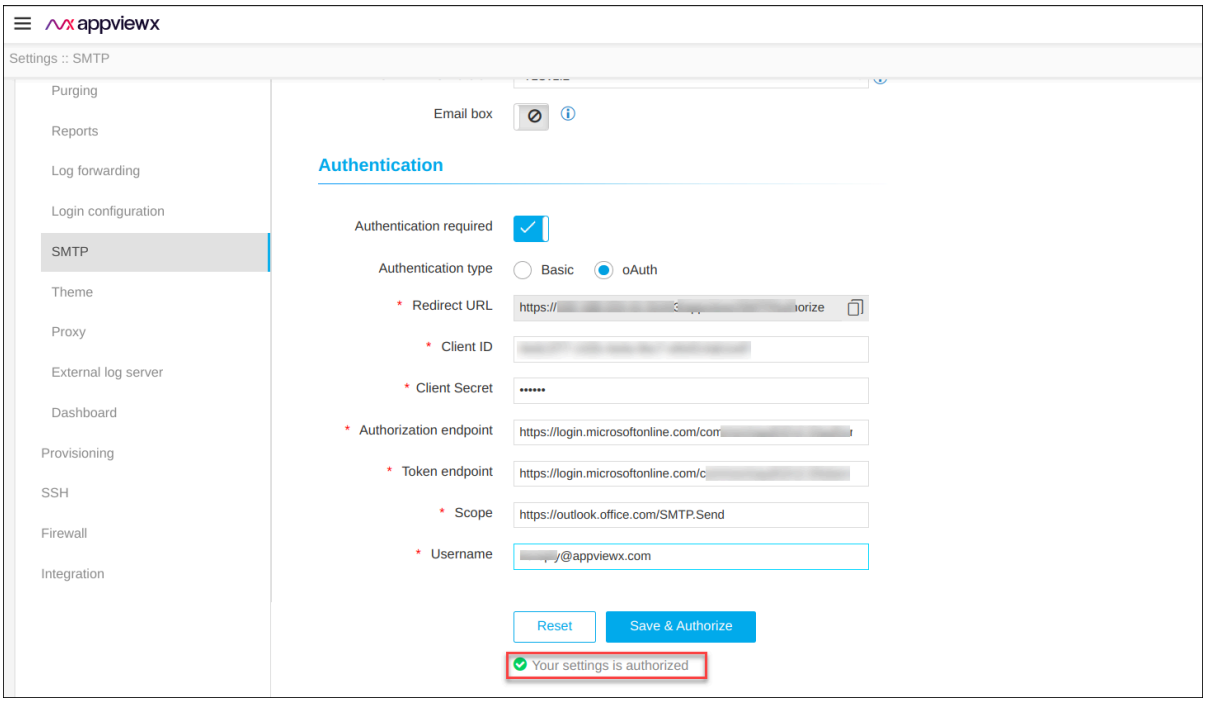


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5. To save the SMTP configuration settings, click **Validate and Save**.
   Upon clicking "Validate and Save," an email will be sent to the user's email address for validation.

> **Note:**
> - If the user does not have an email ID configured, an error will be displayed, prompting them to set up an email address.
> - In case of validation failure, the SMTP settings will not be saved.

6. If the **Authentication type** is selected as **oAuth**, To save the SMTP configuration settings, click **Save & Authorize**.
   New Tab is displayed for Single Sign On (SSO) with microsoft.
7. Provide your login credentials and submit your consent for the mentioned permissions. The login credential should be the same as the username configured in the SMTP Authentication.
8. Displays confirmation of SMTP Settings Authorized.



9. AppViewX can send an email on behalf of the authorized user as the user has given the consent to send email on his behalf during authentication.

> **Note:** The **Username** should have a mailbox assigned, and it should also have all the necessary permissions for web sign-in as per the oAuth 2.0 authorization code flow.

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A new tab will open, prompting for sign-in.

Once authorization is done the user receives an access token and a refresh token from the token endpoint. The access token is used for sending email and the refresh token is used for renewing the access token upon its expiry.

Authentication for Microsoft SMTP Settings

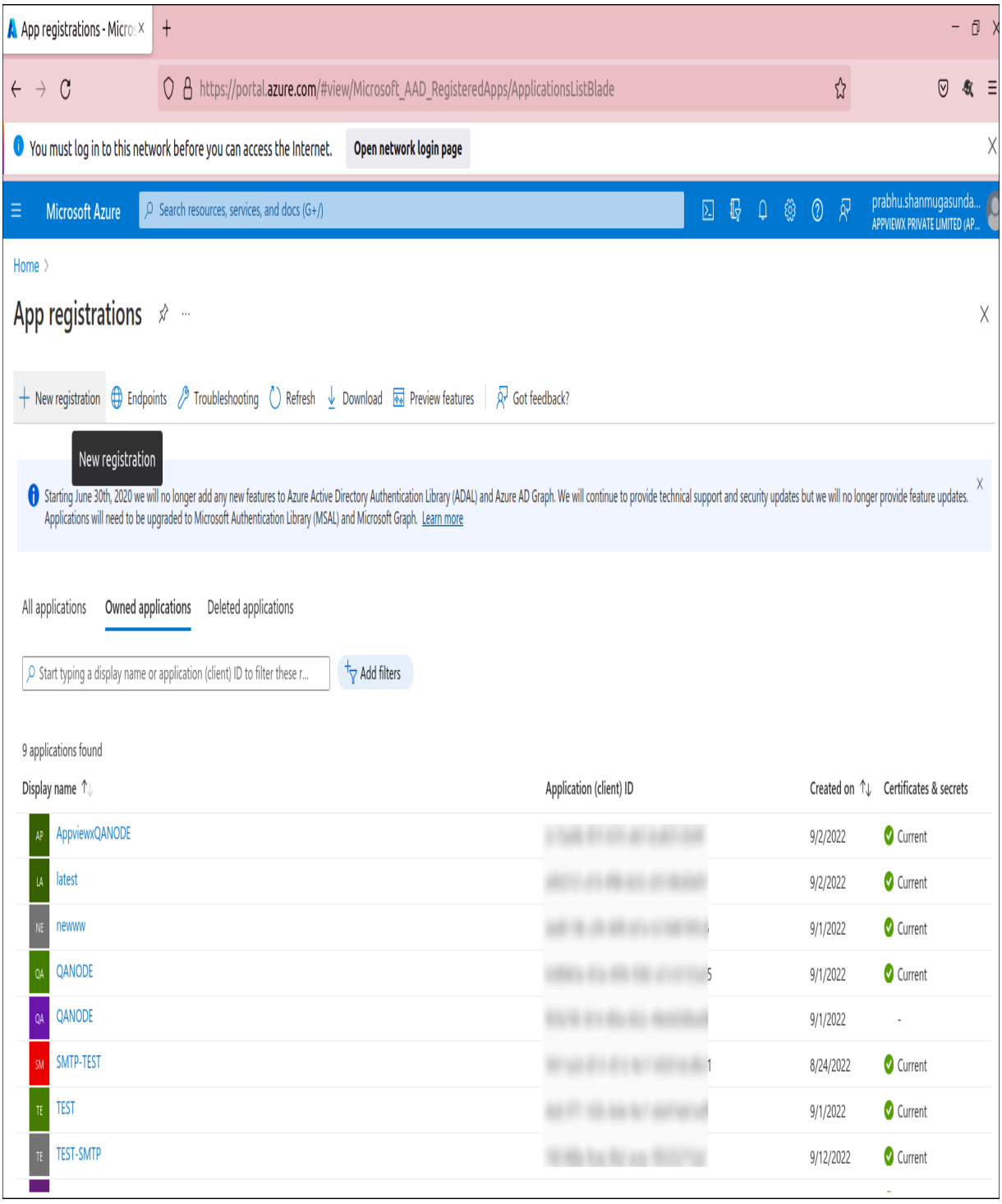
Create authorization credentials.

Registering your application establishes a trust relationship between your app and the Microsoft identity platform. The trust is unidirectional: your app trusts the Microsoft identity platform, and not the other way around.

Follow these steps to create the app registration:

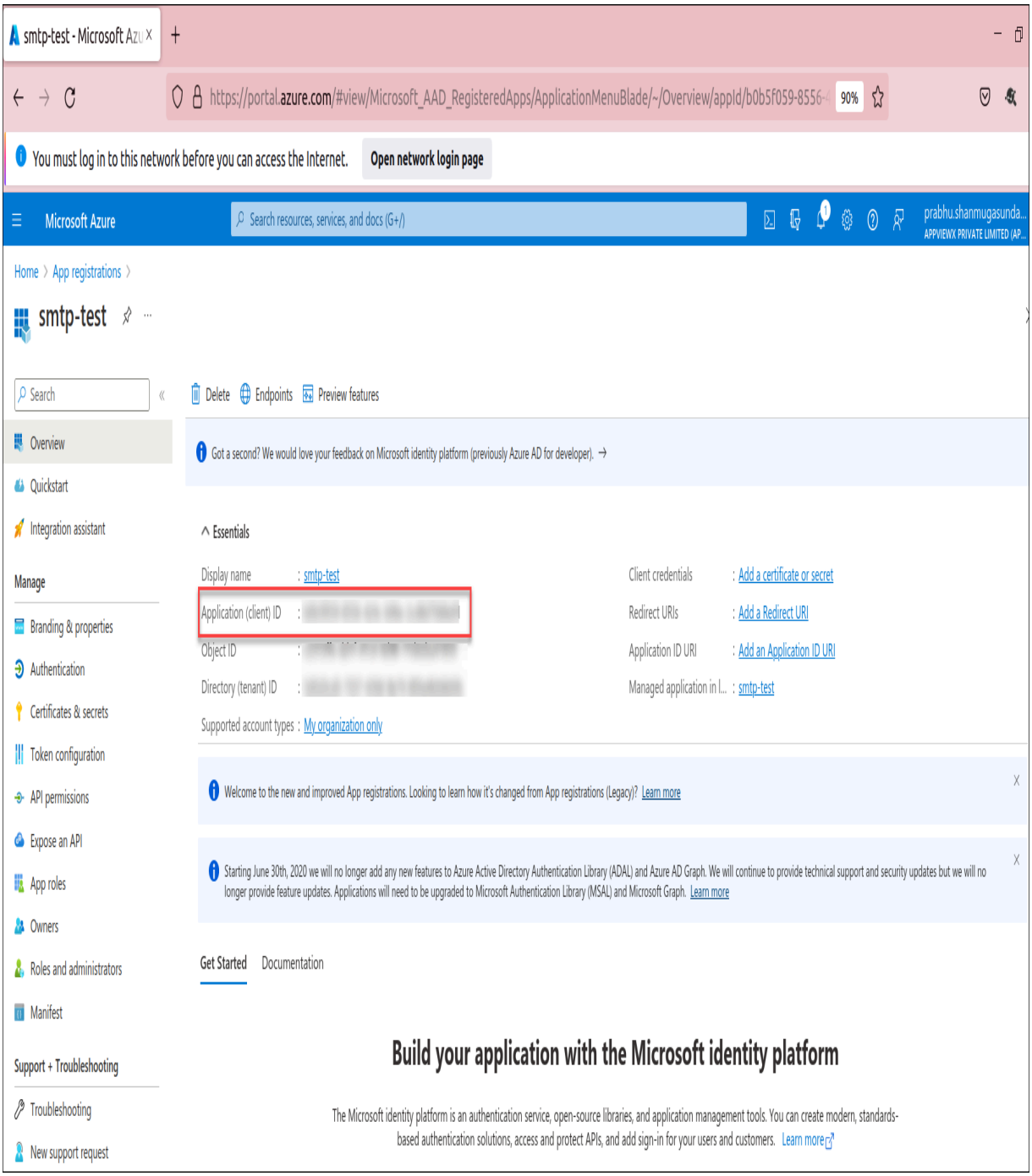
1. Sign in to Microsoft using valid credentials for App Registration using the following URL: https://portal.azure.com/.
2. Under **Manage**, click **App registrations** > **New registration**.

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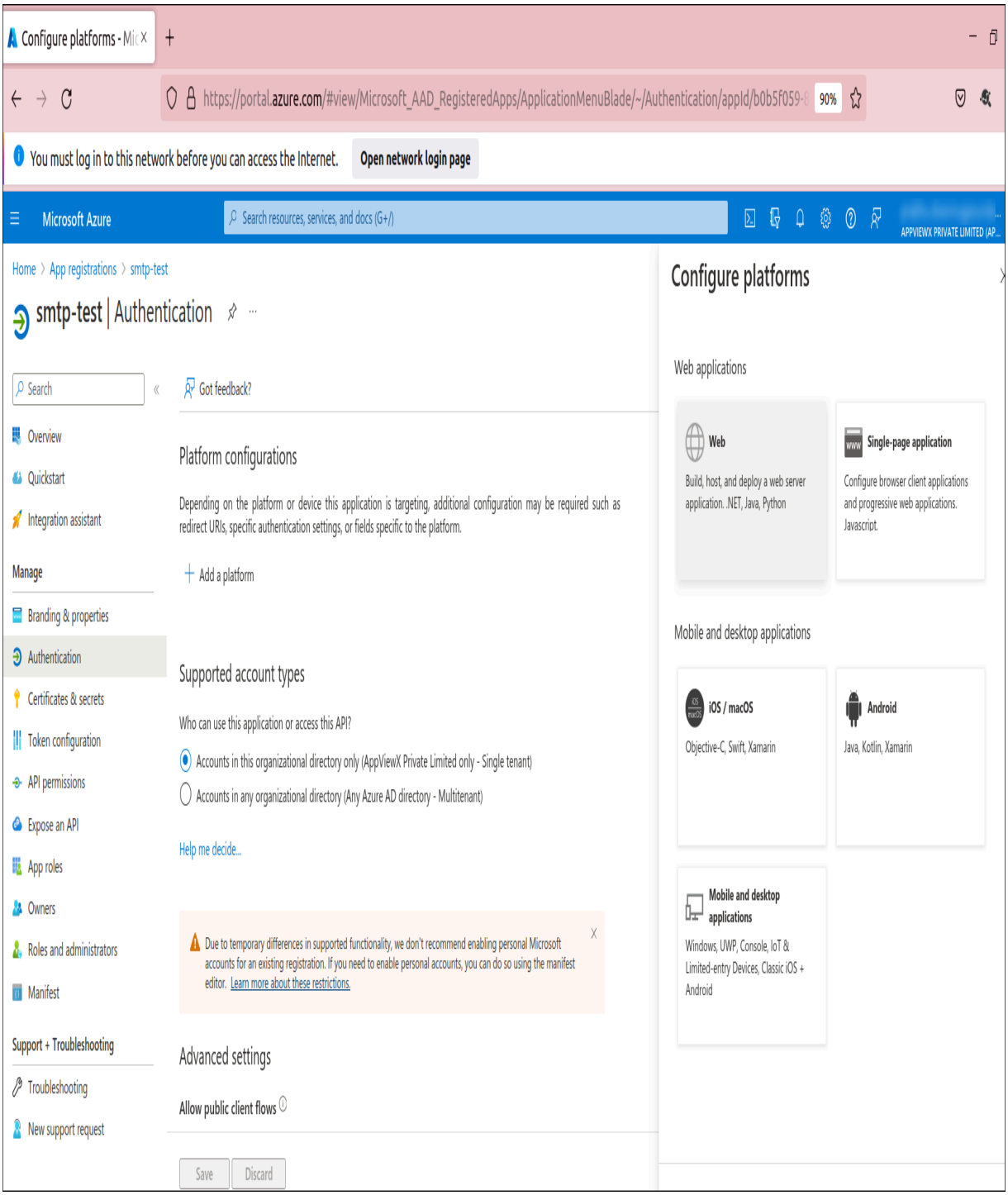
3. In the **Register an Application** section, enter the required field information.
4. Click **Register** to complete the initial app registration.
5. When registration finishes, the Azure portal displays the app registration's Overview pane. You see the **Application (client) ID**.

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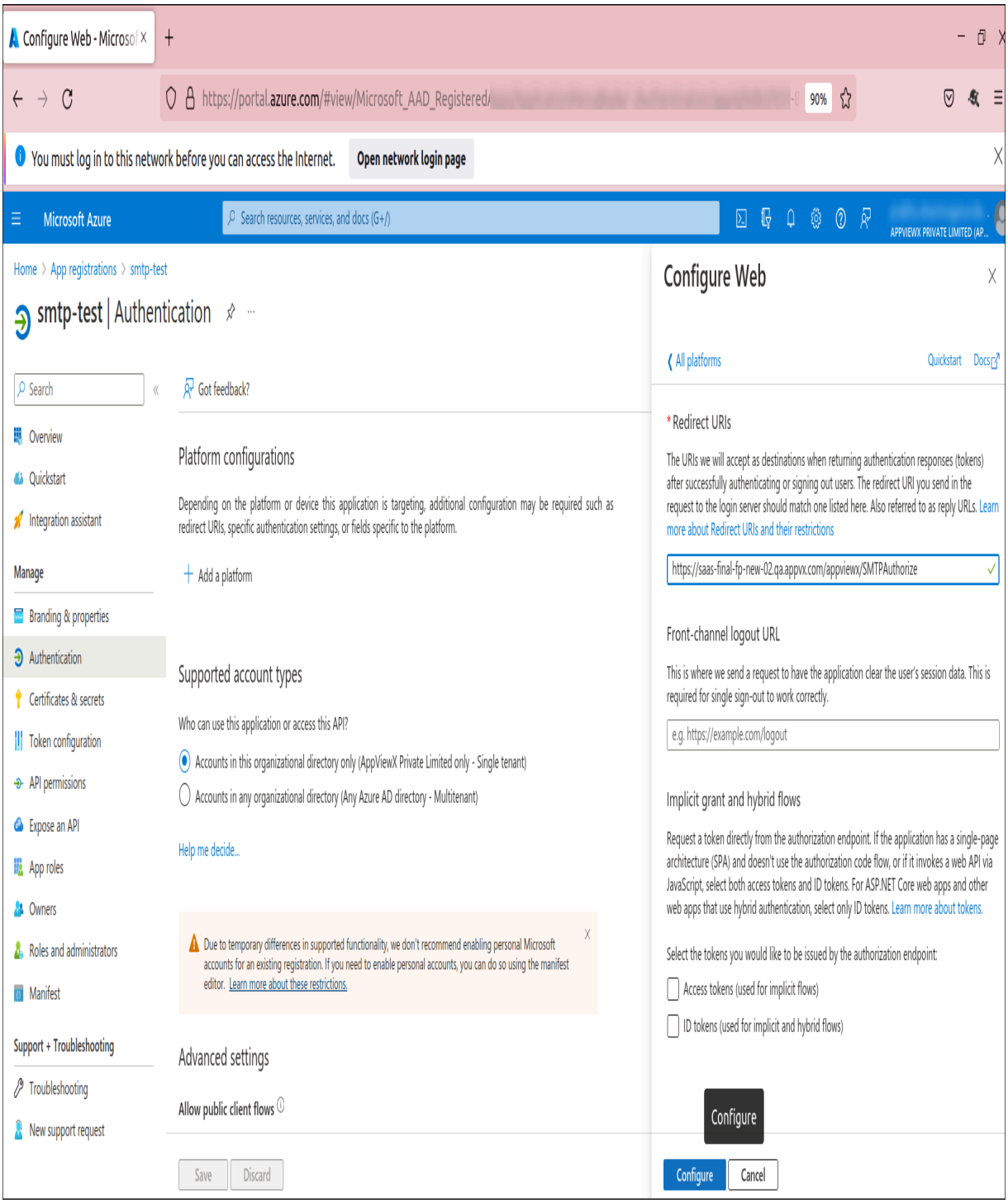
6. Under **Manage**, select **Authentication**.
7. Under **Platform configurations**, select **Add a platform**.

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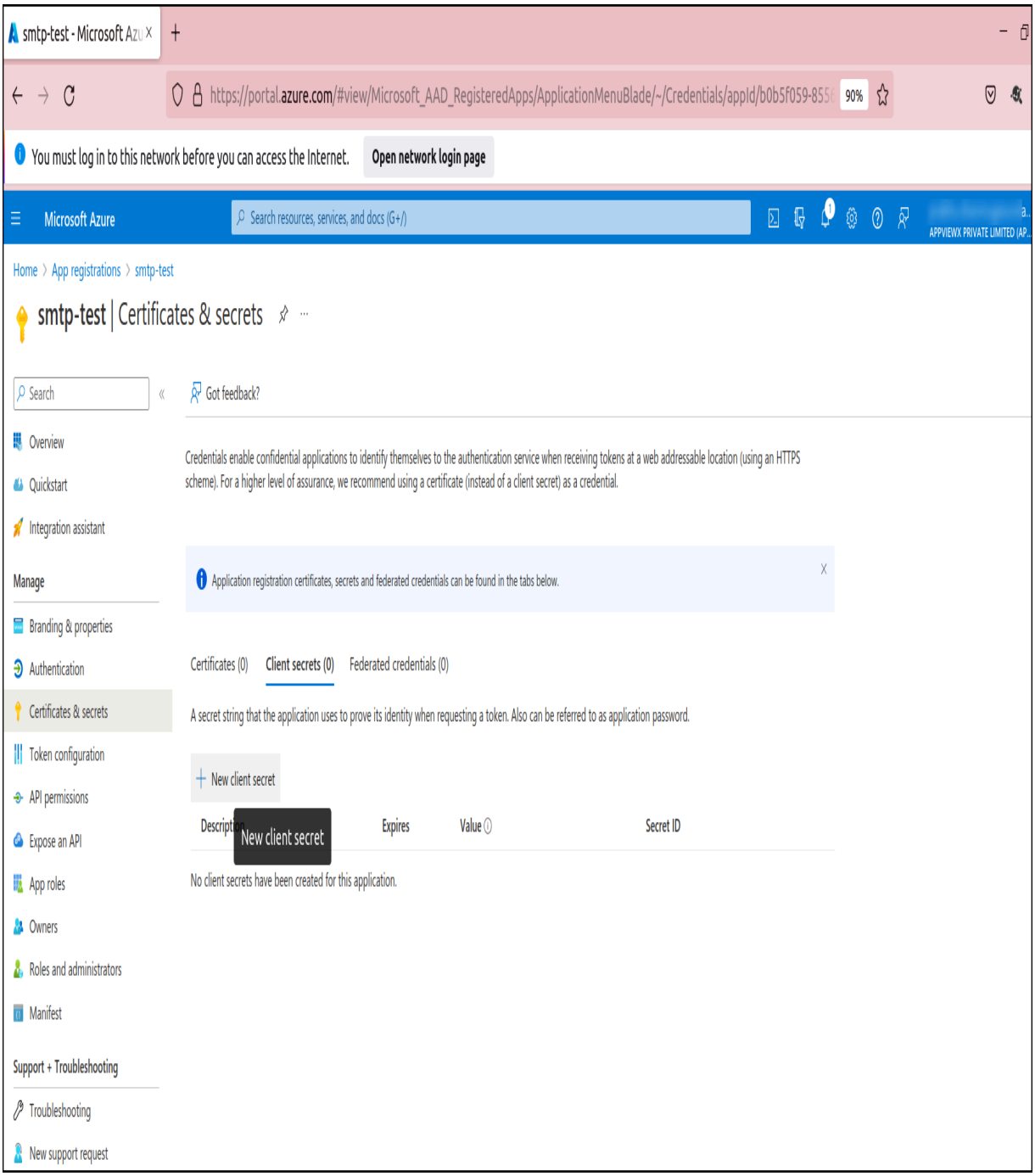
8. Under **Configure platforms**, select **Web** for application type (platform) to configure its settings.
   The **Redirect URI :: Configure Web** page is displayed.

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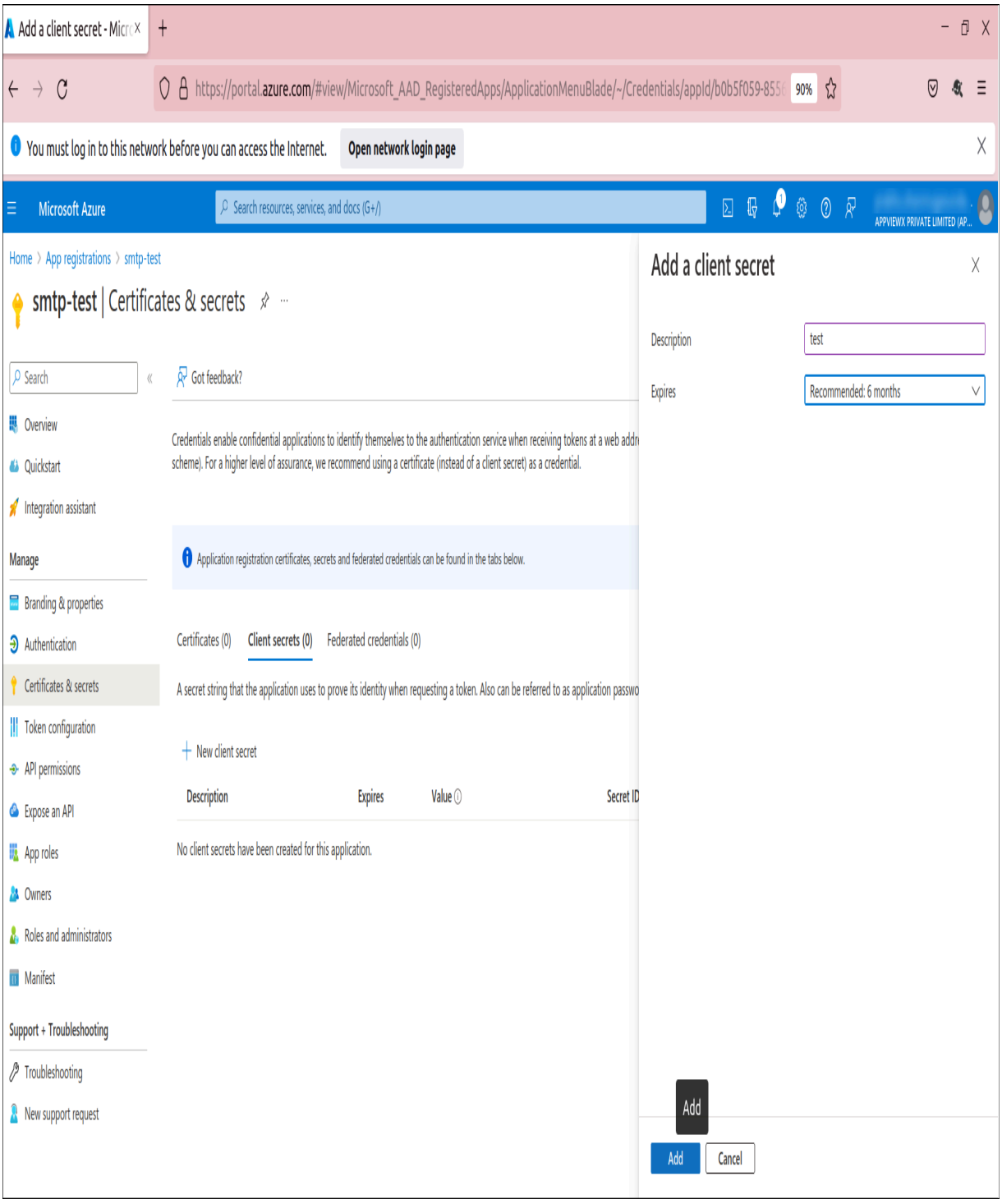
9. Enter a Redirect URI for your app. This URI is the location where the Microsoft identity platform redirects a user's client and sends security tokens after authentication.
10. Click **Configure** to complete the platform configuration.
11. Select **Certificates & secrets** > **Client secrets** > **New client secret**.

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The **New client secret :: Add a client secret** page is displayed.

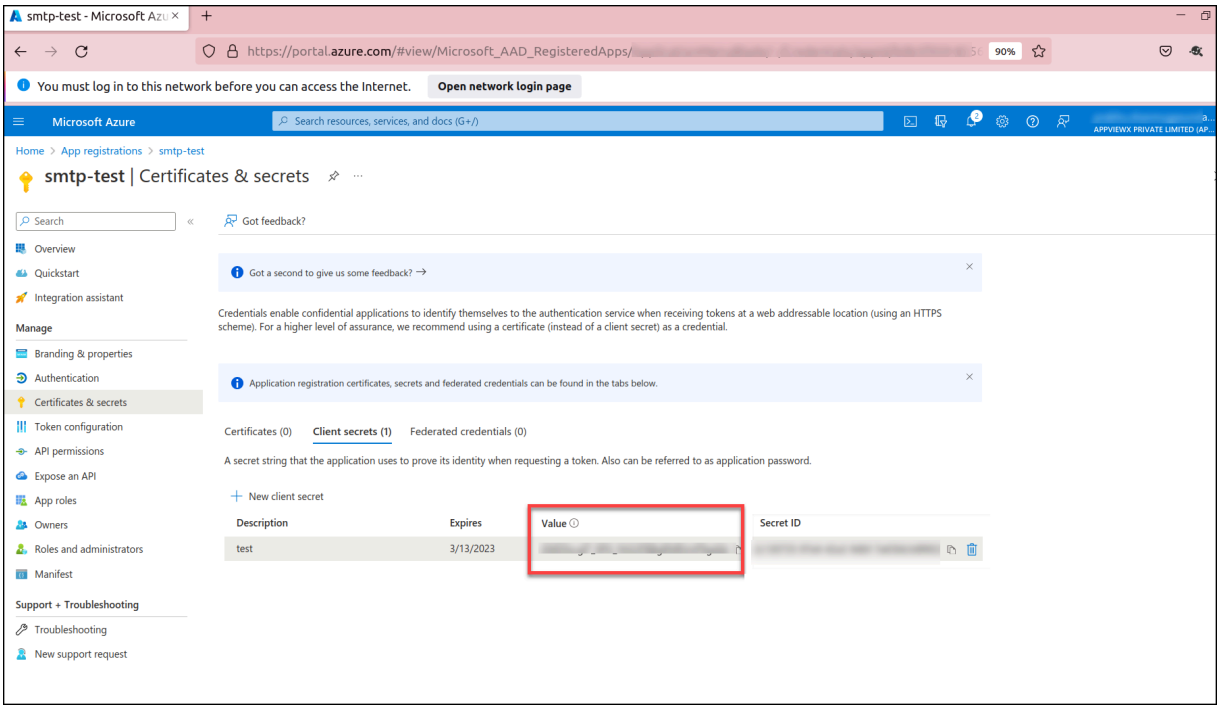
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12. Add a **Description** for your client secret.
13. Select an **Expiration** for the secret or specify a custom lifetime.
14. Click **Add**.

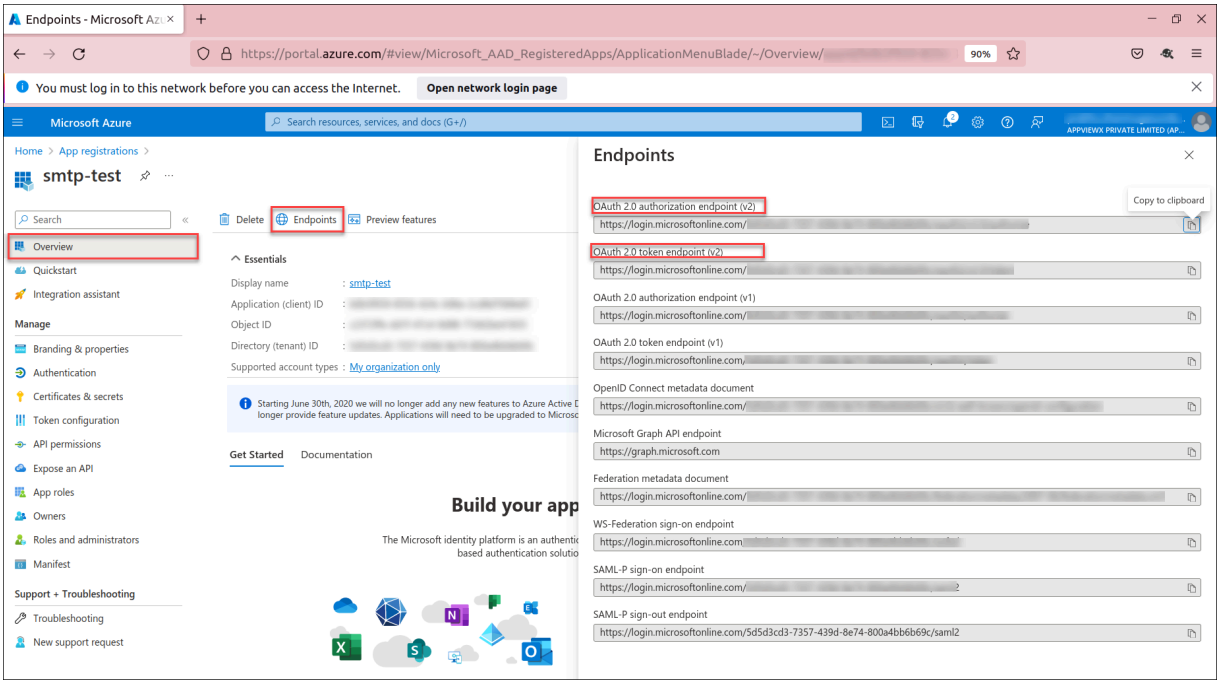
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15. Record the **Secret value** for use in your client application code. This secret value is never displayed again after you leave this page.



16. Under **App Registration**, click **Overview**.
17. Click **Endpoints**.

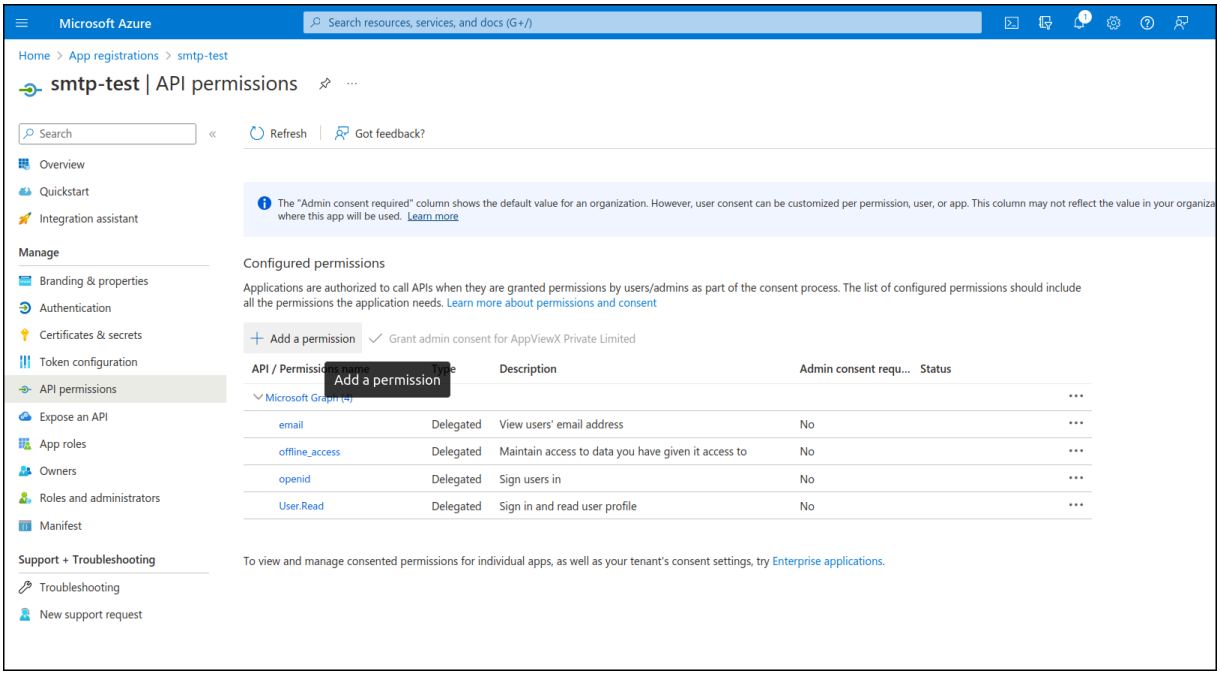
    The **Overview :: Endpoints** page is displayed.



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18. Copy **authorization endpoint** and **token endpoint** for Authentication of SMTP Server Settings.
19. Under **Manage**, click **API permissions**.

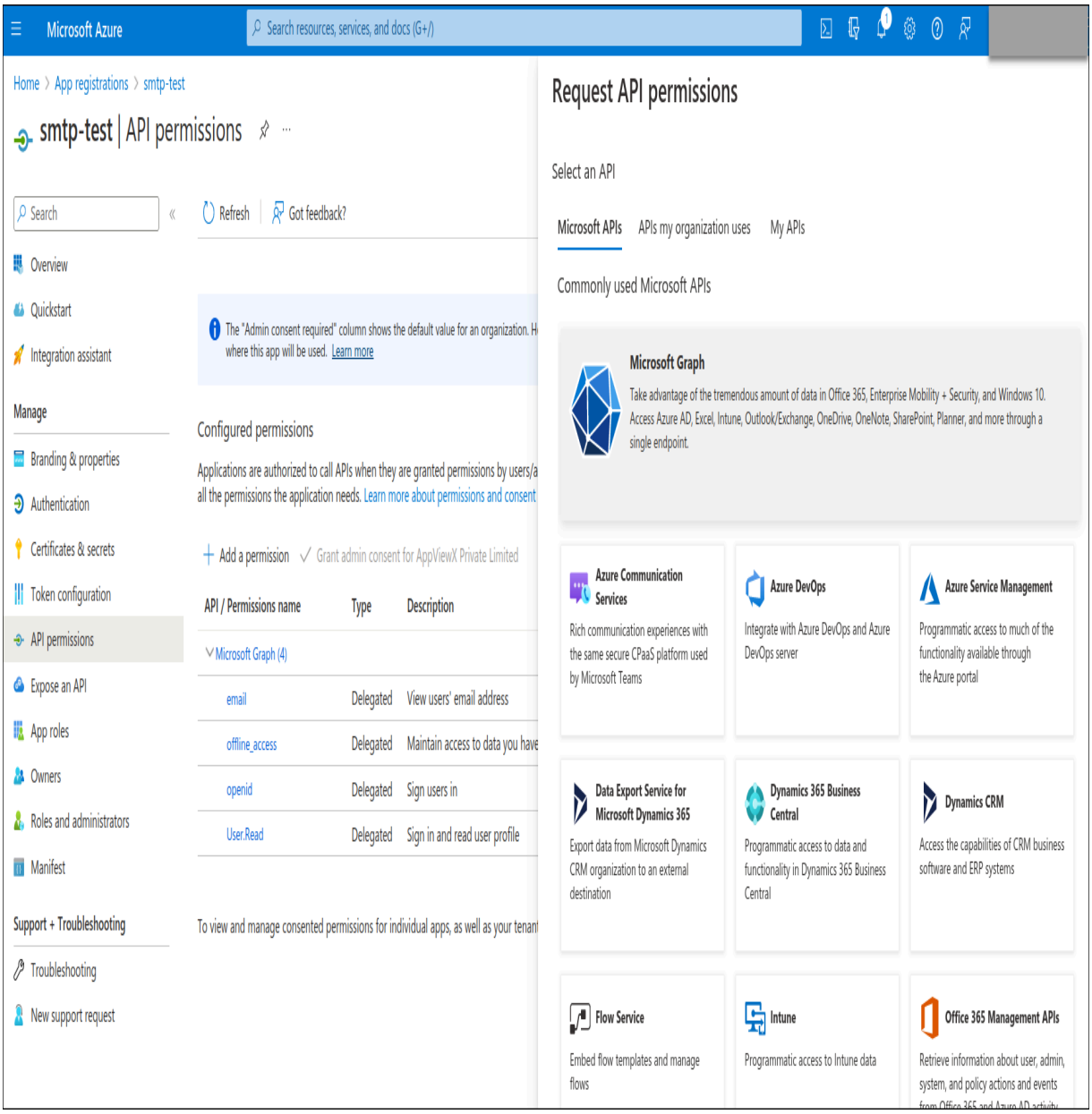
    The **API permissions** page is displayed.



20. To add required permissions, click **Add a permission**.

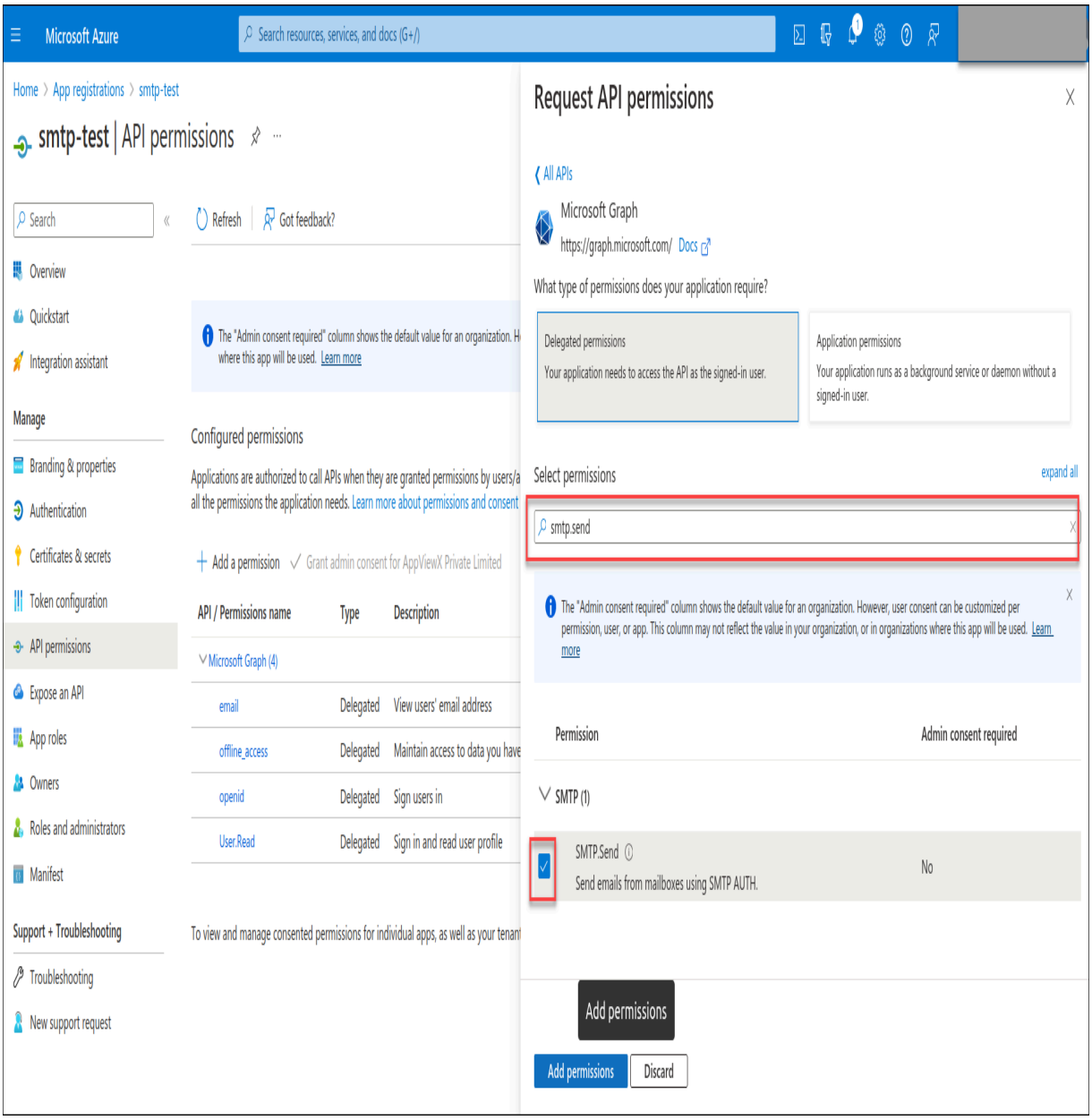
    The **Request API permissions** page is displayed.

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21. Click **Microsoft Graph > Delegated permissions**.

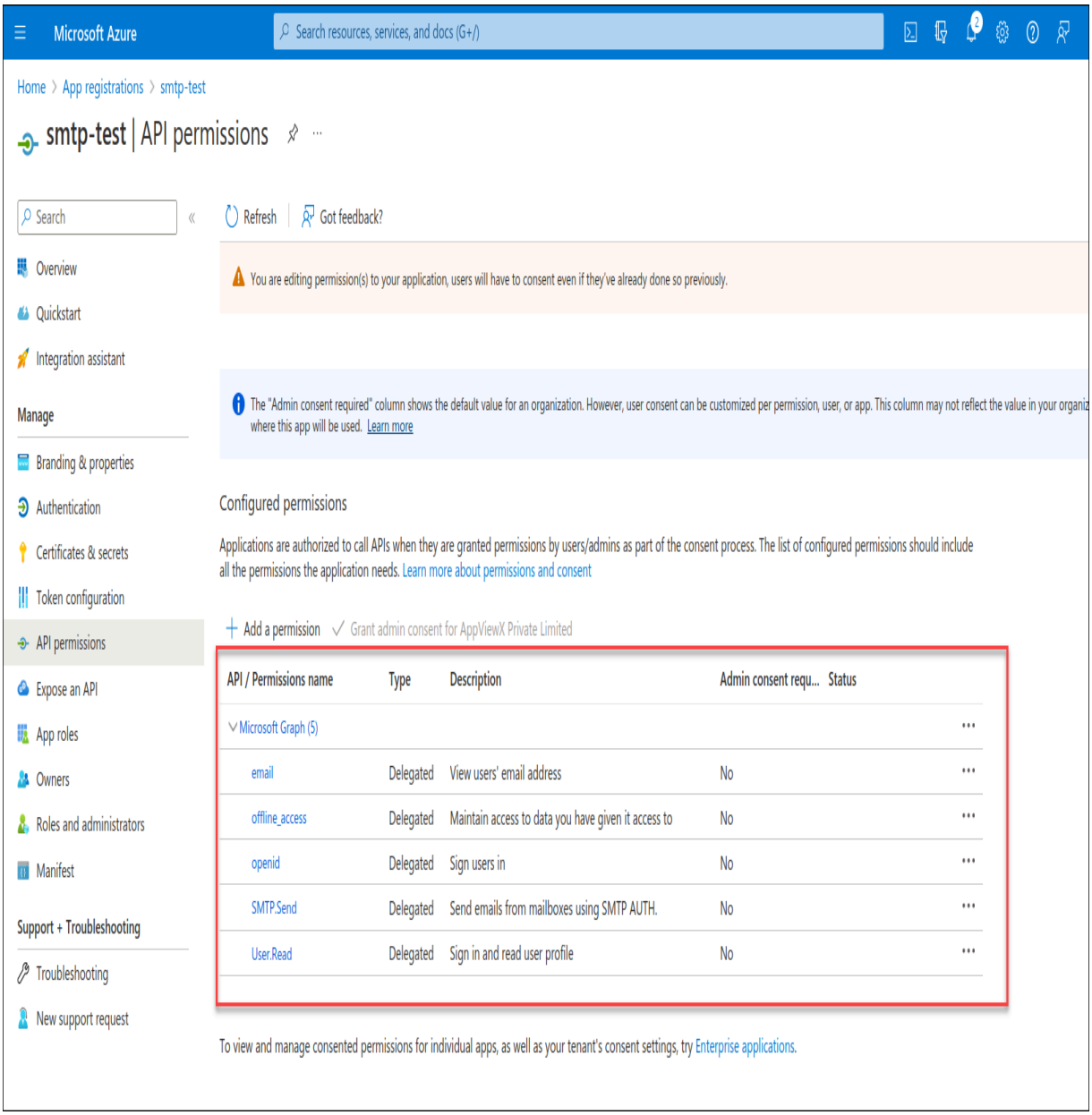
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22. Under **Select permissions** search box, search for the **smtp.send** and select the **SMTP.Send** from the dropdown.
23. Similarly search for **email, offline_access, openid, User.Read** and select the **email, offline_access, openid, User.Read** from the respective dropdowns.
24. Click **Add permissions**.

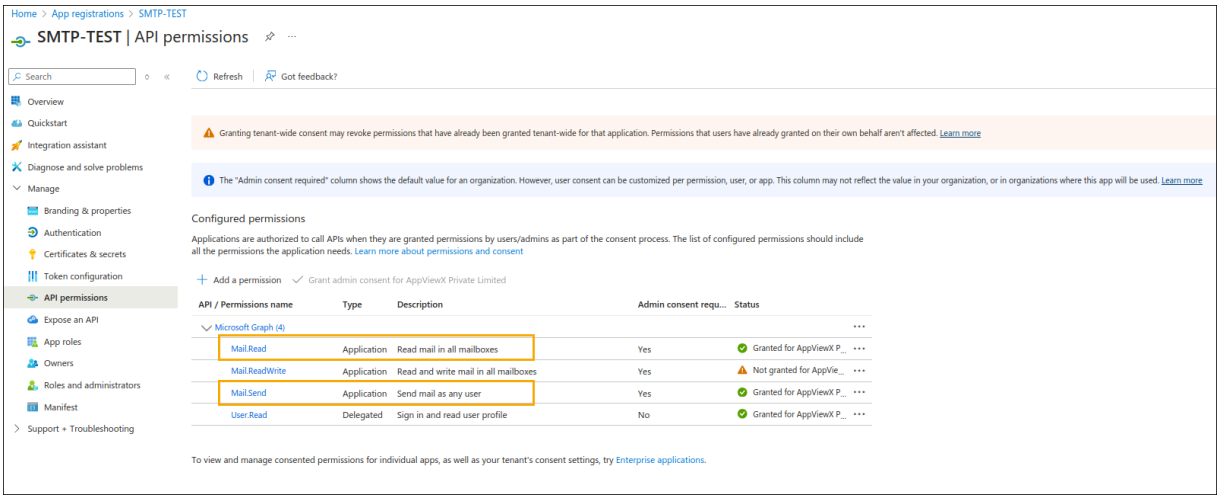
    For **Communication type** = **SMTP**, the **API permissions** added will be displayed below **API / Permissions name** and will be of **Type** = **Delegated**.

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For **Communication type** = **API**, the **API permissions** added will be displayed below **API / Permissions name** and will be of **Type** = **Application**.

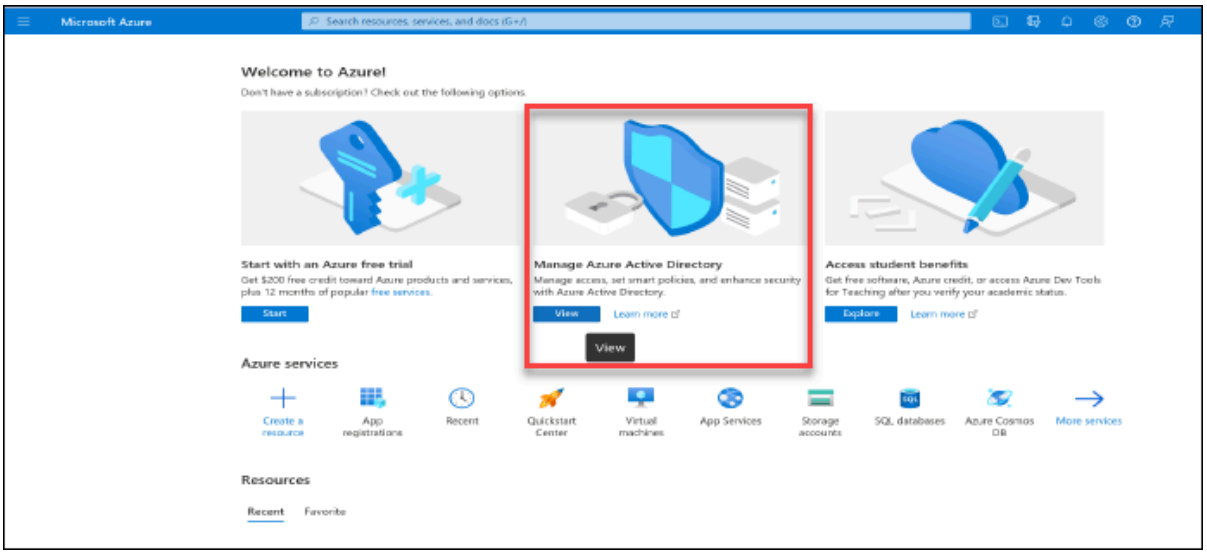


Frequently Asked Questions

While adding **API permissions** Owner Consent Error is shown, to avoid this error following changes have to be done.

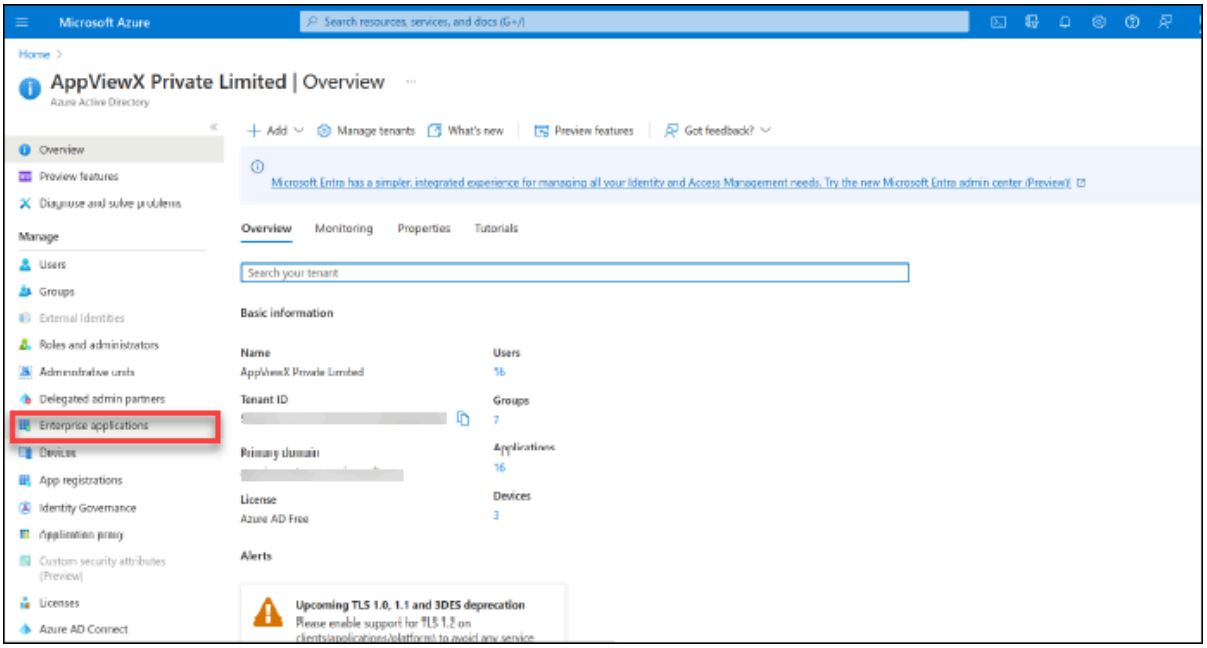
Follow these steps to overcome Owner Consent Error:

1. Sign in to Microsoft using valid credentials for App Registration using the following URL: https://portal.azure.com/.
2. Click **Manage Azure Active Directory**.

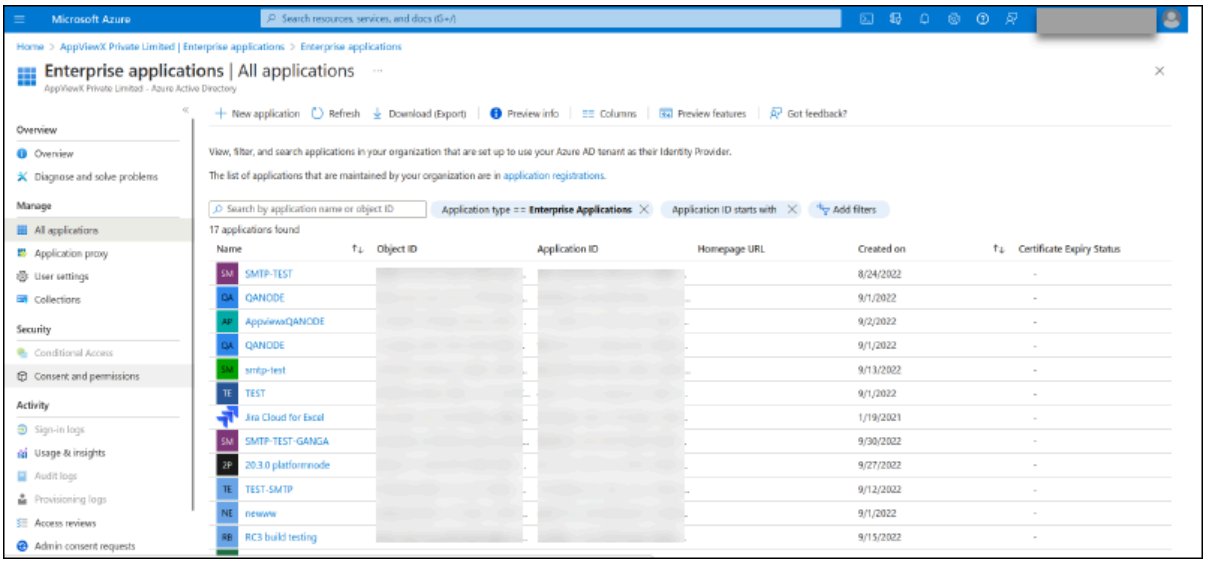


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3. Click **Enterprise applications** in the left menu.



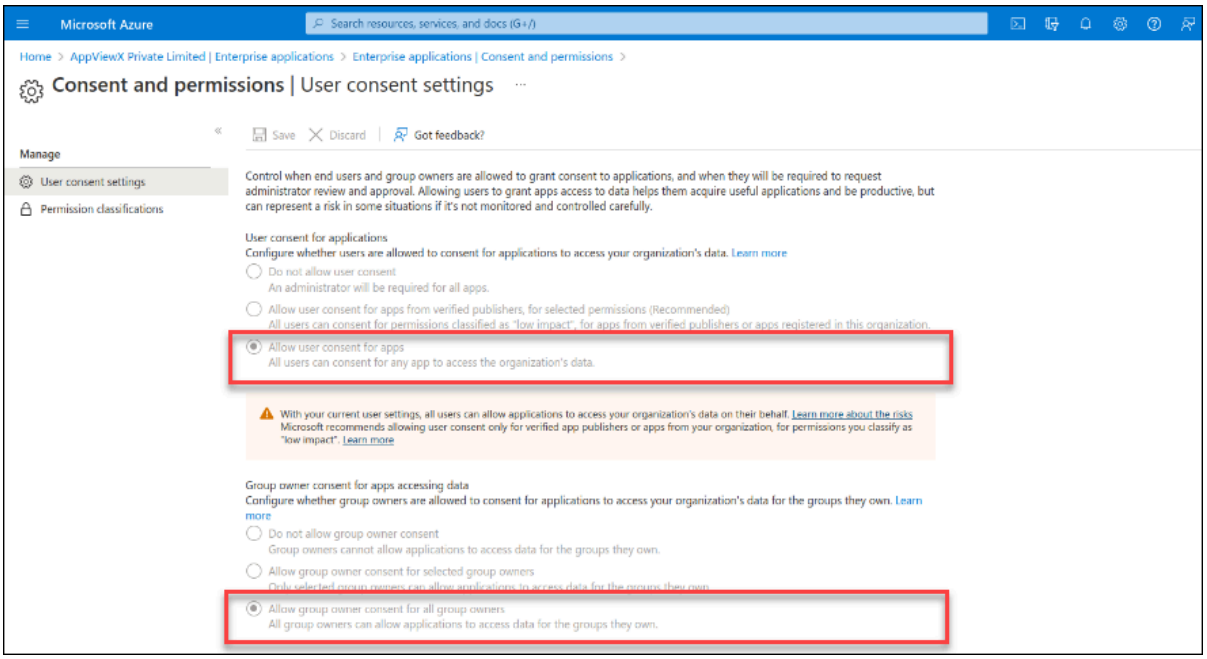
4. Click **Consent and permissions** in the left menu.



5. Change the **User Consent Settings** for user consent for applications from **Do not allow user consent** to **Allow user consent for apps**.

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6. Change the **User Consent Settings** for group owner consent for apps accessing data from **Do not allow group owner consent** to **Allow group owner consent for all group owners**.



Managing Proxy Settings

When deployed at a customer's site, AppViewX communicates with the internet through a proxy server to shield the customer's IP address from exposure.

To configure the proxy settings:

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **SYSTEM ADMINISTRATION**, select **Proxy**. The **Settings :: Proxy** page is displayed.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Proxy**. The **Settings :: Proxy** page is displayed.
For more information on how to switch between menus, click here.	

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1. On the **Settings :: Proxy** page, enter the following details:

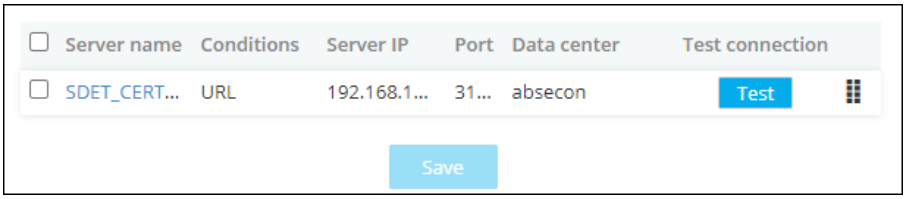
Field descriptions for Proxy Settings

Field	Description
***Proxy Settings**	Select the Proxy settings from the following options: • **Cloud Connector** - When choosing Cloud Connector as your proxy setting, the settings will be shown on the Cloud Connector addition page. To distinguish between the Cloud Connector and AppViewX, not all proxy settings are applicable for the Cloud Connector connectivity. • **AppViewX** - If you choose AppViewX as your proxy setting, the settings will not be visible within the CC addition page.
***Server name**	Name of the proxy server.
***Server IP**	IP address of the proxy server.
***Port**	Port number of proxy server.
Advanced	To enable advanced settings, select this check box.
Data center	From the drop-down menu, select a data center. This field is displayed only when the **Advanced** check box is selected.
URL	From the drop-down menu, select the URL. This field is displayed only when the **Advanced** check box is selected.
Authentication	To enable authentication, select this check box.
***Username**	Enter the username. This field is displayed only when the **Authentication** check box is selected.
***Password**	Enter the password. This field is displayed only when the **Authentication** check box is selected.

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Field	Description
** : Mandatory fields*	

2. To save the proxy settings configured above, click **Add**.
   The settings are saved and displayed in the table.



3. To reconfigure the proxy settings, click **Reset**.

Managing Licenses

This section provides guidance on managing the AppViewX license effectively. It covers processes such as accessing the License page, upgrading the license, and monitoring license product usage, ensuring proper license management.

Note:

- AppViewX blocks the usage/upload of the old license. If an organization uploads an old license, an error message is displayed. **LICENSE_ERROR_037: Unsupported version of the license file. Please contact AppViewX support**. The AppViewX support team will help with the new and latest supported versions of the license.
- AppViewX blocks the usage of the product if the license has expired. If an organization exceeds the threshold of license (maximum number of ADC+ objects, CERT+ certificates, and/or PKI+ Certificates allowed), a warning is issued as a reminder. A pop-up warning is issued for both scenarios.

- Licenses for Onprem
- Licenses for SaaS

Licenses for Onprem

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Accessing the License Page

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **SYSTEM ADMINISTRATION**, select **License**. The **Settings :: License** page is displayed with the **License** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **License**. The **Settings :: License** page is displayed with the **License** tab open by default.
For more information on how to switch between menus, click here.	

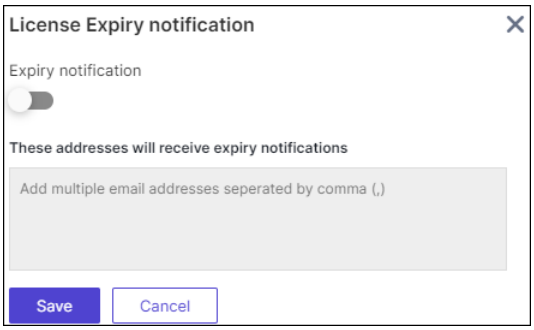
The **Settings :: License** page shows the following details.



Note: The License page screen showcases details of products purchased or subscribed by the user.

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Descriptions of License section

License Detail	Description
Expiry notification	On the top right corner of the screen. Click **Expiry notification** to enable the expiry notification by including email addresses to receive license expiration notifications from AppViewX. 1. On clicking on **Expiry notification**. **License Expiry notification** popup is displayed. 2. Enable the toggle to activate the Expiry notification and add email addresses to receive expiry notifications.  **Note:** Multiple Email addresses can be added using comma (,). 3. Click **Save**. The following license expiry notifications are sent to the email address: 1. License expiry alert: Your AppViewX license for the products [ADC+, DDI+, CERT+, KUBE+, PKI+] is about to expire. Kindly upgrade the license. This notification is sent to the user two days before the license expires. 2. License limit reaching: Your AppViewX License usage limit subscribed for the products [ADC+, DDI+, CERT+, KUBE+, PKI+] is about to be exceeded. Kindly upgrade the license. 3. License limit reached: Your AppViewX License usage limit subscribed for the products [ADC+, DDI+, CERT+, KUBE+, PKI+] has been exceeded. Kindly upgrade the license.
Refresh	Click **(Refresh)** icon to update the license details.

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Descriptions of License section (continued)

License Detail	Description
Subscription	This includes the details of license of AppViewX products subscribed by the user.
License updated on	Displays the date on which the license was last updated.
Account Name	Displays the associated account name.
License Key	Displays the License key details of the user. The key is generated by the customer perspective. Using which License Key of "16 digit Alphanumeric" value is generated by the sales team. Only License Key generated with installation key can be applied in the respective instance of the product. **Note:** Consider only the license key which is provided by the sales team.
Product Name	This includes the details of subscribed licenses of all AppViewX products.
Expires in	Displays the remaining days until the respective products expire.
ADC+	
Nodes	All the ADC devices (Independent devices, Controllers, Nodes within controllers) that are onboarded in the inventory.
Objects	All the ADC Applications (Unique GTM WideIPs, LTM VIPs) discovered from the onboarded ADC devices.
Firewall Devices	Devices integrated with firewall network topology.
CERT+	
Managed Device Certificates Instances	Managed Device Certificates Instances includes all certificates (Client, Code Signing, and Device) excluding Server and OTHERS types, from the inventory in the "Managed" state.
Managed Server Certificates Instances	Managed Server Certificates Instances include only server certificates from the inventory in the "Managed" state.
Managed Certificates Instances	Managed Certificate instance includes all certificates (Server, Client, Code Signing, and others) present in the certificate inventory in the "Managed" state.

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Descriptions of License section (continued)

License Detail	Description
Monitored Certificates Instances	Monitored Certificate Instances include all certificates (Server, Client, Code Signing, and others) present in the certificate inventory in the "Monitored" state.
DDI+	
Managed Domains	Each DDI+ license subscription allows the user a number of managed domains that can be used. The number displays DDI+ managed domains currently in use.
PKI+	
Certificates Issued	Certificates issued are the total number of certificates which includes the number of certificates issued and all CAs created in PKI. **Note:** The certificate count begins from the day the project is initialized in Google Cloud Platform (GCP)and is maintained for a year from that date. The count is reset annually.
Total CA(s)	Total CA is Number of CAs created from AppViewX. Each PKI+ license subscription allows the user a number of total CAs using this license. This is the number of total CAs used.
SIGN+	
Signature Count	Total count of signing requests executed using the signing policy.

License Alerts

Following are the system alerts which indicates the product usage limit.

- **Reaching Limit!**

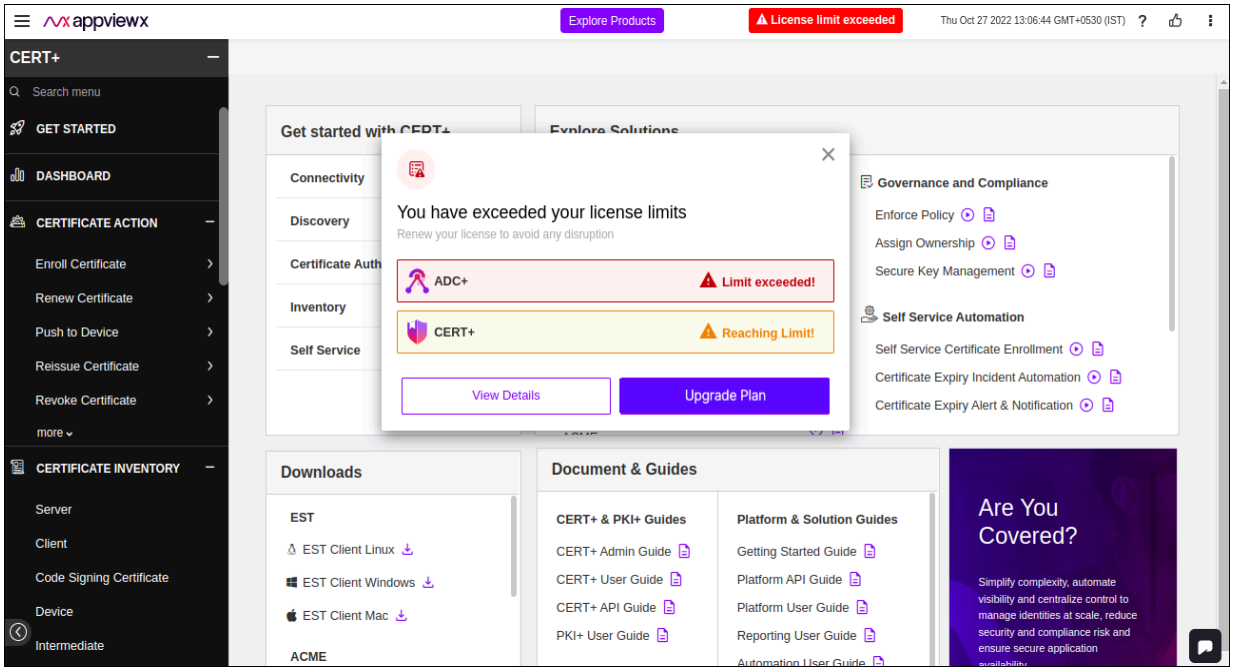
  If the usage reaches 90% of the threshold limit, then **“Reaching Limit!”** alert will be displayed.

- **Limit exceeded!**

  If the usage exceeds the threshold limit, then **“Limit exceeded!”** alert will be displayed.

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• You will see a header alert message while logging In, if the license limit is exceeded.



Upgrading Licenses for On-prem

Note: AppViewX blocks the usage of the license if the license has expired. If an organization exceeds the threshold of license (maximum number of ADC+ objects, CERT+ certificates, and/or PKI+ Certificates allowed), a warning is issued as a reminder. A pop-up warning is issued for both the scenarios.

To upgrade a license:

1. On the **Settings :: License** page, to upgrade a license, click on the **Product Name** you would like **Upgrade Plan**.
   A screen that lets you upload the license file is displayed.
2. In the **Upload License** dialog box, to upload a license file, click **Browse**.

   Note: License files only in the following formats can be uploaded: .txt and .zip.

3. Go to the location of the license file, select the file, and click **Open**.
4. Click **Upload**.

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Licenses for SaaS

- Freemium

Accessing the License Page

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **SYSTEM ADMINISTRATION**, select **License**. The **Settings :: License** page is displayed with the **License** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **License**. The **Settings :: License** page is displayed with the **License** tab open by default.
For more information on how to switch between menus, click here.	

The **Settings :: License** page shows the following details.

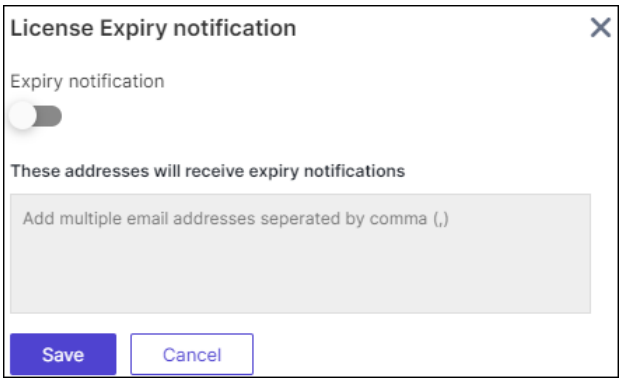


Note: Freemium product expiry will be the same as production product expiry. If multiple products are purchased with different expiry dates, the free product license expiry is determined by the maximum expiration date among them.

Note: The License page screen showcases details of products purchased or subscribed by the user, along with products activated under the Free Plan.

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Descriptions of License section

License Detail	Description
Expiry notification	On the top right corner of the screen. Click **Expiry notification** to enable the expiry notification by including email addresses to receive license expiration notifications from AppViewX. 1. On clicking on **Expiry notification**. **License Expiry notification** popup is displayed. 2. Enable the toggle to activate the Expiry notification and add email addresses to receive expiry notifications.  **Note:** Multiple Email addresses can be added using comma (,). 3. Click **Save**. The following license expiry notifications are sent to the email address: 1. License expiry alert: Your AppViewX license for the products [ADC+, DDI+, CERT+, KUBE+, PKI+] is about to expire. Kindly upgrade the license. This notification is sent to the user two days before the license expires. 2. License limit reaching: Your AppViewX License usage limit subscribed for the products [ADC+, DDI+, CERT+, KUBE+, PKI+] is about to be exceeded. Kindly upgrade the license. 3. License limit reached: Your AppViewX License usage limit subscribed for the products [ADC+, DDI+, CERT+, KUBE+, PKI+] has been exceeded. Kindly upgrade the license.

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Descriptions of License section (continued)

License Detail	Description
Refresh	Click **(Refresh)** icon to update the license details.
Subscription	This includes the details of license of AppViewX products subscribed by the user.
License updated on	Displays the date on which the license was last updated.
Account Name	Displays the associated account name.
License Key	Displays the License key details of the user. The key is generated by the customer perspective. Using which License Key of "16 digit Alphanumeric" value is generated by the sales team. Only License Key generated with installation key can be applied in the respective instance of the product. **Note:** Consider only the license key which is provided by the sales team.
Product Name	This includes the details of subscribed licenses of all AppViewX products. **Note:** Products under the **Free Plan** are indicated with a **Free Plan** flag next to the product name.
Expires in	Displays the remaining days until the respective products expire.
ADC+	
Nodes	All the ADC devices (Independent devices, Controllers, Nodes within controllers) that are onboarded in the inventory.
Objects	All the ADC Applications (Unique GTM WideIPs, LTM VIPs) discovered from the onboarded ADC devices.
CERT+	
Managed Device Certificates Instances	Managed Device Certificates Instances includes all certificates (Client, Code Signing, and Device) excluding Server and OTHERS types, from the inventory in the "Managed" state.

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Descriptions of License section (continued)

License Detail	Description
Managed Server Certificates Instances	Managed Server Certificates Instances include only server certificates from the inventory in the "Managed" state.
Managed Certificates Instances	Managed Certificate instance includes all certificates (Server, Client, Code Signing, and others) present in the certificate inventory in the "Managed" state.
Monitored Certificates Instances	Monitored Certificate Instances include all certificates (Server, Client, Code Signing, and others) present in the certificate inventory in the "Monitored" state.
DDI+	
Managed Domains	Each DDI+ license subscription allows the user a number of managed domains that can be used. The number displays DDI+ managed domains currently in use.
PKI+	
Certificates Issued	Certificates issued are the total number of certificates which includes the number of certificates issued and all CAs created in PKI. **Note:** The certificate count begins from the day the project is initialized in Google Cloud Platform (GCP)and is maintained for a year from that date. The count is reset annually.
Total CA(s)	Total CA is Number of CAs created from AppViewX. Each PKI+ license subscription allows the user a number of total CAs using this license. This is the number of total CAs used.
SIGN+	
Signature Count	Total count of signing requests executed using the signing policy.

License Alerts

Following are the system alerts which indicates the product usage limit.

- **Reaching Limit!**

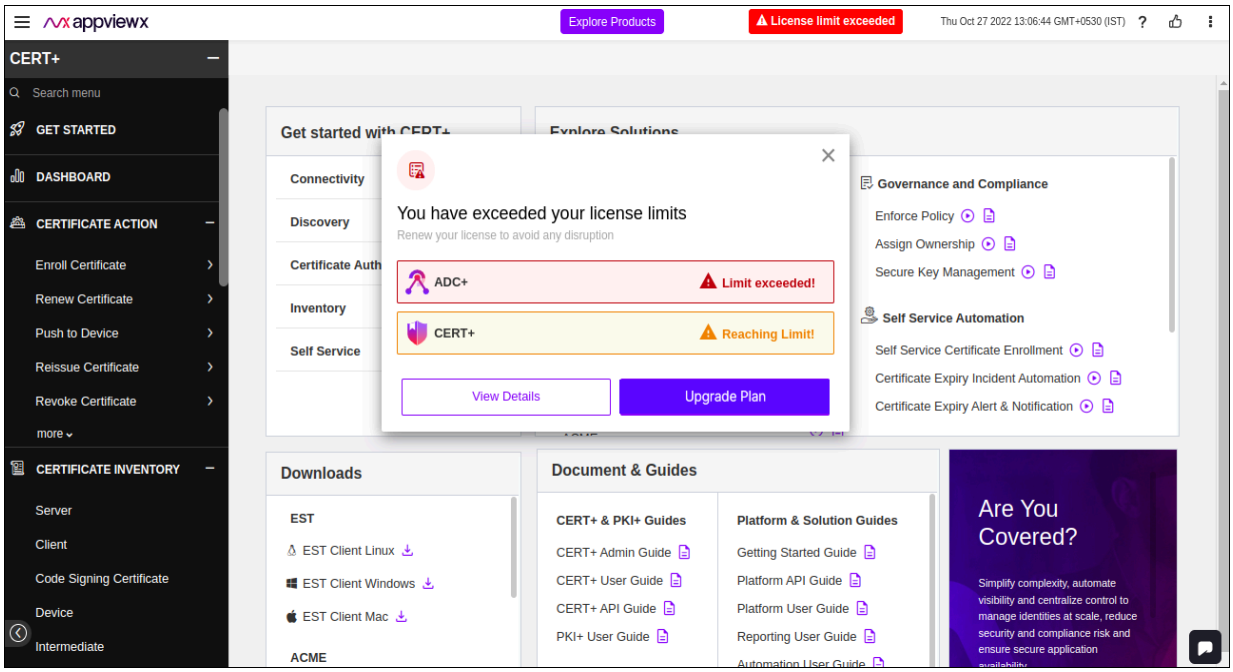
  If the usage reaches 90% of the threshold limit, then **“Reaching Limit!”** alert will be displayed.

- **Limit exceeded!**

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If the usage exceeds the threshold limit, then **“Limit exceeded!”** alert will be displayed.

- You will see a header alert message while logging In, if the license limit is exceeded.



Upgrading Licenses for SaaS

Note: AppViewX blocks the usage of the license if the license has expired. If an organization exceeds the threshold of license (maximum number of ADC+ objects, CERT+ certificates, and/or PKI+ Certificates allowed), a warning is issued as a reminder. A pop-up warning is issued for both the scenarios.

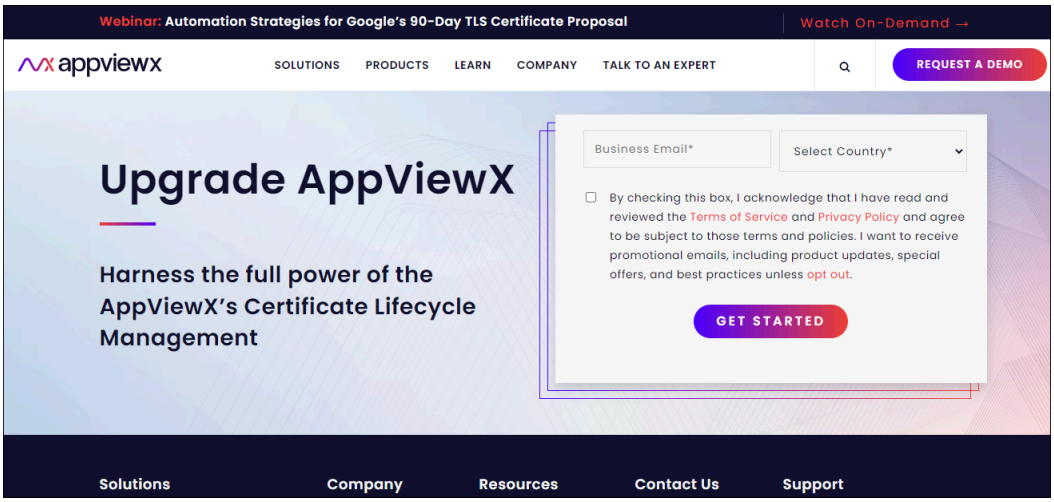
To upgrade a license:

1. On the **Settings :: License** page, to upgrade a license, click on the **Product Name** you would like **Upgrade Plan**.
2. Click **Upgrade Plan**.

   Upon clicking **Upgrade Plan**, AppViewX generates the SFDC ticket, ensuring that the sales team is promptly notified and gets in touch with you shortly.

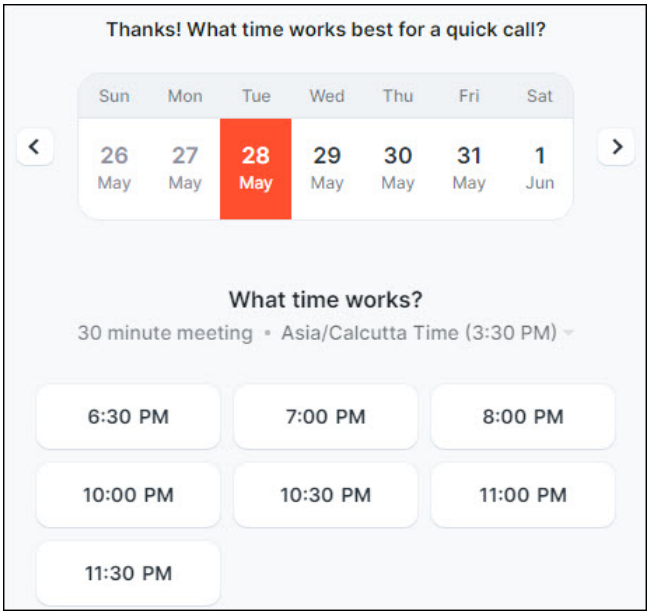
   You will be redirected to the **AppViewX Upgrade** page to select a time slot to contact with the sales team.

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3. Enter the **Business Email*** and **Select Country*** from the dropdown.
4. Select the checkbox to acknowledge the **Terms of Service** and **Privacy Policy**.
5. Click **GET STARTED**.

   What time works best for a quick call? Popup is displayed.



6. Select a feasible date and time for the sales team to connect.
7. A meeting invite will be sent to your registered email address.

   The salesperson details and invite information will be displayed on the screen.

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Freemium

Freemium is AppViewX's offering to customers who have purchased at least one product, providing them with free access to all other products until the purchased product expires. The usage limitations will align with the same count-based restrictions as the trial period.

Note:

- When multiple products are purchased with different expiry dates, the free product license expiry is determined by the maximum expiration date among them.
- To avail freemium plan, please reach out to AppViewX Support.

License Types:

- **Free Trial:** The free trial provides an opportunity to explore the capabilities of the AppViewX SaaS platform. The trial period spans 30 days, beginning from the date you receive the welcome email.
- **Production:** Once the product is purchased, the user gains access to that specific product, adhering to the selected package limit and expiration.
- **Freemium:** Freemium is an offering to customers who have purchased at least one product will receive complimentary access to all other products until the expiration of their purchased product. The usage limitations will align with the same count-based restrictions as the trial period.

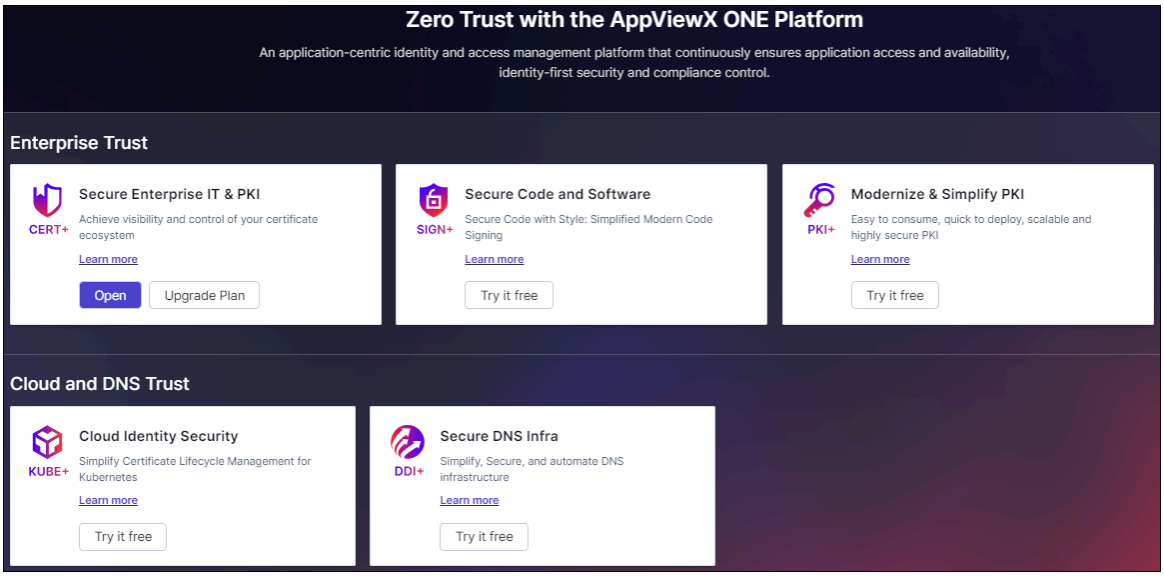
- Activation of Free Plan by Admin Users
- Activation of Free Plan by Non-Admin Users

Activation of Free Plan by Admin Users

To activate Freemium, follow the steps outlined below:

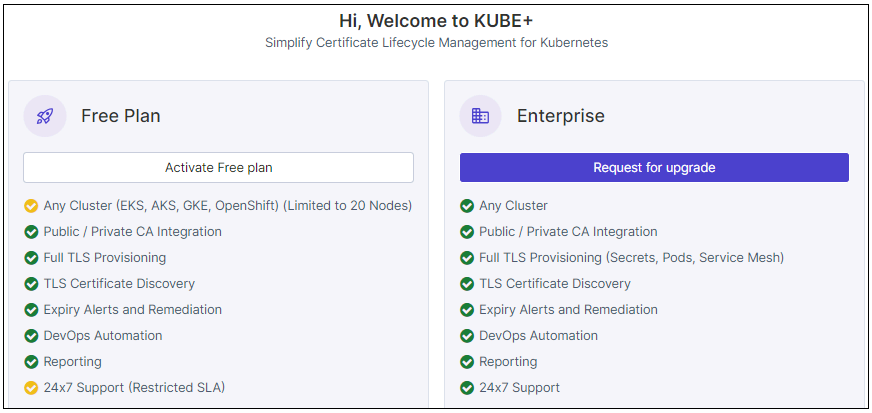
1. Login to your SaaS Account as tenant admin.
2. From the upper left corner of the screen, click **(Menu)**.
3. On the displayed menu click **All Products**.
   The **AppViewX ONE Platform** landing page is displayed.

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Note: The production license product will display options to **Open** and **Upgrade Plan**. All other products showing **Try it Free** are freemium products.

4. To try a product, click **Try it free** to start your free plan of the product.
   You will be redirected to the **Welcome** page of the selected product with features enabled in the Free plan.



Note: The free plan starts on the day you receive the activation email and AppViewX notification. The free plan period is valid until your production license expires. For more details on the free plan usage limit, please reach out to *AppViewX Support*.

Note: Only users with administrative privileges can activate the Free Plan and will be notified upon activation.

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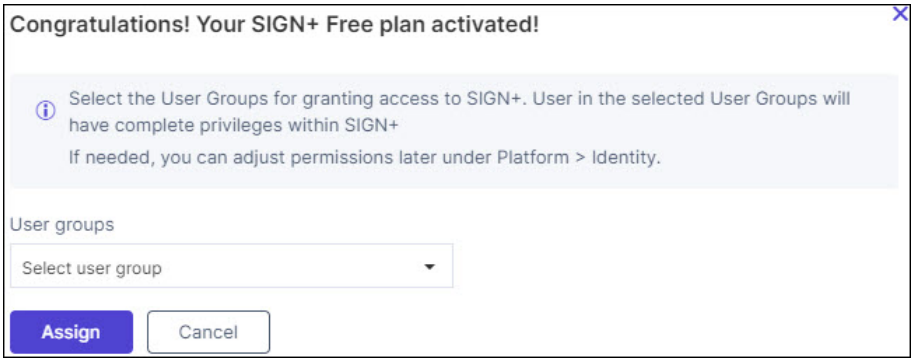
5. Click
   - Activate Free plan
   - Request for upgrade

Activation of Free plan

To Activate free plan, follow the steps below:

1. Click **Activate Free plan** for activation of free plan.
   Congratulations! Your (Product) Free plan activated! Popup is displayed.

   The Free Plan will be activated for the selected product, and you will receive an email with AppViewX notification.



2. (Optional) Select the **User Groups** for the dropdown to grant access to free products.
   Users in the selected User Groups will have complete privileges within the product.

   Note: If needed, you can modify permissions later under **Platform** > **Identity**.

3. Click **Assign**.
   Confirmation popup stating Access granted for the selected user groups is displayed and users in the selected group will receive an email as well as an in-product notification.
4. Click **Explore (Product Name)**.
   You will be redirected to the **GET STARTED/Default landing** page of the selected product and the **Free Plan** flag appears next to the product name.

   The following products are included in the Free Plan and the respective product guide links are mentioned below:
   - ADC+
   - CERT+

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- DDI+
- KUBE+
- PKI+
- SIGN+
- SSH+

Note: Activated Free Plan can also be **Deactivated**, for details click here.

OR

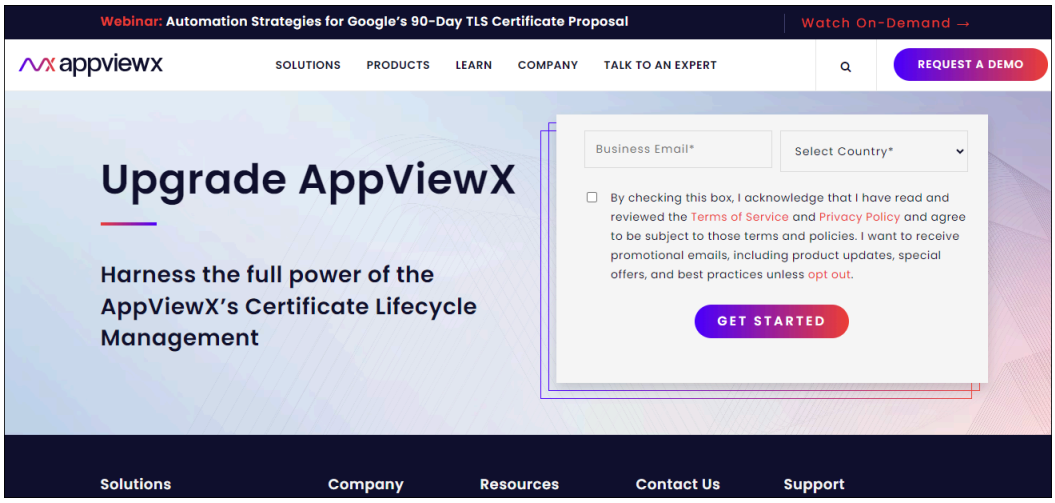
5. Click **Go to All Products** to view other products on the **AppViewX ONE Platform** landing page.

Request for upgrade

To Request for upgrade, follow the steps below:

- Click **Request for upgrade** to buy a production license.

You will be redirected to the AppViewX Upgrade page.



For more details on upgrade steps, click here.

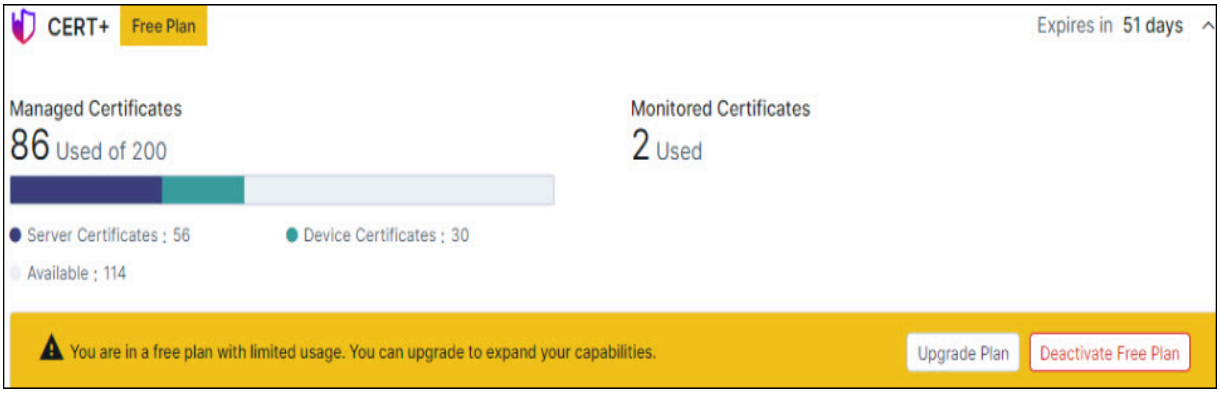
Deactivate Free Plan

Free Plan can be deactivated at any time.

To deactivate the free plan:

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1. On the **Settings :: License** page, Click on the **Product Name** of the activated free plan product.
   The **Product Free Plan** details are displayed.
2. Click **Deactivate Free Plan**.
   Deactivate Free Plan popup is displayed.



3. Click **Deactivate**.
   Product will be Deactivated Successfully and will be removed from the **License** page, the **Menu** dropdown and revoked all free plan/permissions associated with the product.

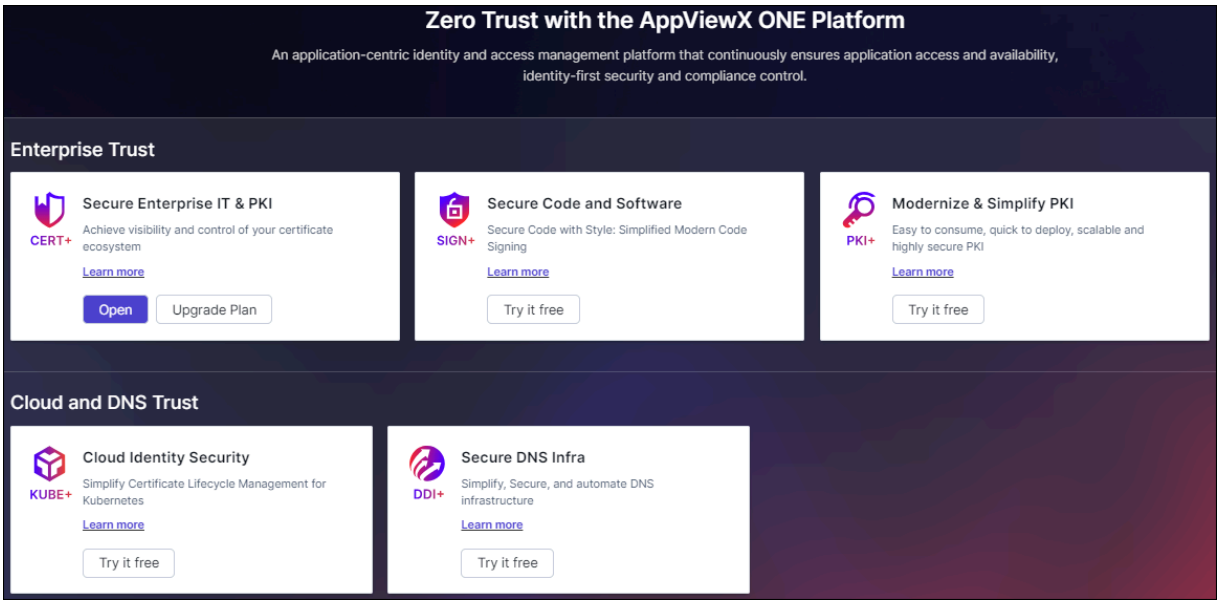
> **Note:** The data will be retained, and users can any time again activate the free plan from all products page.

Activation of Free Plan by Non-Admin Users

The following steps explain how to request for activation of free plan:

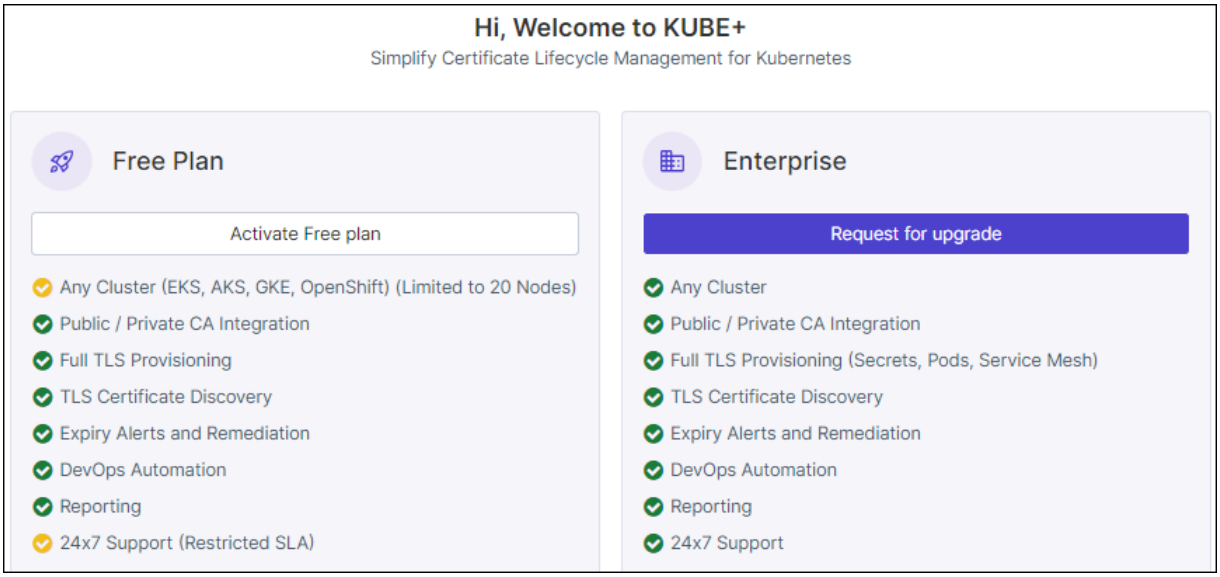
1. Login to your SaaS Account as a non-admin user.
2. From the upper left corner of the screen, click **(Menu)**.
3. On the displayed menu click **All Products**.
   The **AppViewX ONE Platform** landing page is displayed.

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Note: The production license product will display options to **Open** and **Upgrade Plan**. All other products showing **Try it Free** are freemium products.

4. To try a product, click **Try it free** to start your free plan of the product.
   You will be redirected to the **Welcome** page of the selected product with features enabled in the Free plan.



5. Click
   - **Activate Free plan** **OR**
   - **Request for upgrade**.

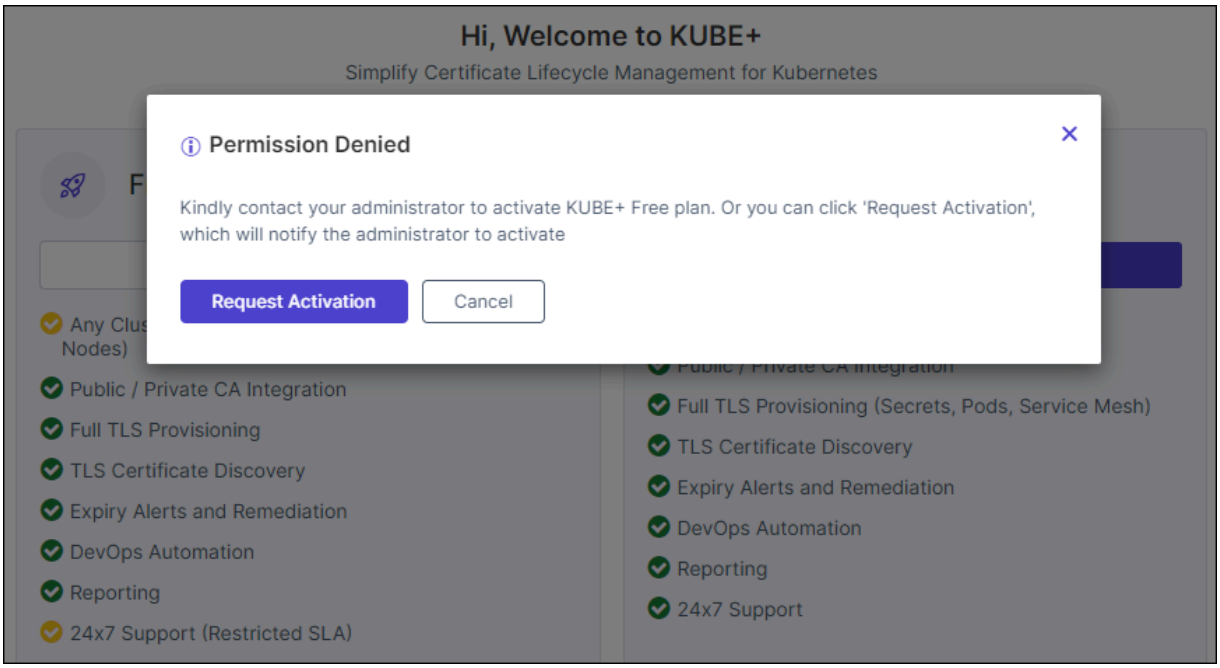
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Activation of Free plan

To request activation of free plan, follow the steps below:

1. Click **Activate Free plan** for requesting activation of free plan.
   Permission Denied Popup is displayed stating.

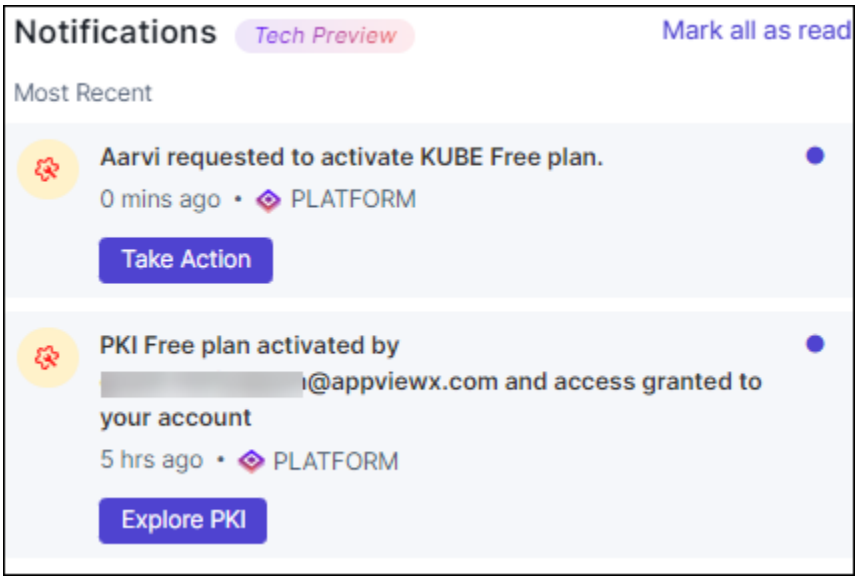
   Kindly contact your administrator to activate **[Product] Free plan**.



> **Note:** Only users with administrative privileges can activate the Free Plan. Users without admin access can click **Request Activation**, which will notify the admin/admin user group to activate the free plan.

2. Click **Request Activation**, which will notify the admin/admin usergroup to activate the free plan.

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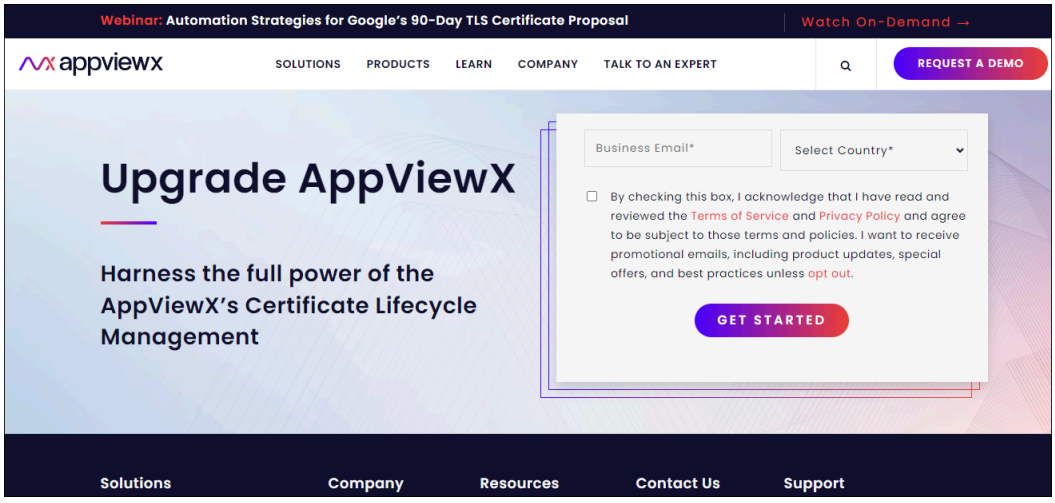
You will be redirected to the **AppViewX ONE Platform** landing page.

Request for upgrade

To Request for upgrade, follow the steps below:

- Click **Request for upgrade** to buy a production license.

You will be redirected to the AppViewX Upgrade page.



For more details on upgrade steps, click here.

Themes and Personalization

AppViewX lets you create a custom theme by customizing the following UI elements:

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- Logo
- Screenheader
- Login screen
- Email attachment representation.

- Customizing the Logo
- Customizing the Screen Header
- Customizing the Login Screen
- Customizing the Email

Accessing Themes and Personalization Settings

New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **SYSTEM ADMINISTRATION**, select **Themes and Personalization**. The **Settings :: Theme** page is displayed with the **Logo** tab open by default.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Theme**. The **Settings :: Theme** page is displayed with the **Logo** tab open by default.
For more information on how to switch between menus, click here.	

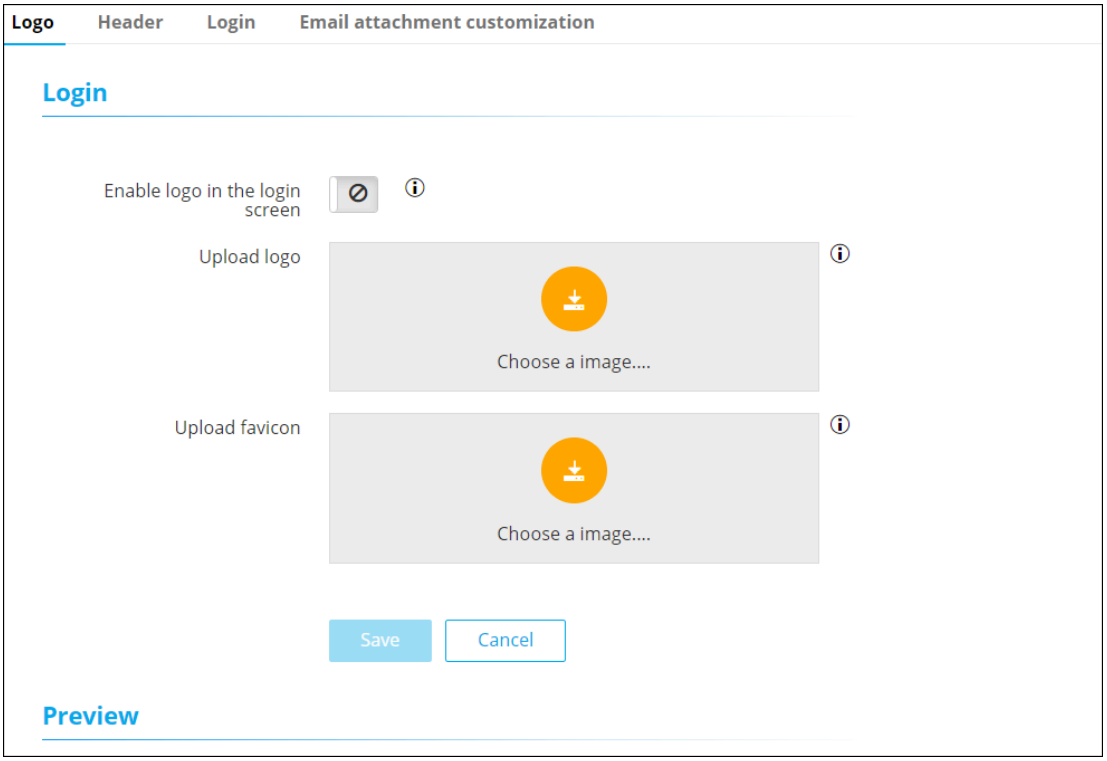
Customizing the Logo

You can replace the AppViewX logo with the logo of your organization.

To add a custom logo:

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1. On the **Settings :: Theme** page, under the Logo tab, enter the **Login** section details:



Field descriptions for Login section

Field	Description
Enable logo in the login screen	To display your organization's logo on the AppViewX screen, turn on this toggle. **Note:** If this toggle key is disabled, AppViewX's default theme settings are applied.
Upload logo	This field is enabled only when the Enable logo in the toggle screen toggle is turned on. To choose a logo image: a. Click  **(Upload)** icon. b. From Windows Explorer, navigate to the location of the logo image, select the image, and click **Open**.

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Field	Description
	Note: • Image formats allowed for upload: **.png** and **.svg** • Maximum image resolution allowed: 865 X 185 (width X height) • Image size: < 5 MB • Recommended image dimensions: 175 X 37 (width X height) c. In the **Confirmation Message** dialog box, click **Yes**.
Upload favicon	This field is enabled only when the Enable logo in the toggle screen toggle is turned on. To choose a favicon image: a. Click  **(Upload)** icon. b. From Windows Explorer, navigate to the location of the logo image, select the image, and click **Open**. **Note:** • Image formats allowed for upload: **.png** • Maximum image resolution allowed: 64 X 64 (width X height) • Image size: < 5MB c. In the **Confirmation Message** dialog box, click **Yes**.

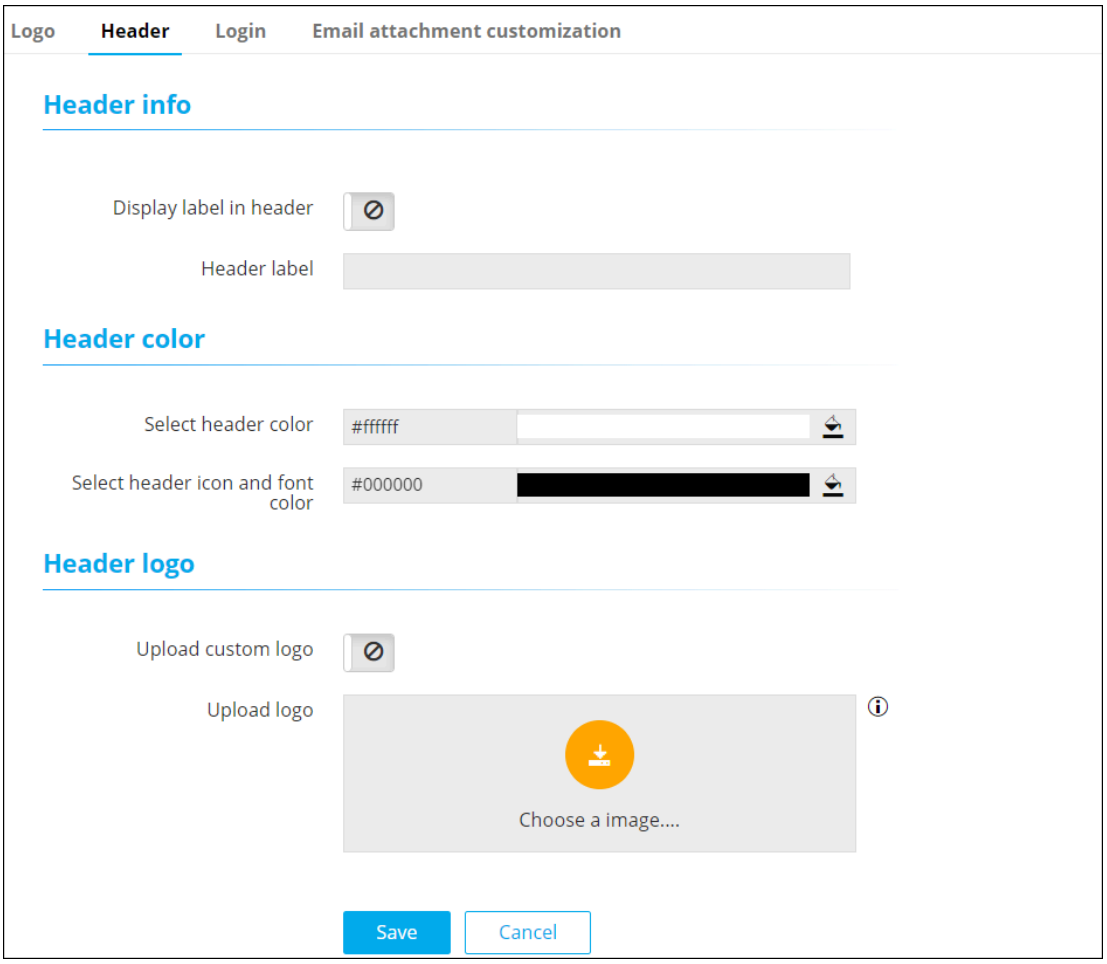
2. In the **Preview** section, view a preview of the login screen after your custom logo and favicon have been uploaded.
3. To apply the changes, click **Save**.

Customizing the Screen Header

To customize the screen header:

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1. On the **Settings :: Theme** page, to customize the screen header, click **Header** tab, enter the **Header Info**, **Header color** and **Header logo** section details:



Field descriptions for Header Info section

Field	Description
Display label in header	To display custom header text, turn on this toggle.
Header label	Enter the custom header text. This field is enabled only when the **Display label in header** toggle is turned on.

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Field descriptions for Header color section

Field	Description
Select header color	To set a color for the header text: a. Enter the hex code of the required header color. **OR** b. To select a color, click  .
Select header icon and font color	To set a color for the header icon and the font: a. Enter the hex code of the required color. **OR** b. To select a color, click  .

Field descriptions for Header logo section

Field	Description
Upload custom logo	To insert a custom logo image in the header, turn on this toggle.
Upload logo	This field is enabled only when the Upload custom logo toggle is turned on. To upload a logo image: a. Click  **(Upload)** icon. b. From Windows Explorer, navigate to the location of the image, select the image, and click **Open**. **Note:** • Image formats allowed for upload: **.png** and **.svg** • Maximum image resolution allowed: 865 X 185 (width X height) • Image size: < 5 MB • Recommended image dimensions: 175 X 37 (width X height) c. In the **Confirmation Message** dialog box, click **Yes**.

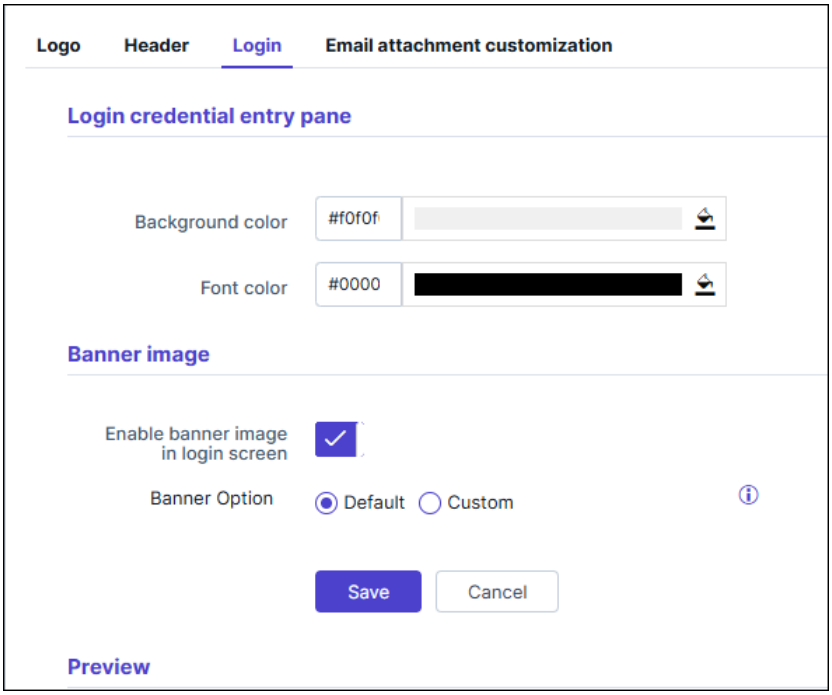
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2. In the **Preview** section, view a preview of your header customization.
3. To apply the changes, click **Save**.

Customizing the Login Screen

To customize the login screen:

1. On the **Settings :: Theme** page, to customize the login screen, click the **Login** tab, enter the **Login credential entry pane** and **Banner image** section details:



Field descriptions for Login credential entry pane section

Field	Description
Background color	To set a background color for the login screen: a. Enter the hex code of the required background color. **OR** b. To select a color, click  .

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Field	Description
Font color	To set a font color for the text on the login screen: a. Enter the hex code of the required font color. **OR** b. To select a color, click  .

Field descriptions for Banner image section

Field	Description
Enable banner image in login screen	To display a banner image on the login screen, turn on this toggle. If turned off the login page banner section is blank.
Banner Option	Choose any of the following: • **Default** - a default AppViewX banner is displayed on the login page. • **Custom** - It displays the radio button field **Banner Type** (described below).
Banner Type	Choose any of the following. • **Image** - Allows to upload an image from the **Upload image** field. The image is displayed in the login page on the left. • **URL** - Allows to enter the internal/external URL. The contents of the URL defined will be displayed on the left of the login page.
***Upload image**	This field is enabled only when the **Banner Option** = **Custom**. To upload a banner image: a. Click  . b. From Windows Explorer, navigate to the location of the image, select the image, and click **Open**. **Note:** • Image formats allowed for upload: **.jpg**, **.jpeg**, and **.png** • Recommended image resolution: 1200px width and 1200px. • Image size: < 5 MB • Image file name can contain letters, numbers, spaces, and special characters (), _, and -. c. In the **Confirmation Message** dialog box, click **Yes**.

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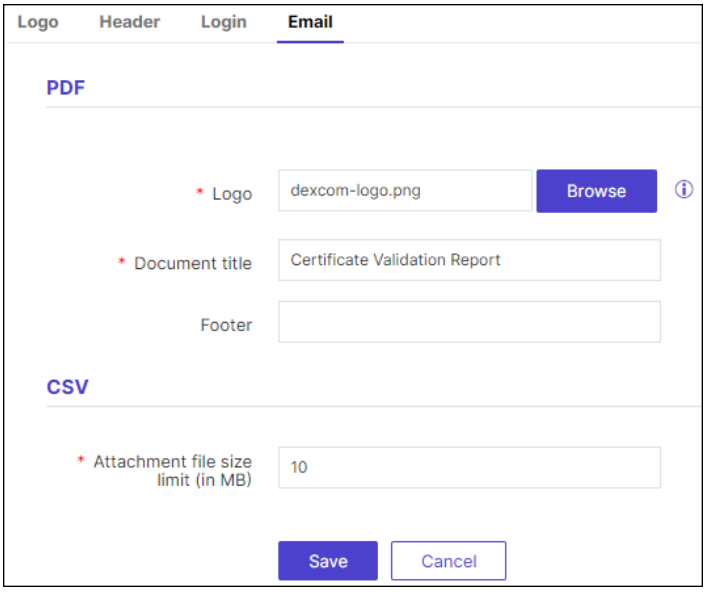
Field	Description
***URL**	Enter a secure HTTPS URL with CORS enabled to display custom content on the login page.

2. In the **Preview** section, view a preview of your customization for the login screen.
3. To apply the changes, click **Save**.

Customizing the Email

To customize the cosmetics of how email are represented:

1. On the **Settings :: Theme** page, click the **Email** tab and enter the **PDF** section details:



Field descriptions for PDF section

Field	Description
***Logo**	To upload a logo image for the attachment: a. Click **Browse**. b. Navigate to the location of the image, select the image, and click **Open**. **Note:** The image size must be less than 50 KB.
***Document title**	Name to be assigned to the PDF when it is downloaded.

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Field	Description
Footer	Footer content to be added to the PDF.
**: Mandatory fields*	

2. In the **CSV** section, enter the **Attachment file size limit (in MB)**.

> **Note:** This is a mandatory field.

3. To apply the changes configured above, click **Save**.
4. For **Email Template** section, refer the section below.

Email Template

Email template involves customizing the design and content to align with specific communication needs, ensuring a consistent and professional appearance for outgoing emails.

In the **Email Template** section, follow these steps to create a new email template:

1. Click **+ Create new**.
   The **Email Template Config** page is displayed.
2. Enter the **Email Template Config** section details:

Field descriptions for Email Template section

Field	Description
***Name**	Provide a unique name for the email template.
Description	Explain or provide information about the email template.

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Field	Description
Upload logo	To choose the logo. a. Click **Browse**. b. From Windows Explorer, navigate to the location of the logo image, select the image, and click **Open**. **Note:** • Image formats allowed for upload: **.png** and **.svg** • Maximum image resolution allowed: 865 X 185 (width X height) • Image size: < 5 MB • Recommended image dimensions: 175 X 37 (width X height).
Upload banner	To choose the banner. a. Click **Browse**. b. From Windows Explorer, navigate to the location of the logo image, select the image, and click **Open**. **Note:** • Upload an image in the **.png / .svg / .jpeg / .jpg** format only • The maximum resolution of the image should be 700 x 200 (width x height) • The size of the image must be less than 5 MB • Recommended image size is 700 x 200 (width x height).
Body	Add the body content before or after the "[[BodyContent]]" and do not remove the "[[BodyContent]]" string. The content before and after the body content can remain the same, while the content added within the string is dynamic and can be adjusted based on the requirements.
Signature	Add signature content in the email, serving as a verification mark for authenticity.
Footer Message	Add the Footer Message content to the email.
**: Mandatory fields*	

3. In the **Preview** section, view a preview of your customization for the email template.

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4. Click **Create**.
   The **Email Template** will be generated and displayed in the Templates section.

What to do next:

- **Edit** an email template by hovering over it, click  **(Edit)** icon, making the necessary changes, and then click **Update**.
- **Clone** an email template by hovering over it, click  **(Clone)** icon, making all the necessary changes, and then click **Create**.
- **Delete** an email template by hovering over it, click  **(Delete)** icon and then click **Delete**.

Managing the Login Policy

Accessing the Login Policy

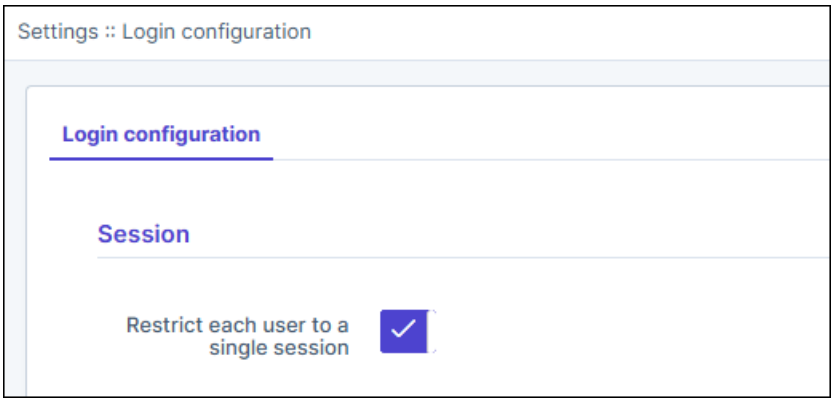
New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **SYSTEM ADMINISTRATION**, select **Login Policy**. The **Settings :: Login configuration** page is displayed.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **SMTP**. The **Settings :: SMTP** page is displayed.
For more information on how to switch between menus, click here.	

Restricting the Number of User Sessions

The **Restrict each user to a single session** toggle is turned off be default. The number of user sessions can be restricted by enabling this feature.

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1. On the **Settings :: Login configuration** page, in the **Session** section, the **Restrict each user to a single session** toggle is enabled by default. To disable the single session, turn off the toggle.

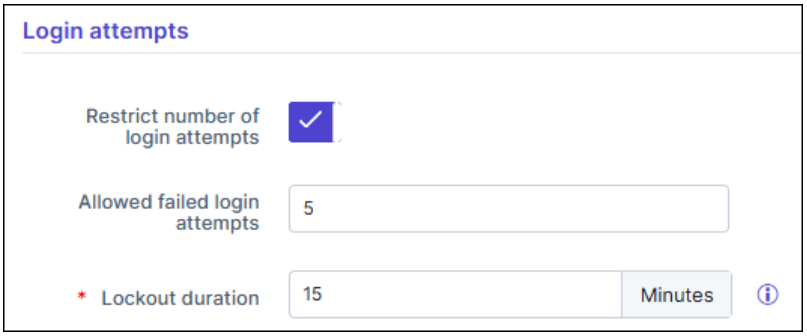


2. Click **Save**.
3. In the **Confirmation** pop-up, click **OK**.
   The Login setting is modified and will be applied from next login for internal users.

Restricting the Number of Login Attempts

The **Restrict number of login attempts** toggle is turned off be default. The number of login attempts can be restricted by enabling this feature.

1. On the **Settings :: Login configuration** page, in the **Login attempts** section, enter the following field information:



Field descriptions for Login attempts

Field	Description
Restrict number of login attempts	Turn on this toggle to restrict the number of login attempts by a user.
Allowed failed login attempts	Enter any number between 0 and 99 to set the number of login attempts permitted.

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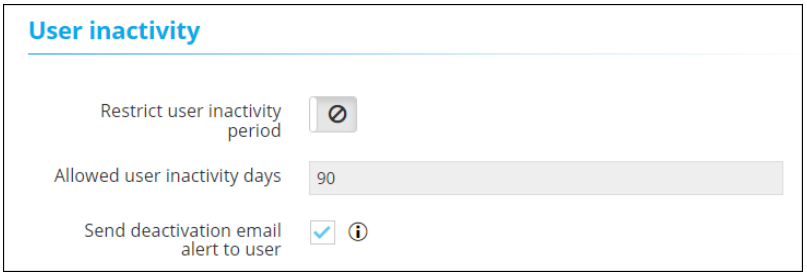
Field	Description
	By default, this value is set to 5. If the user enters incorrect details more than 5 times, he/she will get locked out.
***Lockout duration (Minutes)**	Enter a value for the duration for which the account will be locked after the specified number of failed attempts. If the value entered is 0, then the account will remain locked until the administrator unlocks it manually.
** : Mandatory fields*	

2. Click **Save**.

Managing User Inactivity

AppViewX lets you restrict a user from logging in to the system if they have been inactive for a predefined duration.

1. On the **Settings :: Login configuration** page, in the **User inactivity** section, turn on the **Restrict user inactivity period** toggle.



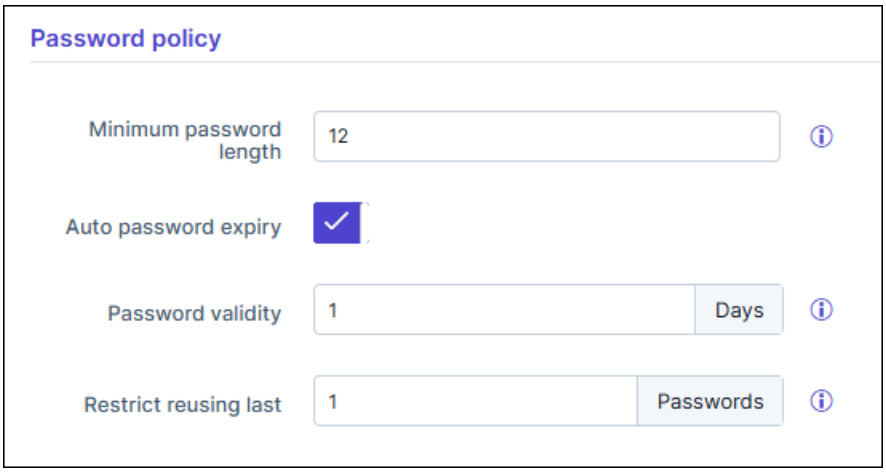
2. To set the number of days for which a user can remain inactive, in the **Allowed user inactivity days** text field, enter the required value (between 0 and 99).
3. To send the user an email when they are deactivated, select the **Send deactivation email alert to user** check box.
   An email alert is sent to the user for three consecutive days before deactivation.
4. Click **Save**.

Managing Password Policy

AppViewX allows you to manage password policies, enabling the configuration and enforcement of rules for minimum password length, automatic password expiry, setting password validity, and restricting the reuse of the last password. These measures enhance security within the system.

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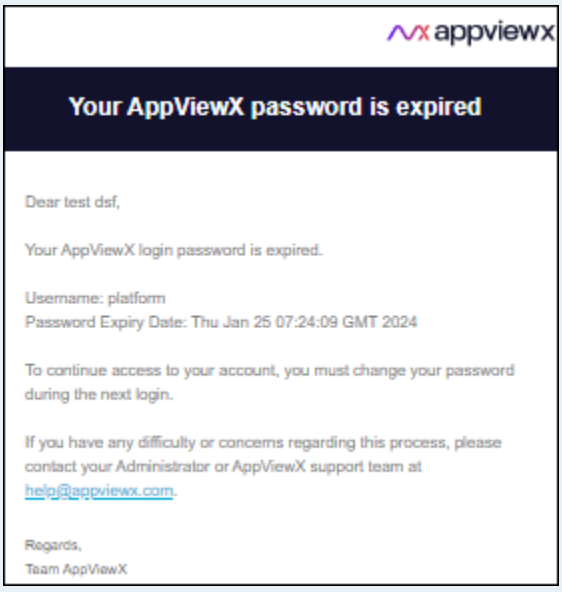
1. On the **Settings :: Login configuration** page, within the **Password Policy** section, adjust the **Minimum password length** from a minimum of 12 characters to a maximum of 128 characters.



Note: Users must reset their passwords for the new password length to take effect. The system applies the minimum password length requirement only to internal users.

2. Enable or Disable the **Auto password expiry** toggle for automatic expiration of user passwords for enhanced security.
3. Define the **Password validity** duration in days, with a maximum limit of 1098 days.

Note: The system sends email notifications to users seven days before their password expires and enforces a password change once the password has expired.



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4. Define the number to **Restrict reusing last** passwords. This prevents users from reusing the last set number of passwords when changing it. The default value is 10 (i.e. users cannot use the last 10 passwords). Configure the value from 1 to 10.
5. Click **Save**.
   The login configuration changes are saved.

User Survey

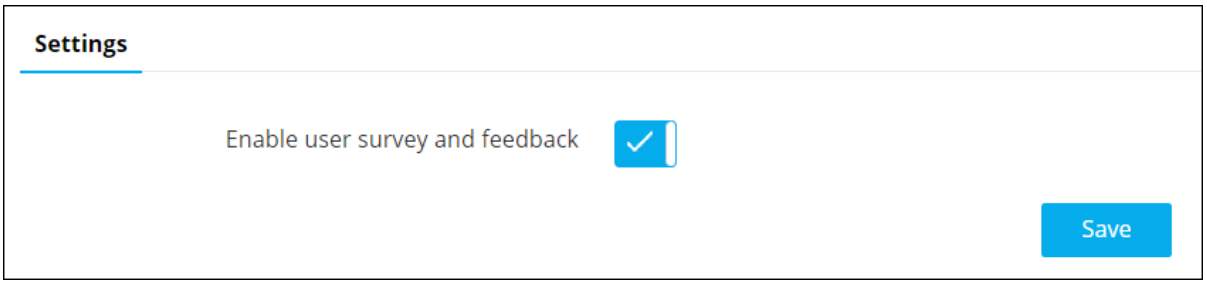
AppViewX hosts a user feedback feature on its report building platform, where users can rate their experience with the report builder and also submit a descriptive comment on the tool. This feedback can then be used to create reports to track customer experience.

Enabling/Disabling the Feedback Option

To enable or disable the feedback option:

New Menu	Old Menu
1. Navigate to the **Platform** module. 2. From the left menu, under **SYSTEM ADMINISTRATION**, click **User Survey**. The **Settings :: Reports** page is displayed.	1. From the main menu, select **Settings**. 2. On the **Settings** page, under **General**, select **Reports**. The **Settings :: Reports** page is displayed.
For more information on how to switch between menus, click here.	

1. To enable feedback, on the **Settings :: Reports** page, turn on the toggle.

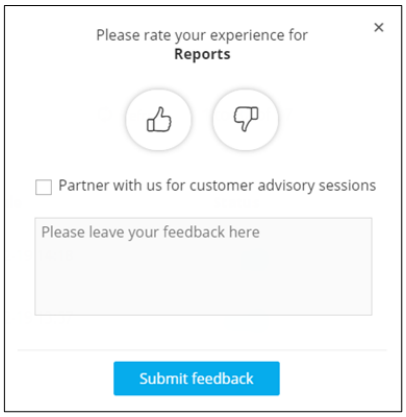


2. To disable feedback, turn off the toggle.
3. Click **Save**.

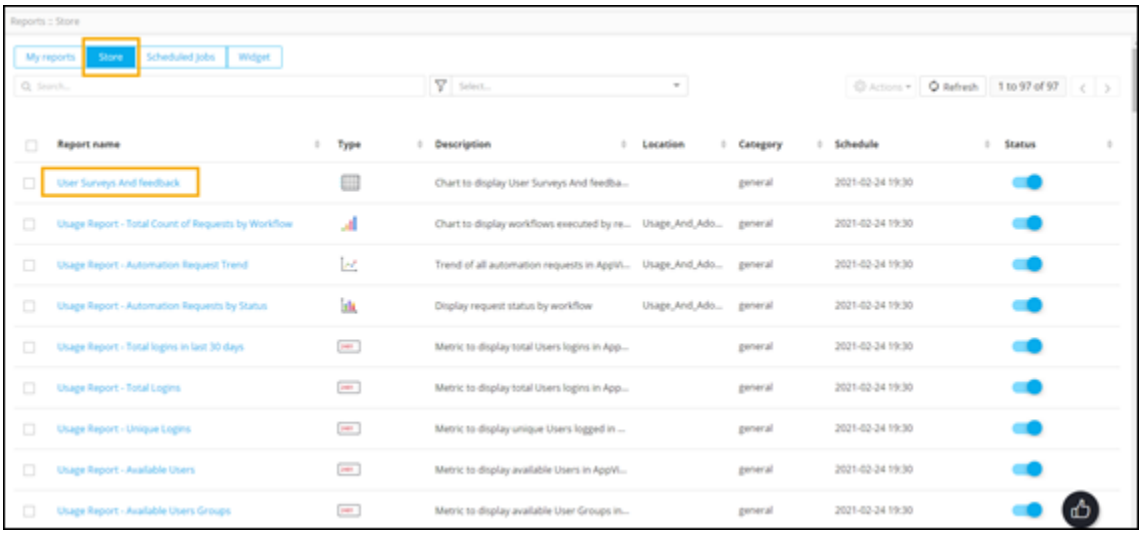
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Submitting a Feedback

1. Log into AppViewX.
2. From the top right corner of the screen, click **(Profile)** icon.
3. From the menu displayed, click **Feedback**.
4. Enter your feedback comments, and then click **Submit feedback**.



The **User Surveys and feedback** report on the **Store** page gives detailed information on user feedback.



Setting the Cryptographic Policy

AppViewX enforces a SFTP-based cryptographic policy for protection of sensitive data. Ciphers are used for performing any file operations within AppViewX's functionality and to communicate with devices added in AppViewX.

To set the cryptographic policy:

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New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **SYSTEM ADMINISTRATION**, select **Crypto Policy**. The **Settings :: Advanced Settings** page is displayed.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Advanced**. The **Settings :: Advanced Settings** page is displayed.
For more information on how to switch between menus, click here.	

1. On the **Settings :: Advanced Settings** page, in the **SFTP Cryptographic Policy** section, enter the following details:

   Field descriptions for SFTP Cryptographic Policy

Field	Description
Key Exchange Algorithms	Algorithms used to exchange keys for a successful handshake between the client and the server.
Cipher parameters	Parameters to encrypt the connection between the client and the server.
HMAC parameters	Parameters to ensure that the received message is intact and not tampered during its delivery from the client to the server and vice versa.
Connection retry limit	Number of attempts to retry establishing a connection between the client and the server.

2. Click **Save**.

Enabling Dashboard View for the User

To prevent loss of control over organizational data in the event that a resource leaves the organization, AppViewX lets the admin user have default access to all user dashboard, private as well as public.

To enable default admin access to all dashboards:

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New Menu	Old Menu
In the **Platform** module, from the navigation pane on the left, under **SYSTEM ADMINISTRATION**, select **Dashboard**. The **Settings :: Dashboard** page is displayed.	1. From the main navigation menu, click **Settings**. 2. On the **Settings** page, from the left menu, select **General** > **Dashboard**. The **Settings :: Dashboard** page is displayed.
For more information on how to switch between menus, click here.	

1. On the **Settings :: Dashboard** page, you can perform any of the following:
   a. To enable the admin users default access to all the dashbords, turn on the **Dashboard view for admin** toggle.
   b. To allow users to configure automatic refresh on Application View widgets, toggle the **Auto Refresh** option.
2. Click **Save**.

Glossary

Definitions of common terms used in guide

Term	Definition
HSM	An HSM (Hardware Security Module) is a piece of hardware and associated software or firmware that usually resides in a PC or server and provides at least the minimal cryptographic functions. These functions include (but are not limited to) encryption, decryption, key generation, and hashing.
LDAP	The Lightweight Directory Access Protocol (LDAP) is an authentication protocol to validate a user's credentials, entered in an application, against the credentials stored in the Active Directory database.
PAM	Privileged Access Management (PAM) is the practice of managing users/ devices/applications that have elevated access to an organization's most confidential and critical resources.
RADIUS	The Remote Authentication Dial-In User Service (RADIUS) protocol is a networking protocol that provides centralized authentication, authorization, and accounting management.

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Definitions of common terms used in guide (continued)

Term	Definition
RBAC	Role and Resource-Based Access Control (RBAC) is a method of restricting AppViewX functions, network resources that can be managed and monitored in AppViewX based on the roles of individual users within an enterprise.
Resource	All the devices and objects that are configured within AppViewX are termed as Resources. Resources can be assigned to a user group. Users within a user group will inherit resources assigned to that group. User groups can be assigned more than a resource.
Role	A set of permissions to execute specific tasks in the application is termed as Roles in AppViewX. Roles can be assigned only to a user group. Users within user groups will inherit role permissions assigned to that group. User groups can be assigned more than one role.
SAML	The SecurityAssertion Markup Language (SAML) protocol is used for authenticating and authorizing user identity for Single Sign On (SSO) services.
TACAS	The Terminal Access Controller Access Control System (TACACS) authentication is used to validate users requesting remote access.
User	A user is an individual who has access to AppViewX using a unique username and password maintained internally or by an external enterprise server such as Active Directories (AD).
User Group	user group is a set of individual users assigned with the same roles and resources. You can associate one or more roles and resources to a user group. Users within that user group are granted the role and resource permissions.

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Chapter 2: Platform API Guide

This guide provides information about the AppViewX exposed APIs intended for use in **Platform** actions.

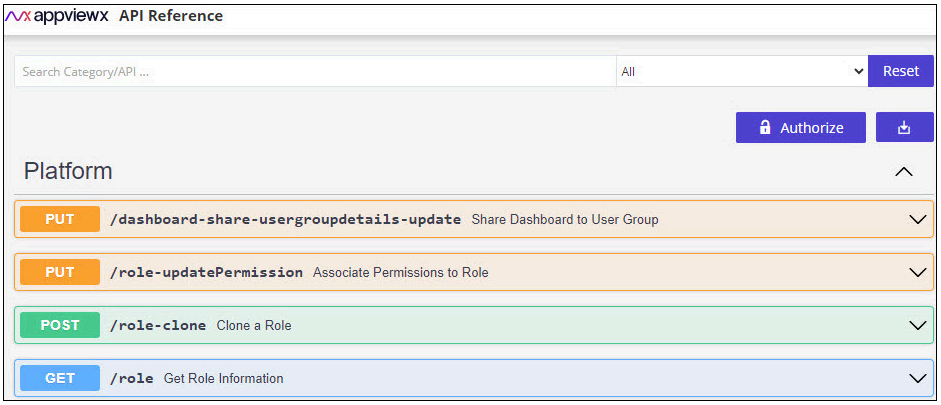
API Reference

This applies only to AppViewX customers. To try the AppViewX exposed APIs on Swagger, follow these steps:

1. From the top right corner of your screen, click {...} **(API Reference)** icon.

   Note: The **API Reference** icon is displayed for the Admin user and users with ACF permission enabled for API Reference.

   You will be redirected to **AppViewX API Reference** page.



2. Click any API to **Try it out**.

Enable ACF Permission for API Reference

To enable the ACF permission for non-admin roles to access the API reference, follow these steps:

1. Go to **Platform** module **IDENTITY** > **Role**.

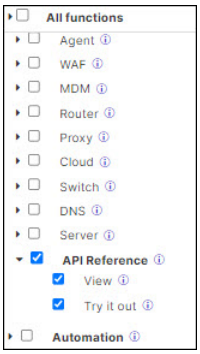
   You will be redirected to **Role** page.

2. Click on the role name to enable the ACF permission.

   You will be redirected to the **Modify :: [RoleName]** page, with the **Information** tab open by default.

3. Switch to the **Authorized Functions** tab and expand the **Platform** by clicking **(Expand)** icon.
4. To assign **API Reference**, select the checkbox beside **API Reference**.

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5. Click **Save**.

Best Practices for Working with the AppViewX API

- **Use appropriate HTTP methods**

  Ensure that the correct HTTP method is used for each operation (e.g., GET for retrieval, POST for creation).

- **Handle errors gracefully**

  Implement proper error handling in your application to manage API responses.

- **Use secure storage**

  Store access tokens securely and avoid hardcoding them in your application code.

- **Implement pagination**

  For endpoints that return large datasets, implement pagination using limit and offset parameters.

- Understanding the AppViewX Platform API
- Authentication Using a User Account
- Authentication Using a Service Account
- Commons
- Glossary

Understanding the AppViewX Platform API

The AppViewX API is a programmatic way to get data in and out of the AppViewX subsystems. With access to RESTful AppViewX APIs, you can leverage the raw potential of AppViewX. It provides a

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powerful way to channel the data into native business applications. This document comprises of module-wise APIs used in AppViewX.

RESTful HTTPS Requests

The Platform API uses RESTful principles, leveraging standard HTTP methods to interact with resources. All requests must be made over HTTPS to ensure security.

Type	Description
GET	GET requests, retrieve resource representation/information only and not to modify it.
POST	POST APIs create new subordinate resources. For example, a file is subordinate to a directory containing it or a row is subordinate to a database table. In terms of REST, POST methods are used to create a new resource into the collection of resources.
PUT	PUT APIs are used to update existing resources (if a resource does not exist then API may decide whether to create a new resource or not).
DELETE	DELETE APIs are used to delete resources (identified by the Request-URI).

Requests

Each endpoint URL is built in the same way by the following structure:

```
http://<IP/HostName/TenantName>:<GWPORT>/avxapi/<Endpoint>?<gwsource>
```

The explanation has been added to all APIs in the Reference section.

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.

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- **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

  The tenant name will be included in the endpoint URL for a SaaS deployment.

- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Request Structure

All endpoints accept a request structure that should consist of JSON formatted data. To ensure the request is accepted, set the header **Content-Type: application/json**.

The following example shows a request to add a resource:

```
{
"payload": {
"name": "resource_1",
"description": "This is a sample resource."
}
}
```

Response Structure

The Content-Type of the response is typically determined by the Content-Type header, and for most endpoints, it will be application/json. All requests that reach the server, regardless of the response code, will retrieve a response body. A successful request will contain a body with the requested information, for example:

```
https://appviewxapi.com/avxapi/resource?gwkey=f000ca01&gwsource=external
```

Returns the following JSON structure that a resource is added:

```
{
"response": "Resource added successfully",
"message": "Resource added successfully",
```

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```
"appStatusCode": null,
"tags": null,
"headers": null
}
```


Description of Server Responses

HTTP Code	Response Message
200 OK	The request was successful (some API calls may return 201 or 202 instead).
400 Bad Request	The request is not understood or required parameters are missing.
401 Unauthorized	Authentication failed or the user doesn't have permissions for the requested operation.
409 Forbidden	Access denied.
404 Not Found	Resource not found.
429 Too many requests	The number of requests to the service has crossed the threshold.
503 Service unavailable	The client cannot communicate with the service.
504 Gateway timeout	The given request has exceeded the expected time.

URI Scheme

- **Host :** {url}
- **BasePath :** /avxapi
- **Schemes :** HTTPS
- **URL :** https://{url}/avxapi

Types of Accounts in AppViewX

There are two types of accounts in AppViewX:

- **User Accounts**: These are used by actual users.
- **Service Accounts**: These are used by system services such as web servers, automation tools, and so on.

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AppViewX recommends using a Service Account for accessing APIs from automation tools. Service Accounts are supported with oAuth standard for a more secure and standard way of accessing APIs.

Note: AppViewX supports both User Account and Service Account for accessing APIs.

Authentication Using a User Account

For accessing APIs, you can login via two types of accounts:

- User account

  A **User account** represents an individual person interacting with the application or the system. User accounts are used for accessing the system on behalf of a user.

  For accessing APIs with a user account, you need to get the session ID by providing a username and password in the login API. This session ID can then be used for accessing other APIs.

  Note: You can also use the username and password in all API calls instead of the sessionId. However, this is not recommended.

- Service account

  A **Service account** represents a non-human entity such as an application or a service. It is used for automated processes or system-to-system interactions without human intervention.

  For accessing APIs with a service account, you need to get the Access Token by providing Client ID and Client Secret in get-service-token API. This Access Token can then be used for accessing other APIs.

  Note: Access Token Validity is 30 minutes by default and it can be configured in **Settings** > **Authentication** > **oAuth Settings**.

- Retrieve session ID using login API
- Using Session ID for further API calls
- Logout Active Session

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Retrieve session ID using login API

This API used to retrieve the session ID using the login API for secure authentication and access to system resources.

Before you begin

- Make sure you have valid login credentials (Username and Password) for accessing the system.
- You cannot use OAuth credentials (Client ID and Client Secret) for login.
- To access the APIs using the service token, use the API with the Service Account.

Request Structure

Endpoint	`/login`
Type	`POST`
Sample URL	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/login?gwsource=external` To understand the elements of the sample URL, click here.
Headers	
Content-Type	application/json
Request timeout period	15 minutes

Input Parameters

Name	Description
username *Header*	(Mandatory) Use login name of the user. **Type:** String **Example:** "admin"
password *Header*	(Mandatory) Password for the username. **Type:** String **Example:** "AppViewX@123"

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Input Parameters (continued)

Name	Description
otp *Header*	(Mandatory only if MFA is enabled) If MFA is enabled, enter the OTP received on your registered email ID in the header. Multifactor authentication (MFA) is a security mechanism that requires users to provide two or more verification factors to gain access to a resource If MFA is enabled, and you try to login with only the username and password, you will get the following error upon execution of the API: **MFA is enabled. We have sent an OTP to your email ID: aaa********r@appviewx.com**. In this case, ensure that the OTP is included in the header and try logging in again. **Type:** String **Example:** "OTP : **609700**"
Content-Type *Header*	(Mandatory) The parameter should be set to `application/json` to specify the nature of the data in the payload. **Type:** String **Example:** "application/json"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** String

Response Structure

- **Status Code:** 200 Ok
- **Message:** Login Successful
- **Headers:**
  - **Content-Type:** application/json

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Response Parameters

Name	Description
response	The response contains the attributes needed to retrieve the session ID.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Name	Description
status	Indicates the overall status of the response. The values can be: • SUCCESS • FAILURE
appStatusCode	An application-specific status code, if applicable.
statusDescription	Description of the status, if available.
sessionId	Unique identifier for the session.
lockDownPeriod	Number of login attempts remaining.
termsAccepted	
passwordExpiryMsg	
emailId	

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	NA	Login successful
400 Bad request	ACCT_AUTH_001	Username or password cannot be null or empty.
401 Unauthorized	ACC_AUTH_022	Login failed. Invalid credentials.
401 Unauthorized	ACC_AUTH_006	Login failed. Invalid credentials.

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Sample Request/Response

Use Case

Login to the application with a username and password.

Request URL

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/login?gwsource=external
```

Request Payload

```
{}
```

Sample Response

```
{
    "response": {
        "status": "SUCCESS",
        "appStatusCode": null,
        "statusDescription": null,
        "sessionId": "avx~~c73a4f56-f4ab-4cdf-aadf-6d90bf406077",
        "authCode": null,
        "lockDownPeriod": 15,
        "emailId": null,
        "termsAccepted": true,
        "passwordExpiryMsg": ""
    },
    "message": "Login successful.",
    "appStatusCode": null,
    "tags": null,
    "headers": null
}
```

What's Next

- **Using Session ID for further API calls**

Reference

Understanding the sample URL:

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- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Using Session ID for further API calls

The sessionID retrieved using the login API can be used in the header for making further API calls.

In this section, as an example, we are using the session ID with the API call for adding a role.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.

Request Structure

Endpoint:	`/role`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/role?&gwsource=external`

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To understand the elements of the sample URL, click here.	
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId *Header*	(Mandatory) Use session ID retrieved from login API, if username and password are not provided. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
name *String*	(Mandatory) Name of the role to be added. **Example:** "role_1"
description *String*	(Optional) Description of the role to be added. **Example:** "Adding a new role"

Response Structure

- **Status Code:** 201 Created
- **Message:** Role added successfully

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- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for role added successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
201 Created	null	Role added successfully.
409 Conflict	ACCT_RO_002	Role name already exists
400 Bad Request	VALIDATION_ERROR_0004	'name' should have at least '2' characters, Mandatory Field 'name' is missing or empty.
400 Bad Request	ACCT_RO_015	Role name invalid.

Sample Request/Response

Use Case

Using the session ID acquired from the login API to execute subsequent API calls, specifically for adding a role API.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/role?gwsource=external
```

Request Payload

```
{
"payload": {
 "name":"role_01",
 "description":"Adding a new role"
```

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```
}
}
```

Sample Response

```
{
"response": "Role added successfully",
"message": "Role added successfully",
"appStatusCode": null,
"tags": null,
"headers": null
}
```

What's Next

- **Search for a Role**
- **Delete a Role**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

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- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Logout Active Session

This API endpoint is used to logout a user by terminating their active session. It ensures that the user is no longer authenticated.

Request Structure

Endpoint	`/acctmgmt-perform-logout`
Type	`POST`
Sample URL	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/acctmgmt-perform-logout?gwsource=external` To understand the elements of the sample URL, click here.
Headers	
Content-Type	application/json

Input Parameters

Name	Description
sessionId *Header*	(Mandatory) Use Session Id received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
Content-Type *Header*	(Mandatory) The parameter should be set to `application/json` to specify the nature of the data in the payload. **Type:** String **Example:** "application/json"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external

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Input Parameters (continued)

Name	Description
	Type: String

Response Structure

- **Status Code:** 200 OK
- **Message:** SUCCESS
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	The response contains the attributes needed to retrieve the session ID.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Name	Description
status	Indicates the overall status of the response. The values can be: • SUCCESS
appStatusCode	An application-specific status code, if applicable.
statusDescription	Description of the status, if available.
sessionId	Unique identifier for the session.
lockDownPeriod	Number of login attempts remaining.
termsAccepted	
passwordExpiryMsg	
emailId	

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Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	NA	SUCCESS

Sample Request/Response

Use Case

Logout API is used to logout a user by terminating their active session.

Request URL

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/acctmgmt-perform-logout?gwsource=external
```

Request Payload

```
{}
```

Sample Response

```
{
   "response": {
      "status": "SUCCESS",
      "appStatusCode": null,
      "statusDescription": null,
      "sessionId": null,
      "authCode": null,
      "lockDownPeriod": 0,
      "emailId": null,
      "termsAccepted": false,
      "passwordExpiryMsg": ""
   },
   "message": null,
   "appStatusCode": null,
   "tags": null,
   "headers": null
}
```

What's Next

- Retrieve session ID using login API

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Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Authentication Using a Service Account

For accessing APIs, you can login via two types of accounts:

- User account

  A **User account** represents an individual person interacting with the application or the system. User accounts are used for accessing the system on behalf of a user.

  For accessing APIs with a user account, you need to get the session ID by providing a username and password in the login API. This session ID can then be used for accessing other APIs.

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Note: You can also use the username and password in all API calls instead of the sessionId. However, this is not recommended.

- Service account

  A **Service account** represents a non-human entity such as an application or a service. It is used for automated processes or system-to-system interactions without human intervention.

  For accessing APIs with a service account, you need to get the Access Token by providing Client ID and Client Secret in get-service-token API. This Access Token can then be used for accessing other APIs.

  Note: Access Token Validity is 30 minutes by default and it can be configured in **Settings** > **Authentication** > **oAuth Settings**.

- Retrieve Access Token using get-service-token API
- Using Access Token in the header for further API calls

Retrieve Access Token using get-service-token API

The API provides a streamlined process for retrieving service tokens related to account management tasks.

Before you begin

- Make sure you have valid login credentials for accessing the system.

Request Structure

Endpoint:	`/acctmgmt-get-service-token`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/acctmgmt-get-service-token?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

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Authentication:	Yes
Request timeout period	15 minutes

Input Parameters

	Description
Authorization *Header*	(Mandatory) Please form a string in this format <Client ID>:<Client Secret> and do base64 encoding. Then prepend a key 'Basic' before the encoded value. Final value should be "Basic <EncodedValue>". **Type:** *String* **Example:** "admin"
Content-Type *Header*	(Mandatory) The parameter should be set to `application/json` to specify the nature of the data in the payload. **Type:** *String* **Example:** "application/json"
grant_type *Payload*	(Mandatory) Payload Type should be "Form". The value of the param should be "Client_Credentials". **Type:** *Text*

Response Structure

- **Status Code:** 200 Ok
- **Message:** Successful
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	The response contains the attributes needed to retrieve the access token.

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Response Parameters (continued)

Name	Description
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	NA	Successful
400 Bad request	ACCT_SA_003	Service account is invalid/not found::[Service account not found in the database]
400 Bad request	OAUTH_CLNT_015	Client Password is incorrect::[Invalid Client credential]
400 Bad request	ACCT_SA_001	Invalid Request::[Invalid client Id or secret]
500 Internal Server Error	avx-common-011	Error while processing.

Sample Request/Response

Use Case

Retrieve Access Token.

Request URL

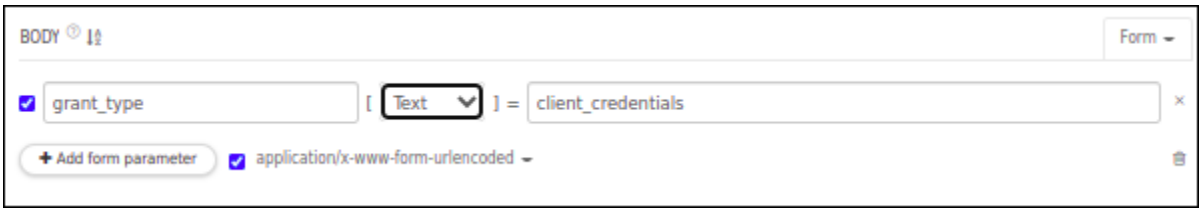
```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/acctmgmt-get-service-token?gwsource=external
```

Content-Type: application/x-www-form-urlencoded

Authorization: Basic
NTIxYzNhZDItZWE0ZS00NDdiLWE1MWItOTYyMWJiN2VhMTI2OjU1QVUjTk84JSpaaGd2TmZhWVVtdHZYMGRrRWhvZ

Request Payload

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Sample Response


```
{
"response":
 "eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJzdWIiOiJwbGF0Zm9ybSIsImF1ZCI6ImF2eCIsImNsaWVudElkIjoiOTcwNzRlNDEtOGFmOS00NTZkLTlhNjQtZjBj
NGJiOTA4MDQ4IiwiaXNzIjoiYXZ4IiwiZXhwIjoxNjUwMzY5MzY3LCJncmFudCB0eXBlIjoiY2xpZW50X2NyZWRlbnRpYWxzIn0.HZnkuUEjXIeqJWqpqiNWFHqIDI7
GYf4cWx6VwbjGD_0",
"message": null,
"appStatusCode": null,
"tags":{},
"headers": null
}
```


What's Next

- **Using Access Token in the header for further API calls**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.

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- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Using Access Token in the header for further API calls

The access token retrieved using the get-service-token API can be used in the header for making further API calls.

In this section, as an example, we are using the access token with the API call for adding a resource.

Before you begin

- Access Token is obtained from the get-service-token API.
- Ensure that the Access Token is valid and has not expired.

Request Structure

Endpoint:	`/resource`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/resource?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
Token	(Mandatory) Use token retrieved from login API.

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Input Parameters (continued)

Name	Description
Header	**Type:** *String* **Example:** eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJzdWIiOiJwbGF0Zm9ybSIsImF1ZCI6ImF2eCIsImNsaWVudElkIjoiOTcwNzRlNDEtOGFmOS00NTZkLTlhNjQtZjBjNGJiOTA4MDQ4IiwiaXNzIjoiYXZ4IiwiZXhwIjoxNjUwMzY5MzY3LCJncmFudCB0eXBlIjoiY2xpZW50X2NyZWRlbnRpYWxzIn0.HZnkuUEjXIeqJWqpqiNWFHqIDI7GYf4cWx 6VwbjGD_0
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
name *String*	(Mandatory) Name of the resource to create. Name cannot be duplicated. **Example:** "resource_1"
description *String*	(Optional) Description of the resource. **Example:** "This is a sample resource."

Response Structure

- **Status Code:** 201 Created
- **Message:** Resource added successfully
- **Headers:**
  - **Content-Type:** application/json

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Response Parameters

Name	Description
response	Contains the response attributes for resource added successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
201 Created	null	Resource added successfully
409 Conflict	RBAC_RE_005	Resource with the given name already exists
400 Bad Request	VALIDATION_ERROR_0004	'name' should have at least '2' characters, Mandatory Field 'name' is missing or empty
400 Bad Request	VALIDATION_ERROR_0004	Invalid "name".
401 Unauthorized	AVX_GW_012	Unauthorized access, reason - Invalid Token
407 Proxy Authentication Required	AVX_GW_011	Session validation failed, reason - Session information is missing.

Sample Request/Response

Use Case

Add a resource using API with Access Token.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/resource?gwsource=external
```

Request Payload

```
{
 "payload": {
```

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```
"name": "resource_1",
"description": "This is a sample resource."
}
}
```

Sample Response

```
{
"response": "Resource added successfully",
"message": "Resource added successfully",
"appStatusCode": null,
"tags": null,
"headers": null
}
```

What's Next

- **Search for a Resource**
- **Delete a Resource**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

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A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Commons

- Add a Resource
- Search for a Resource
- Delete a Resource
- Associate User Group with Resources
- Add a Role
- Search for a Role
- Get Role Information
- Associate Permissions to Role
- Clone a Role
- Delete a Role
- Add a User Group
- Search User Group
- Associate Roles to a User Group
- Delete a User Group
- Get Resources for User Group
- Share Dashboard to User Group
- Add a User
- Search for a user
- Delete a User
- Associate User Groups to a User
- Add Service Account
- Assign User group to Service Account
- Update Workflow Resource Permission

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- Regenerate Client Secret
- SCIM Resource Type
- SCIM Schemas

Add a Resource

This API is used to create a new resource. A resource is a logical entity to group one or more ACL managed entities.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.
- Make sure you have valid login credentials for accessing the system.

Request Structure

Endpoint:	`/resource`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/resource?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
username *Header*	(Mandatory) Use login name of the user. **Type:** *String* **Example:** "admin"

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Input Parameters (continued)

Name	Description
Password *Header*	(Mandatory) Password for the username. **Type:** *String* **Example:** "AppViewX@123"
gwkey *Query*	(Optional) Tenant Key. Needed only in case of multi-tenant installation. **Type:** *String* **Example:** "f000ca01"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
name *String*	(Mandatory) Name of the resource to create. Name cannot be duplicated. **Example:** "resource_1"
description *String*	(Optional) Description of the resource. **Example:** "This is a sample resource."

Response Structure

- **Status Code:** 201 Created
- **Message:** Resource added successfully

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- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for resource added successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
201 Created	null	Resource added successfully
409 Conflict	RBAC_RE_005	Resource with the given name already exists
400 Bad Request	VALIDATION_ERROR_0004	'name' should have at least '2' characters, Mandatory Field 'name' is missing or empty
400 Bad Request	VALIDATION_ERROR_0004	Invalid "name".
401 Unauthorized	AVX_GW_012	Unauthorized access, reason - Invalid Token
407 Proxy Authentication Required	AVX_GW_011	Session validation failed, reason - Session information is missing.

Sample Request/Response

Use Case

Add a new resource with the name resource_1.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/resource?gwsource=external
```

Request Payload

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```
{
 "payload": {
 "name": "resource_1",
 "description": "This is a sample resource."
 }
 }
```

Sample Response

```
{
 "response": "Resource added successfully",
 "message": "Resource added successfully",
 "appStatusCode": null,
 "tags": null,
 "headers": null
 }
```

What's Next

- **Search for a Resource**
- **Delete a Resource**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

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A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Search for a Resource

This API is used to search for a resource based on input filter condition. A resource is a logical entity to group one or more ACL managed entities. The response could be one or more resource(s) matching the input.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.
- Make sure you have valid filter value for search.

Request Structure

Endpoint:	`/resource-search`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/resource-search?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token	(Mandatory) Use either Session Id or Token received after login.
Header	**Type:** *String*

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Input Parameters (continued)

Name	Description
	Example: "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
Token *Query*	(Mandatory) Access token received after login. **Type:** *String* **Example:** eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJzdWIiOiJwbGF0Zm9ybSIsImF1ZCI6ImF2eCIsImNsaWVudElkIjoiOTcwNzRlNDEtOGFmOS00NTZkLTlhNjQtZjBjNGJiOTA4MDQ4IiwiaXNzIjoiYXZ4IiwiZXhwIjoxNjUwMzY5MzY3LCJncmFudCB0eXBlIjoiY2xpZW50X2NyZWRlbnRpYWxzIn0.HZnkuUEjXIeqJWqpqiNWFHqI DI7GYf4cWx6VwbjGD_0
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
startIndex *Integer*	(Optional) Start index to show in output in case if there are more than one matching records. **Example:** "1"
maxSize *Integer*	(Optional) The number of records to return in a response. maxSize is starting from the start index. **Example:** "3"
sortOrder	(Optional) The order to sort. Possible values are asc and desc.

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Name	Description
String	**Example:** "asc"
sortColumn	(Optional) Column by which the output has to be sorted.
String	**Example:** "name"
filterValue	(Optional) Input filter string value to filter the resources.
String	**Example:** "resource_1"

Response Structure

- **Status Code:** 200 OK
- **Message:** Matching results found for the given input.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for search of resource successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Matching results found for the given input.
404 Not Found	DG_009	No matching records found
401 Unauthorized	AVX_GW_012	Unauthorized access, reason - Invalid Token

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HTTP Code	appStatusCode	Response Message
400 Bad Request	DG_006	Invalid sort Column.

Sample Request/Response

Use Case

Search a resource with the name Role_admin.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/resource-search?gwsource=external
```

Request Payload

```
{
 "payload": {
 "startIndex" : 1,
 "maxSize" : 3,
 "sortOrder":"asc",
 "sortColumn" : "name",
 "filterValue" : "resource_1"
 }
 }
```

Sample Response

```
{
 "response": {
 "data": [
 {
 "name": "Role_admin",
 "description": "Super access will have the permissions to access all the resources in AppViewX.",
 "state": "A",
 "_id": " Role_admin ",
 "_keywords": null
 }
 ],
 "totalRecords": 1,
 "obtainedRecords": 1,
 "obtainedRecordRange": {
```

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```
"start": 1,
"end": 1
}
},
"message": "Matching results found for the given input.",
"appStatusCode": null,
"tags": null,
"headers": null
}
```


Note: The state of a resource indicates if the resource is active or not. ‘A’ stands for active.

What's Next

- **Associate User Group with Resources**
- **Delete a Resource**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

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Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Delete a Resource

This API is used to delete a resource.

Before you begin

- Ensure that the session ID is valid and has not expired.
- Make sure you have valid resource name to be deleted.

Request Structure

Endpoint:	`/resource`
Type:	`DELETE`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/resource?gwsource=External&resourceName=resource_1` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"

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Input Parameters (continued)

Name	Description
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
resourceName *Query*	(Mandatory) Name of the resource to be deleted. **Type:** *String* **Example:** "resource_1"

Response Structure

- **Status Code:** 200 OK
- **Message:** Resource deleted successfully.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for resource deleted successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Resource deleted successfully.
404 Not Found	RBAC_RE_005	Resouce Name doesnot exist.

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HTTP Code	appStatusCode	Response Message
403 Forbidden	RBAC_RE_020	Current user(s) aclIdentifier/resource cannot be deleted.
400 Bad request	RBAC_RE_001	ResourceName Cannot be Empty.

Sample Request/Response

Use Case

Delete a resource with name resource_1.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/resource?resourceName=resource_1;gwsource=external
```

Request Payload

```
NA
```

Sample Response

```
{
"response": "Resource deleted successfully",
"message": "Resource deleted successfully",
"appStatusCode": null,
"tags": null,
"headers": null
}
```

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.

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- **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

  The tenant name will be included in the endpoint URL for a SaaS deployment.

- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Associate User Group with Resources

This API is used to associate one or more resources to a user group.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.

Request Structure

Endpoint:	`/usergroup-updateResource`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/usergroup-updateResource?gwsource=web` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token	(Mandatory) Use either Session Id or Token received after login.

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Input Parameters (continued)

Name	Description
Header	**Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
name *String*	(Mandatory) Name of the user group. **Example:** "internal90"
assignList *Array*	(Optional) List of resources to be assigned to the user group. **Example:** "resource_2"
unassignList *Array*	(Optional) List of resources to be unassigned from the user group. . **Example:** "resource_1"

Response Structure

- **Status Code:** 200 OK
- **Message:** Successfully associated user group - resource
- **Headers:**
  - **Content-Type:** application/json

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Response Parameters

Name	Description
response	Contains the response attributes for getting details about a user group.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Successfully associated user group - resource
400 Bad Request	ACCT_USERGROUP_001	Mandatory field 'userGroupName' is missing or empty
404 Not Found	ACCT_USERGROUP_027	UserGroup not found.

Sample Request/Response

Use Case

Get the details about a user group with the name usergroup_1.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/usergroup-updateResource?gwsource=external
```

Request Payload

```
{
 "payload": {
  "name": "testgroup",
  "assignList" : [
    "resource_2"
  ],
  "unassignList": [
    "resource_1"
  ]
 }
}
```

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Sample Response


```
{
 "response": "Updating usergroup with resource(s) successful",
 "message": "Updating usergroup with resource(s) successful",
 "appStatusCode": null,
 "tags": null,
 "headers": null
 }
```


Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Add a Role

This API is used to add a new role to the system.

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Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.

Request Structure

Endpoint:	/role
Type:	POST
Sample URL:	https://<IP/HostName/TenantName>:<GWPORT>/avxapi/role?gwkey=f000ca01&gwsource=external To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId *Header*	(Mandatory) Use session ID retrieved from login API, if username and password are not provided. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

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Payload

Name	Description
name	(Mandatory) Name of the role to be added.
String	**Example:** "role_1"
description	(Optional) Description of the role to be added.
String	**Example:** "Adding a new role"

Response Structure

- **Status Code:** 201 Created
- **Message:** Role added successfully
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for role added successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
201 Created	null	Role added successfully
409 Conflict	ACCT_RO_002	Role name already exists
400 Bad Request	VALIDATION_ERROR_0004	'name' should have at least '2' characters, Mandatory Field 'name' is missing or empty.
400 Bad Request	ACCT_RO_015	Role name invalid

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Sample Request/Response

Use Case

Add a role with a valid role name.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/role?gwsource=external
```

Request Payload

```
{
"payload": {
 "name":"role_01",
 "description":"Adding a new role"
}
}
```

Sample Response

```
{
"response": "Role added successfully",
"message": "Role added successfully",
"appStatusCode": null,
"tags": null,
"headers": null
}
```

What's Next

- **Search for a Role**
- **Delete a Role**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.

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- **HostName**: A human-readable label assigned to a device (host) on a network

  The hostname will be included in the endpoint URL for an on-prem deployment.

- **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

  The tenant name will be included in the endpoint URL for a SaaS deployment.

- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Search for a Role

This API is used to search for a role based on the input filter condition. A role is a logical entity to group one or more Access Control Functions. The response could be one or more resource(s) matching the input.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.
- Make sure you have valid filter value for search.

Request Structure

Endpoint:	`/role-search`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/role-search?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	

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Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
filterValue *String*	(Optional) Input filter string value to filter the role. **Example:** "admin"
sortColumn *String*	(Optional) Column by which the output has to be sorted. **Example:** "name"
sortOrder *String*	(Optional) The order to sort. Possible values are asc and desc. **Example:** "asc"

Response Structure

- **Status Code:** 200 OK
- **Message:** Matching results found for the given input.

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- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for search of role successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Matching results found for the given input.
404 Not Found	DG_009	No matching records found.
400 Bad Request	DG_006	Invalid sort Column.
401 Unauthorized	AVX_GW_003	Authentication failed, reason - Invalid Credentials.

Sample Request/Response

Use Case

Search a role with the name Role_admin.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/role-search?gwsource=external
```

Request Payload

```
{
  "payload": {
    "filterValue": "Std_API_Account_Search_Role_With_Only_Alphabets",
    "sortColumn": "name",
    "sortOrder": "asc"
```

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```
 }
}
```

Sample Response


```
{
 "response": {
 "data": [
 {
 "name": "admin",
 "description": "admin",
 "permissions": [
 "certificate:connectorActions:secureConnector",
 "certificate:settings:casettings:custom_ca",
 "certificate:settings:appsettings:view",
 "adc:dashboard:deviceheatmap:modifysettings",
 "certificate:client:adminaccess",
 "adc:deviceGroup:delete"
 ],
 "state": "A",
 "accessControlObjects": null,
 "_id": "admin",
 "_keywords": null
 }
 ],
 "totalRecords": 1,
 "obtainedRecords": 1,
 "obtainedRecordRange": {
 "start": 1,
 "end": 1
 }
 },
 "message": "Matching results found for the given input.",
 "appStatusCode": null,
 "tags": null,
 "headers": null
 }
```


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Note: The state of a role indicates if the role is active or not. ‘A’ stands for active.

What's Next

- **Clone a Role**
- **Get Role Information**
- **Associate Permissions to Role**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Get Role Information

This API is used to retrieve the role information.

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Before you begin

- Ensure that the session ID is valid and has not expired.
- Make sure you have valid role name to get its information.

Request Structure

Endpoint:	/role
Type:	GET
Sample URL:	https://<IP/HostName/TenantName>:<GWPORT>/avxapi/role?roleName=role_1;gwsource=external To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
roleName *Query*	(Mandatory) Name of the role. **Type:** *String* **Example:** "role_1"

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Response Structure

- **Status Code:** 200 OK
- **Message:** Role Information Retrieved Successfully.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for role information retrieved successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Role Information Retrieved Successfully.
404 Not Found	ACCT_RO_001	Role(s) not found.
400 Bad request	ACCT_RO_015	Mandatory field 'roleName' is missing or empty

Sample Request/Response

Use Case

Get the information about the role **role_1**.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/role?roleName=role_1;gwsource=external
```

Request Payload

```
NA
```

Sample Response

```
{
 "response": {
```

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```
"name": "role_1",
"description": "role_1 details",
"permissions": [
"permission_1"
],
"state": "A",
"_id": "log",
"_keywords": [
"role used to test role functions.",
"log",
"Enabled"
]
},
"message": "Role Information Retrieved Successfully",
"appStatusCode": null,
"tags": null
}
```


What's Next

- **Clone a Role**
- **Associate Permissions to Role**
- **Delete a Role**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.

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- **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

  The tenant name will be included in the endpoint URL for a SaaS deployment.

- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Associate Permissions to Role

This API is used to assign/un-assign ACF permissions to a role.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.

Request Structure

Endpoint:	`/role-updatePermission`
Type:	`PUT`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/role-updatePermission?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token	(Mandatory) Use either Session Id or Token received after login.

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Input Parameters (continued)

Name	Description
Header	**Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: **Type:** *String* • web • external
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
roleName *String*	(Mandatory) Name of the role. **Example:** "role_1"
assignPermissionList *Array*	(Optional) ACF permissions to be assigned to the role. Refer to the list of possible permissions list for details. **Example:** "["general:accounts:resource:clone", "general:accounts:resource:delete"]"
unassignPermissionList *Array*	(Optional) ACF permissions to be unassigned from the role. Refer to the list of possible permissions list for details. **Example:** "["general:accounts:resource:delete"]"

Note: Even if the assignPermissionList and unassignPermissionList contain invalid ACF permission text that cannot be processed, the API would still go-ahead to assign/un-assign any functions in wither list that can be processed.

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Response Structure

- **Status Code:** 202 Accepted
- **Message:** ACF assignment initiated for the given role.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for ACF assignment initiated for the given role.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
202 Accepted	null	ACF assignment initiated for the given role.
400 Bad Request	ACCT_RO_015	Mandatory field 'roleName' is missing or empty.
404 Not Found	ACCT_RO_001	Role(s) not found.

Sample Request/Response

Use Case

Assign and unassign few ACF permissions to/from the role “role_1”.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/role-updatePermission?gwsource=external
```

Request Payload

```
{
 "payload": {
  "roleName": "role_1",
  "assignPermissionList": [
```

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```
    "general:accounts:resource:clone",
    "general:accounts:resource:delete"
  ],
  "unassignPermissionList": [
    "general:accounts:resource:delete"
  ]
 }
}
```


Sample Response


```
{
"response": "ACF assignment initiated for the given role",
"message": "ACF assignment initiated for the given role",
"appStatusCode": null,
"tags": null,
"headers": null
}
```


What's Next

- **Delete a Role**
- **Clone a Role**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.

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- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Clone a Role

This API is used to clone a role.

Before you begin

- Ensure that the session ID is valid and has not expired.
- Make sure you have valid role name to be cloned.

Request Structure

Endpoint:	`/role-clone`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/role-clone?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"

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Input Parameters (continued)

Name	Description
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
existingName *payload*	(Mandatory) Name of the role to be cloned. **Type:** *String* **Example:** "role_1"
newName *payload*	(Mandatory) Name of the cloned new role. **Type:** *String* **Example:** "clonerole_1"
description *payload*	(Optional) Description of the cloned role. **Type:** *String* **Example:** "Clone test role"

Response Structure

- **Status Code:** 200 OK
- **Message:** Clone role successful.
- **Headers:**
  - **Content-Type:** application/json

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Response Parameters

Name	Description
response	Contains the response attributes for role cloned successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Clone role successful.
404 Not Found	ACCT_RO_001	Role Name to be cloned not found
400 Bad request	VALIDATION_ERROR_0004	Mandatory Field 'existingName' is missing or empty, Mandatory Field 'newName' is missing or empty
400 Bad request	VALIDATION_ERROR_0004	Mandatory Field 'existingName' is missing or empty, 'existingName' should have at least '2' characters
400 Bad request	VALIDATION_ERROR_0004	'newName' should have at least '2' characters, Mandatory Field 'newName' is missing or empty
400 Bad request	VALIDATION_ERROR_0004	'newName' cannot exceed '64' characters
400 Bad request	ACCT_RO_026	Invalid Description
409 Conflict	ACCT_RO_002	ClonedRole Name already exists for the given RoleName

Sample Request/Response

Use Case

Clone a role role_1 to create a new cloned role named clonerole_1.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/role-clone?gwsource=external
```

Request Payload

```
{
 "payload": {
```

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```
 "existingName": "role_1",
 "newName": "clonerole_1",
 "description": "clone test role."
 }
}
```


Sample Response


```
{
"response": "Clone role successful",
"message": "Clone role successful",
"appStatusCode": null,
"tags": null,
"headers": null
}
```


What's Next

- **Associate Permissions to Role**
- **Delete a Role**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

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A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Delete a Role

This API is used to delete a role.

Before you begin

- Ensure that the session ID is valid and has not expired.
- Make sure you have valid role name to be deleted.

Request Structure

Endpoint:	`/role`
Type:	`DELETE`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/role?gwsource=External&roleName=role_01` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"

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Input Parameters (continued)

Name	Description
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
roleName *Query*	(Mandatory) Name of the role to delete. **Type:** *String* **Example:** "role_01"

Response Structure

- **Status Code:** 200 OK
- **Message:** Role deleted successfully.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for role deleted successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Role deleted successfully.
404 Not Found	ACCT_RO_001	RoleName doesnot exist.

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HTTP Code	appStatusCode	Response Message
409 Forbidden	NA	Role(s) which have active user(s) cannot be deleted.
409 Conflict	ACCT_RO_016	Administrative role cannot be deleted
401 Unauthorized	AVX_GW_003	Authentication failed, reason - Invalid Credentials.
400 Bad Request	ACCT_RO_015	Mandatory field 'roleName' is missing or empty.
400 Bad Request	ACCT_RO_032	Pre-shipped role(s) are not eligible for updation/deletion

Sample Request/Response

Use Case

Delete a role with name role_01.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/role?gwsource=External&roleName=role_01
```

Request Payload

```
NA
```

Sample Response

```
{
 "response": "Role deleted successfully",
 "message": "Role deleted successfully",
 "appStatusCode": null,
 "tags": null,
 "headers": null
 }
```

Reference

Understanding the sample URL:

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- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Add a User Group

This API is used to add a new user group to the system.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.

Request Structure

Endpoint:	`/usergroup`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/usergroup?gwsource=external`

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To understand the elements of the sample URL, click here.
Headers:
Content-Type: application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
name *String*	(Mandatory) Name of the user group. **Example:** "usergroup_1"
description *String*	(Optional) Description of the user group. **Example:** "Adding user group"

Response Structure

- **Status Code:** 201 Created
- **Message:** Usergroup added successfully

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- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for user group added successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
201 Created	null	Usergroup added successfully
409 Conflict	RBAC_US_023	Usergroup already exists.
400 Bad Request	ACCT_USERGROUP_001	Mandatory field 'userGroupName' is missing or empty.

Sample Request/Response

Use Case

Add a user group with a valid name.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/usergroup?gwsource=external
```

Request Payload

```
{
 "payload": {
    "name": "usergroup_1",
    "description": "Adding user group"
   }
 }
```

Sample Response

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```
{
"response": " Usergroup added successfully",
"message": " Usergroup added successfully",
"appStatusCode": null,
"tags": null,
"headers": null
}
```


What's Next

- **Associate Roles to a User Group**
- **Search User Group**
- **Delete a User Group**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL

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- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Search User Group

This API is used to search / get the details about a user group. The user group can be filtered by the given input.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.
- Make sure you have valid filter value for search.

Request Structure

Endpoint:	`/usergroup-search`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/usergroup-search?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource	(Mandatory) Source from which the request is triggered. The values can be:

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Input Parameters (continued)

Name	Description
Query	**Type:** *String* • web • external
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
startIndex *Integer*	(Optional) Start index to show in output in case if there are more than one matching records. **Example:** "1"
maxSize *Integer*	(Optional) The number of records to return in a response. maxSize is starting from the start index. **Example:** "2"
sortColumn *String*	(Optional) Column by which the output has to be sorted. **Example:** "name"
sortOrder *String*	(Optional) The order to sort. Possible values are asc and desc. **Example:** "asc"
filterValue *String*	(Mandatory) Input filter string value to filter the user group. **Example:** "admin usergroup""

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Response Structure

- **Status Code:** 200 OK
- **Message:** Matching results found for the given input.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for search of user group successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Matching results found for the given input.
404 Not Found	DG_009	No matching records found::[No matching records are found in the AppViewX database for your query. Check your query parameters.]
400 Bad Request	DG_006	Invalid sort Column
400 Bad Request	avx-common-028	Invalid/ Incorrect payload
400 Bad Request	DG_007	Invalid sort order

Sample Request/Response

Use Case

Get the details about a user group with the name usergroup_1.

Sample Request

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```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/usergroup-search?gwsource=external
```

Request Payload

```
{
 "payload": {
    "startIndex" : 1,
    "maxSize" :1,
    "sortColumn" : "name",
    "sortOrder":"asc",
    "filterValue" : "admin usergroup"
   }
 }
```

Sample Response

```
{
 "response":{
 "data":[
 {
 "name": "super access",
 "description": "Super access will have the permissions to access all the resources in AppViewX.",
 "state": "A",
 "_id": "super access",
 "_keywords":[
 "super access",
 "Super access will have the permissions to access all the resources in AppViewX.",
 "Enabled"
 ]
 }
 ],
 "totalRecords": 1,
 "obtainedRecords": 1,
 "obtainedRecordRange":{
 "start": 1,
 "end": 1
 }
 },
 "message": "Matching results found for the given input.",
 "appStatusCode": null,
```

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```
"tags": null,
"headers": null
}
```


What's Next

- **Associate Roles to a User Group**
- **Add a User Group**
- **Delete a User Group**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

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Associate Roles to a User Group

This API is used to associate or disassociate one or more roles to a user group.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.

Request Structure

Endpoint:	/usergroup-updateRoles
Type:	PUT
Sample URL:	https://<IP/HostName/TenantName>:<GWPORT>/avxapi/usergroup-updateRoles?gwsource=web To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

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Payload

Name	Description
userGroupName *String*	(Mandatory) Name of the user-group for consideration. **Example:** "UG1"
assignedRoles *Array*	(Optional) An array of role names to assign. **Example:** ["R1"]
unassignedRoles *Array*	(Optional) An array of role names to unassign. **Example:** "[ ]"

Note: Even if the assignedRoles and unassignedRoles contain invalid role names that cannot be processed, the API would still go-ahead to assign/unassign any role in the list that can be successfully processed.

Response Structure

- **Status Code:** 200 OK
- **Message:** Successfully updated usergroup - role association.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for assign role to user group.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

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Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Successfully updated usergroup - role association.
400 Bad Request	ACCT_USERGROUP_001	Mandatory field 'userGroupName' is missing or empty
400 Bad Request	ACCT_USERGROUP_044	Assign/Unassign Role list cannot be empty
404 Not Found	ACCT_USERGROUP_027	UserGroup not found.

Sample Request/Response

Use Case

role_1, role_2, and role_3 are existing in the application. role_1 and role_2 have to be assigned to the user group *appviewx_usergroup* and role_3 has to be unassigned.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/usergroup-updateRoles?gwsource=external
```

Request Payload

```
{
 "payload" : {
  "userGroupName": "admin usergroup",
  "assignedRoles": ["R1"],
  "unassignedRoles": []
 }
 }
```

Sample Response

```
{
   "response": "Successfully updated usergroup - role association. ",
   "message": "Successfully updated usergroup - role association. ",
   "appStatusCode": null,
   "tags": null,
   "headers": null
}
```

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What's Next

- **Search User Group**
- **Add a User Group**
- **Delete a User Group**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Delete a User Group

This API is used to delete a user group.

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Before you begin

- Ensure that the session ID is valid and has not expired.
- Make sure you have valid user group name to be deleted.

Request Structure

Endpoint:	`/userGroup`
Type:	`DELETE`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/userGroup?userGroupName=group_1;gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
userGroupName *Query*	(Mandatory) Name of the user group to be deleted. **Type:** *String* **Example:** "group_1"

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Response Structure

- **Status Code:** 200 OK
- **Message:** UserGroup deleted successfully.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for user group deleted successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	UserGroup deleted successfully.
404 Not Found	ACCT_USERGROUP_030	UserGroup doesnot exist.
403 Forbidden	AVX_GW_005	User does not have access to the targeted API
400 Bad request	RBAC_US_019	Usergroup(s) which have active user(s) cannot be deleted
405 Method Not Allowed	RBAC_US_015	Admin usergroup cannot be deleted

Sample Request/Response

Use Case

Add a user group with the name group_1.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/userGroup?userGroupName= group_1;gwsource=external
```

Request Payload

```
NA
```

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Sample Response


```
{
"response": "UserGroup deleted successfully",
"message": "UserGroup deleted successfully",
"appStatusCode": null,
"tags": null,
"headers": null
}
```


Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Get Resources for User Group

This API is used to fetch all the resources for a given user group.

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Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.
- Make sure you have valid User Group name.

Request Structure

Endpoint:	/usergroup-getResources
Type:	POST
Sample URL:	https://<IP/HostName/TenantName>:<GWPORT>/avxapi/usergroup-getResources?gwsource=external To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

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Payload

Name	Description
startIndex *Integer*	(Optional) Start index to show in output in case if there are more than one matching records. **Example:** "1"
maxSize *Integer*	(Optional) The number of records to return in a response. maxSize is starting from the start index. **Example:** "0"
name *String*	(Mandatory) Name of the user group. **Example:** "admin usergroup"

Response Structure

- **Status Code:** 200 OK
- **Message:** Matching results found for the given input.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for resource of user group.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Matching results found for the given input.

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HTTP Code	appStatusCode	Response Message
404 Not Found	DG_009	No matching records found.
400 Bad Request	RBAC_RE_021	Mandatory field 'name' is missing or empty
401 Unauthorized	AVX_GW_003	Authentication failed, reason - Invalid Credentials.

Sample Request/Response

Use Case

Get all resources under the user group usergroup_1.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/usergroup-getResources?gwsource=external
```

Request Payload

```
{
 "payload": {
 "startIndex": 1,
 "maxSize": 0,
 "name": "usergroup_1"
 }
 }
```

Sample Response

```
{
 "response":{
 "data":[
 {"name": " resource_0", "description": "Resource for usergroup_0", "state": "A",…},
 {"name": "resource_1", "description": " Resource for usergroup_1", "state": "A",…},
 {"name": " resource_2", "description": “Resource for usergroup_1”, "state": "A", ,…},
 {"name": " resource_3", "description": "Resource for usergroup_1", "state": "A",…}
 ],
 "totalRecords": 4,
 "obtainedRecords": 4,
 "obtainedRecordRange":{
 "start": 1,
 "end": 4
```

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```
}
},
"message": "Matching results found for the given input.",
"appStatusCode": null,
"tags": null,
"headers": null
}
```


Note: The state of a resource indicates if the resource is active or not. ‘A’ stands for active.

What's Next

- **Search User Group**
- **Delete a User Group**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL

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- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Share Dashboard to User Group

This API is used to share an existing dashboard to one or more existing usergroups. The sharing can be restricted to read-only or as a read-write.

Before you begin

- Session ID is obtained from the login API.
- Ensure that you have the necessary payload details.

Request Structure

Endpoint:	`/dashboard-share-usergroupdetails-update`
Type:	`PUT`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/dashboard-share-usergroupdetails-update?name=Dashboard1&gwsource=WEB` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external

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Input Parameters (continued)

Name	Description
	Type: *String*
name *Query*	(Mandatory) Name of the dashboard to be shared. **Type:** *String* **Example:** "Dashboard1"
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
readUserGroup *String*	(Optional) Name of the user group that need to have only read access to the dashboard. **Example:** "UG1"
readWriteUserGroup *String*	(Optional) Name of the user group that need to have read-write access to the dashboard. **Example:** "UG2"

Response Structure

- **Status Code:** 200 OK
- **Message:** Success
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for share dashboard to user group successfully.
message	Success message or failure description in case of error.

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Response Parameters (continued)

Name	Description
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Success
404 Not Found	ADC_DASH_0045	Dashboard not available for given name.
400 Bad Request	ADC_DASH_0051	Invalid dashboard name.
403 Forbidden	ADC_DASH_0048	Permission not available for dashboard.

Sample Request/Response

Use Case

Share a dashboard named Dashboard1 in read mode to the usergroup and in read/write mode to the usergroup.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/dashboard-share-usergroupdetails-update?name=Dashboard1&gwsource=WEB
```

Request Payload

```
{
"payload": {
  "readUserGroups": [
    "UG1"
  ],
  "readWriteUserGroups": ["UG2"]
  }
}
```

Sample Response

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```
{
"response": "Success",
"message": null,
"appStatusCode": null,
"tags": null,
"headers": null
}
```


Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Add a User

This API is used to create a new user.

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Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.

Request Structure

Endpoint:	/user
Type:	POST
Sample URL:	https://<IP/HostName/TenantName>:<GWPORT>/avxapi/user?gwsource=external To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

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Payload

Name	Description
loginName *String*	(Mandatory) Unique names used as the username for authentication. Duplication is not allowed. **Example:** "appviewx"
password *String*	(Mandatory) A password that can be used to authenticate. It must be in the base64 encoded format. **Note:** Not relevant if 'isExternalAuth' is set to Y. **Example:** "QWRtaW5AMTIz"
confirmPassword *String*	(Mandatory) Reconfirm the given password. It must be in the base64 encoded format. **Note:** Not relevant if 'isExternalAuth' is set to Y. **Example:** "QWRtaW5AMTIz"
isExternalAuth *String*	(Mandatory) Specify if the user is from an external authentication system like LDAP, Radius, etc. Possible values are 'Y' for yes and 'N' for No. **Example:** "N"
comment *String*	(Optional) Comment for the user. **Example:** "This is a test user"
preferredContactMode *String*	(Mandatory) Preferred contact mode. Possible values are 'E' for email. **Example:** "E"
email *String*	(Mandatory) Email address. **Example:** "appviewx@app.com"

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Response Structure

- **Status Code:** 201 Created
- **Message:** User added successfully.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for user added successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
201 Created	null	User added successfully.
401 Unauthorized	AVX_GW_003	Authentication failed, reason - Invalid Credentials.
409 Conflict	ACCT_US_042	User name already exist.
400 Bad Request	ACCT_US_015	Mandatory field 'loginName' is missing or empty.

Sample Request/Response

Use Case

Add a new internal user with login name **appviewx**.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/user?gwsource=external
```

Request Payload

```
{
 "payload": {
```

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```
"loginName": "appviewx",
"password":"QWRtaW5AMTIz",
"confirmPassword": "QWRtaW5AMTIz",
"isExternalAuth" : "N",
"comment": "This is a test user",
"preferredContactMode": "E",
"email": "appviewx@app.com"
}
}
```


Sample Response


```
{
"response": "User added successfully",
"message": "User added successfully",
"appStatusCode": null,
"tags": null,
"headers": null
}
```


What's Next

- **Associate User Groups to a User**
- **Search for a User**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.

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- **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

  The tenant name will be included in the endpoint URL for a SaaS deployment.

- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Search for a user

This API is used to search for a user using filter conditions.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.
- Make sure you have valid filter value for search.

Request Structure

Endpoint:	`/user-search`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/user-search?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

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Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: **Type:** *String* • web • external
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
startIndex *Integer*	(Optional) Start index to show in output in case if there are more than one matching records. **Example:** "1"
maxSize *Integer*	(Optional) The number of records to return in a response. maxSize is starting from the start index. **Example:** "2"
sortColumn *String*	(Optional) Column by which the output has to be sorted. **Example:** "loginName"
sortOrder *String*	(Optional) The order to sort. Possible values are asc and desc. **Example:** "asc"
filterValue	(Mandatory) Input filter string value to filter the user.

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Name	Description
String	**Example:** "appviewx_user1"

Response Structure

- **Status Code:** 200 OK
- **Message:** Matching results found for the given input.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for search of user successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Matching results found for the given input.
404 Not Found	DG_009	No matching records found.
400 Bad Request	DG_006	Invalid sort Column.

Sample Request/Response

Use Case

Search for use with name appviewx_user1.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/user-search?gwsource=external
```

Request Payload

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```
{
"payload": {
   "startIndex" : 1,
   "maxSize" : 2,
   "sortColumn" : "loginName",
   "sortOrder" :"asc",
   "filterValue" : "appviewx_user1"
   }
}
```

Sample Response

```
{
"response": {
"data": [
{
"loginName": "appviewx_user1",
"firstName": "Appviewx",
"lastName": "user1",
"comment": Appviewx login user,
"email": "",
"mobile": "",
"preferredContactMode": "",
"isExternalAuth": "N",
"state": "A",
"roles": null,
"swImages": null,
"authenticationMode": "Internal",
"available": "Active",
"lastLogIn": "Online",
"sessionIds": null,
"aclIdentifiers": null,
"tenantId": null,
"availableIncorrectAttempt": 10,
"lastLoginTimestamp": 1585669200198,
"adUserGroups": null,
"sso": false,
"date": "2020-04-13 12:05:09",
"_id": "5d258291d7f495bb31691fc4",
```

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```
"userGroups": null,
"_keywords": null,
"isSSO": false
}
],
"totalRecords": 1,
"obtainedRecords": 1,
"obtainedRecordRange": {
"start": 1,
"end": 1
}
},
"message": "Matching results found for the given input.",
"appStatusCode": null,
"tags": null,
"headers": null
}
```


What's Next

- **Associate User Groups to a User**
- **Add a User**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.

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- **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

  The tenant name will be included in the endpoint URL for a SaaS deployment.

- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Delete a User

This API allows you to permanently remove a user's account from the system. To use this API, you will need to provide the name of the user you wish to delete. After a successful request, the user will no longer have access to their account.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.
- Make sure you have valid user name to be deleted.

Request Structure

Endpoint:	`/acctmgmt-remove-user`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/acctmgmt-remove-user?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

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Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
OR	
username *Header*	(Mandatory) Use login name of the user. **Type:** *String* **Example:** "admin"
password *Header*	(Mandatory) Password for the username. **Type:** *String* **Example:** "AppViewX@123"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *list*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
userNames *list*	(Mandatory) Name of the user account. **Note:** You can delete multiple users by providing their usernames, separated by commas: ["user_1", "user_2", "user_3"].

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Name	Description
	Example: ["user_01"]

Response Structure

- **Status Code:** 200 OK
- **Message:** Success.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for role deleted successfully.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Success
404 Not Found	ACCT_US_001	User Not Found.
401 Unauthorized	AVX_GW_012	Unauthorized access, reason - Invalid Token
407 Proxy Authentication Required	AVX_GW_011	Session validation failed, reason - Session information is missing.

Sample Request/Response

Use Case

Delete a user with user name **user_01**.

Sample Request

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```
https://<IP/HostName/TenantName>:<GWPORT>/acctmgmt-remove-user?gwsource=external
```

Request Payload

```
{
"payload":{"userNames": ["user_01"]}
}
```

Sample Response

```
{
    "response": {
        "result": "Success",
        "isOperationSuccess": true
    },
    "message": null,
    "appStatusCode": null,
    "tags": null,
    "headers": null
}
```

Reference

Associate User Groups to a User

This API is used to associate or disassociate one or more user groups to a user.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.

Request Structure

Endpoint:	`/user-updateUsergroups`
Type:	`PUT`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/user-updateUsergroups?gwsource=web` To understand the elements of the sample URL, click here.
Headers:	

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Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
loginName *String*	(Mandatory) Login name of the user. **Example:** "internal90"
assignUserGroups *Array*	(Optional) An array of user group names to assign. **Example:** "usergroup_1", "usergroup_2"
unassignUserGroups *Array*	(Optional) An array of user group names to unassign. **Example:** "usergroup_3"

Note: Even if the assignUserGroups and unAssignUserGroups contain invalid user group names that cannot be processed, the API would still go-ahead to assign/un-assign any user group in the list that can be successfully processed.

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Response Structure

- **Status Code:** 200 OK
- **Message:** Successfully modified user-usergroup association.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for assigning user group to a user.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Successfully modified user-usergroup association.
400 Bad Request	ACCT_US_015	Mandatory Field 'loginName' is missing or empty
400 Bad Request	ACCT_US_56	Assign/Unassign Usergroup list cannot be empty for User

Sample Request/Response

Use Case

"usergroup_1, usergroup_2, and usergroup_3 are existing in the application. usergroup_1 and usergroup_2 have to be assigned to the user with loginname user_1 and usergroup_3 has to be unassigned"

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/user-updateUsergroups?gwsource=external
```

Request Payload

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```
{
 "payload": {
  "loginName": "appviewx",
  "assignUserGroups": [
    "usergroup_1", "usergroup_2"
  ],
  "unassignUserGroups": [
    "usergroup_3"
  ]
 }
}
```

Sample Response

```
{
 "response": "Successfully modified user-user group association",
 "message": " Successfully modified user-user group association ",
 "appStatusCode": null,
 "tags": null,
 "headers": null
 }
```

What's Next

- **Search for a User**
- **Add a User**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.

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- **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

  The tenant name will be included in the endpoint URL for a SaaS deployment.

- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Add Service Account

This API is used to create a new service account.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.
- Make sure you have valid login credentials for accessing the system.

Request Structure

Endpoint:	`/acctmgmt-add-service-account`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/acctmgmt-add-service-account?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json
Authentication:	Yes

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Request timeout period	15 minutes

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
loginName *String*	(Mandatory) Unique names used as the service account name for authentication. Duplication is not allowed. **Example:** "internal90"
email *String*	(Mandatory) Email Address. **Example:** "internaldemo188@appviewx.com"
description *String*	(Optional) Description of the service account. **Example:** "description"

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Response Structure

- **Status Code:** 200 OK
- **Message:** Success
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for service account added success.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	Success
409 Conflict	ACCT_SA_008	Operation failed. Unable to add new entity. Entity already exists
400 Bad Request	ACCT_US_015	Mandatory Field 'email' is missing or empty.
401 Unauthorized	AVX_GW_003	Authentication failed, reason - Invalid Credentials.
407 Proxy Authentication Required	AVX_GW_011	Session validation failed, reason - Session information is missing.

Sample Request/Response

Use Case

To add a Service account.

Sample Request

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```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/acctmgmt-add-service-account?gwsource=external
```

Request Payload

```
{
"payload": {
   "loginName":"internal90",
   "email": "internaldemo188@appviewx.com",
   "description":"description"
   }
}
```

Sample Response

```
{
   "response": "Success",
   "message": null,
   "appStatusCode": null,
   "tags": null,
   "headers": null
}
```

What's Next

- **Assign User group to Service Account**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.

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- **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

  The tenant name will be included in the endpoint URL for a SaaS deployment.

- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Assign User group to Service Account

This API is used to create a new resource. A resource is a logical entity to group one or more ACL managed entities.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.

Request Structure

Endpoint:	`/platform-assign-usergroup-to-service-account`
Type:	`PUT`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/platform-assign-usergroup-to-service-account?gwsource=web` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

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Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
loginName *String*	(Mandatory) Unique names used as the service account name for authentication. Duplication is not allowed. **Example:** "internal90"
assignedUserGroup *Array*	(Optional) Mention the array of user groups to be assigned. **Example:** "admin usergroup" **Type:** *String*
unassignedUserGroup *Array*	(Optional) Mention the array of user groups to be unassigned. **Example:** "[ ]"

Response Structure

- **Status Code:** 200 OK
- **Message:** Success

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- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for create a new resource.
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
201 OK	null	Success
400 Bad Request	ACCT_SA_003	Service account is invalid/not found.
404 Not Found	ACCT_USERGROUP_027	UserGroup not found.

Sample Request/Response

Use Case

To assign/unassign user groups to service account.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/platform-assign-usergroup-to-service-account?gwsource=web
```

Request Payload

```
{
"payload": {
   "loginName": "internal90",
   "assignedUserGroup": [
      "admin usergroup"
   ],
   "unassignedUserGroup": []
```

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```
  }
}
```

Sample Response

```
{
"response": "success",
"message": null,
"appStatusCode": null,
"tags": null,
"headers": null
}
```

What's Next

- **Add a Resource**
- **Add a User Group**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

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- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Update Workflow Resource Permission

This API is used to update resource permission for request execution, and user task-level RBAC of workflows. The user can assign and unassign resource permissions based on the action provided in the API payload. They can update the request resource permission of a workflow for any resource only if the user has workflow request permission.

Before you begin

- Session ID is obtained from the login API.
- Ensure that the session ID is valid and has not expired.

Request Structure

Endpoint:	`/visualworkflow-update-workflow-resource-permission`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/visualworkflow-update-workflow-resource-permission?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId (or) Token *Header*	(Mandatory) Use either Session Id or Token received after login. **Type:** *String* **Example:** "sessionId": "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
gwsource	(Mandatory) Source from which the request is triggered. The values can be:

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Input Parameters (continued)

Name	Description
Query	**Type:** *String* • web • external
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
workflowNames *List<String>*	(Mandatory) Name of the workflow(s) to which the permission should be updated for resources. **Example:**["Update Resource Workflow"]
resources *List<String>*	(Mandatory) Resource name(s). **Example:**["ak_resource", "CLM Level1 Approver"]
action *String*	(Optional) assign/unassign. The default action will be “assign”. **Example:**assign

Response Structure

- **Status Code:** 202 Accepted
- **Message:** ACF assignment initiated for the given role.
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for ACF assignment initiated for the given role.

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Response Parameters (continued)

Name	Description
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	{"SuccessWorkflows": ["<WorkflowName>"], "PartiallyUpdated or FailedWorkflows": ["<Failed workflow name if any>"] }
500	WORKFLOW_1000	Invalid input from the client. **Possible Remediation**: Provide a valid payload, or workflow name, or resource, or action value.
400 Bad Request	VALIDATION_ERROR_0006	Invalid '%s'::[Invalid '%s'. Field: workflowName]. **Possible Remediation**: Any one or few of the WorkflowName provided in the workflowNames array has invalid characters.
400 Bad Request	VALIDATION_ERROR_0006	Invalid '%s'::[Invalid '%s'. Field: resource]. **Possible Remediation**: Any one or few of the resource name provided in the resources array has invalid characters.
400 Bad Request	VALIDATION_ERROR_0008	%s' cannot exceed '%s' characters::['workflowName' cannot exceed '255' characters] **Possible Remediation**: Any one or few of the WorkflowName provided in the workflowNames array has invalid length. Lenght must be between 2 to 255.

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HTTP Code	appStatusCode	Response Message
400 Bad Request	VALIDATION_ERROR_0008	'%s' cannot exceed '%s' characters::['resource' cannot exceed '128' characters] **Possible Remediation**: Any one or few of the resource name provided in the resources array has invalid length. Lenght must be between 2 to 128.
400 Bad Request	VALIDATION_ERROR_0009	Validation Failure: Field ${key} is empty::[Validation Failure: Field ${key} is empty. Field: resource] **Possible Remediation**: Any one or few of the resource name provided in the resources array is empty string or null.
400 Bad Request	VALIDATION_ERROR_0009	Validation Failure: Field ${key} is empty::[Validation Failure: Field ${key} is empty. Field: workflowName] **Possible Remediation**: Any one or few of the WorkflowName provided in the workflowNames array is empty string or null.

Sample Request/Response

Use Case

1. **Workflow Request ACL Permission Update**: Resource ACL permissions can now be assigned or unassigned for workflow requests.
2. **User Interface Palette ACL Permissions**:
   - RBAC permissions for user tasks can be assigned or unassigned at the task level within workflows.
   - For form tasks, **submit** permission will be provided during assignment.
   - For other user tasks, **read-write (RW)** permission will be granted.
3. **Audit Log Enhancements**: Audit logs will now include workflow names for which resource permissions were successfully updated, as well as those for which updates failed.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/visualworkflow-update-workflow-resource-permission?gwsource=external
```

Request Payload

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```
{
    "payload": {
  "workflowNames": [
    "Update Resource Workflow"
  ],
  "resources": [
    "ak_resource",
    "CLM Level1 Approver"
  ],
  "action":"assign/unassign"
}
}
```

Sample Response

```
{
"response": {
    "SuccessWorkflows": [
      "Update Resource Workflow"
    ],
    "PartiallyUpdated or FailedWorkflows": []
}
"message": "{SuccessWorkflows=[Update Resource Workflow], PartiallyUpdated or FailedWorkflows=[]}
"appStatusCode": "WORKFLOW_1611",
"tags": null,
"headers": null
}
```

What's Next

- **Delete a Role**
- **Clone a Role**

Reference

Understanding the sample URL:

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- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Regenerate Client Secret

This API is used to generate the client secret during the grace period, once the service account has expired. In the grace period, the old client's secret can only be used for regenerating the new client's secret.

Request Structure

Endpoint:	`/acctmgmt-regenerate-client-secret`
Type:	`POST`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/acctmgmt-regenerate-client-secret?gwsource=external` To understand the elements of the sample URL, click here.

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Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*
Payload *String*	(Mandatory) Input data for request body in application/json format. For payload details, see **Payload** section.

Payload

Name	Description
client_id *String*	(Mandatory) The old client id of the service account. **Example:** "admin"
client_secret *String*	(Mandatory) The old client secret of the service account. **Example:** "name"

Response Structure

- **Status Code:** 200 OK
- **Message:** (Return the client id and client secret)
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
response	Contains the response attributes for search of role successfully.

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Response Parameters (continued)

Name	Description
clientId *response*	Contains the new/generated client id. **Type:** *String* **Example:** "*e7deb0fc-f0a6-4ffa-b5a1-8acf07491186*"
clientSecret *response*	Contains the new/generated client secret. **Type:** *String* **Example:** "*meR0eQKssBjGk*7BO#O0SH170PoDG0I7*"
expireAt *response*	Contains the Client Secret Validity in milliseconds. **Type:** *Integer* **Example:** "*1749370443395* "
message	Success message or failure description in case of error.
appStatusCode	Application specific status code for the response. Will be non-null for failure response.
tags	More info in case of failure response.

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	The new client id and client secret are sent in the response.
401 Unauthorized	OAUTH_CLNT_22	Client Credentials is Invalid.

Sample Request/Response

Use Case

Generate a new client id and secret for the expired service account within the duration of the grace period. (If the grace period in the backend is set to 0, then the API cannot be used.)

Sample Request

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```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/acctmgmt-regenerate-client-secret?gwsource=external
```

Request Payload

```
{
 "payload": {
 "client_id": "sample_client_id",
 "client_secret": "sample_secret"
 }
}
```

Sample Response

```
{
   "response": {
      "clientId": "e7deb0fc-f0a6-4ffa-b5a1-8acf07491186",
      "clientSecret": "meR0eQKssBjGk*7BO#O0SH170PoDG0I7",
      "expireAt": 1749370443395
   },
   "message": null,
   "appStatusCode": null,
   "tags": null,
   "headers": null
}
```

What's Next

- **Clone a Role**
- **Get Role Information**
- **Associate Permissions to Role**

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.

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- **HostName**: A human-readable label assigned to a device (host) on a network

  The hostname will be included in the endpoint URL for an on-prem deployment.

- **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

  The tenant name will be included in the endpoint URL for a SaaS deployment.

- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

SCIM Resource Type

This API is used to expose metadata about SCIM resource type. The APIs fetch their configuration details from a database collection named `scimConfigcollection`. This configuration is categorized and stored based on a "config type". A script named `scimConfig_24_2_2` is responsible for storing (persisting) the SCIM configuration into the `scimConfigcollection`. When a request is made to one of these SCIM APIs (e.g., from a third-party tool like Omada), the system looks up the requested configuration type in the `scimConfigcollection` and returns the appropriate configuration data based on the request.

This API response lists the available SCIM resource types (User, Group), their endpoints, and schema details, using a standardized SCIM list format.

Request Structure

Endpoint:	`scim/v2/ResourceTypes`
Type:	`GET`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/scim/v2/ResourceTypes?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	

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Content-Type:	application/json

Input Parameters

Name	Description
sessionId *Header*	(Mandatory) Use session ID retrieved from login API, if username and password are not provided. **Type:** *String* **Example:** "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
username *Header*	(Mandatory) Username for authentication if sessionID is not provided. **Type:** *String* **Example:** "john.doe@abc.com"
password *Header*	(Mandatory) Password for authentication if sessionID is not provided. **Type:** *String* **Example:** "4e4a89a8"
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*

Response Structure

- **Status Code:** 200 OK
- **Message:** NA
- **Headers:**
  - **Content-Type:** application/json

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Response Parameters

Name	Description
schemas	Indicates the SCIM schema(s) used in the response. This tells us that the response follows the standard SCIM List Response format. **Type:** *Array* **Example:** "urn:ietf:params:scim:api:messages:2.0:ListResponse"
totalResults	Specifies the total number of resources returned in the response. **Type:** *Integer* **Example:** "2"
Resources	Contains the actual SCIM resource definitions. Each object describes a resource type. **Type:** *Array of Objects*
id *Resources*	Unique identifier for the resource type. **Type:** *String* **Example:** "User" or "Group"
name *Resources*	Unique identifier for the resource type. **Type:** *String* **Example:** "4e4a89a8"
endpoint *Resources*	The API endpoint associated with the resource type. **Type:** *String* **Example:** "/SCIM/V2/Users"
description *Resources*	A brief description of the resource type. **Type:** *String* **Example:** "User Account" or "Group of Users"

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Response Parameters (continued)

Name	Description
schema	Defines the core SCIM schema used for the resource.
Resources	**Type:** *String* **Example:** "urn:ietf:params:scim:schemas:core:2.0:User" OR "urn:ietf:params:scim:schemas:core:2.0:Group"

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	NA

Sample Request/Response

Use Case

To expose metadata about SCIM resource type.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/scim/v2/ResourceTypes?gwsource=external
```

Sample Response

```
{
   "schemas": [
      "urn:ietf:params:scim:api:messages:2.0:ListResponse"
   ],
   "totalResults": 2,
   "Resources": [
      {
         "id": "User",
         "name": "User",
         "endpoint": "/SCIM/V2/Users",
         "description": "User Account",
         "schema": "urn:ietf:params:scim:schemas:core:2.0:User"
      },
      {
         "id": "Group",
```

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```
        "name": "Group",
        "endpoint": "/SCIM/V2/Groups",
        "description": "Group of Users",
        "schema": "urn:ietf:params:scim:schemas:core:2.0:Group"
      }
  ]
}
```

Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

  A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

  Example: **31443**
- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

SCIM Schemas

This API is used to expose metadata about SCIM schemas. The APIs fetch their configuration details from a database collection named `scimConfigcollection`. This configuration is categorized and stored based

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on a "config type". A script named `scimConfig_24_2_2` is responsible for storing (persisting) the SCIM configuration into the `scimConfigcollection`. When a request is made to one of these SCIM APIs (e.g., from a third-party tool like Omada), the system looks up the requested configuration type in the `scimConfigcollection` and returns the appropriate configuration data based on the request.

This SCIM API response lists two resource types (e.g. User and Group) along with their schemas and supported attributes.

Request Structure

Endpoint:	`scim/v2/Schemas`
Type:	`GET`
Sample URL:	`https://<IP/HostName/TenantName>:<GWPORT>/avxapi/scim/v2/Schemas?gwsource=external` To understand the elements of the sample URL, click here.
Headers:	
Content-Type:	application/json

Input Parameters

Name	Description
sessionId *Header*	(Mandatory) Use session ID retrieved from login API, if username and password are not provided. **Type:** *String* **Example:** "ce7f1a14-2bf9-4e4a-89a8-bc780a255813"
username *Header*	(Mandatory) Username for authentication if sessionID is not provided. **Type:** *String* **Example:** "john.doe@abc.com"
password *Header*	(Mandatory) Password for authentication if sessionID is not provided. **Type:** *String* **Example:** "4e4a89a8"

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Input Parameters (continued)

Name	Description
gwsource *Query*	(Mandatory) Source from which the request is triggered. The values can be: • web • external **Type:** *String*

Response Structure

- **Status Code:** 200 OK
- **Message:** NA
- **Headers:**
  - **Content-Type:** application/json

Response Parameters

Name	Description
schemas	Lists the SCIM schemas that apply to this response. In this case, it uses the standard SCIM ListResponse schema. **Type:** *Array* **Example:** "urn:ietf:params:scim:api:messages:2.0:ListResponse"
totalResults	Total number of SCIM resource types returned. **Type:** *Integer* **Example:** "2"
Resources	Contains detailed definitions for each SCIM resource type available. **Type:** *Array of Objects*
id *Resources*	Unique identifier for the schema. **Type:** *String* **Example:** "User" or "Group"

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Response Parameters (continued)

Name	Description
name *Resources*	Display name for the resource. **Type:** *String* **Example:** "User" or "User Group"
description *Resources*	Description of the resource **Type:** *String* **Example:** "User Account" or "Group"
schema *Resources*	SCIM schema URI used for User or User Group – must match the `id`. **Type:** *String* **Example:** "urn:ietf:params:scim:schemas:core:2.0:User" OR "urn:ietf:params:scim:schemas:core:2.0:Group"
attributes *Resources*	Defines all the attributes that the User or the User Group resource supports.
startIndex	Indicates the starting index of the result set. **Type:** *Integer* **Example:** "2"
itemsPerPage	Number of items included per page of the response. **Type:** *Integer* **Example:** "2"

Key attributes under User

Name	Description
userName	**Type**: `string`, **Required**: `true`, Unique

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Key attributes under User (continued)

Name	Description
	The username used by the user to log in.
name	**Type:** *complex type* Includes sub-attributes like: `formatted`, `familyName`, `givenName`, `middleName` Not required, but allows structured name information.
emails	**Type:** *multiValued complex type* Includes sub-attributes like: • `value` – email address • `type` – email type (e.g., work, home) • `primary` – boolean flag indicating the primary email

Key attributes under User Group

Name	Description
displayName	Represents the name of the group. **Type:** `String`, **Required**: `true`
members	Defines the users in the group. **Type:** *String* Includes sub-attributes like: • `value` – identifier of the user • `display` – user's display name • `$ref` – reference link to the user object, with `referenceTypes` set to `User`

Status Codes

HTTP Code	appStatusCode	Response Message
200 OK	null	NA

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Sample Request/Response

Use Case

To expose metadata about SCIM schemas.

Sample Request

```
https://<IP/HostName/TenantName>:<GWPORT>/avxapi/scim/v2/ResourceTypes?gwsource=external
```

Sample Response


```
{
   "schemas": [
      "urn:ietf:params:scim:api:messages:2.0:ListResponse"
   ],
   "totalResults": 2,
   "Resources": [
      {
         "id": "urn:ietf:params:scim:schemas:core:2.0:User",
         "name": "User",
         "description": "User Account",
         "schema": "urn:ietf:params:scim:schemas:core:2.0:User",
         "attributes": [
            {
               "name": "userName",
               "type": "string",
               "multiValued": false,
               "required": true,
               "caseExact": false,
               "mutability": "readWrite",
               "returned": "always",
               "uniqueness": "server"
            },
            {
               "name": "name",
               "type": "complex",
               "multiValued": false,
               "required": false,
               "mutability": "readWrite",
               "returned": "default",
```


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```
        "subAttributes": [
          {
            "name": "formatted",
            "type": "string",
            "required": false
          },
          {
            "name": "familyName",
            "type": "string",
            "required": false
          },
          {
            "name": "givenName",
            "type": "string",
            "required": false
          },
          {
            "name": "middleName",
            "type": "string",
            "required": false
          }
        ]
      },
      {
        "name": "emails",
        "type": "complex",
        "multiValued": true,
        "required": false,
        "subAttributes": [
          {
            "name": "value",
            "type": "string",
            "required": false
          },
          {
            "name": "type",
            "type": "string",
```


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```
                    "required": false
                },
                {
                    "name": "primary",
                    "type": "boolean",
                    "required": false
                }
            ]
        }
    ]
},
{
    "id": "urn:ietf:params:scim:schemas:core:2.0:Group",
    "name": "Group",
    "description": "Group",
    "schema": "urn:ietf:params:scim:schemas:core:2.0:Group",
    "attributes": [
        {
            "name": "displayName",
            "type": "string",
            "multiValued": false,
            "required": true,
            "mutability": "readWrite",
            "returned": "always"
        },
        {
            "name": "members",
            "type": "complex",
            "multiValued": true,
            "required": false,
            "subAttributes": [
                {
                    "name": "value",
                    "type": "string",
                    "required": false
                },
                {
```


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```
                    "name": "display",
                    "type": "string",
                    "required": false
                },
                {
                    "name": "$ref",
                    "type": "reference",
                    "referenceTypes": [
                        "User"
                    ],
                    "required": false
                }
            ]
        }
    ]
  }
 ],
 "startIndex": 1,
 "itemsPerPage": 2
}
```


Reference

Understanding the sample URL:

- **IP/HostName/TenantName**: Replace with the actual IP address, hostname, or tenant name based on the specific configuration in AppViewX.
  - **IP**: A unique identifier assigned to each device connected to a computer network that uses the Internet Protocol for communication

    The IP address will be included in the endpoint URL for an on-prem deployment.
  - **HostName**: A human-readable label assigned to a device (host) on a network

    The hostname will be included in the endpoint URL for an on-prem deployment.
  - **TenantName**: An identifier label for a tenant given to indicate which tenant's data the API request will access/modify

    The tenant name will be included in the endpoint URL for a SaaS deployment.
- **GWPORT**: AppViewX gateway port

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A gateway port refers to a network port through which data is sent and received to communicate with a gateway in an on-prem deployment.

Example: **31443**

- **avxapi**: Path parameter value (static) that is part of the endpoint's URL
- **Endpoint**: Endpoint of the API, for example: **execute-hook**
- **gwsource**: Source or origin of a gateway, for example: **external**.

Glossary

This section describes common terms used in this guide.

Acronyms and Abbreviations

Term/Abbreviation	Expansion
ACL	Access Control List
API	Application Programming Interface
HSM	Hardware Security Module
HTTPS	Hypertext Transfer Protocol Secure
SMTP	Simple Mail Transfer Protocol
URI	Uniform Resource Indicator
URL	Uniform Resource Locator

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Chapter 3: Reporting User Guide

This guide describes AppViewX's Build Your Own Report (BYOR) tool and provides step by step instructions on creating customized reports using preexisting hooks and query builder, sharing and scheduling reports, performing actions on reports (pin, share, clone, delete), associating workflows to reports and more.

- Module Overview
- Prerequisites
- Reference Architecture
- Configuring Role Based Access Control
- Getting Started with Dashboards
- Accessing the Reports Module
- Creating a Report/BYOR
- Sharing your Reports
- Hooks
- Report Widgets
- Downloading Reports
- Performing Actions on Reports
- BYOR with Actionable Workflow
- Best Practices
- Troubleshooting

Module Overview

AppViewX's Build Your Own Report (BYOR) report builder is a low-code reporting and product usage analytics tool that empowers non-technical users to build best-in-class reports and eliminates dependence on development teams. AppViewX's Reporting platform showcases interactive dashboards that display compelling report data, thereby assisting in smarter decision making.

With AppViewX's BYOR you can:

- **Explore pre-shipped reports:** Application Delivery, Security, Certificate, and Automation.
- **Build your own reports (BYOR):** Build customizable reports using Low Code report builder.
- **Access multiple data sources:** Query explorer, REST API, Script.
- **WYSIWYG:** What you see is what you get, preview reports as you build them.

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- **Configure chart drilldowns:** Add detailed levels of data to your reports.
- **Visualize your data:** Pin reports to a self-service dashboard for quick access and insights.
- **Schedule reports:** Schedule and share reports as email attachments (PDF, xls, csv).
- **Build actionable reports:** Integrate with workflows for actionable reports and auto remediation.
- **Connect to your data:** Study data quickly and easily through product & feature usage report metrics.
- **Reduce turnaround time:** Increased efficiency with automation of the reporting process.

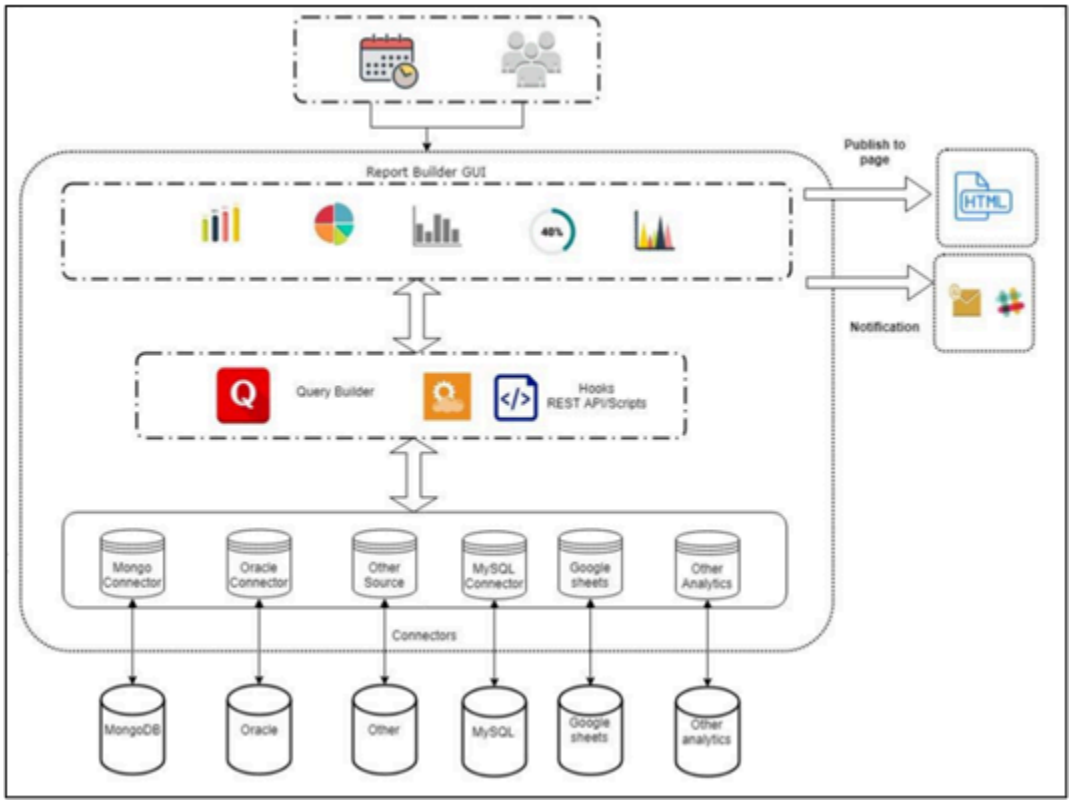
Prerequisites

Web Browser Requirement

Browsers	Version
Internet Explorer	v11.0.9600.18817 or later
Firefox	v74.0.1 (64-bit) or later
Google Chrome	117.0.5938.134 (Official Build) (64-bit) or later

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Reference Architecture

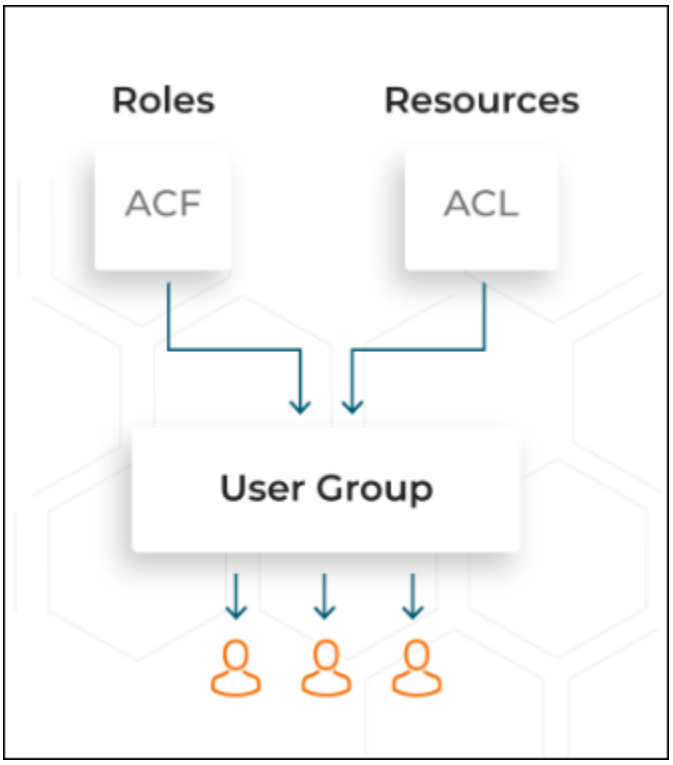


The plug-in as part of the above architecture is **avx-commons**.

Configuring Role Based Access Control

AppViewX offers comprehensive support for Role and Resource-Based Access Control (RBAC). RBAC is a method of restricting AppViewX functions, network resources that can be managed and monitored in AppViewX based on the roles of individual users within an enterprise. It allows you to integrate with the existing identity stores such as Active Directory (AD) and Lightweight Directory Access Protocol (LDAP) to enforce authorization policies. Roles and Resources can be customized to suit any organizational structure and user requirements.

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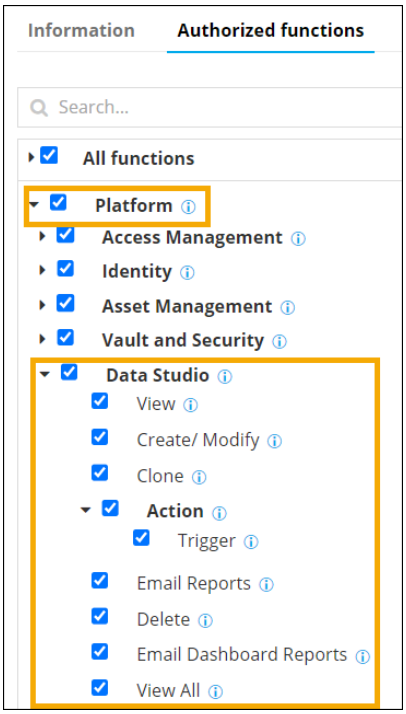
RBAC lets employees have access rights only to the AppViewX functions and network resources they need to do their jobs and prevents them from accessing information that doesn't pertain to them.

To get an overview of the actions that can be permitted or restricted in the Reports module:

New Menu	Old Menu
In the **Platform** module, from the left pane, under **IDENTITY**, select **Role**. The **Role** page is displayed, with all the roles listed with their **Name**, **Description**, and **Status**.	From the main menu, select **Account** > **Role**. The **Role** page is displayed, with all the roles listed with their **Name**, **Description**, and **Status**.
For more information on how to switch between menus, click here.	

1. On the **Role** page, select any role from the list of roles, for example **admin**.
2. To see the list of permissions that can be defined for this role, under the **Authorized Functions** tab, click ▸ to expand **Platform** and then expand **Data Studio**. A selected checkbox indicates that the corresponding action has been authorized in the Reports module.

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The following table describes the various actions that can be authorized or restricted in the **Reports** module:

Action	Description
View	Provision to allow or restrict a user to view detailed information on the reports created by the logged in user.
Create/Modify	Provision to allow or restrict a user to create or modify a report.
Clone	Provision to allow or restrict a user to clone existing report(s).
Action > Trigger	Provision to allow or restrict a user to execute reports across AppViewX.
Email Reports	Provision to allow or restrict user access to email reports in My Reports, Store, Widget in PDF format and manage scheduling.
Delete	Provision to allow or restrict a user to delete existing report(s).
Email Dashboard Reports	Provision to allow or restrict a user to email entire dashboards in a PDF format.
View All	Provision to allow or restrict a user to view detailed information on existing reports created for all users.

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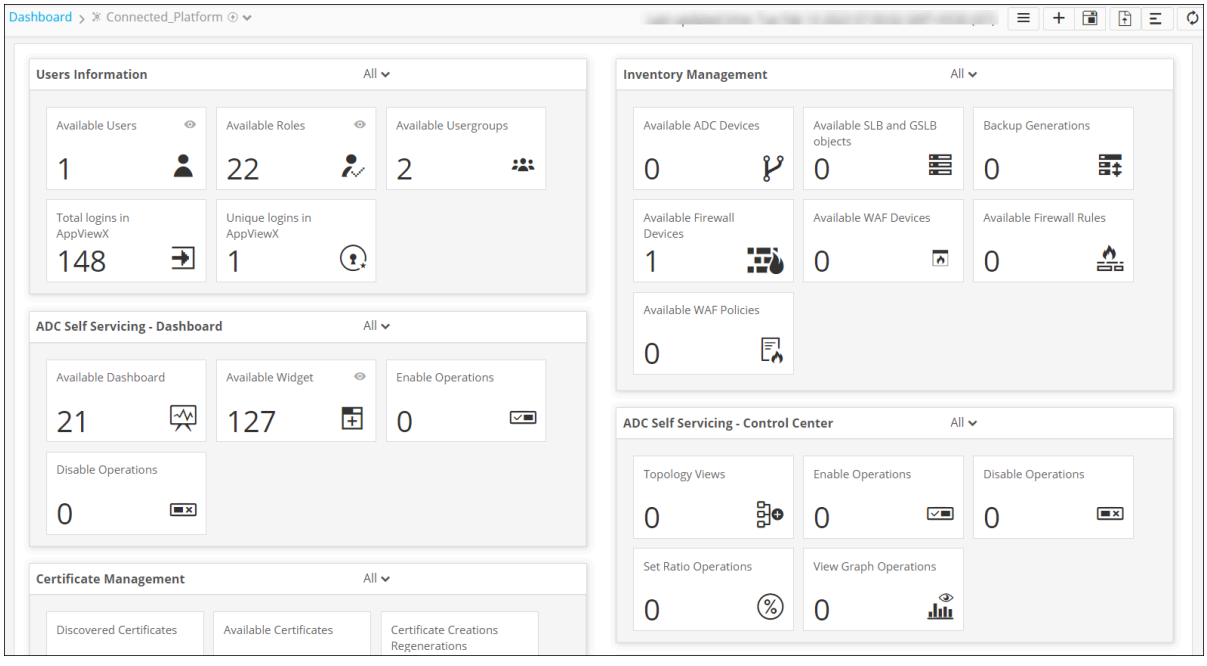
> **Note:** If you are using the old menu, under the **Authorized Functions** tab, expand **Studio** > **Reports**.

3. Once the required permissions have been assigned, click **Save**.

Getting Started with Dashboards

Dashboards allow you to manage, monitor, and interpret all configured applications and their objects. Widgets on the dashboard display reports that provide consolidated statistics of all accessible certificates, devices, and objects by extracting data from the respective inventories and recording the key value indicators.

- **Legacy dashboards:** These are hard-coded dashboards displaying predefined widgets to serve specific use cases. Widgets and reports on these dashboards cannot be modified or downloaded. For example: **Connected Platform**.



The following table describes the options available on this dashboard:

Options	Description
Dashboard name	Displays the name of the current dashboard.

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Options	Description
	Allows you to navigate to the Dashboard inventory.

Options	Description
	Allows you to create a dashboard/widget.
Options	**Description**
	Allows you to save the dashboard.
Options	**Description**
	Allows you to align the widgets on the dashboard.
Options	**Description**
	Refreshes the dashboard.

- **Custom dashboards:** These dashboards display reports and widgets created and pinned by the user. Widgets and reports on these dashboards can be added, removed, or modified as necessary and can also be shared among multiple roles. These dashboards can also be downloaded to your laptop. For example: Usage and Adoption Metrics, License Usage, and so on.

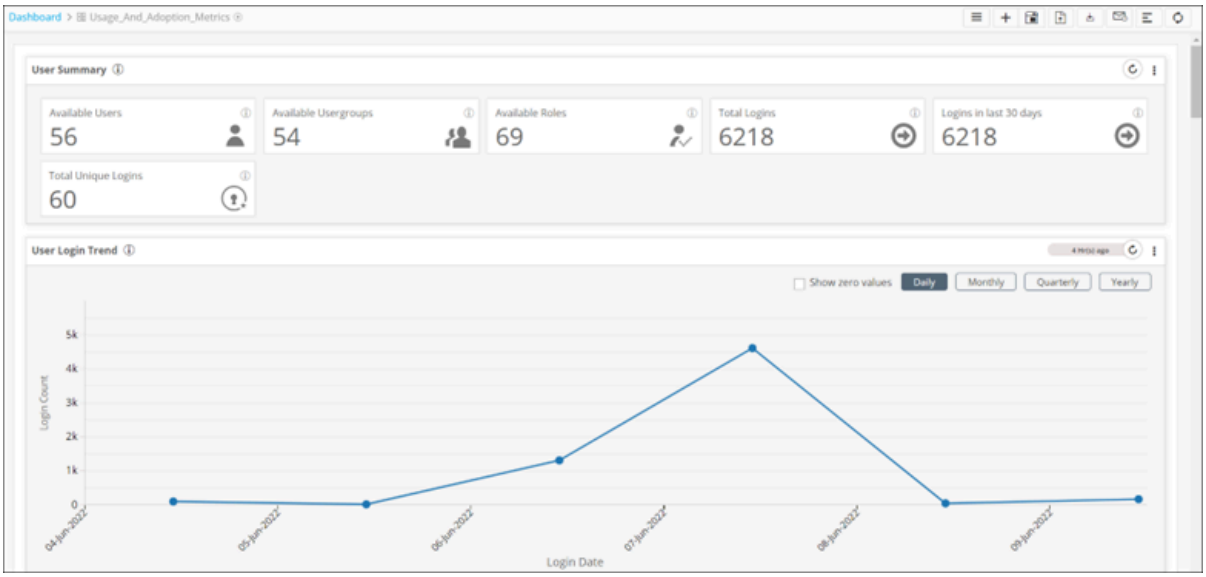
- Usage and Adoption Metrics Dashboard
- Accessing the Dashboard Inventory
- Building a Custom Dashboard
- Pinning Reports to a Dashboard
- Downloading a Dashboard

Usage and Adoption Metrics Dashboard

Product Usage and Metrics is a useful tool for understanding the interactions between the customer and your product/service. It helps capture day to day information on how the product or service is being used by customers. Moreover, it can help capture the duration, frequency, feature usage, activity logs. Analyzing this data empowers you to provide an improved customer experience.

The **Usage and Adoption Metrics** dashboard displays predefined widgets to provide the AppViewX metric usage reports and up-to-the-minute reports. It contains the status and statistics of devices and certificates managed within the AppViewX platform. It displays reports related to user summary, logins, user activity, asset inventory and more.

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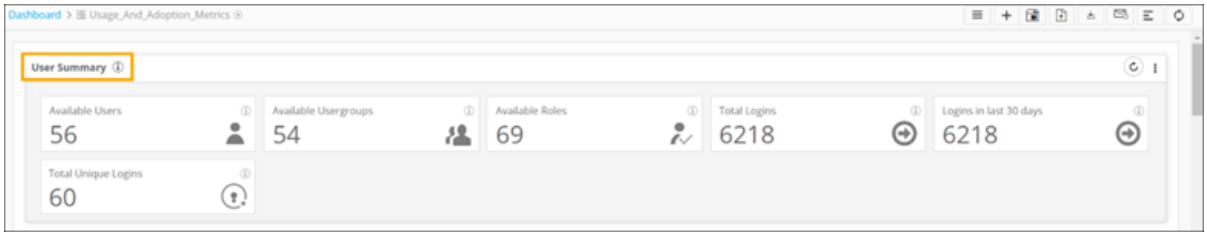
The following table describes the options available on this dashboard:

Options	Description
Dashboard name	Displays the name of the current dashboard.
	Allows you to navigate to the Dashboard inventory.
	Allows you to create a dashboard/widget.
	Allows you to save the dashboard.
	Allows you to export the dashboard.
	Allows you to download the dashboard to your laptop.
	Allows you to schedule and email reports from the dashboard.
	Allows you to align the widgets on the dashboard.
	Refreshes the dashboard.

Following are the various reports and metrics that are available on this dashboard:

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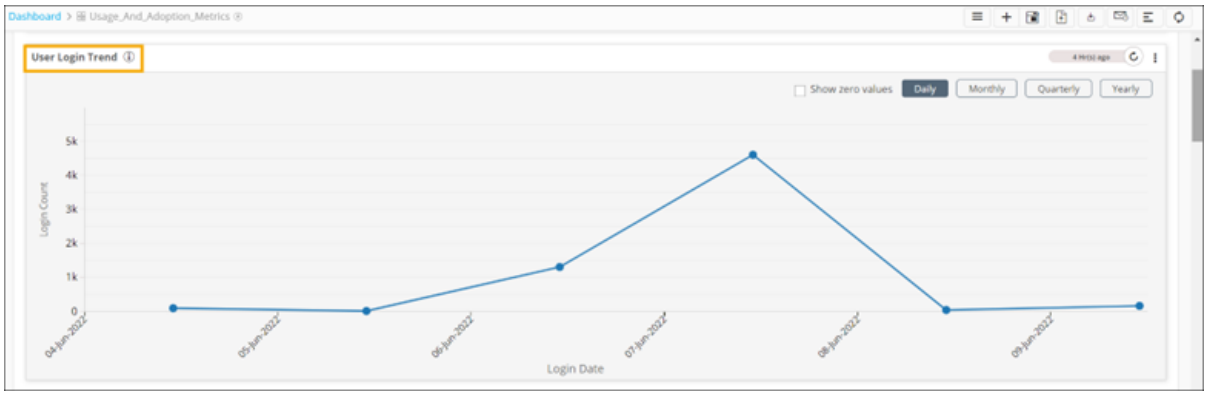
- The **User Summary** report gives a snapshot of user login, summary, and trends.



The following table describes the metrics displayed in this widget:

Metric	Description
Available Users	This metric displays available users in AppViewX.
Available User Groups	This metric displays available user groups in AppViewX.
Available Roles	This metric displays the available roles in AppViewX.
Total Logins	This metric displays the total number of logins in AppViewX.
Logins in last 30 days	This metric displays the number of logins in the last 30 days.
Total Unique Logins	This metric displays the total unique logins from different IDs.

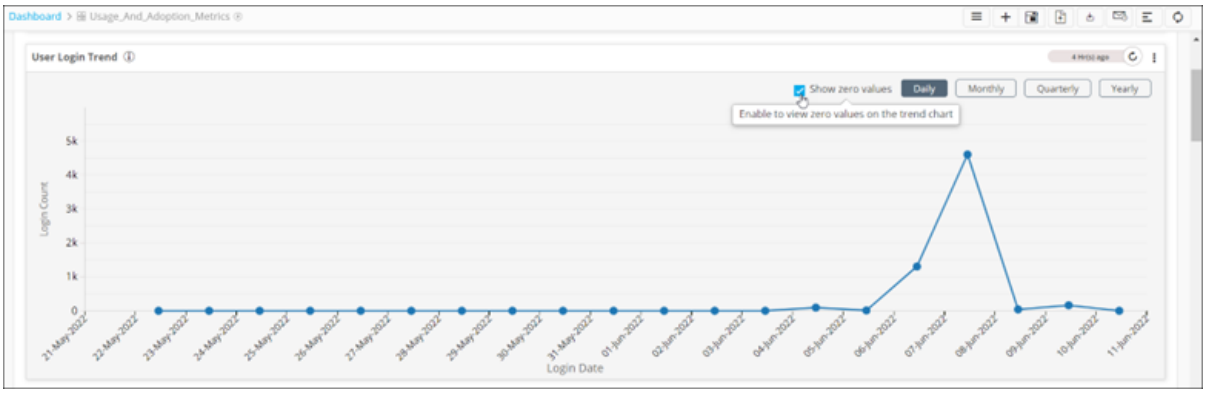
- The **User Login Trend** report displays the date-wise count of logins in AppViewX.



Note: The default selection is set to **Daily**.

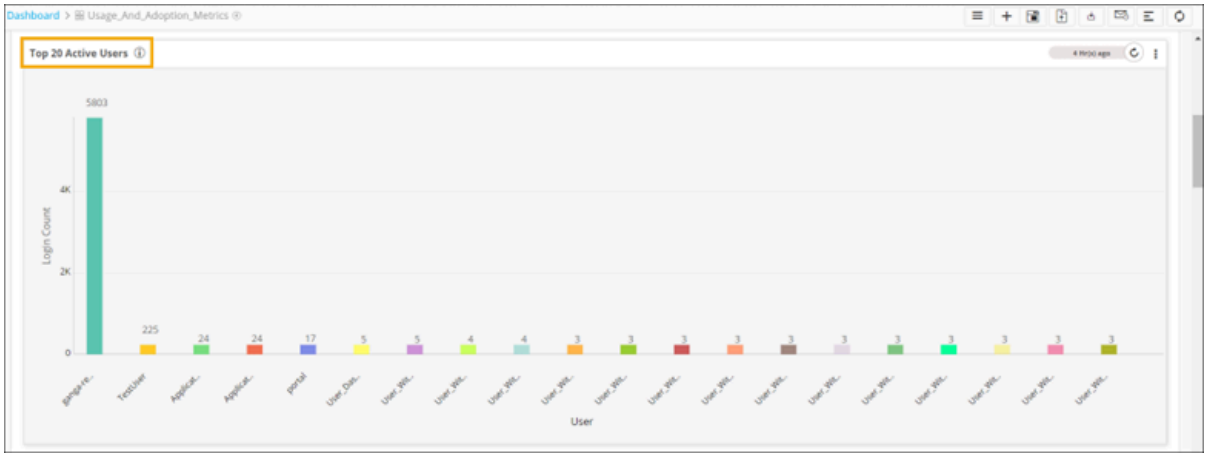
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- To display dates on which there were zero logins into AppViewX, select the **Show zero values** checkbox.

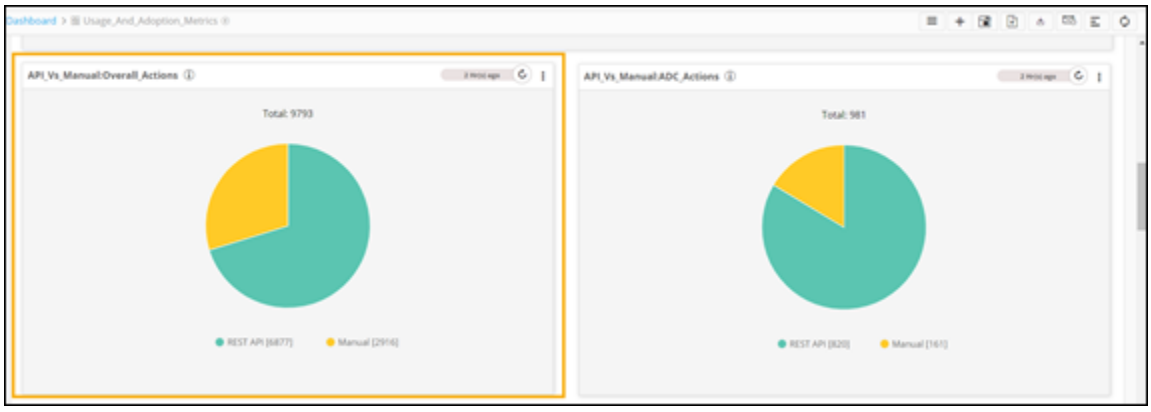


- Select **Monthly**, **Quarterly**, and **Yearly** options to get data based on the respective timelines.

- The **Top 20 Active Users** chart displays the top 20 active users by login count.

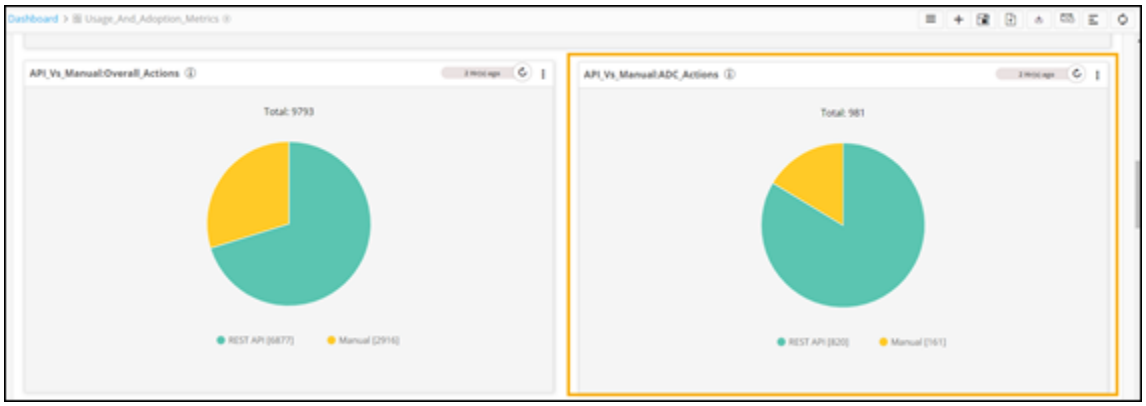


- The **API_vs_Manual:Overall_Actions** pie chart shows the list of actions triggered either manually or via API.

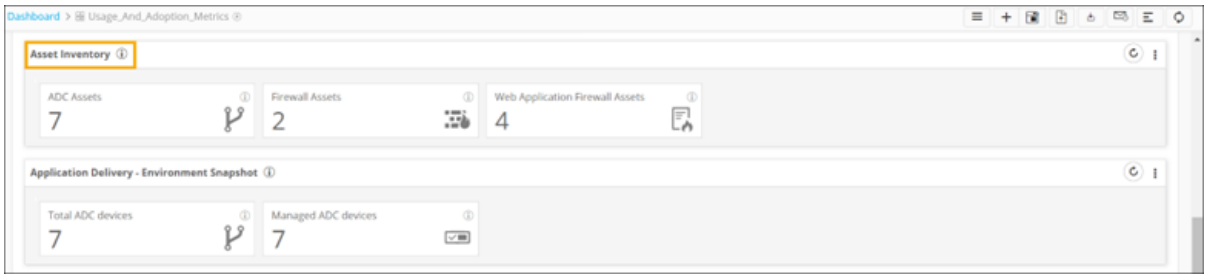


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- The **API_vs_Manual:ADC_Actions** pie chart shows the list of ADC actions triggered either manually or via API.



- The **Asset Inventory** widget displays the inventory of different types of assets such as ADC, firewall, and WAF.

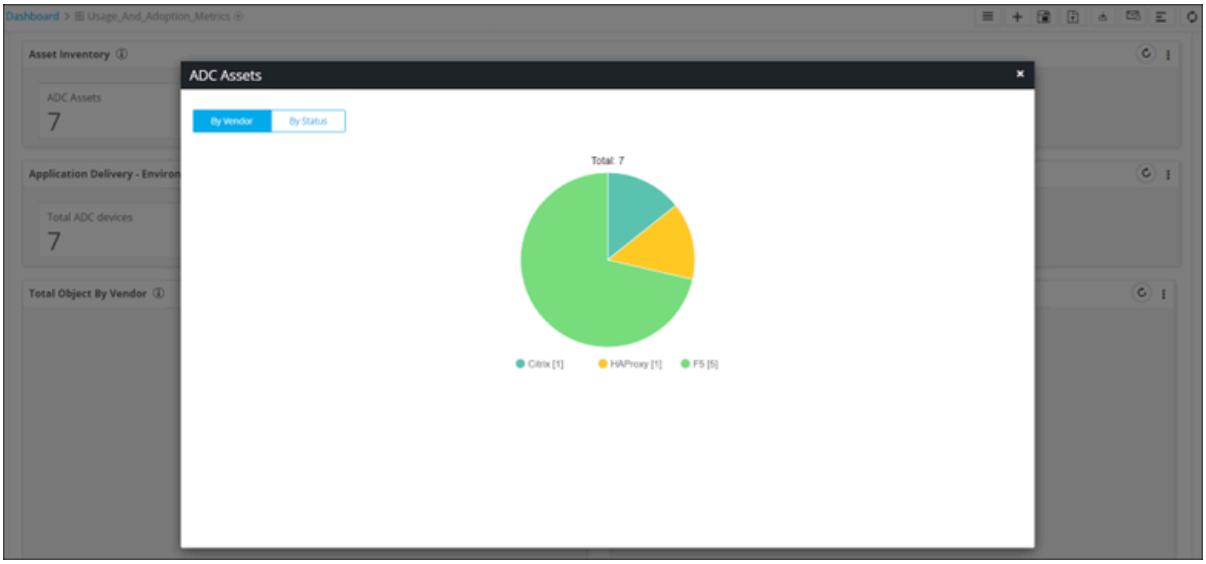


The following table describes the metrics displayed on this widget:

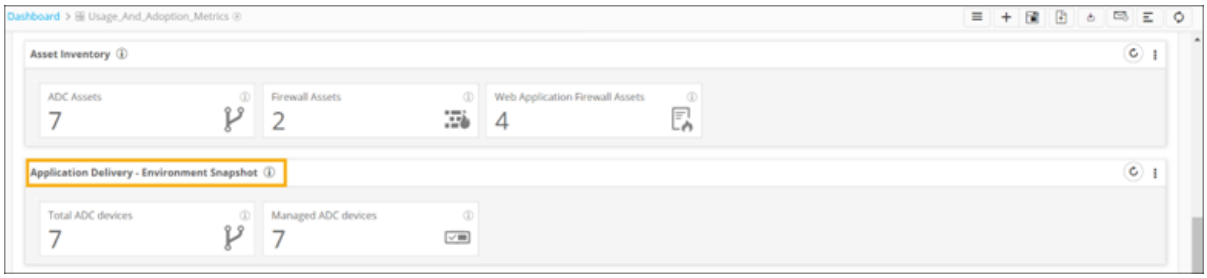
Metric	Description
ADC Assets	This metric displays the total count of all available ADC devices.
Firewall Assets	This metric displays the total count of all available Firewall devices.
Web Application Firewall Assets	This metric displays the total count of all available WAF devices.

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- To drill down a chart to display more levels of information, click any metric.



- The **Application Delivery - Environment Snapshot** widget displays a snapshot of application delivery. Each metric displays the total count of respective devices.

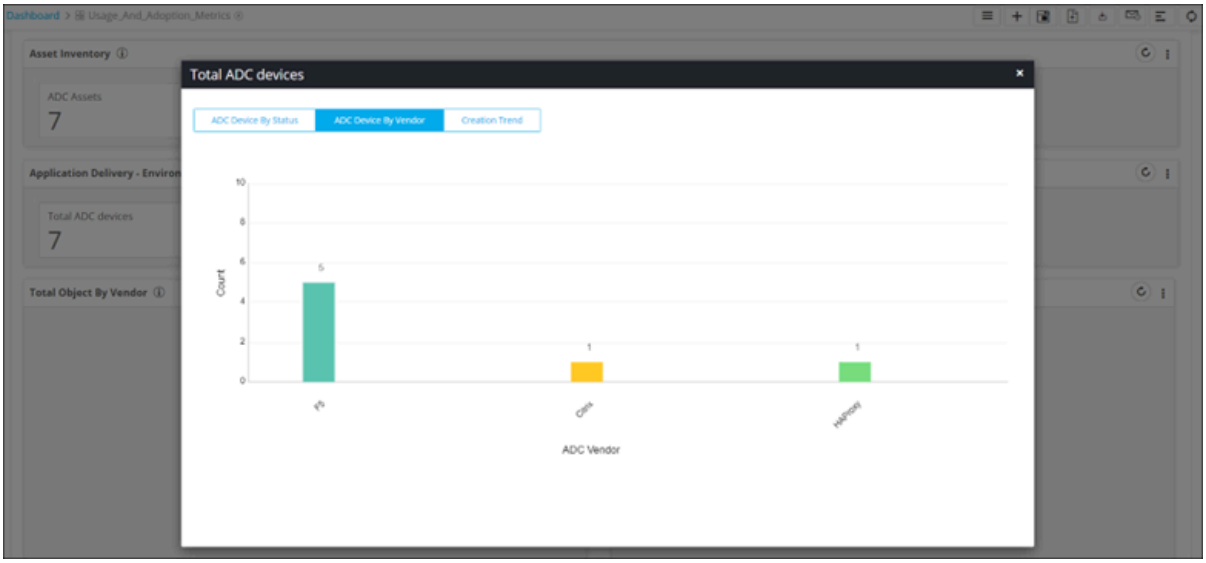


The following table describes the metrics displayed on this widget:

Metric	Description
Total ADC devices	This metric displays the total count of all available ADC devices.
Total Application Service Objects	This metric displays the total application service objects.
Managed ADC devices	This metric displays all the managed ADC devices.

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- To drill down a chart to display more levels of information, click any metric.



- The **Total Object by Vendor** pie chart displays the count of all ADC objects by vendor.

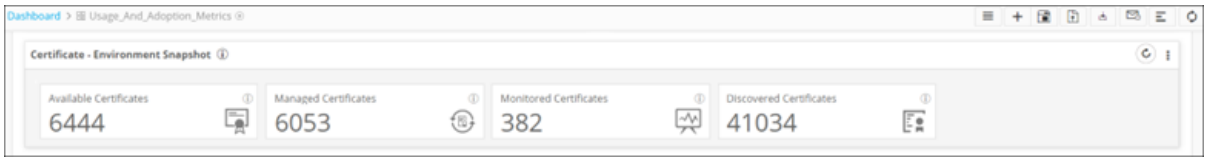


- The **Application Service Actions** pie chart shows a snapshot of application services performed.



- The **Certificate - Environment Snapshot** widget displays a snapshot of managed and monitored certificates.

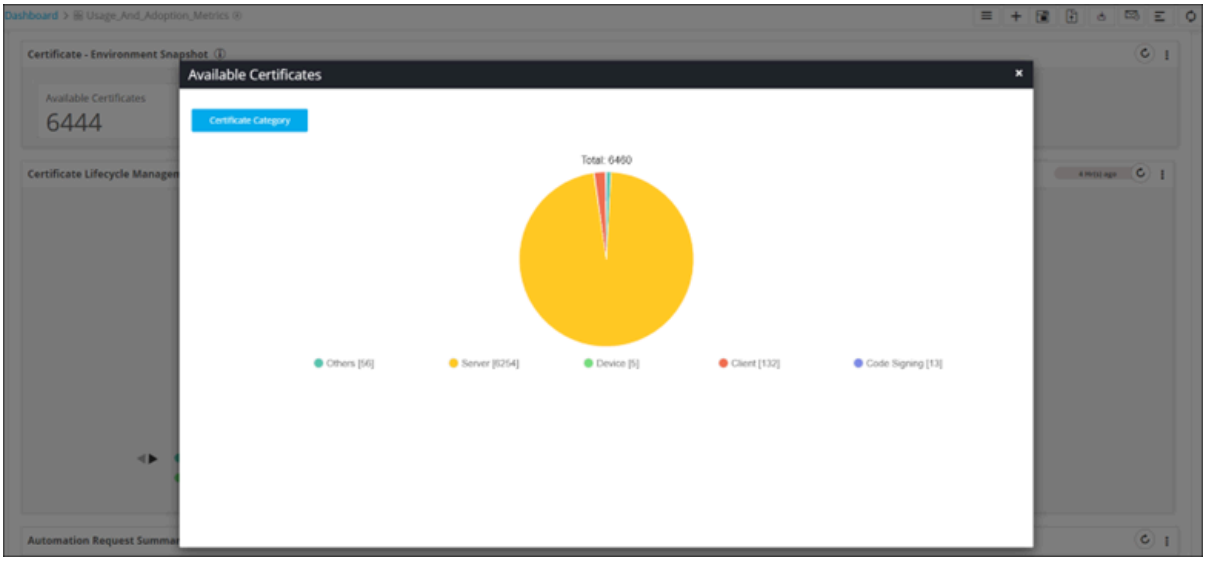
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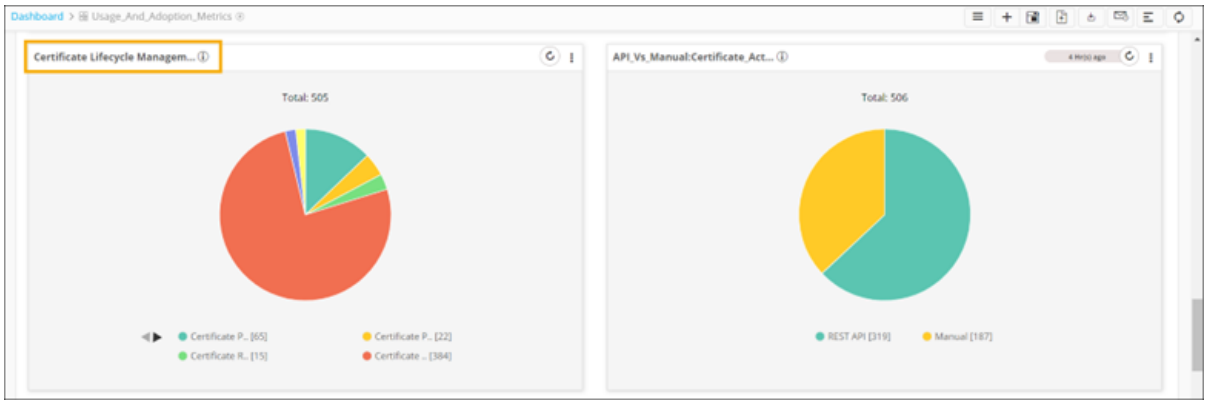
The following table describes the metrics displayed on this widget:

Metric	Description
Available Certificates	This metric displays the total count of all available certificates.
Managed Certificates	This metric displays the total count of all managed certificates.
Discovered Certificates	This metric displays the total count of all discovered certificates.

- To drill down a chart to display more levels of information, click any metric.

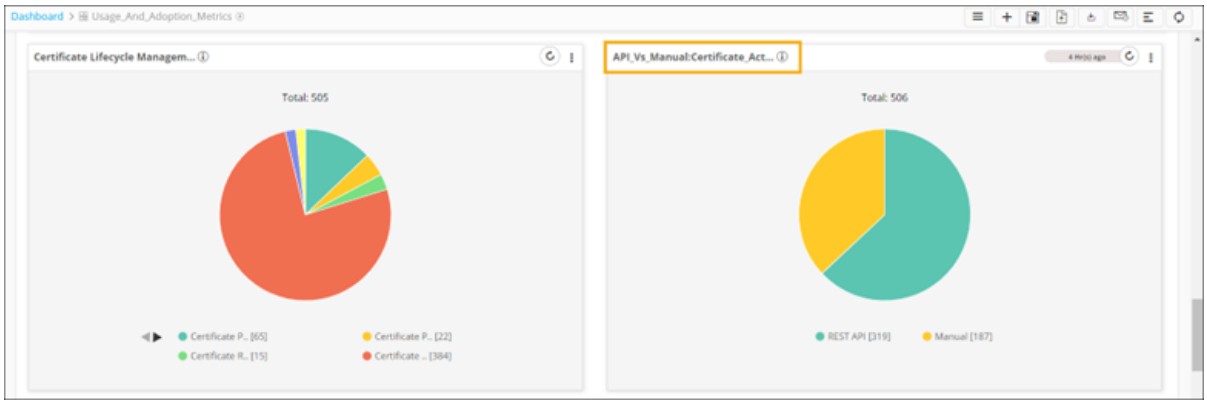


- The **Certificate Lifecycle Management** pie chart displays a snapshot of certificate actions performed, such as certificate push, certificate rollback, certificate push and bind and so on.

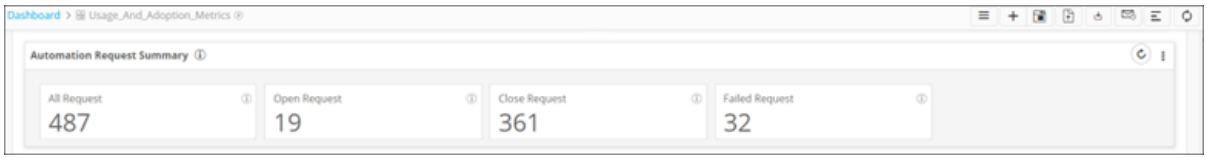


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- The **API_vs_Manual:Certificate_Actions** pie chart shows a list of certificate actions triggered either manually or via API.



- The **Automation Request Summary** widget displays a snapshot of automation request status and trend.

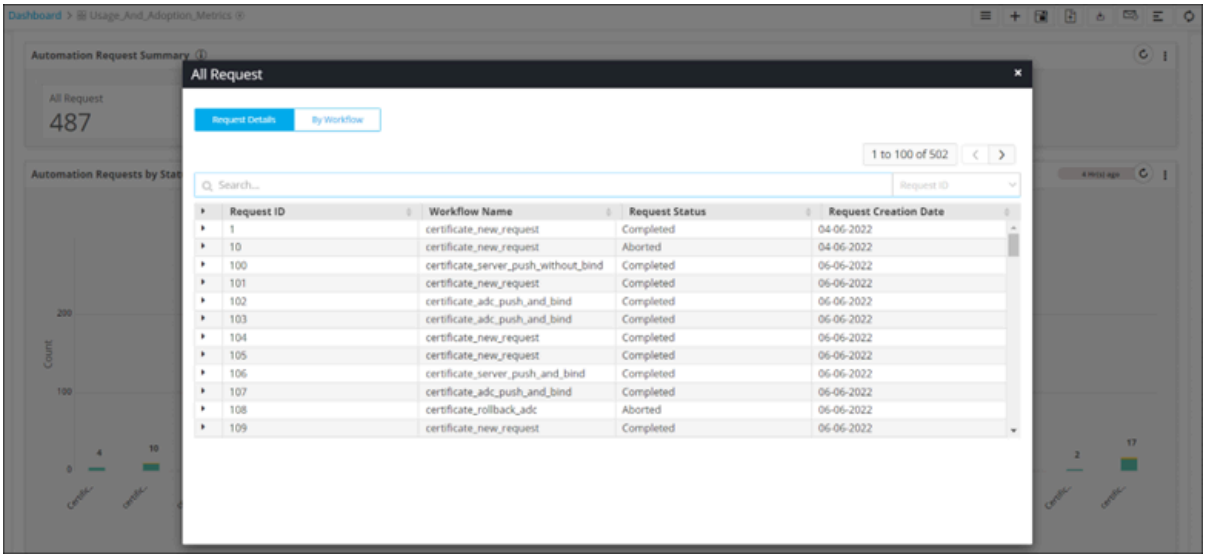


The following table describes the metrics displayed in this widget:

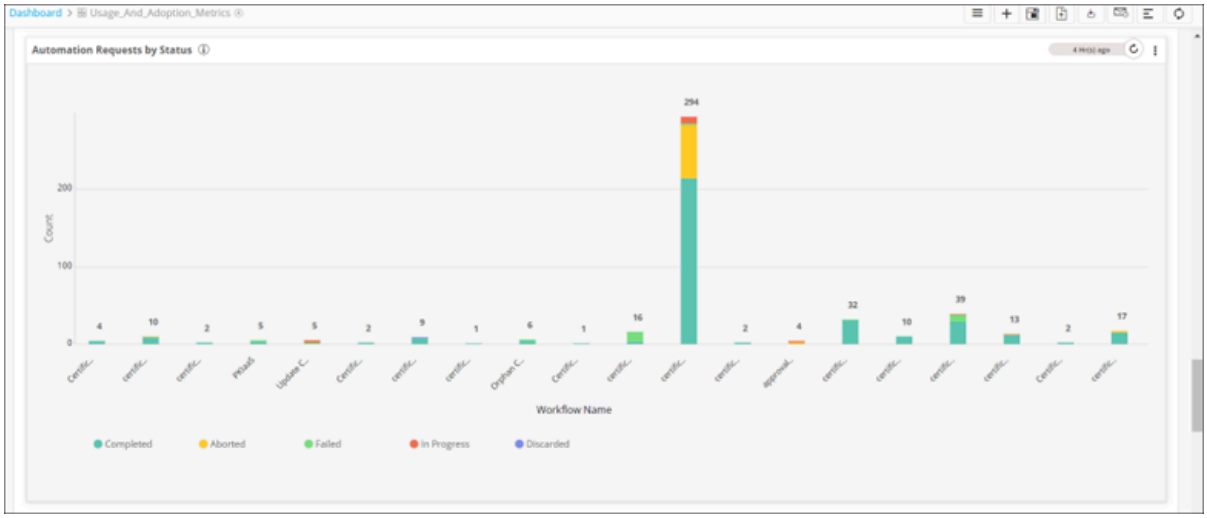
Metric	Description
All Request	This metric displays the count of total workflow automation requests.
Open Request	This metric displays the count of open workflow automation requests.
Close Request	This metric displays the count of closed workflow automation requests.
Failed Request	This metric displays the count of failed workflow automation requests.

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- To drill down a chart to display more levels of information, click any metric.

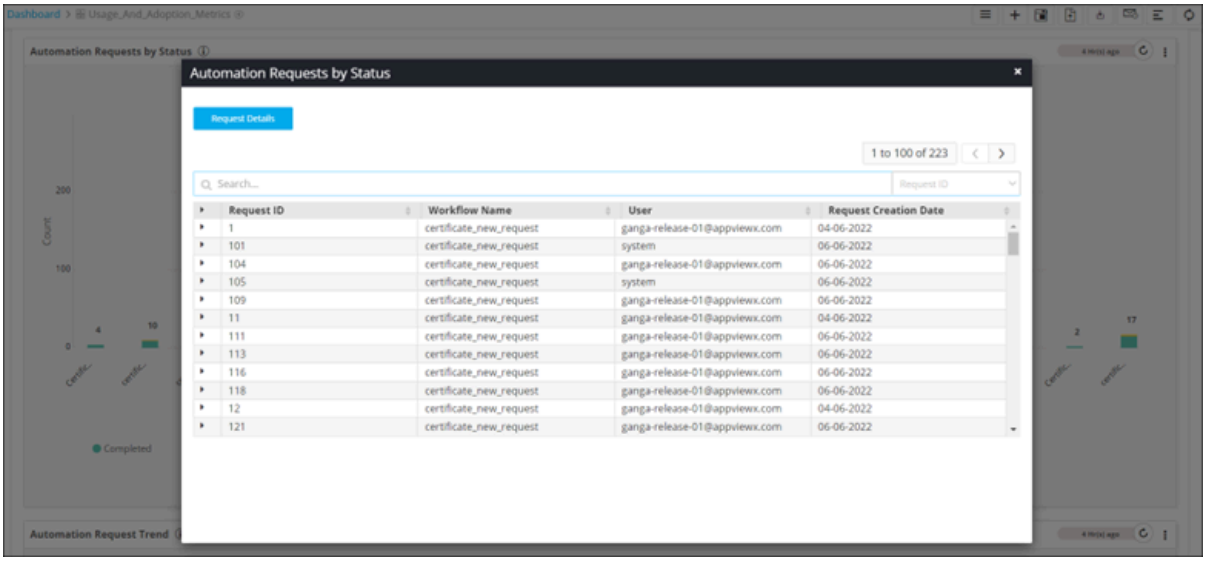


- The **Automation Request by Status** stacked bar graph displays the request status by workflow.

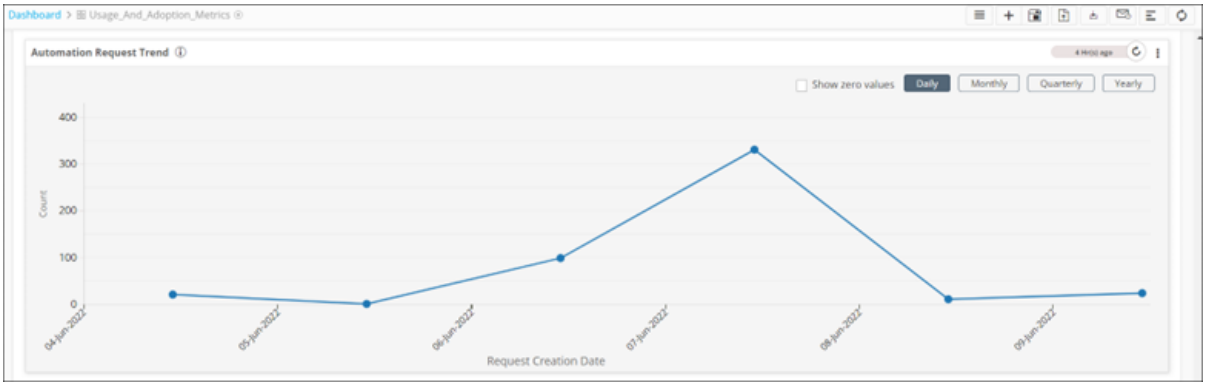


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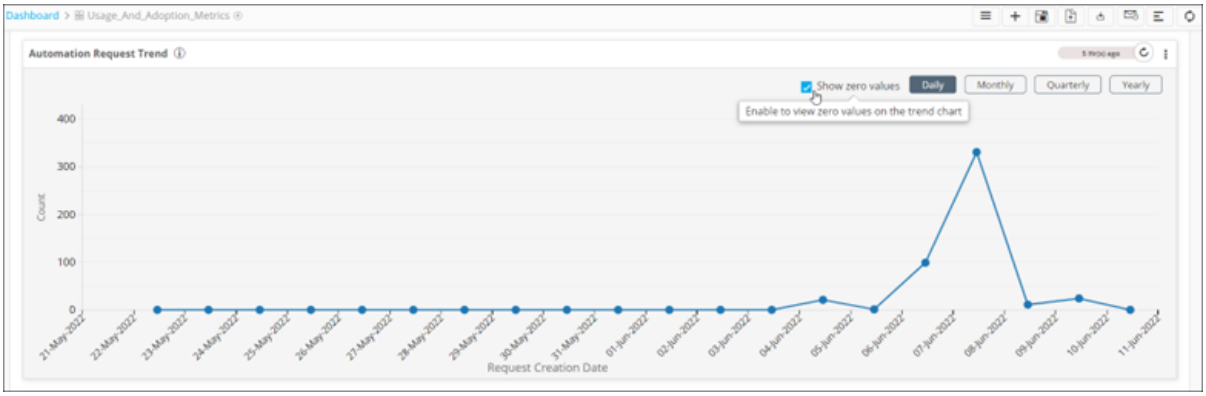
- To drill down a chart to display more levels of information, click any metric.



- The **Automation Request Trend** line chart displays the trend of all automation requests.



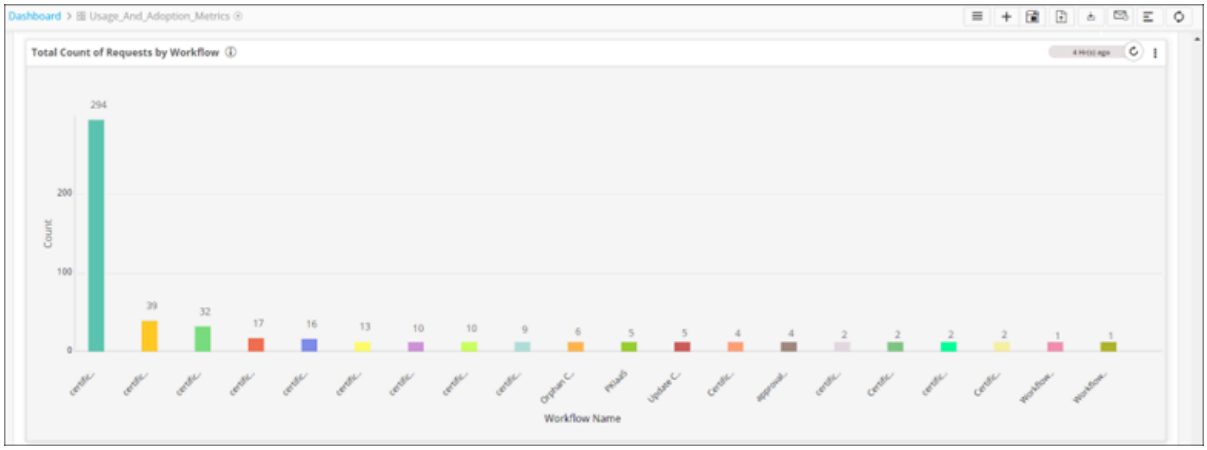
- To display dates on which there were zero logins into AppviewX, select the **Show zero values** checkbox.



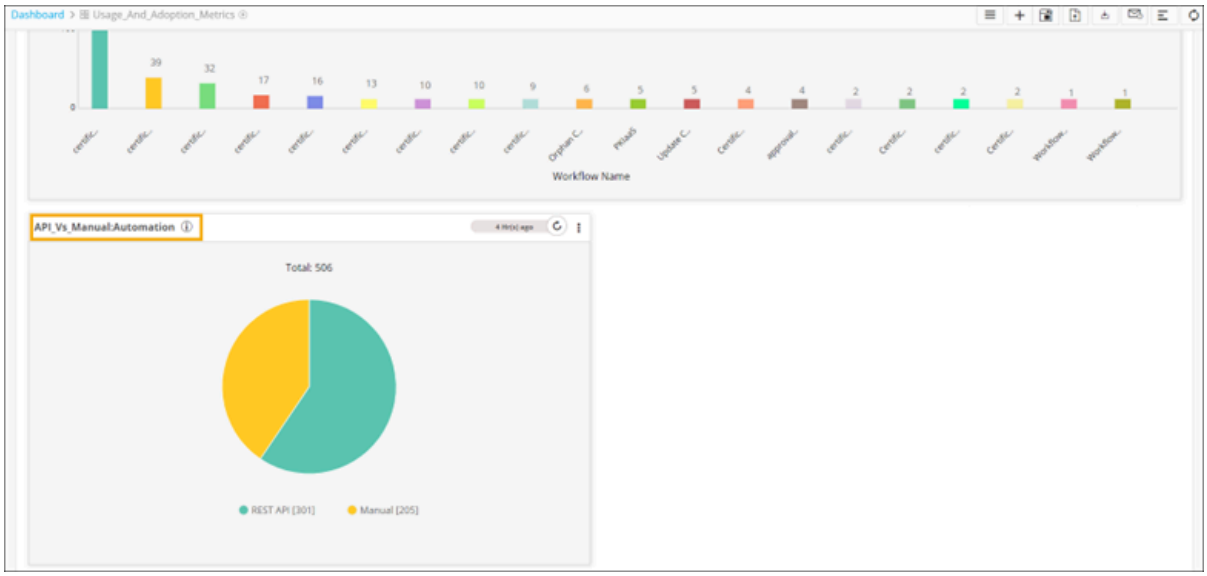
- To get data based on the respective timelines, click **Monthly**, **Quarterly**, and **Yearly** buttons.

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- The **Total Count of Requests by Workflow** bar graph displays the total count of requests by workflow.



- The **API_vs_Manual:Automation** pie chart displays a list of automation requests triggered either manually or via API.



Accessing the Dashboard Inventory

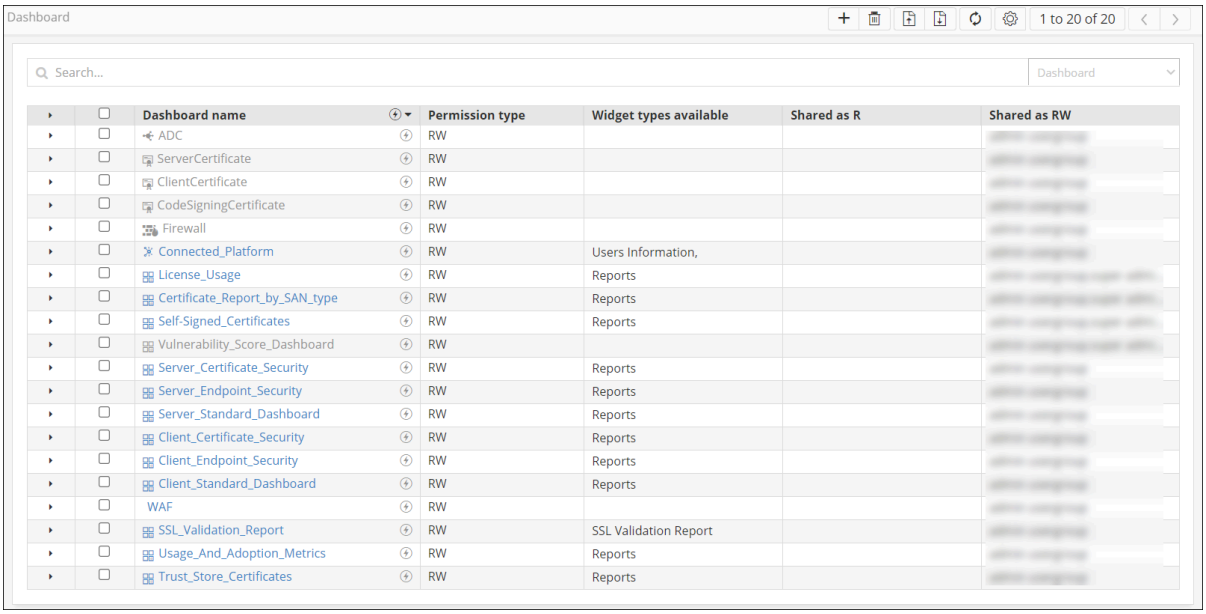
New Menu	Old Menu
In the **ADC+** or **CERT+** module, from the left pane, click **Dashboards**. The default dashboard is displayed.	From the main menu, select **Dashboards**. The default dashboard is displayed.
For more information on how to switch between menus, click here.	

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From the top left corner of the screen, click **Dashboard**.

> **Tip:** You can also click ☰ from the command bar on the top right to navigate to the **Dashboard** inventory page.

The dashboard inventory is displayed.



The following table describes the various options available on the **Dashboard** inventory page:

Options	Description
Search bar	Searches for the given keyword(s) in the field and shows a list of results that match the searched keyword(s).
	Allows you to assign the dashboard as the default dashboard that is displayed when the user logs in.
	Allows users to create a new dashboard.
	Allows users to delete a dashboard from the list.
	Allows users to export a dashboard from the list.
	Allows users to import a file to create a dashboard.

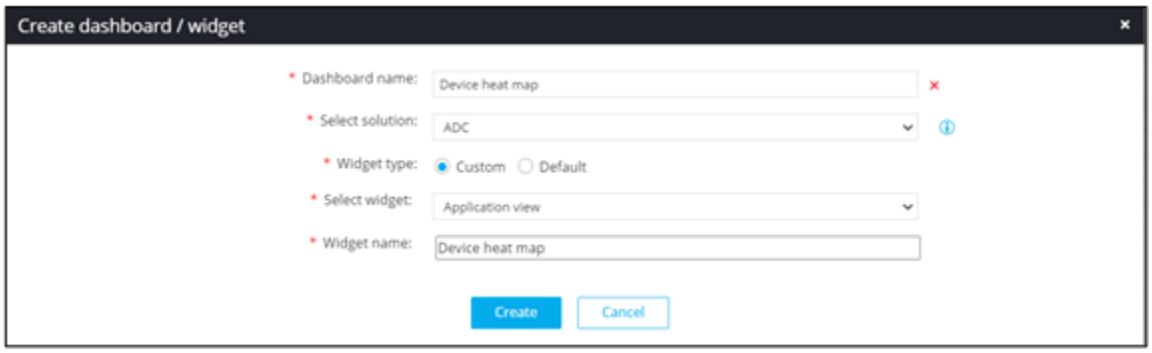
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Options	Description
	Refreshes the page by clicking on the refresh button.
	Allows users to auto-sort the dashboards alphabetically.

Building a Custom Dashboard

You can build a custom dashboard to display a specific set of reports.

1. On the Dashboard inventory page, from the top right corner of the screen, click **(Add)** icon in the command bar.
   The **Create dashboard / widget** pop-up window is displayed.
2. Enter or select the required field information.



The following table describes the field description to create a custom dashboard:

Field	Description
***Dashboard name**	Enter the name of the dashboard.
***Select solution**	ADC is the default selection. You can add widgets belonging to multiple solutions to this dashboard.
***Widget type**	Select the type of widget as: • **Custom**: Choose this option to build a customized widget. • **Default**: Choose this option to select the default widget.
***Select widget**	Select an required widget from the customized widgets in the dropdown.
***Widget name**	Enter the name of the widget.
** : Mandatory fields*	

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3. Click **Create**.
   A new dashboard is created. You can now pin reports and widgets to this dashboard as per your requirement.

Pinning Reports to a Dashboard

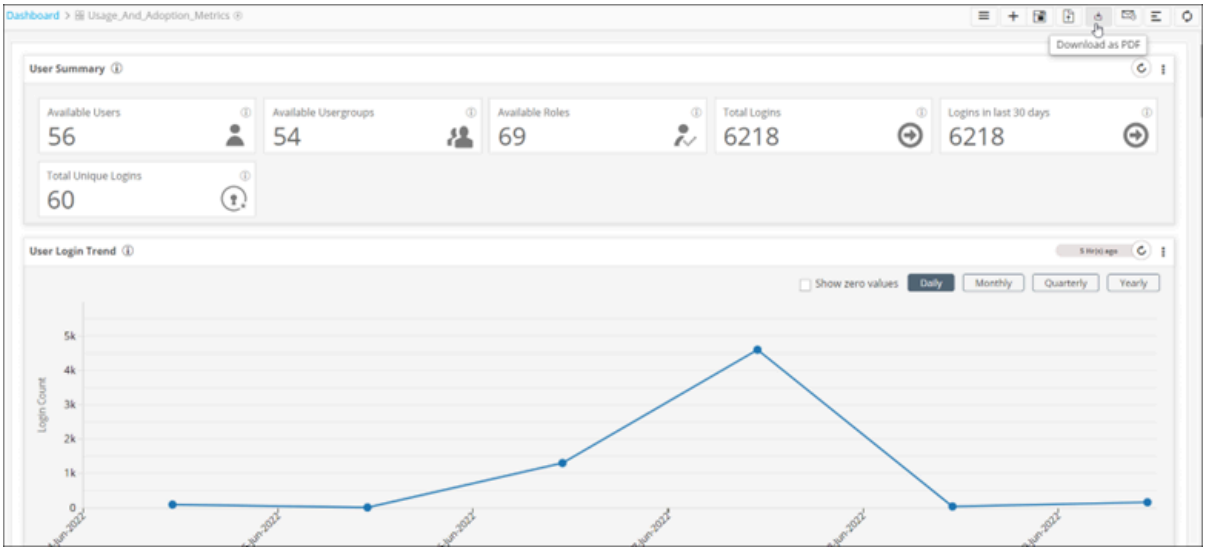
You can pin customized reports to an existing dashboard or a new dashboard. A maximum of 20 reports can be pinned to a dashboard. Pinning a report to the dashboard allows users to visualize different reports in the same place.

Note: For more information on how to pin a report to the dashboard, click here.

Downloading a Dashboard

An entire dashboard can be downloaded as a PDF to your device. However, only Custom dashboards can be downloaded. Legacy dashboards cannot be downloaded

1. On the Dashboard inventory page, click on a dashboard name.
   The selected dashboard is displayed on the screen.
2. To download the dashboard as a PDF file, from the command bar on the top right corner of the screen, click **(Download)** icon.



   The dashboard is downloaded to your device as a PDF.
3. To view the dashboard in PDF format, click on the downloaded file.

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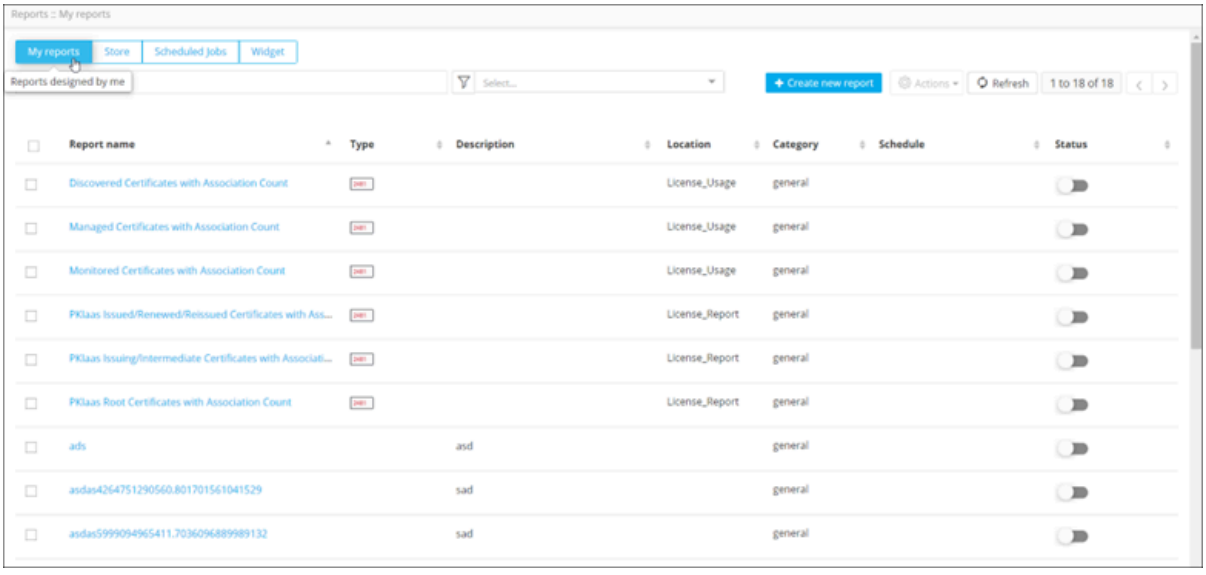
Accessing the Reports Module

New Menu	Old Menu
In the **Platform** module, from the left pane, under **DATA STUDIO**, select **Reports**. The **Reports :: My Reports** page is displayed.	From the main menu, select **Studio** > **Reports**. The **Reports :: My Reports** page is displayed.
For more information on how to switch between menus, click here.	

- My Reports
- AI Reports
- Store
- Scheduled jobs
- Widget

My Reports

The **Reports :: My reports** page shows the list of all reports created by users.



The following table describes the options available on the **My reports** page:

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Options	Description
Search bar	Searches for the given keyword(s) in the field and produces results featuring the searched keyword(s).
	Allows you to filter reports according to different categories, such as ADC, Certificate and so on.
Create new report	Allows you to create a new custom report.
Actions	Allows you to perform actions (pin, share, clone, delete) on the reports. **Note:** This option is enabled only when a report(s) is selected.
Refresh	Refreshes the page.
Report name	Displays the names of the reports in alphabetical order (A to Z and Z to A).
Type	Displays reports according to the type - pie, donut, bar, stacked bar, grid, line metric.
Description	Displays a brief description of the report.
Location	Displays the location of the report on the dashboard.
Category	Displays the category of the report - • **General**: This is a default category. • **Certificate**: This relates to Certificate reports specifically. • **ADC**: This relates specifically to ADC reports.
Schedule	Displays the date and time of a scheduled report.
Status	Displays whether a report has been enabled or is disabled.

AI Reports

Attention: The AI Reports feature is currently in **Tech Preview** and supports only certificate management reporting at this stage.

AppViewX has introduced AI Reports, offering a natural language processing (NLP) interface for generating certificate management reports. This feature enables users to query certificate data using

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natural language, making complex reporting accessible to non-technical users while maintaining the power and flexibility of advanced certificate analytics. It provides an intuitive interface where users can:

- Enter natural language queries about their certificate infrastructure
- Access pre-defined sample queries for common use cases
- Generate instant reports based on their queries

The key features are:

- **Natural Language Input**: Users can type questions in plain English
- **Sample Query Templates**: Pre-defined queries for common scenarios
- **Instant Report Generation**: Real-time report creation based on queries
- **Responsive Design**: Adapts to different screen sizes
- **Error Handling**: Graceful handling of invalid inputs and system errors

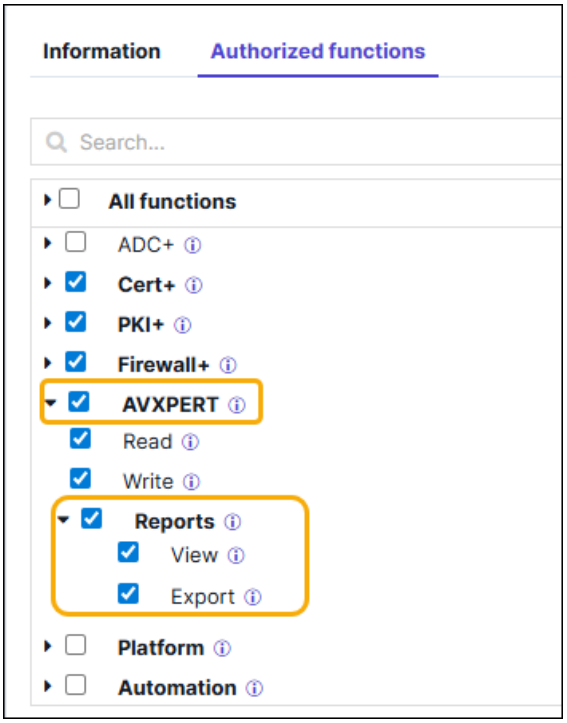
Prerequisites

To configure the role based access control for enabling the AI Reports feature.

1. Go to  (**Menu**) > **Platform** > **Identity** > **Role**.
   The **Role** page is displayed. The predefined roles are listed here.
2. Click  **Add**.
   The **Role > Add** page is displayed with the **Information** tab enabled.
3. From the **Information** tab, Enter the **Name** (mandatory) and **Description** and click **Save**.
   The Role name is created successfully and the **Authorized functions** tab is enabled.
4. Click the **Authorized functions** tab.

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5. Expand **AVXPERT** > **Reports** and select the following options:



   - **View** - Access to query any data source using natural language and generate AI-based reports
   - **Export** - Access to export AI-generated reports.

Accessing and Generating AI Reports

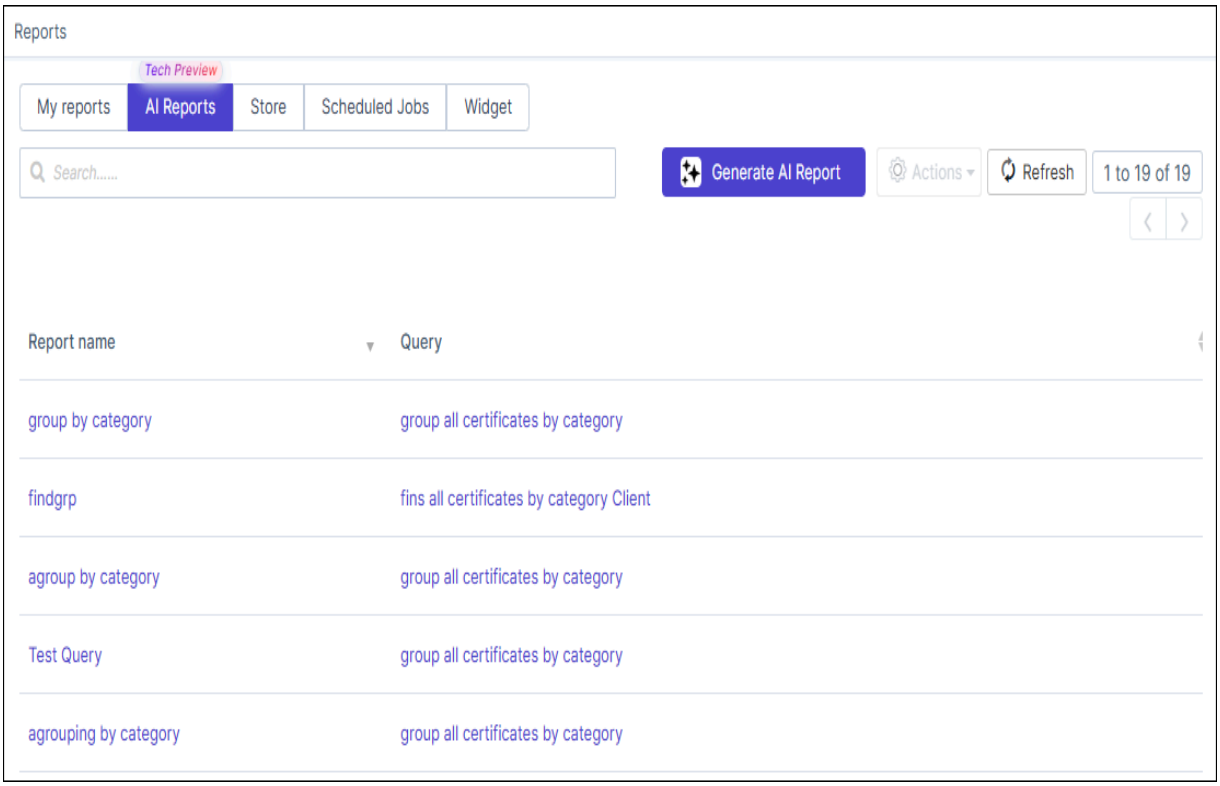
Accessing AI Reports

To access the AI Reports,

1. Go to (**Menu**) > **Platform** > **DATA STUDIO** > **Reports**.
   The **Reports** page is displayed.
2. Click AI Reports (AI Reports).

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The **AI Reports** page is displayed with a list of previously saved reports and the **Generate AI Report** button.

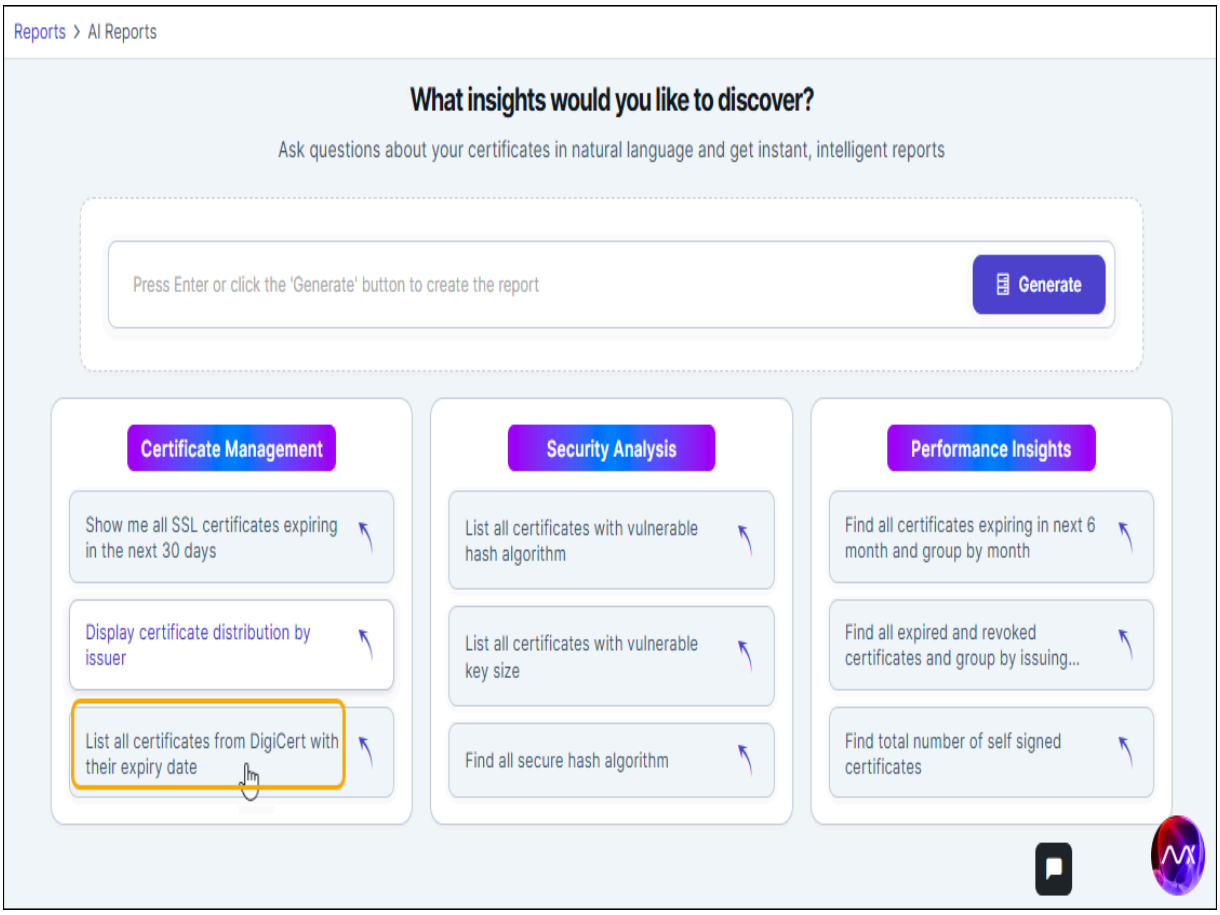


Generating Pre-Defined AI Reports

To generate pre-configured AI Reports,

1. Click **Generate AI Report**.
   The **AI Reports** page is displayed with the following widgets:
   - **Certificate Management**
   - **Security Analysis**
   - **Performance Insights**

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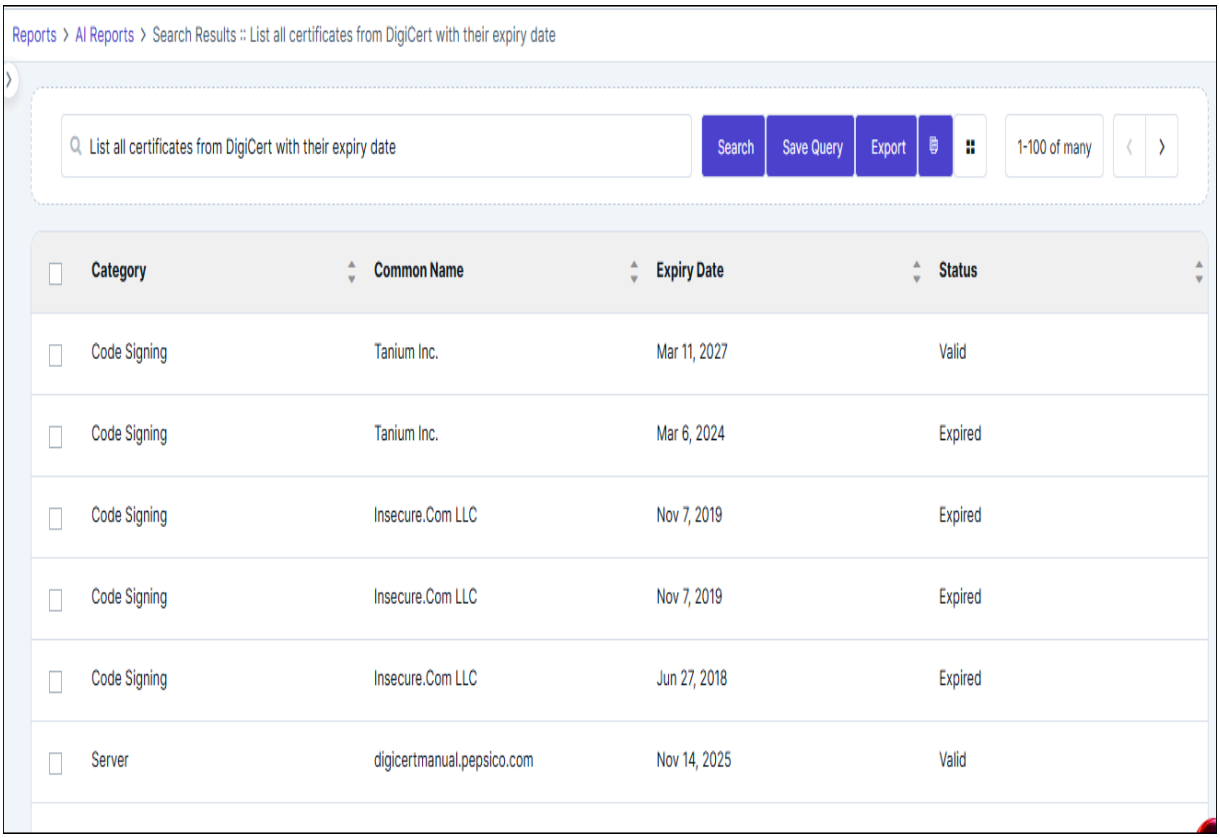


Each widget has a list of pre-defined reports under it.

Note: The report is intuitive to display the values either in a grid or a bar chart.

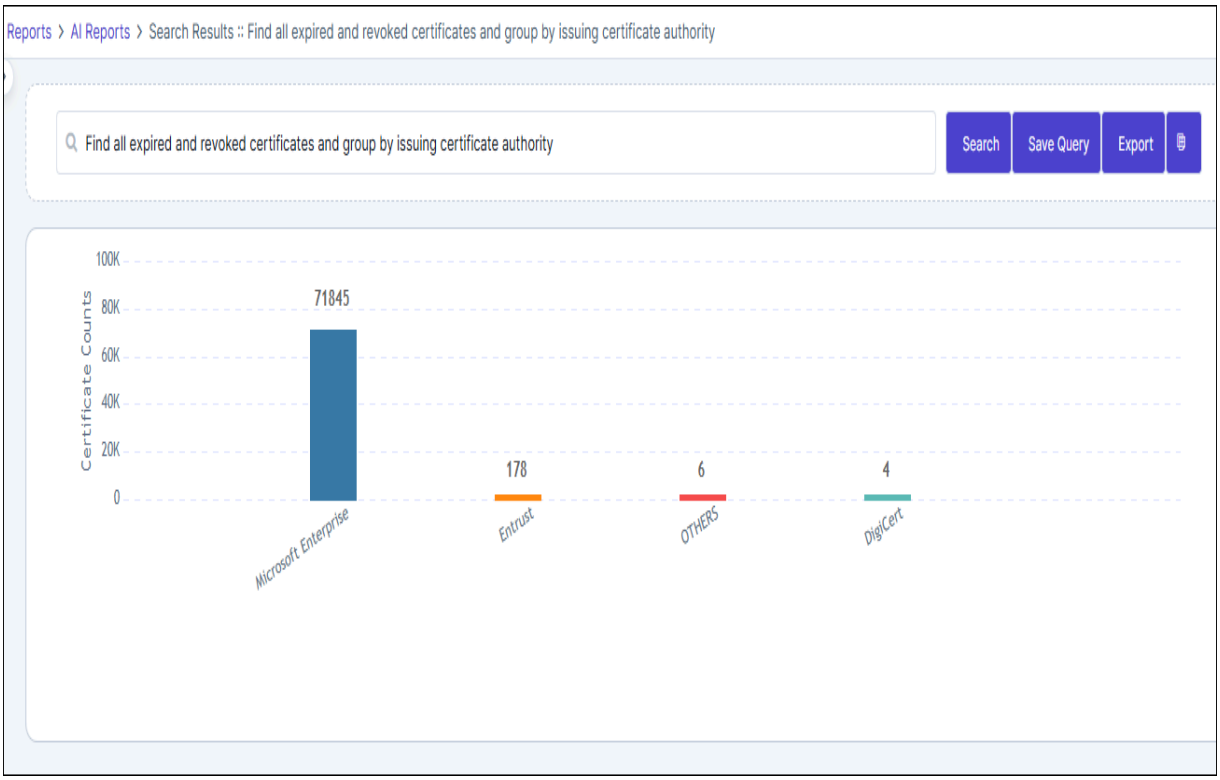
2. Click any value within the widget.
   An example of a grid report is **Certificate Management** > **List all certificates from DigiCert with their expiry date**.

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An example of a bar graph is **Performance Insights** > **Find all expired and revoked certificates and group by issuing certificate authority**.

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3. Use the following options provided in the report output page:

a. Save Query (*Save Query*) - To save a query

   i. Click **Save Query** to display the pop-up.

   ii. Enter a name for the query.

   iii. Click the **Save Query** button in the pop-up.

b. (*View Collection Reasoning*) - When the button is clicked, the reason is displayed in a pop-up above the search bar.

c. (*Manage Grid Columns*) - To add or delete column in the grid.

> **Note:** This button is only displayed for grid-based reports.

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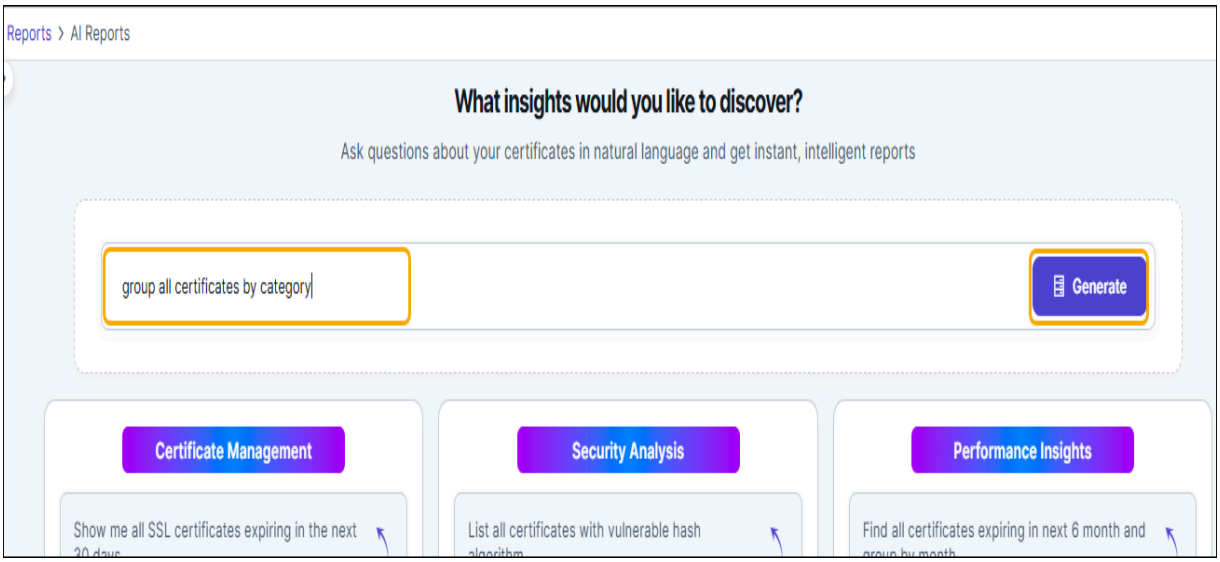
i. Click the manage grid column button to display a pop-up with **Available Columns** and **Selected Columns** list.
ii. Click the arrow buttons to move the columns from the Available to Selected list and vice versa.
iii. Click the **Save** button in the pop-up.

d. Export (*Export*) - Click the Export button to download the report in the CSV format.

Generating Real-Time AI Reports

To generate real-time AI Reports,

1. Click **Generate AI Report**.
   The **AI Reports** page is displayed with widgets:
2. Enter the query in the search bar as shown below and click **Generate**.



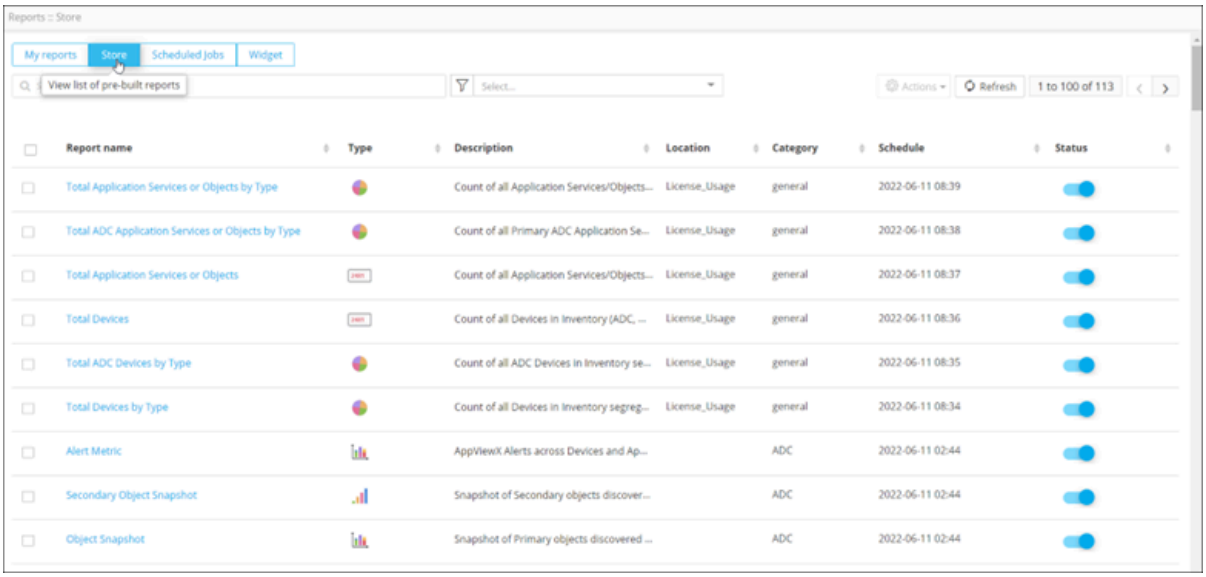
Note: The report is intuitive to display the values either in a grid or a bar chart.

3. Use the options: *Save Query*, *View Collection Reasoning*, *Manage Grid Columns*, and *Export* in the report output page as explained in the section above.

Store

The **Reports :: Store** page shows a list of ready-to-use reports made available to users.

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The following table describes the options available under the **Store** page:

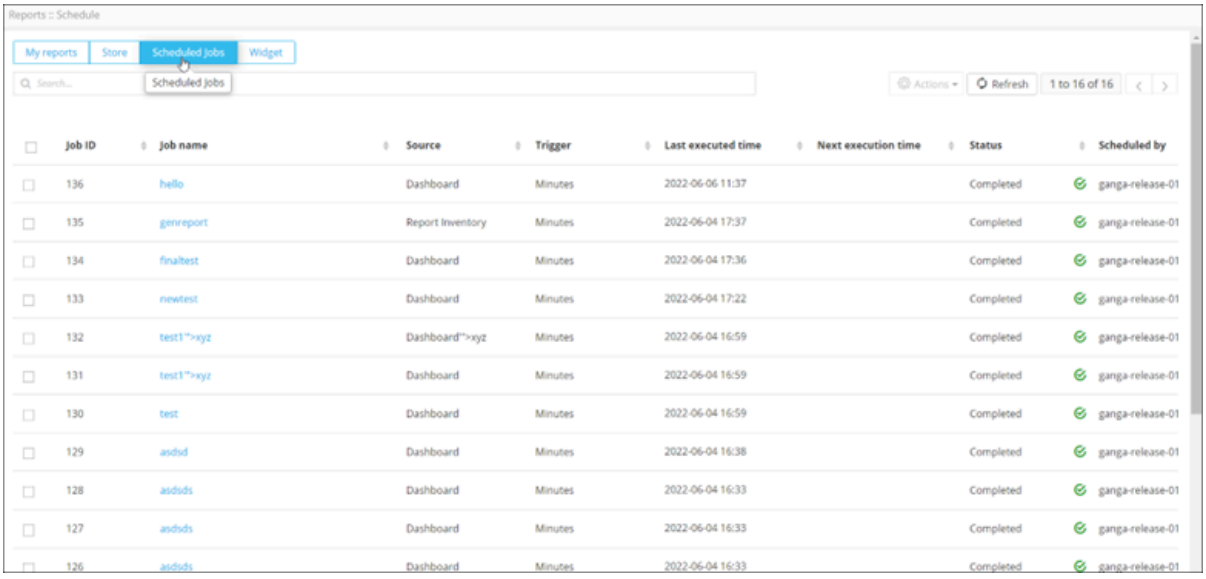
Options	Description
Search bar	Searches for the given keyword(s) in the field and produces results featuring the searched keyword(s).
	Allows you to filter reports according to different categories.
Actions	Allows you to perform actions (pin, share, clone) on the reports. **Note:** • This option is enabled only when a report(s) is selected. • Only reports available in the Store can be deleted.
Refresh	Refreshes the page.
Report name	Displays the names of the reports in alphabetical order (A to Z and Z to A).
Type	Displays reports according to the type - pie, donut, bar, stacked bar, grid, line metric.
Description	Displays a brief description of the report.
Location	Displays the location of the report on the dashboard.

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Options	Description
Category	Displays the category of the report - • **General**: This is a default category. • **Certificate**: This relates to Certificate reports specifically. • **ADC**: This relates to ADC reports specifically.
Schedule	Displays the date and time of a scheduled report.
Status	Displays whether a report has been enabled or is disabled.

Scheduled jobs

The **Reports :: Schedule** page lists all the scheduled jobs or the emails that have been scheduled by a user to trigger at pre-set time intervals.



The following table describes the options available under the **Scheduled Jobs** tab:

Options	Description
Search bar	Searches for the given keyword(s) in the field and produces results featuring the searched keyword(s).
Refresh	Refreshes the page.
Job ID	Displays the Job ID.

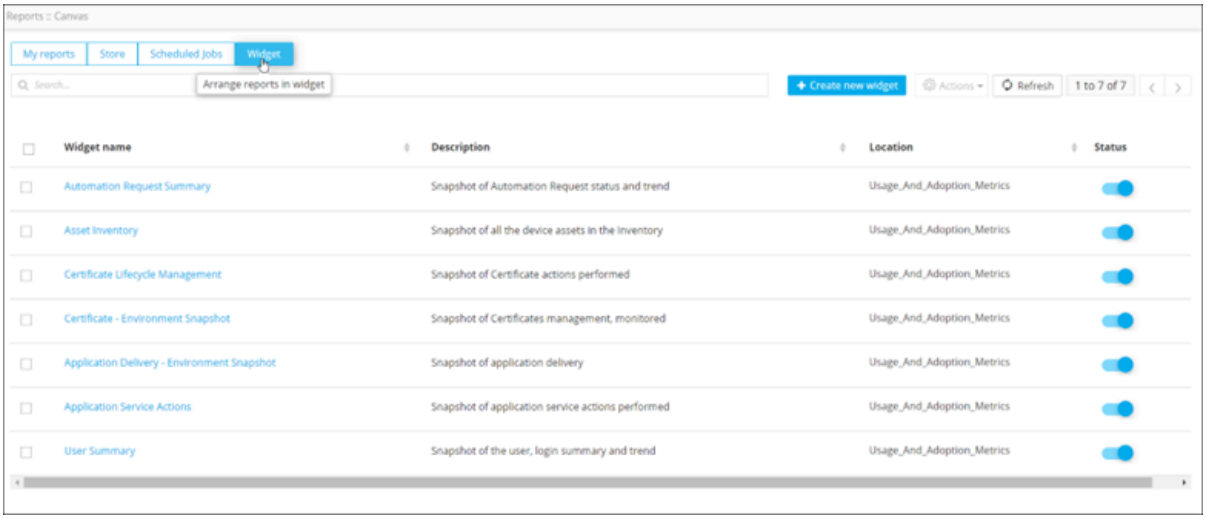
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Options	Description
Job name	Displays the Job name.
Source	Displays the source of the scheduled job.
Trigger	Displays the frequency at which the job is scheduled to be triggered.
Last executed time	Displays the time when the job was last executed.
Next execution time	Displays the time when the job will be executed next.
Status	Displays the status (pause/resume) of the job. You can click on the green arrow to change the status.
Scheduled by	Displays the name of the user who scheduled the job.

Note: For more information on scheduling reports, click here.

Widget

A widget allows you to arrange data in a visually striking display. Only metric charts can be used to create widgets. The **Reports :: Canvas** page shows the list of pre-built widgets available for the user.



This table describes the options available under the **Widget** page:

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Options	Description
Search bar	Searches for the given keyword(s) in the field and produces results featuring the searched keyword(s).
Create new widget	Allows you to create a new widget.
Actions	Allows you to perform actions (pin, clone, delete, share) on the widgets. This option is enabled only when a widget(s) is selected.
Refresh	Refreshes the page.
Widget name	Displays the names of the widget.
Description	Displays a brief description of the widget.
Location	Displays the location of the widget on the dashboard.
Status	Displays whether a widget has been enabled or is disabled. **Note:** You can enable or disable a widget by turning the toggle on or off.

Creating a Report/BYOR

There are three steps involved in creating a report using AppViewX's report builder tool.

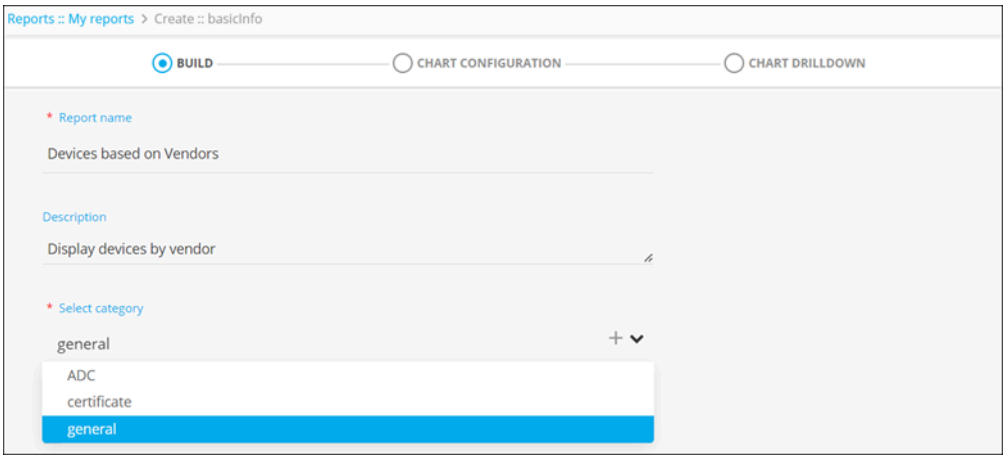
- Build
- Chart Configuration
- Chart Drilldown.

- Build
- Chart Configuration
- Chart Drilldown

Build

1. To create a customized report, on the **Reports :: My Reports** page, click **Create New Report**.
2. On the **Reports :: My reports > Create :: basicinfo** page, under the **BUILD** section, enter or select the required field information.

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The following table describes the field information in this section:

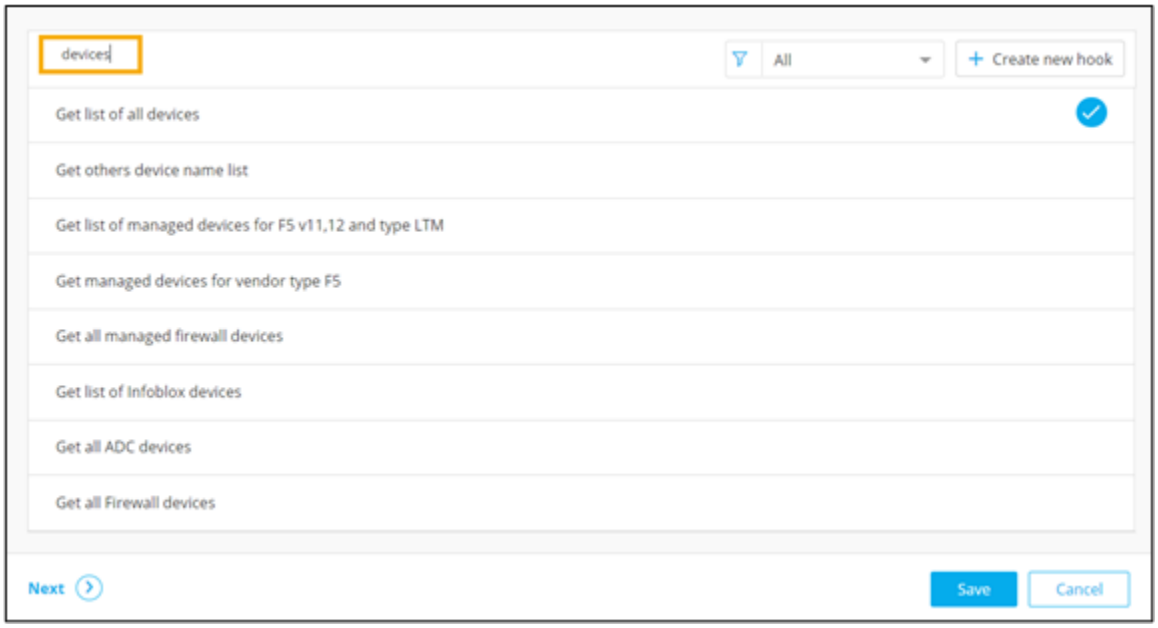
Field	Description
***Report name**	Enter a valid report name. For example: **Devices based on vendors**.
Description	Enter a valid description of the report. For example: **Display devices by vendor**.
***Select category**	Select category from the options available in the drop down menu or click + to add a new category. • **Certificate** - Select category as certificate for creating certificate related reports specifically. • **ADC** - Select category as ADC for building ADC related reports specifically. • **General** - Select category as general for all reports.
** : Mandatory fields*	

3. To query certificates based on role permissions, select the **ACL Restricted** check box.

> **Note:** Check this box specifically for creating certificate related reports.

4. To query report data, either select a preexisting hook or click **Create new Hook**.

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Note: For more information on creating hooks, click here.

5. To save this basic information on the report, click **Save**.
6. To go to the next stage of report building, click **Next**.
   The CHART CONFIGURATION section is displayed.

Chart Configuration

The chart configuration page lists seven types of chart options that can be selected for creating reports. These options are:

- Pie Chart
- Donut
- Bar
- Stacked Bar
- Grid
- Line
- Metric
- Line Area

- Designing a Custom Pie Chart
- Designing a Custom Donut Chart
- Designing a Custom Bar Chart

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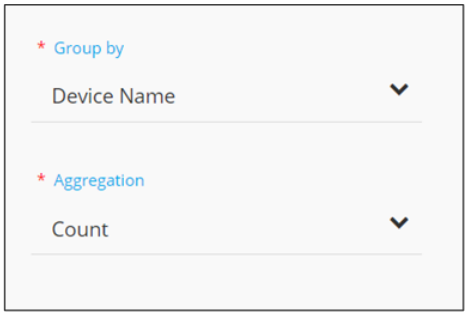
- Designing a Custom Stacked Bar Chart
- Designing a Custom Grid Chart
- Designing a Custom Line Chart
- Designing a Custom Metric Chart
- Designing a Custom Line Area Chart

Designing a Custom Pie Chart

Creating a report using a pie chart allows you to display multiple classes of data and their proportions. It helps to summarize a large data set visually. It is easy to understand and requires minimal explanation.

To design a custom pie chart:

1. Build a report.
2. Under the **CHART CONFIGURATION** section, **Select chart type** as **PIE**.
3. Enter or select the required field information.



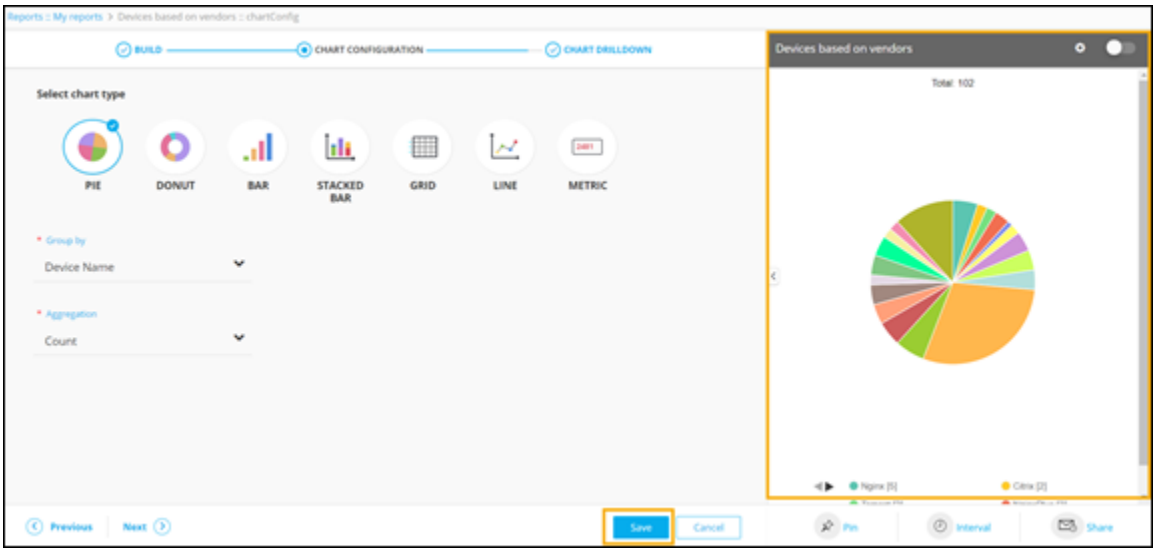
The following table describes the field information in this section:

Field	Description
***Group by**	Select a value from the dropdown menu on the basis of which report data will be grouped. For example: **Device Name**.
***Aggregation**	Select the calculation to be done on the report data for the dropdown. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data.
** : Mandatory fields*	

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4. Click **Save**.

   A preview of the pie chart is generated on the right side of the screen.

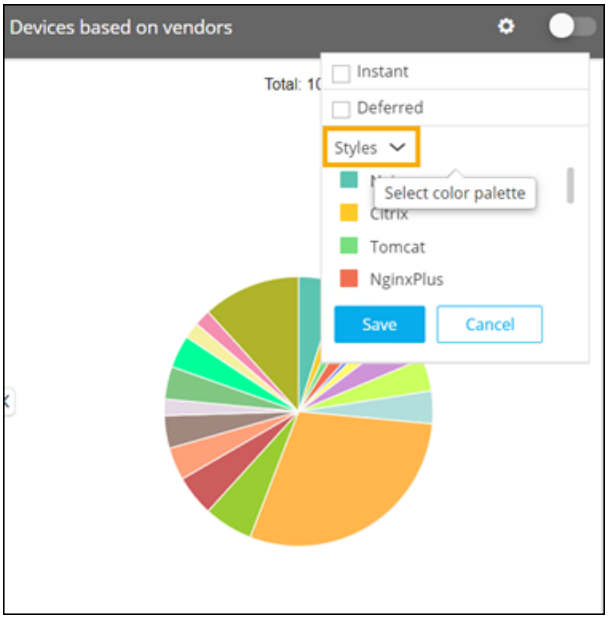


5. To select the data loading pattern, in the chart's preview window, click **(Settings)** icon.

   The following options are displayed:

   - **Instant**: This option allows you to enable live data loading and see changes in data immediately. This can be used in the case of small databases.
   - **Deferred**: This option allows you to enable lazy data loading and is useful in the case of larger databases. The default time interval for this is set at 30 minutes.

6. To change the style/font color of their pie chart, click **Styles**.



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a. Click on the coloured value boxes to display the color palette.
b. Choose the desired color.
c. Similarly click the coloured boxes and choose different colors from the palette for the different values,
d. Click **Save**.

7. To enable the report, turn on the toggle. Only enabled reports are visible on the dashboard to which they are pinned.
8. Click **Next**.
   The CHART DRILLDOWN section is displayed.

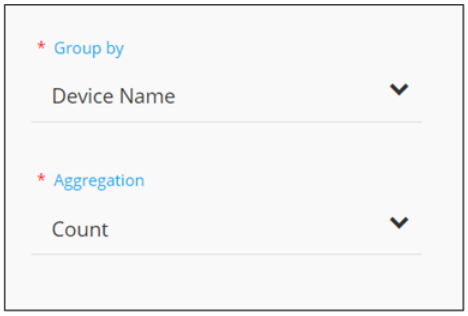
What to do next: To **modify** any chart report parameters, first disable toggle button from the preview screen. Settings and Styles can also be edited only when the report is in a disabled state.

Designing a Custom Donut Chart

A donut chart, similar to a pie chart, allows you to compare between categories and visualize part to whole relationships. A donut chart has the added advantage of having a blank space in the middle where extra information can be supplemented.

To design a custom donut chart:

1. Build a report.
2. Under the **CHART CONFIGURATION** section, select the **DONUT** chart.
3. Enter or select the required field information .



The following table describes the field information in this section:

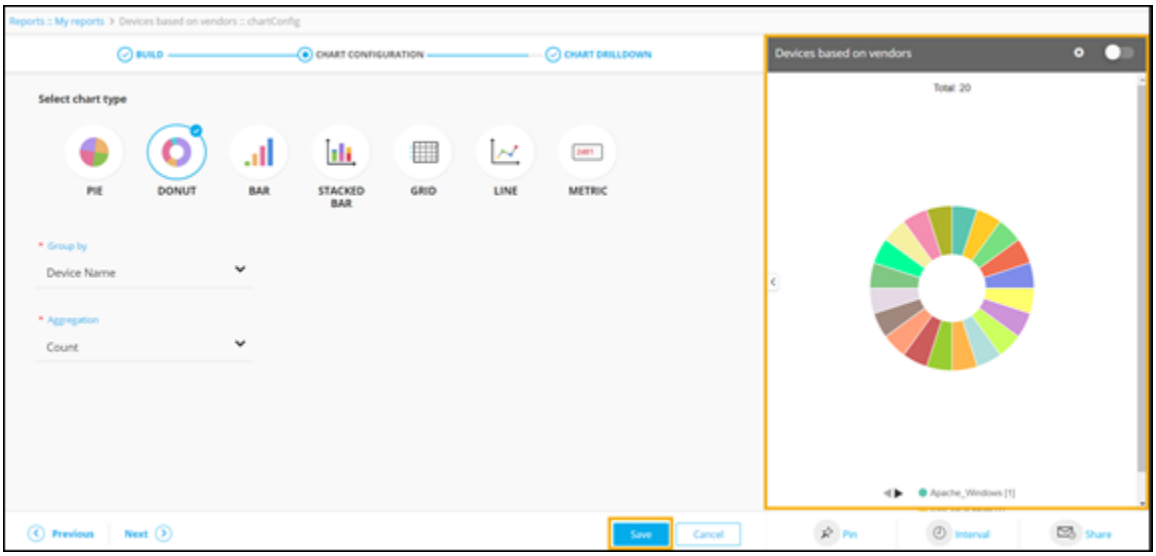
Field	Description
***Group by**	Select a value from the dropdown menu on the basis of which report data will be grouped. For example: **Device Name**.

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Field	Description
***Aggregation**	Select the calculation to be done on the report data for the dropdown. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data.
** : Mandatory fields*	

4. Click **Save**.

   A preview of the donut is generated on the right side of the screen.



5. To select the data loading pattern, in the chart's preview window, click  **(Settings)** icon.

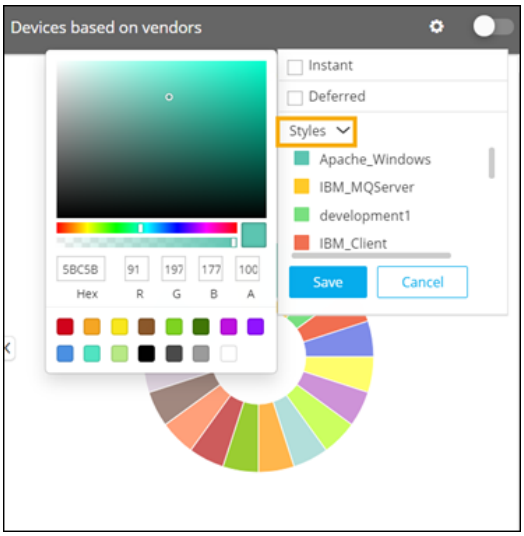
   The following options are displayed:

   • **Instant**: This option allows you to enable live data loading and see changes in data immediately. This can be used in the case of small databases.

   • **Deferred**: This option allows you to enable lazy data loading and is useful in the case of larger databases. The default time interval for this is set at 30 minutes.

6. To change the style/font color of the donut, click **Styles**.

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a. Click on the coloured value boxes to display the color palette.
b. Choose the desired color.
c. Similarly click the coloured boxes and choose different colors from the palette for the different values,
d. Click **Save**.
e. Enable the toggle button to view the applied changes.

7. To enable the report, turn on the toggle. Only enabled reports are visible on the dashboard to which they are pinned.
8. Click **Next**.
   The CHART DRILLDOWN section is displayed.

What to do next: To **modify** any chart report parameters, first disable toggle button from the preview screen. Settings and Styles can also be edited only when the report is in a disabled state.

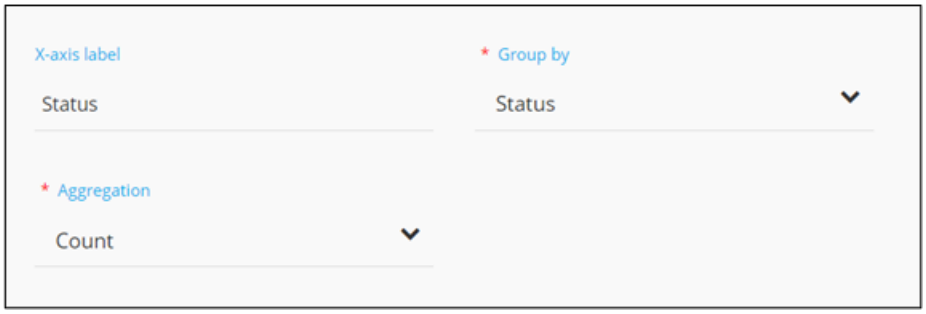
Designing a Custom Bar Chart

A bar chart allows you to compare data across different categories. It is especially useful for measuring changes in data over longer periods of time or measuring larger changes in data.

To design a custom bar Chart:

1. Build a report.
2. Under the **CHART CONFIGURATION** section, select the **BAR** chart.
3. Enter or select the required field information.

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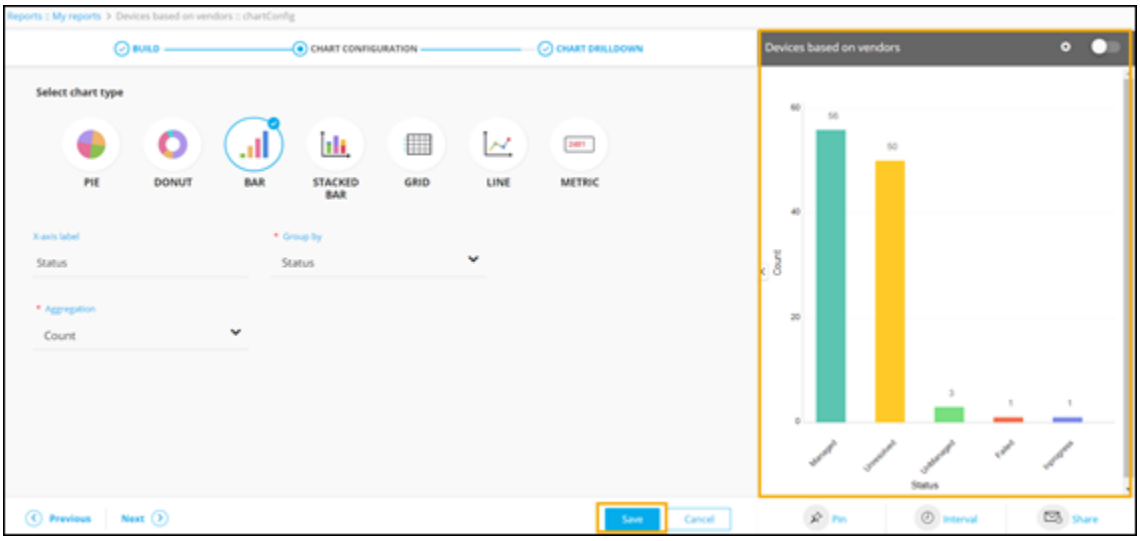


The following table describes the field information in this section:

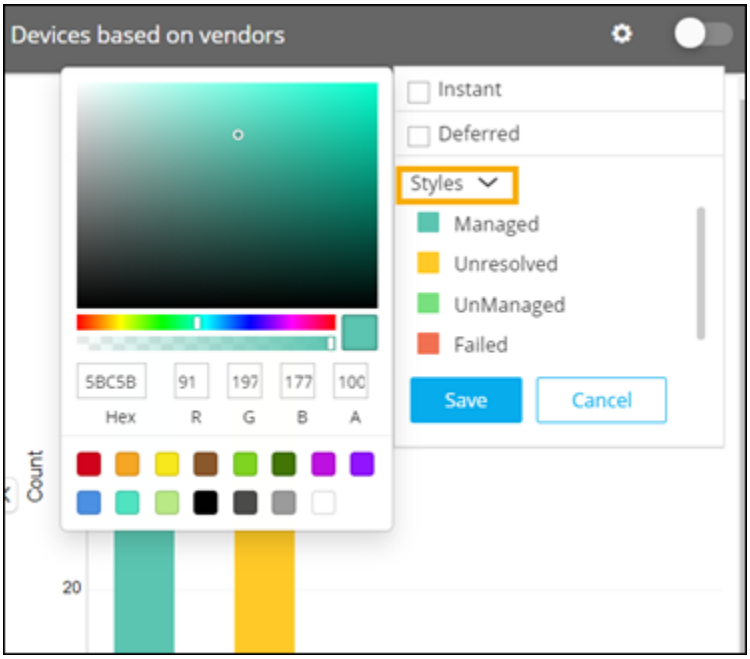
Field	Description
X-axis label	Enter the criteria for the X-axis label. For example: **Status**.
***Group by**	Select a value from the drop down menu on the basis of which data will be grouped. For example: **Status**. This will generate a report that shows the status of devices as managed, unmanaged and so on.
***Aggregation**	Select the calculation to be done on the report data for the dropdown. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data.
** : Mandatory fields*	

4. Click **Save**.
   A preview of the bar chart is generated on the right side of the screen.

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5. To select the data loading pattern, in the chart's preview window, click **(Settings)** icon.
   The following options are displayed:
   - **Instant**: This option allows you to enable live data loading and see changes in data immediately. This can be used in the case of small databases.
   - **Deferred**: This option allows you to enable lazy data loading and is useful in the case of larger databases. The default time interval for this is set at 30 minutes.
6. To change the style/font color of the bar chart, in the chart's preview window, click **Styles**.



   a. Click on the coloured value boxes to display the color palette.
   b. Choose the desired color.

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c. Similarly click the coloured boxes and choose different colors from the palette for the different values,
d. Click **Save**.
e. Enable the toggle button to view the applied changes.

7. To enable the report, turn on the toggle. Only enabled reports are visible on the dashboard to which they are pinned.
8. Click **Next**.
   The CHART DRILLDOWN section is displayed.

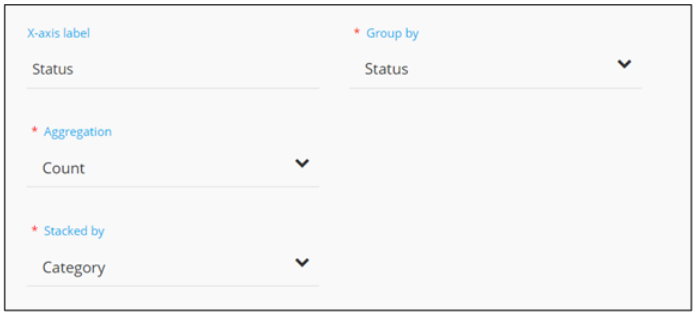
What to do next: To **modify** any chart report parameters, first disable toggle button from the preview screen. Settings and Styles can also be edited only when the report is in a disabled state.

Designing a Custom Stacked Bar Chart

A stacked bar chart is useful for comparing data across several categories as well as analysing the relation between sub-categories. In a stacked bar, each bar is divided into segments which represent different categories within that single bar category.

To design a custom stacked bar chart:

1. Build a report.
2. Under the **CHART CONFIGURATION** section, select the **STACKED BAR** chart.
3. Enter or select the required field information.



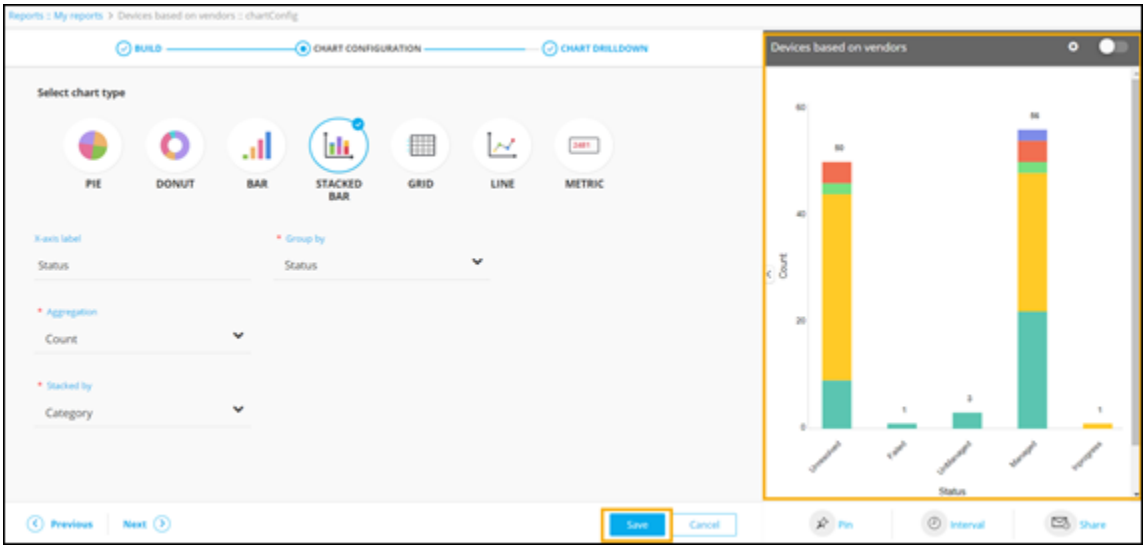
The following table describes the field information in this section:

Field	Description
X-axis label	Enter the criteria for the X-axis label. For example: **Status**.
***Group by**	Select a value from the drop down menu on the basis of which report data will be grouped. For example: **Status**.

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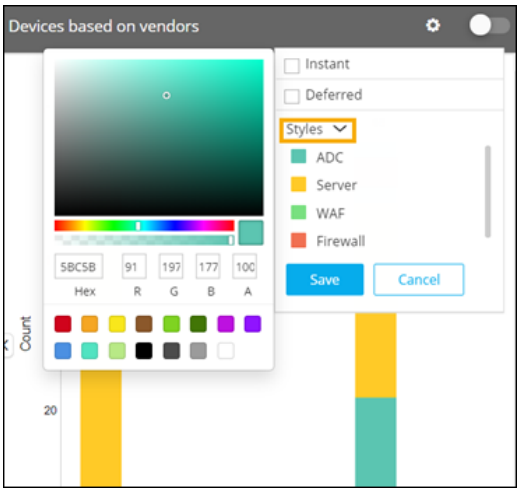
Field	Description
***Aggregation**	Select the calculation to be done on the report data for the dropdown. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data.
***Stacked by**	Select the parameter from the drop down menu on the basis of which the data will be stacked in the chart. For example: **Category** of device.
** : Mandatory fields*	

4. Click **Save**.
   A preview of the stacked bar chart is generated on the right side of the screen.



5. To select the data loading pattern, in the chart's preview window, click  **(Settings)** icon.
   The following options are displayed:
   - **Instant**: This option allows you to enable live data loading and see changes in data immediately. This can be used in the case of small databases.
   - **Deferred**: This option allows you to enable lazy data loading and is useful in the case of larger databases. The default time interval for this is set at 30 minutes.
6. To change the style/font color of the stacked bar chart, click **Styles**.

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a. Click on the coloured value boxes to display the color palette.
b. Choose the desired color.
c. Similarly click the coloured boxes and choose different colors from the palette for the different values,
d. Click **Save**.
e. Enable the toggle button to view the applied changes.

7. To enable the report, turn on the toggle. Only enabled reports are visible on the dashboard to which they are pinned.
8. Click **Next**.
   The CHART DRILLDOWN section is displayed.

What to do next: To **modify** any chart report parameters, first disable toggle button from the preview screen. Settings and Styles can also be edited only when the report is in a disabled state.

Designing a Custom Grid Chart

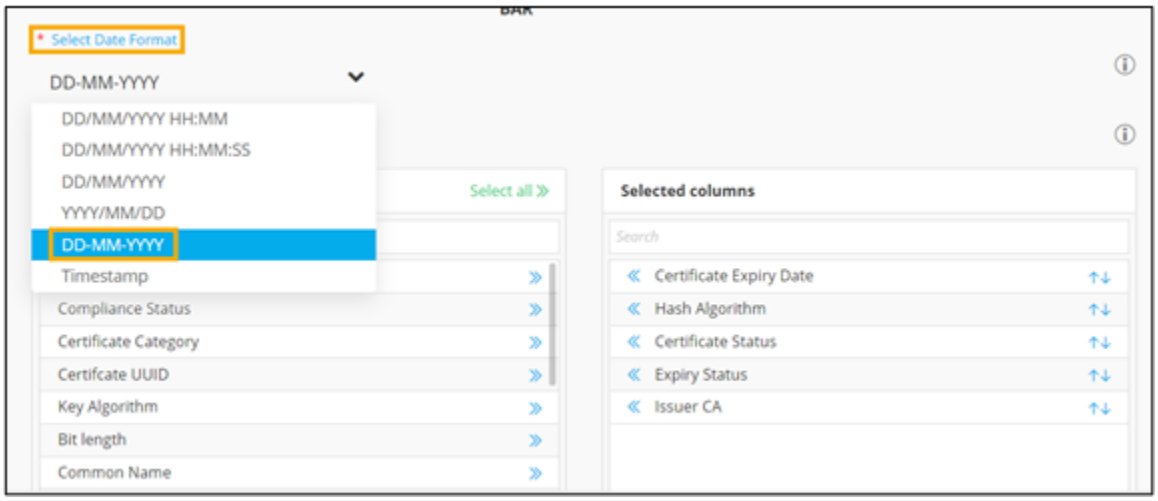
A grid is a tabular representation of data with each row displaying specific information pertaining to selected fields in the columns.

- The grid chart supports server side search functionality.
- It also supports server side sorting, where you can sort the report data in ascending or descending order.
- Grid chart also has provision for downloading high volumes of data in Excel or CSV formats.
- Date formats are customizable for grid charts as per user needs. You can select the specific date format from the dropdown.

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To design a custom grid chart:

1. Build a report.
2. Under the **CHART CONFIGURATION** section, select the **GRID** chart.
3. **Select Date Format** from the dropdown.

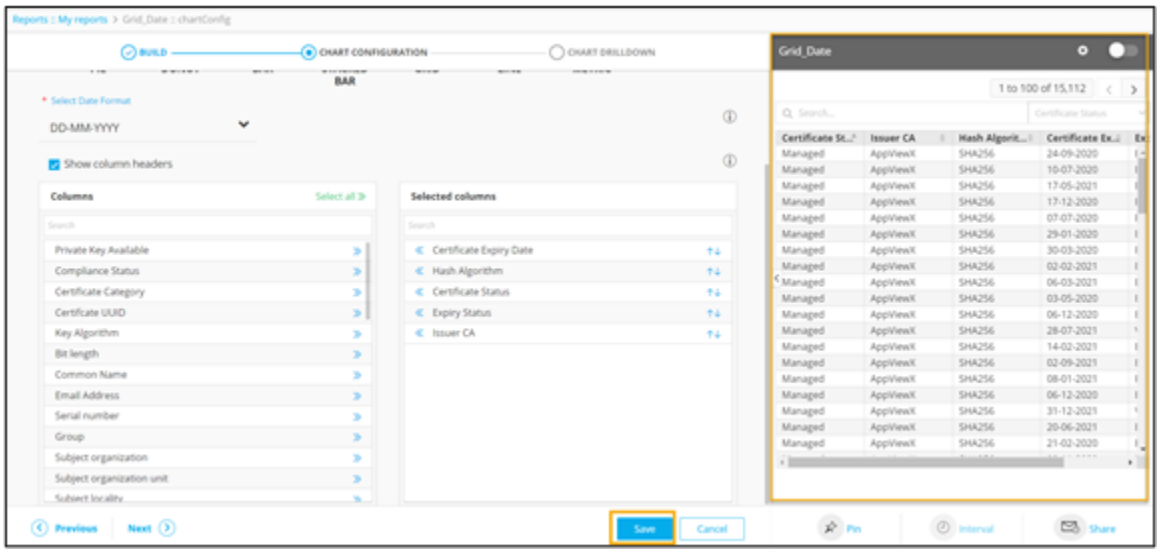


4. To configure the column headers to be displayed within the grid, click  .

> **Tip:** To arrange the order in which **Selected columns** are displayed in the grid, click  .

5. Click **Save**.

   A preview of the grid chart is generated on the right side of the screen.



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6. To select the data loading pattern, click  **(Settings)** icon.
   The following options are displayed:
   - **Instant**: This option allows you to enable live data loading and see changes in data immediately. This can be used in the case of small databases.
   - **Deferred**: This option allows you to enable lazy data loading and is useful in the case of larger databases. The default time interval for this is set at 30 minutes.
7. In the **Format Grid** section, update the colours for Grid Head and Grid Row as follows:
   For **Grid Head:**
   - **Select Grid head font colour* - Click the colour box below to display the colour palette and choose the desired color for the font.
   - **Select Grid head background colour* - Click the colour box below to display the colour palette and choose the desired color for the background.
   - **Select Grid head font size* - Choose between Small, Medium, and Large.

   For **Grid Row:**
   - **Select Grid row font colour* - Click the colour box below to display the colour palette and choose the desired color for the font.
   - **Select Grid row background colour* - Click the colour box below to display the colour palette and choose the desired color for the background.
   - **Select Grid row font size* - Choose between Small, Medium, and Large.
8. To enable the report, turn on the toggle. Only enabled reports are visible on the dashboard to which they are pinned.

   Note: Color code mapping is not applicable to the grid chart.

9. Click **Next**.
   The CHART DRILLDOWN section is displayed.

What to do next: To **modify** any chart report parameters, first disable toggle button from the preview screen. Settings and Styles can also be edited only when the report is in a disabled state.

Designing a Custom Line Chart

Line charts are a simple and quick way of tracking changes over a period of time. They are a better choice for tracking changes over a short period of time. A line chart can also be used to compare changes for multiple groups over the same period of time.

To design a custom line chart:

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1. Build a report.
2. Under the **CHART CONFIGURATION** section, select the **LINE** chart.
3. Enter or select the required field information.



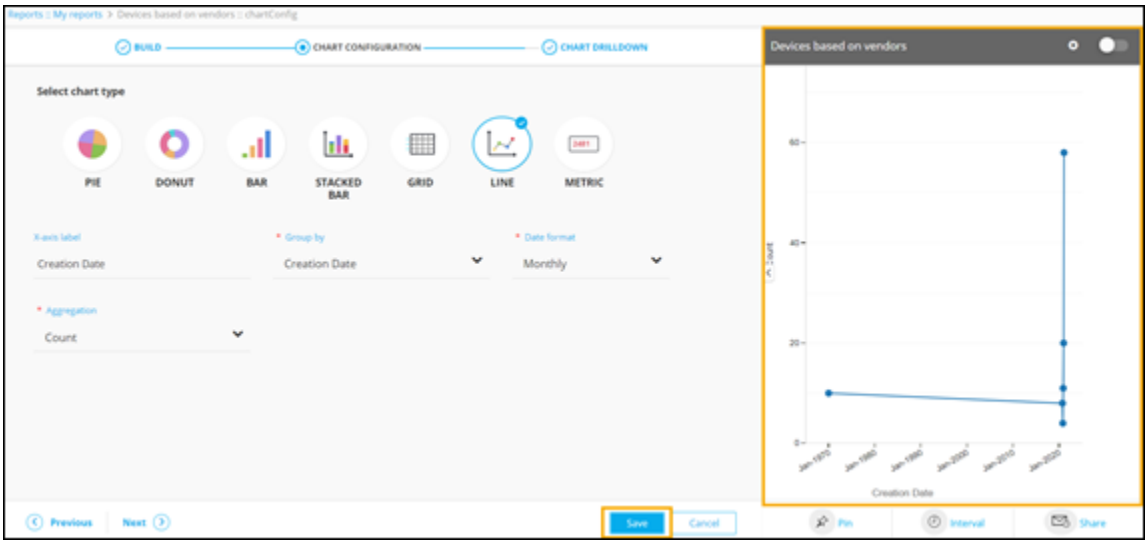
The following table describes the field information in this section:

Field	Description
X-axis label	Enter the criteria for the X-axis label. For example: **Creation Date**.
***Group by**	Select a value from the dropdown on the basis of which report data will be grouped. For example: **Creation Date**.
***Date format**	Select a valid date format from the dropdown menu. For example: **Monthly**.
***Aggregation**	Select the calculation to be done on the report data for the dropdown. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data.
** : Mandatory fields*	

4. Click **Save**.

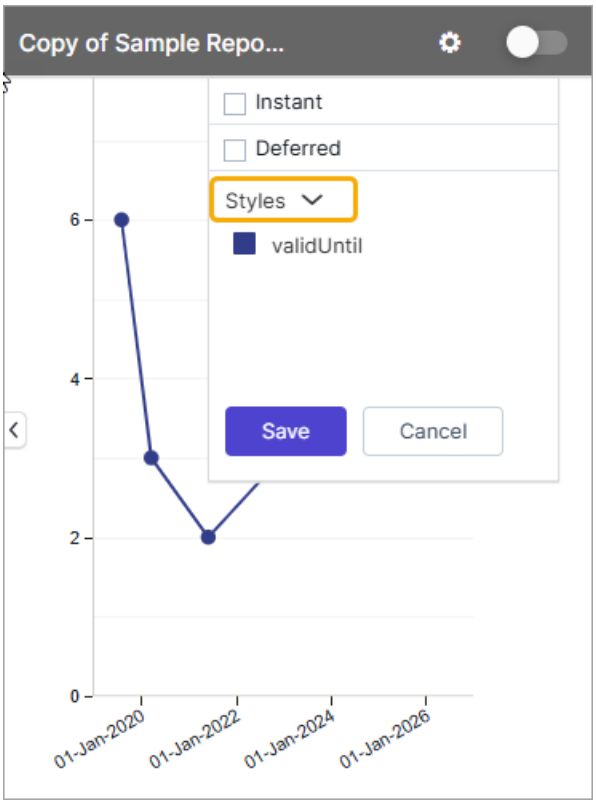
   A preview of the line chart is generated on the right side of the screen.

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5. To select the data loading pattern, in the chart's preview window, click **(Settings)** icon.
   The following options are displayed:
   - **Instant**: This option allows you to enable live data loading and see changes in data immediately. This can be used in the case of small databases.
   - **Deferred**: This option allows you to enable lazy data loading and is useful in the case of larger databases. The default time interval for this is set at 30 minutes.
6. To change the style/font color of their line chart, click **Styles**.

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a. Click on the coloured value boxes to display the color palette.
b. Choose the desired color.
c. Similarly click the coloured boxes and choose different colors from the palette for the different values,
d. Click **Save**.

7. To enable the report, turn on the toggle. Only enabled reports are visible on the dashboard to which they are pinned.

> **Note:** Color code mapping is not applicable to the line chart.

8. Click **Next**.
   The CHART DRILLDOWN section is displayed.

What to do next: To **modify** any chart report parameters, first disable toggle button from the preview screen. Settings and Styles can also be edited only when the report is in a disabled state.

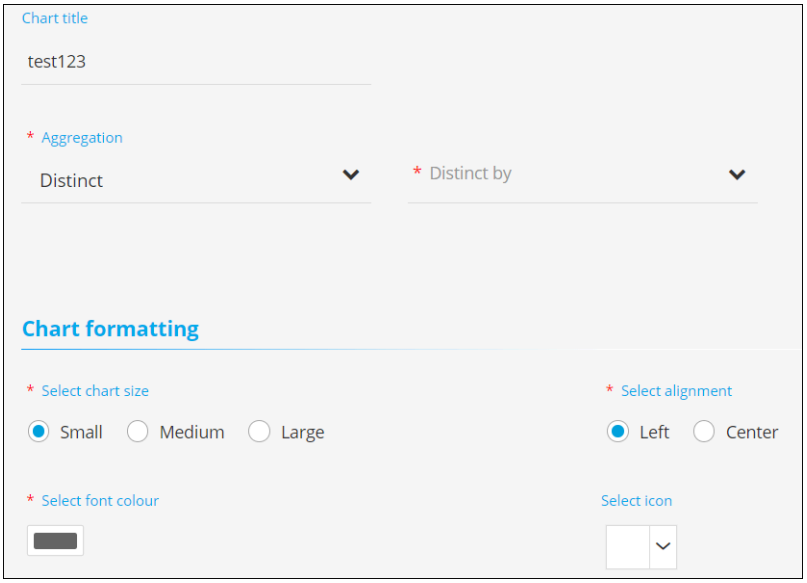
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Designing a Custom Metric Chart

A metric chart displays specific information about a process and its functioning. It allows you to highlight a metric on the dashboard, giving instant information about the data and helps in tracking progress.

To design a custom metric chart:

1. Build a report.
2. Under the **CHART CONFIGURATION** section, select the **METRIC** chart.
3. Enter or select the required field information.



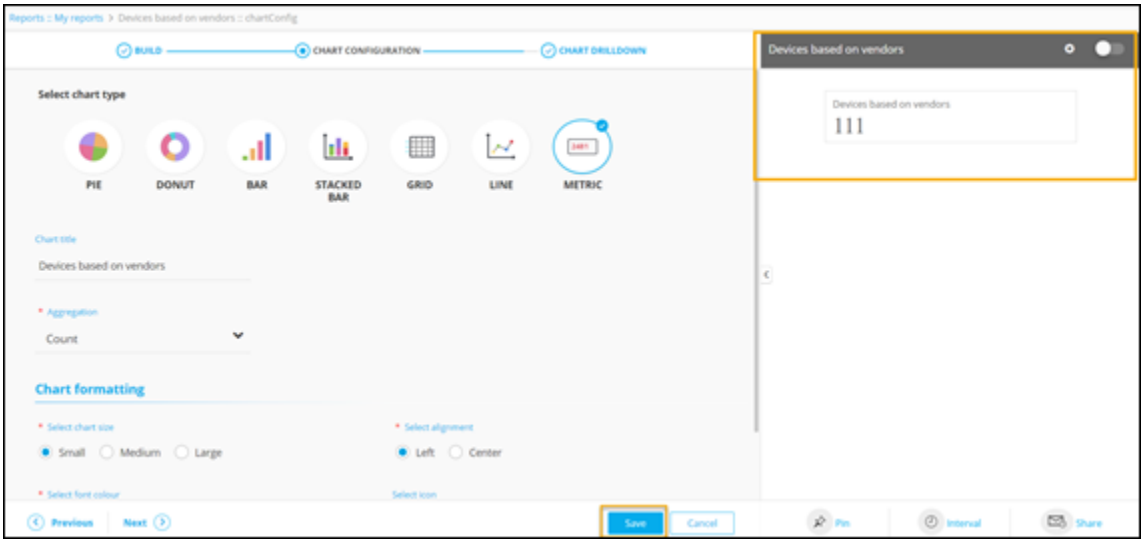
The following table describes the field information in this section:

Field	Description
Chart Title	Enter the chart title. For example: **Devices based on vendors**.
***Aggregation**	Select the calculation to be done on the report data for the dropdown. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data. • **Distinct**: Displays the number of distinct or unique values as specified in the **Distinct by** field.

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Field	Description
***Select chart size**	Select the metric size. For example, Small.
***Select alignment**	Select the placement of the metric on the screen. For example: **Left**.
***Select font color**	Select the color of the font on the metric.
Select icon	Select an icon for the metric chart from the dropdown menu.
** : Mandatory fields*	

4. Click **Save**.
   A preview of the metric chart is generated on the right side of the screen.



5. To select the data loading pattern, in the chart's preview window, click  **(Settings)** icon.
   The following options are displayed:
   - **Instant**: This option allows you to enable live data loading and see changes in data immediately. This can be used in the case of small databases.
   - **Deferred**: This option allows you to enable lazy data loading and is useful in the case of larger databases. The default time interval for this is set at 30 minutes.
6. To enable the report, turn on the toggle. Only enabled reports are visible on the dashboard to which they are pinned.

> **Note:** Color code mapping is not applicable to the metric chart.

7. Click **Next**.
   The CHART DRILLDOWN section is displayed.

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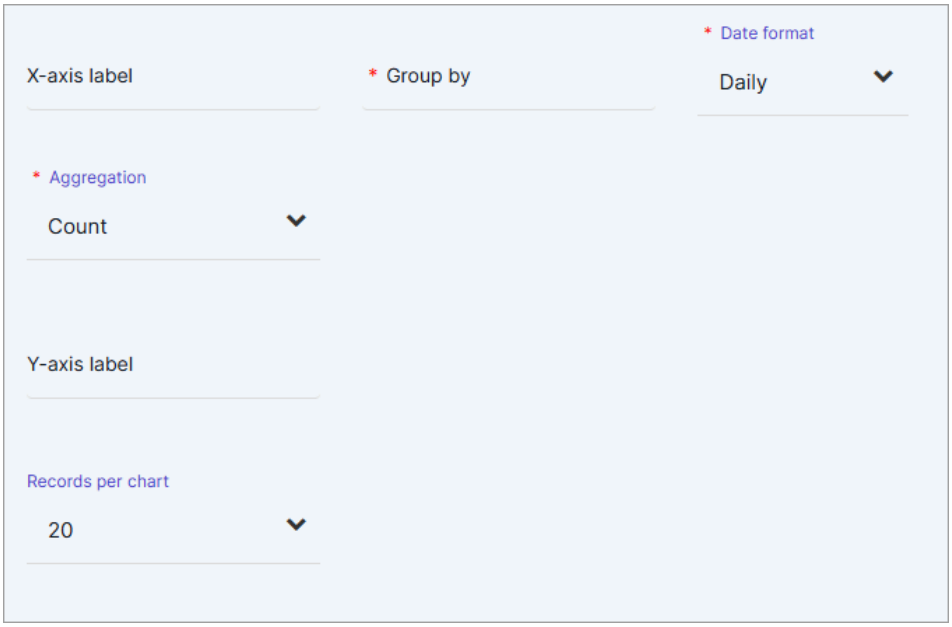
What to do next: To **modify** any chart report parameters, first disable toggle button from the preview screen. Settings and Styles can also be edited only when the report is in a disabled state.

Designing a Custom Line Area Chart

Line Area charts are a simple and quick way of tracking changes over a period of time. They are a better choice for tracking changes over a short period of time. A line area chart can also be used to compare changes for multiple groups over the same period of time.

To design a custom line chart:

1. Build a report.
2. Under the **CHART CONFIGURATION** section, select the **AREA** chart.
3. Enter or select the required field information.



The following table describes the field information in this section:

Field	Description
X-axis label	Enter the criteria for the X-axis label. For example: **No of Certs**.
***Group by**	Select a value from the dropdown on the basis of which report data will be grouped. For example: **validUntil**.
***Date format**	Select a valid date format from the dropdown menu. For example: **Monthly**.

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Field	Description
***Aggregation**	Select the calculation to be done on the report data for the dropdown. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data.
Y-axis label	Provide a place holder (e.g.: datacenter) for the Y-axis of the chart.
Records per chart	Select the number of records from the dropdown to be displayed in the chart (minimum is 20).
***Sort Order**	This field is displayed only when the chart is modified. Select from the dropdown values - Ascending or Descending.
** : Mandatory fields*	

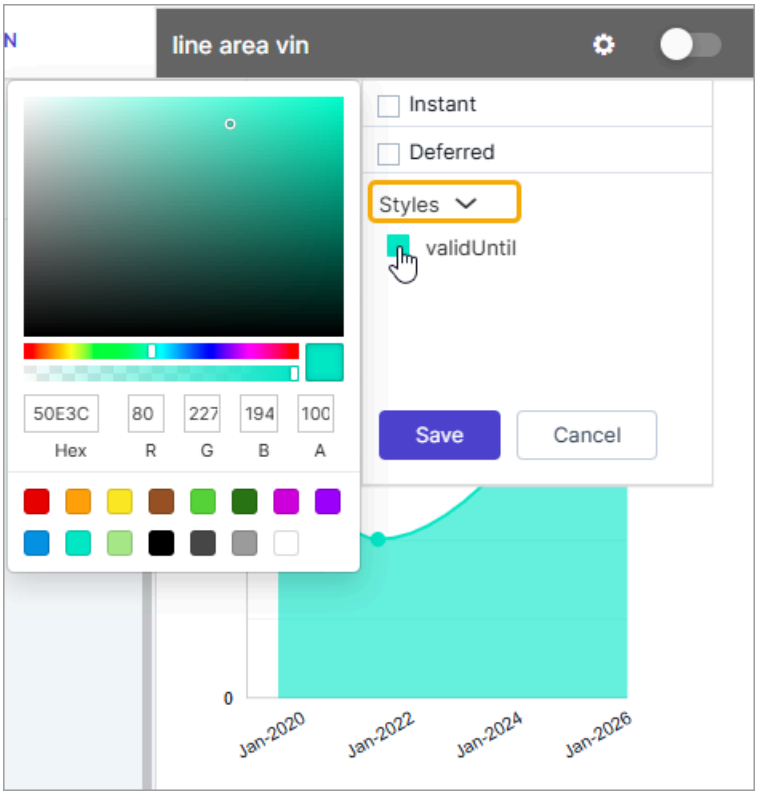
4. Click **Save**.

   A preview of the line area chart is generated on the right side of the screen.



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5. To select the data loading pattern, in the chart's preview window, click **(Settings)** icon.
   The following options are displayed:
   - **Instant**: This option allows you to enable live data loading and see changes in data immediately. This can be used in the case of small databases.
   - **Deferred**: This option allows you to enable lazy data loading and is useful in the case of larger databases. The default time interval for this is set at 30 minutes.
6. To change the style/font color of their line chart, click **Styles**.



   a. Click on the coloured value boxes to display the color palette.
   b. Choose the desired color.
   c. Similarly click the coloured boxes and choose different colors from the palette for the different values,
   d. Click **Save**.
7. To enable the report, turn on the toggle. Only enabled reports are visible on the dashboard to which they are pinned.

> **Note:** Color code mapping is not applicable to the line chart.

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8. Click **Next**.
   The CHART DRILLDOWN section is displayed.

What to do next: To **modify** any chart report parameters, first disable toggle button from the preview screen. Settings and Styles can also be edited only when the report is in a disabled state.

Chart Drilldown

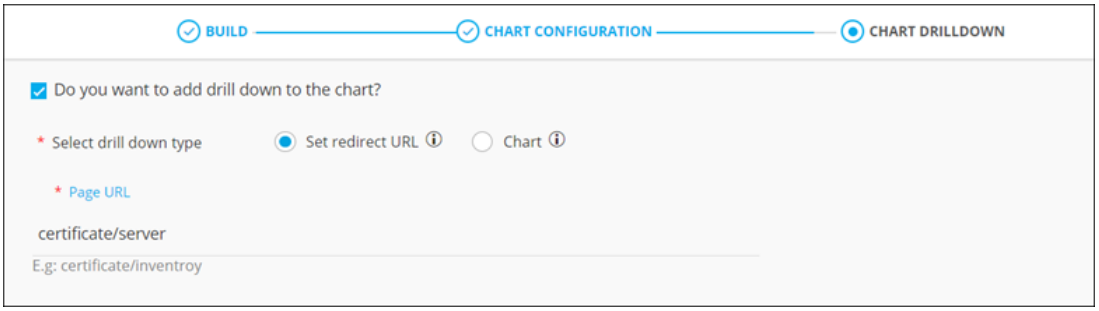
This section of the report builder allows you to make reporting more interactive and engaging by supplementing additional details within a chart. Adding a drilldown to your report helps in visualizing specific data pertaining to information displayed in the chart with a single click of the mouse. Drilldown also lightens the load on the server by presenting only a single layer of data at a time, which also significantly enhances the reporting performance.

How to Set a Redirect URL

You can enter a URL to redirect to any webpage or another existing report (within AppViewX pages) directly from the chart .

To add a redirect URL to your report:

1. Build a report.
2. Design a custom chart.
3. Under the **CHART DRILLDOWN** section, enter or select the required field information.



The following table describes the field information required in this section:

Field	Description
Do you want to add a drill down to the chart?	To add a drilldown to the chart, select this checkbox.
***Select drill down type**	Select **Set redirect URL**.

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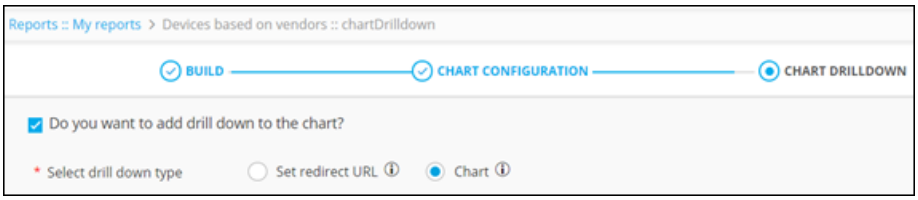
Field	Description
***Page URL**	Enter a valid URL.
** : Mandatory fields*	

4. Click **Save & Enable**.

How to Add a Drilldown Chart

You can add up to five levels of drilldown charts to a report.

1. Under the **CHART DRILLDOWN** section, enter or select the required field information.



The following table describes the field information required in this section:

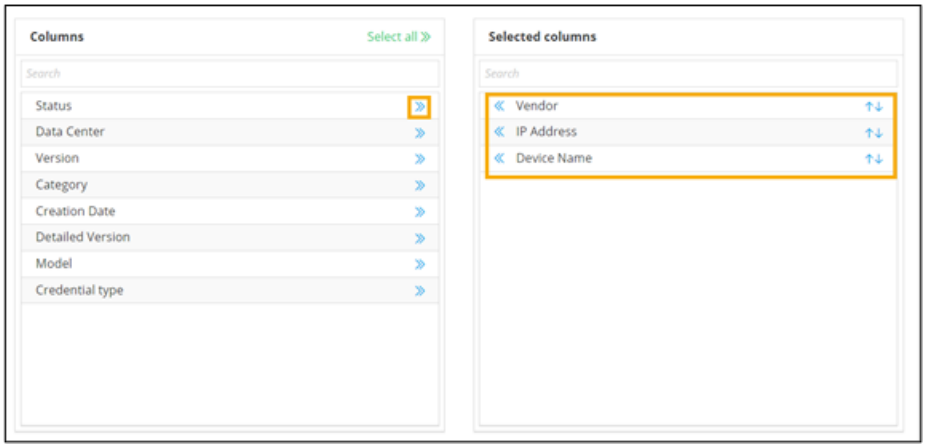
Field	Description
Do you want to add a drill down to the chart?	Check this box to add a drilldown to the chart.
***Select drill down type**	Select **Chart** as the drilldown type.
** : Mandatory fields*	

2. Select the **GRID** chart. and enter a suitable **Chart title**.



3. To configure the column headers to be displayed within the grid, click  .
Selected columns are displayed on the right side.

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Note: To remove a column, click .

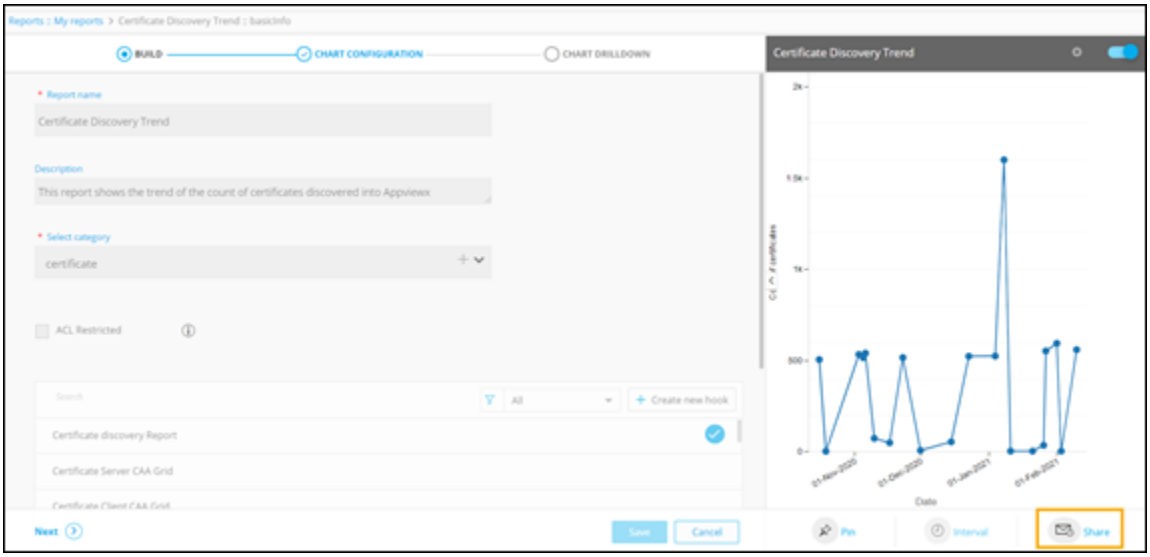
4. To enable the chart, click **Save & Enable**.
5. To get more information on the devices in the drilldown, click on any of the bars on the bar chart.

Sharing your Reports

Once a report is generated, it can be emailed either as inline content or as a PDF attachment. You can also schedule reports to be generated on a recurring basis.

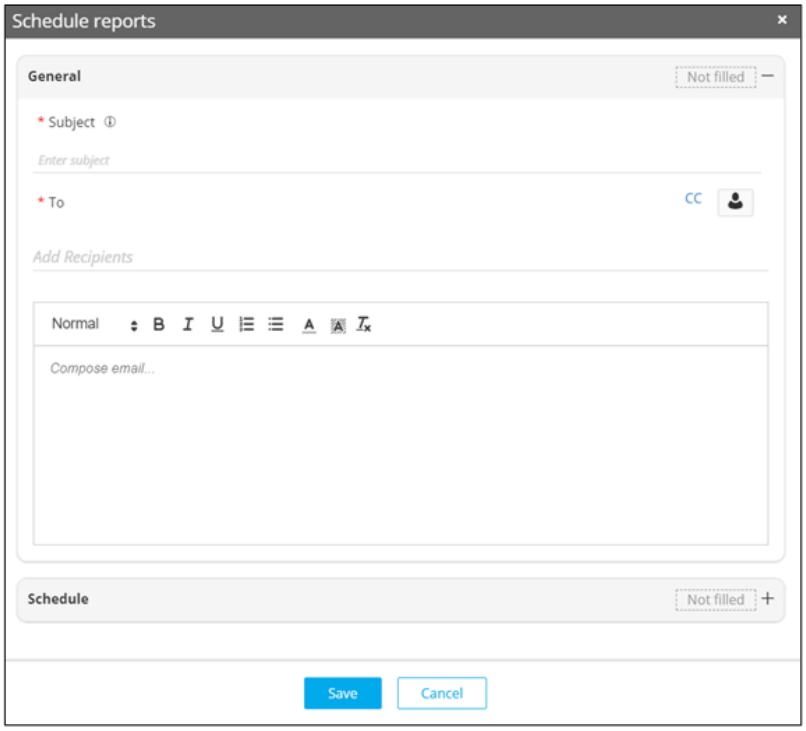
Emailing Reports as PDF

1. Under the **BUILD** section, from the bottom right corner of the screen, click **Share**.



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A pop-up window to **Schedule reports** is displayed.



2. In the **Schedule reports** window, under the **General** section, enter or select the required field information.
   The following table describes all the fields in the **General** section:

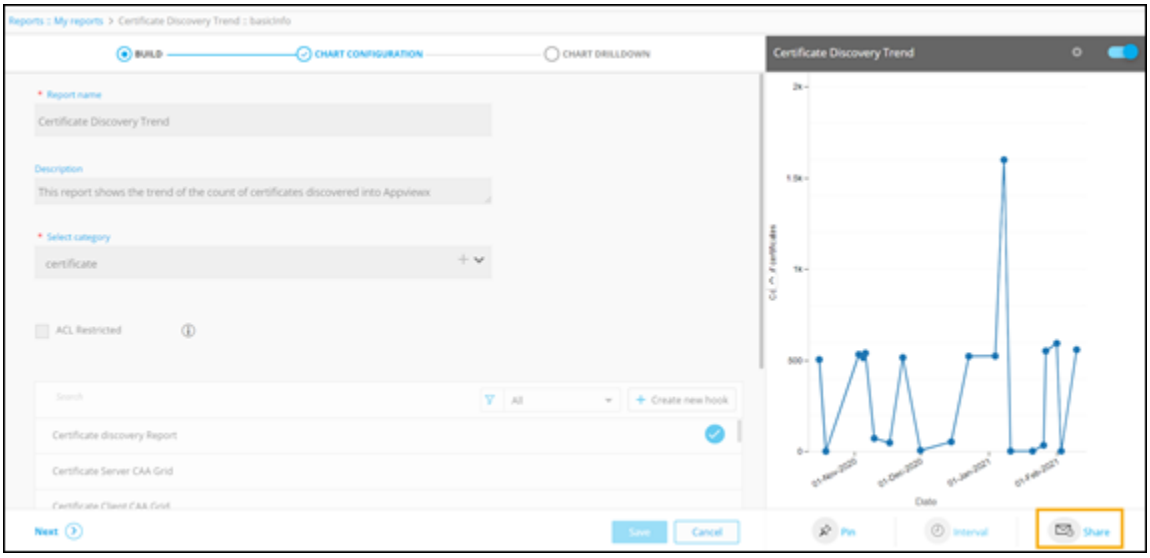
Field	Description
***Subject**	Enter a subject for the email which will also be populated under **Scheduled Jobs** on the **Reports :: Schedule** page.
***To**	Enter the names of the recipients of the email. Two options are available here: • Add single/multiple email addresses. • Add user groups(s).
Email body/text	Compose the email.
** : Mandatory fields*	

Scheduling Reports

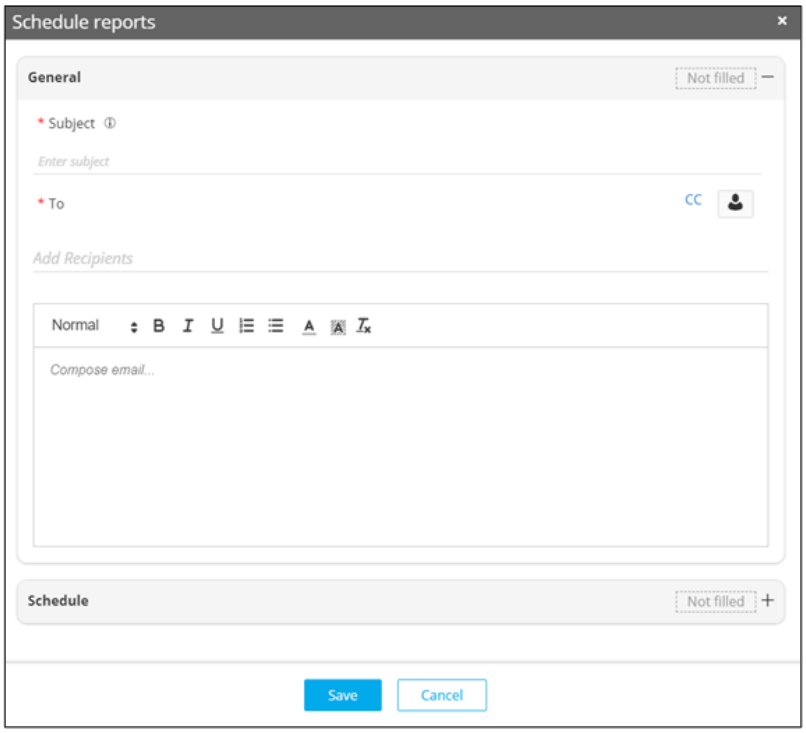
Reports can be scheduled to be generated on a recurring basis.

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1. Under the **BUILD** section, from the bottom right corner of the screen, click **Share**.

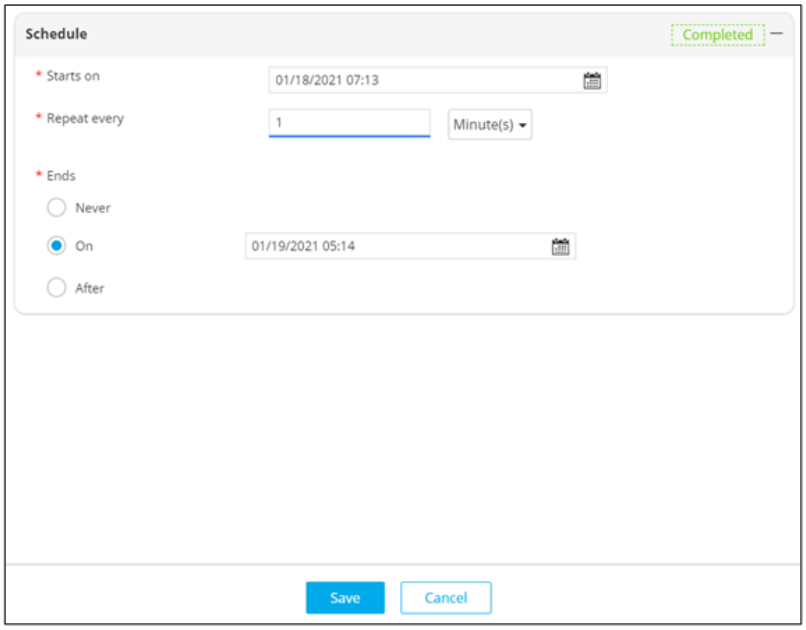


A pop-up window to **Schedule reports** is displayed.



2. In the **Schedule reports** window, under the **Schedule** section, enter or select the required field information.

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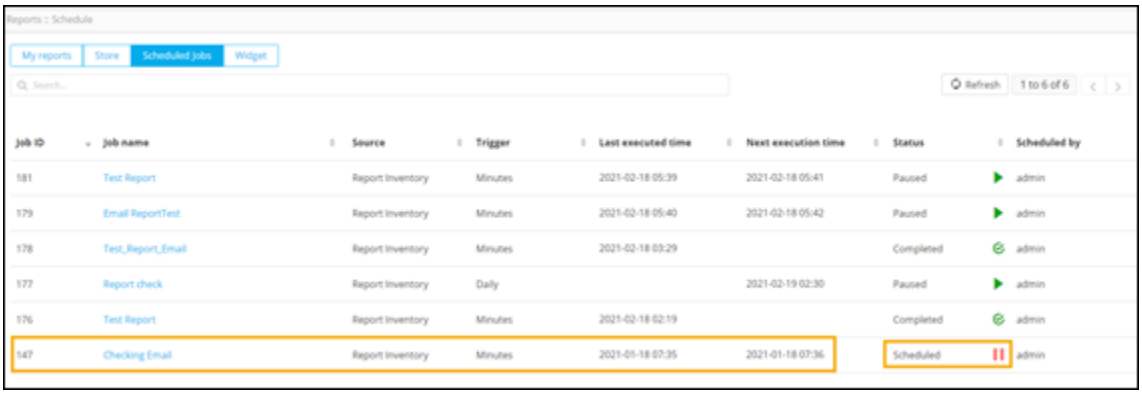
The following table describes the fields in the **Schedule** section:

Field	Description
***Starts on**	Select the date on which report is to be scheduled.
***Repeat every**	Select the numeric value and the frequency of recurrence as minutes, hours, days, weeks, months, or years.
***Ends**	Select when the report should stop recurring. The options available are: • **Never** • **On** a specific date. • **After** a set number of occurrences.
** : Mandatory fields*	

3. Click **Save**.

   The scheduled report will be displayed on the **Reports :: Schedule** page.

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4. To disable/pause the scheduled job, click **(Pause)** icon.
5. To resume the scheduled job, click **(Resume)** icon.

Hooks

A hook is a mechanism used to query and retrieve data from different sources such as database, device, or external vendors, and leverage them as part of the report building process.

The mode of query can be one of the following:

- Query Explorer (GUI based)
- Script (Python)
- REST API.

- Using Preexisting Hooks to Build Reports
- Using Query Explorer to build Reports
- Using Scripts to build Reports
- Using REST API to build Reports
- Creating a New Hook
- Reusing Hooks

Using Preexisting Hooks to Build Reports

You can build customized reports by using preexisting hooks from the **Hooks Inventory**.

Note: For more information on the **Hooks Inventory**, refer to the Automation User Guide.

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Example 1

The report builder can be used to build a report to get a list of devices based on vendors using a preexisting hook.

1. On the Reports :: My Reports page, click **Create new report**.
2. On the **Reports :: My reports > Create :: basicinfo** page that is displayed, under the **BUILD** section, enter or select the required field information.



The following table describes the various fields in this section:

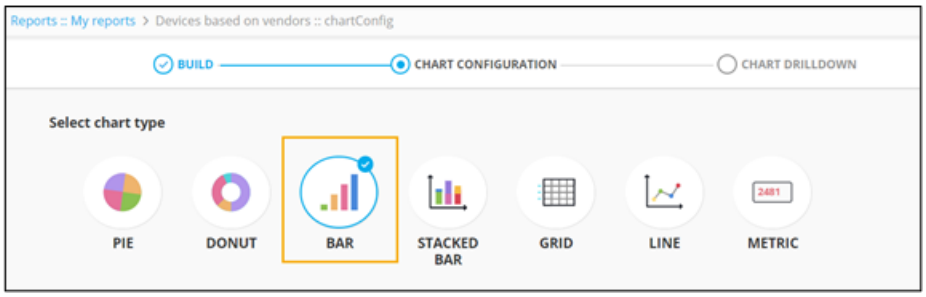
Field	Description
***Report name**	Enter a valid report name. For example: **Devices based on vendors**.
Description	Enter a valid description. For example: **Devices based on the vendor names**.
***Select category**	Select the category as **general** from the dropdown list.
** : Mandatory fields*	

3. Search for the required hook from the pre-existing inventory.
4. To select the hook, click .

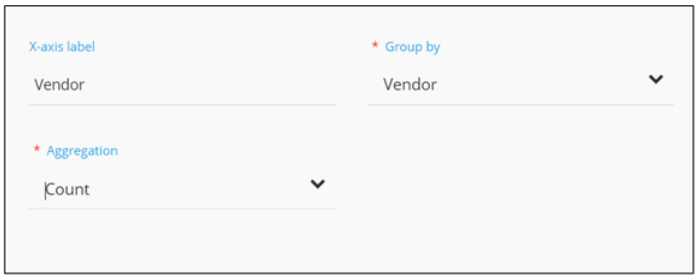
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5. Click **Next**.
6. Under the **CHART CONFIGURATION** section, that is displayed, select the **BAR** chart.



7. Enter or select the required field information.



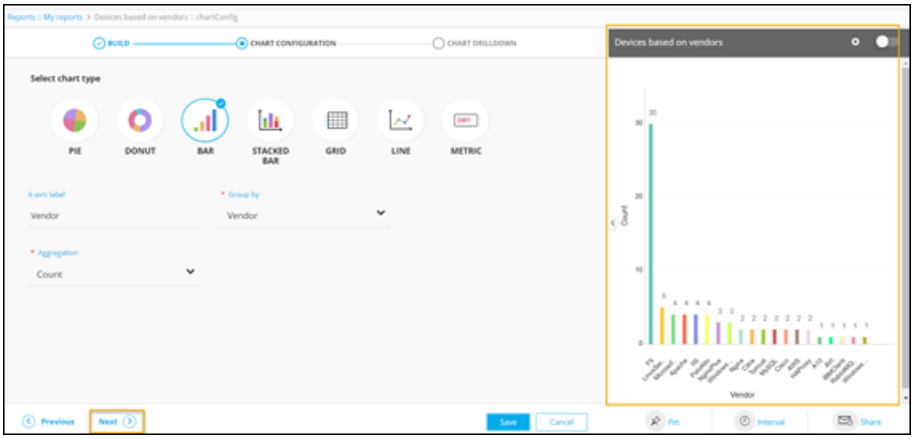
The following table describes the various fields in this section:

Field	Description
X-axis label	Enter criteria for the X-axis label. For example: **Vendor**.
***Group by**	Select a value from the drop down menu on the basis of which report data will be grouped.

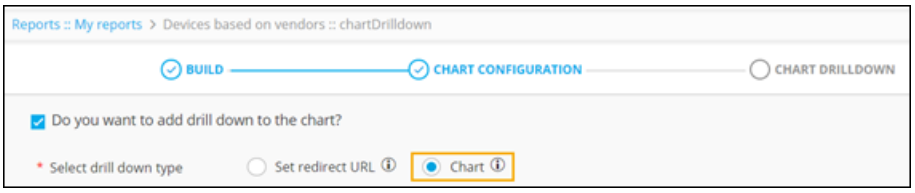
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Field	Description
	For example: **Vendor**.
***Aggregation**	Select the calculation to be done on the report data for the dropdown. For example, count to get the number of devices by name. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data.
** : Mandatory fields*	

8. To save chart configuration, click **Next**.
   A preview of the bar chart is displayed on the right side of the screen.



9. To add a drill down to the chart, under the **CHART DRILLDOWN** section that is displayed, select the **Do you want to add drill down to the chart?** check box.
10. Select the type of drill down as **Chart**.

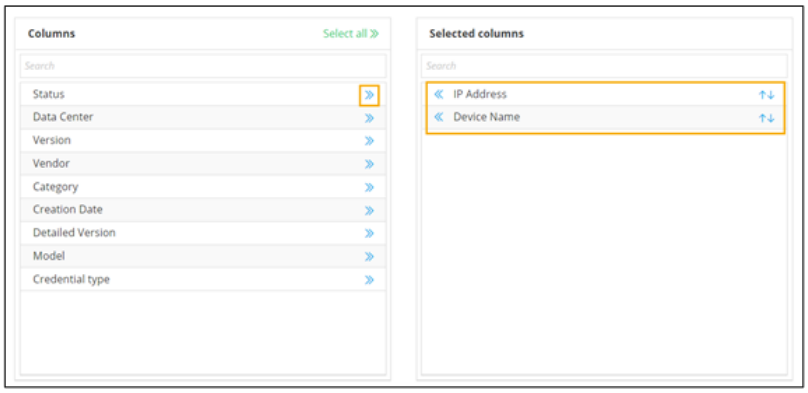


11. Select chart type as **GRID** and enter the **Chart title**.

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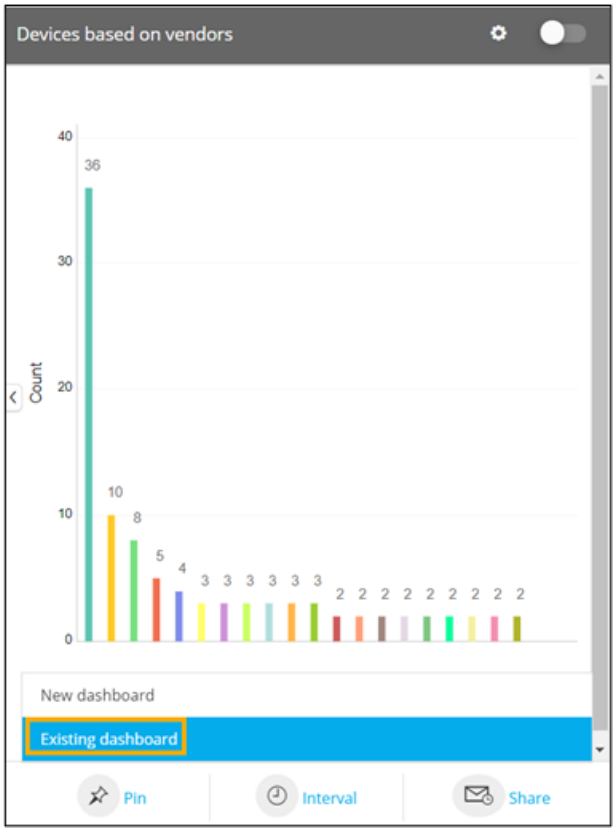


12. To configure the column headers to be displayed within the grid, click  . **Selected columns** are displayed on the right side.



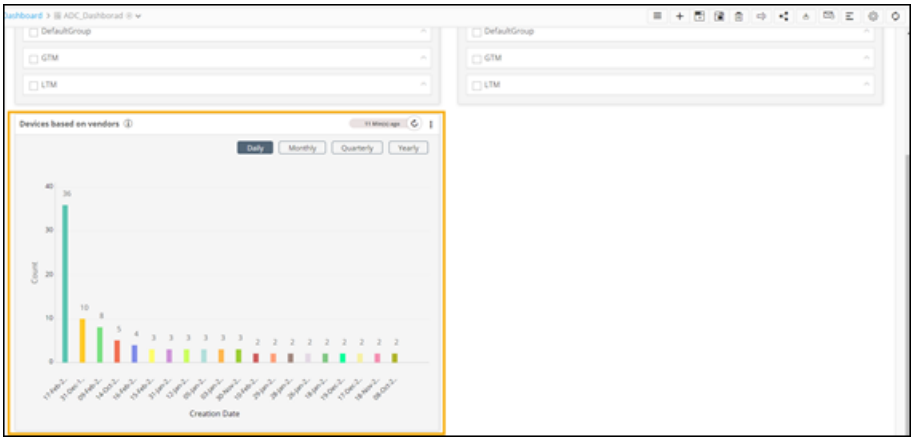
13. To pin the report to a dashboard, under the chart preview, click **Pin**.
14. To pin the report to a dashboard already available in the Dashboard inventory, select **Existing dashboard** from the options.

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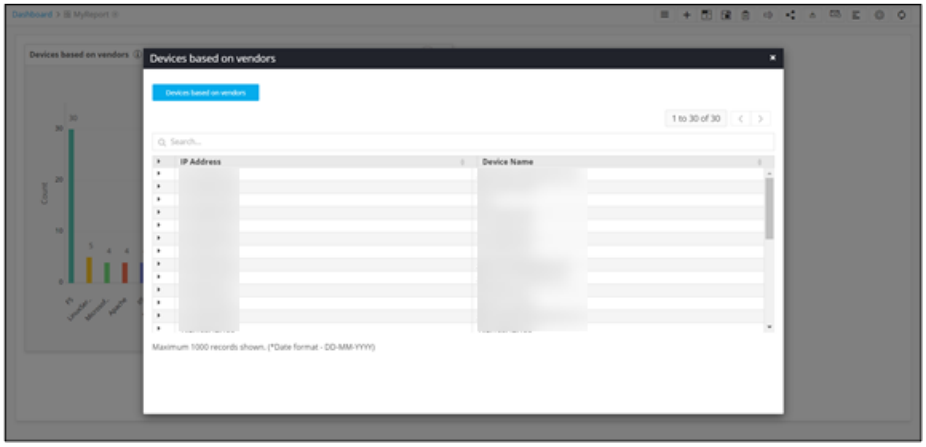
15. Select a dashboard from the list and click **Save**.
16. To enable the report, click **Save & Enable**.
17. To view this report on the dashboard, select this dashboard on the Dashboard inventory page.

    The **Devices based on vendors** report can be seen on the selected dashboard.



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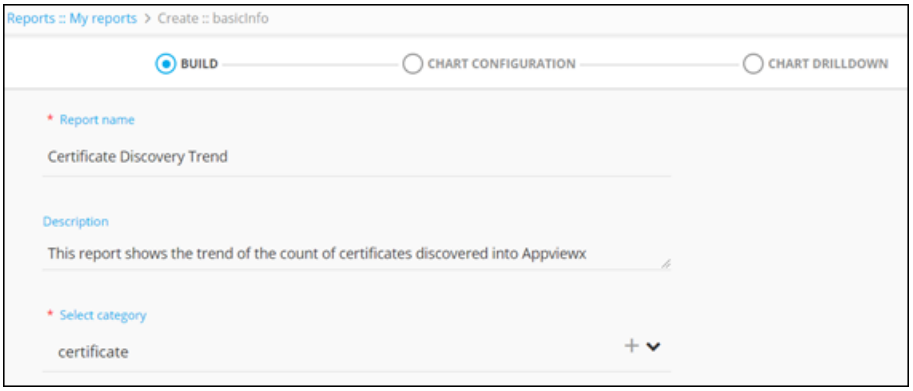
18. To display specific data on each of the vendors, click on any of the bars for the chart drilldown.



Example 2

To create a report for getting the **Certificate Discovery Trend** for all certificate types using a preexisting hook:

1. On the Reports :: My Reports page, click **Create new report**.
2. On the **Reports :: My reports > Create :: basicinfo** page that is displayed, under the **BUILD** section, enter or select the required field information.



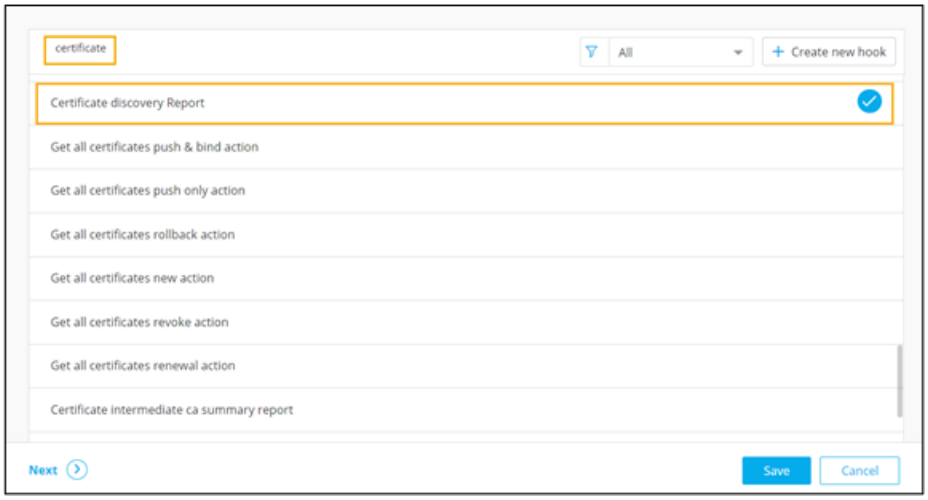
The following table describes the various fields in this section:

Field	Description
***Report name**	Enter a valid report name. For example: **Certificate Discovery Trend**.
Description	Enter a valid description.

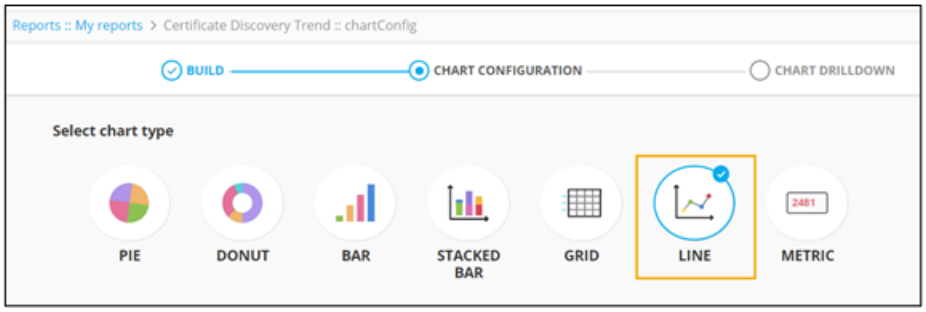
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Field	Description
	For example: **This report shows the trend of the count of certificates discovered into AppViewX.**
***Select category**	Select the category as **certificate** from the dropdown list.
** : Mandatory fields*	

3. Search for the required hook from the pre-existing inventory.
4. To select the hook, click .

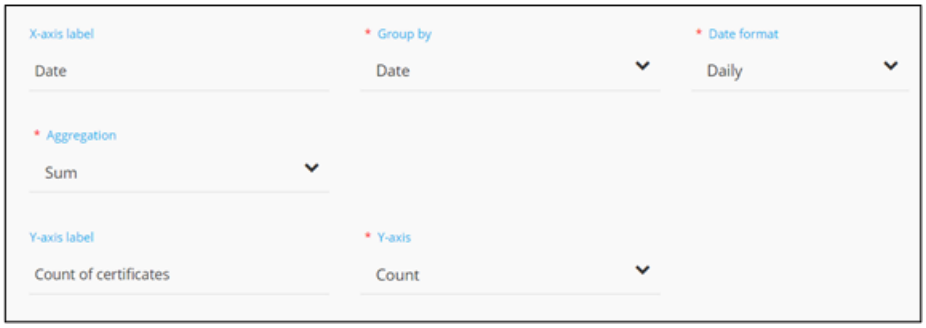


5. Click **Next**.
6. Under the **CHART CONFIGURATION** section that is displayed, select the **LINE** chart.



7. Enter or select the required field information.

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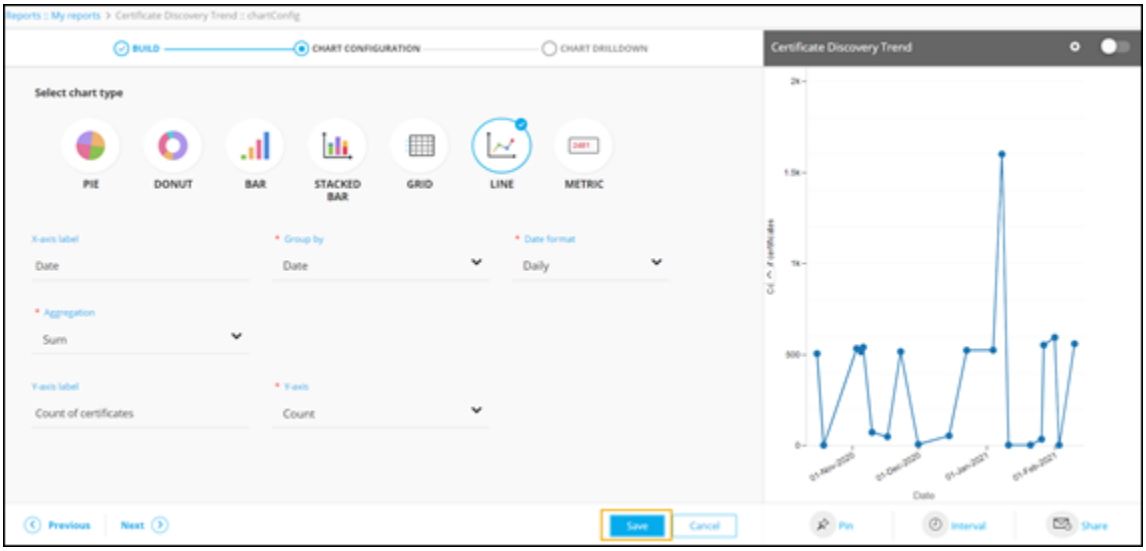
The following table describes the various fields in this section:

Field	Description
X-axis label	Enter the criteria for the X-axis label. For example: **Date**.
***Group by**	Enter the value on which data will be grouped. For example: **Date**.
***Date format**	Select a valid date format from the dropdown. For example: **Daily**.
***Aggregation**	Select the calculation to be done on the report data for the dropdown. For example, count to get the number of devices by name. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data.
Y-axis label	Enter the criteria for the Y-axis label. For example: **Count of certificates**.
***Y-axis**	Select a value from the dropdown. For example: **Count**.

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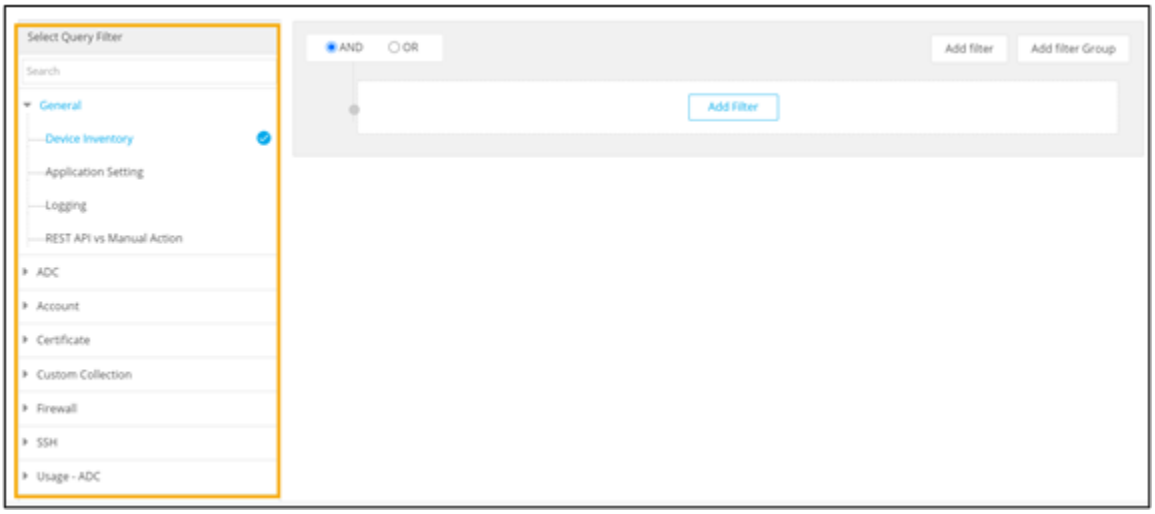
Field	Description
** : Mandatory fields*	

8. To save chart configuration details, click **Save**.
   A preview of the line chart is displayed on the right side of the screen.



Using Query Explorer to build Reports

AppViewX's Report builder has an enhanced, intuitive **Query Explorer**. The GUI-based query explorer maps all major database collections in AppViewX and helps you build your own customized reports. Over 40 out of the box (OOB) queries are pre-shipped to the end-user. It also comes with advanced conditional operators to build complex queries.



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Each query filter has a set of predefined fields associated with it. Query actions will differ according to the data in the query fields. The query builder also comes equipped with an auto-suggestion feature that aids you in selecting appropriate values from the suggested entries.

Query explorer also exhibits improved performance with query optimization by supporting four million to 50 million records. Its performance optimized search inventory enables higher volumes of data to be balanced and reduces load time.

Conditional Operators

Query Explorer has ten conditional operators that allow users to build complex queries. All of these operators support dynamic values. The dynamic values can be passed at runtime by using payload to perform queries.

The conditional operators are categorized based on field types: String, Integer, Date, and Boolean Variable.

Field Type: String

When you choose the field type as **String**, the values for the conditional operators are auto-populated from the database. The following conditional operators are available when you choose the field type as **String**:

- **Is** - This operator is used if the query is for a particular value.

  For example, Status is Managed.



  The report will display data specific to this query and show the list of devices only with **Managed** status.
- **Is not** - This operator generates results where the condition is not matched.

  For example, Vendor is not Citrix.

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The report will display data that matches all criteria except the one that is selected and show the list of devices of all vendors except Citrix.

- **Is one of** - This operator allows multiple values to be selected and matches all conditions. For example, Category is one of Server, Firewall, WAF.



The report will display data where all the three conditions are matched and show a list of devices that belong to the three selected categories.

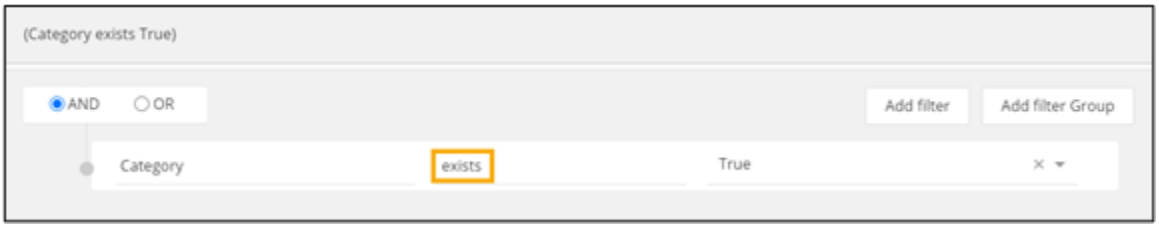
- **Is not one of** - This operator allows multiple values to be selected and gives results where the conditions are not matched.

For example, Category is not one of ADC, Firewall.



The report will display data that matches all criteria except the ones that are selected and show a list of all devices except ADC and Firewall.

- **Exists** - A boolean operator is provided for narrowing down the search parameters so that the result is either True or False.



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The report will display data after confirming if the selected field is available in the database (True) or not (False).

- **Regex** - Regular expression (Regex) is a sequence of characters defining a search pattern specifying a set of strings for a particular purpose.

  For example, Device name regex .*



  The period (.) means match any character and the asterisk (*) means any number of times. So .* means match anything and the report will display all the device names.

- **Starts with** - This operator allows users to enter the first three letters/numbers of the search criteria.



  The report will display results matching hash algorithms that start with ‘SHA’.

- **Ends with** - This operator allows users to enter the last three letters/numbers of the search criteria.



  The report will display results matching hash algorithms that end with ‘256’.

- **Contains** - This operator allows users to enter some values for the search criteria and generates results that contain those values.



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The report will display results with hash algorithms that contain the value ‘256’.

- **Does not contain** - This operator allows users to enter some values for the search criteria and generates results that do not contain those values.

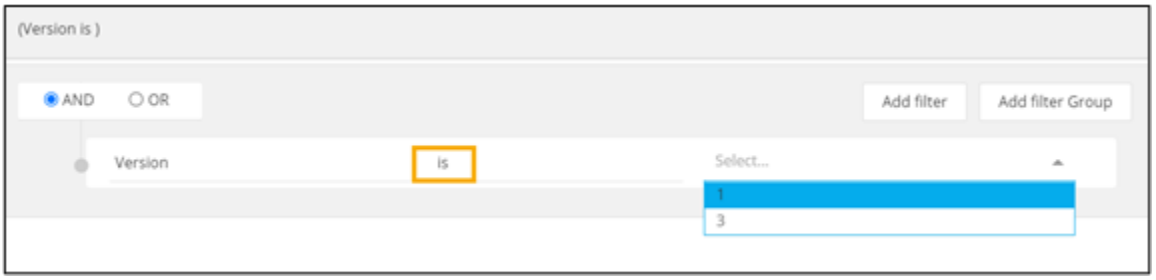


The report will display results with hash algorithms that do not contain the value ‘256’.

Field Type: Integer

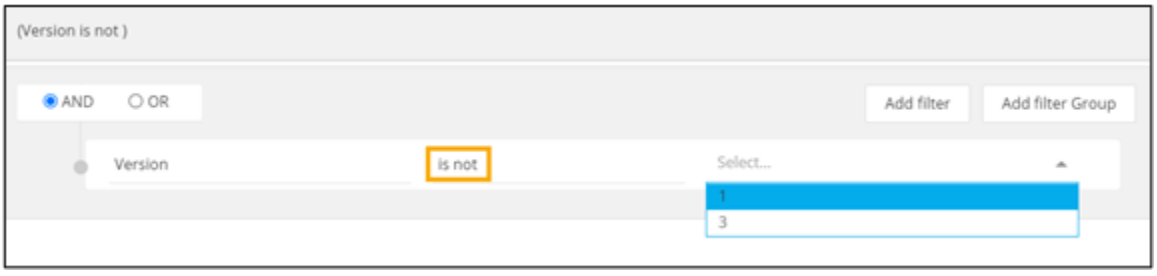
When you choose the field type as Integer, the values for the conditional operator are auto-populated from the database. The following conditional operators are available when you choose the field type as Integer:

- **Is**: This operator is used if the query is for a particular value. For example, version is 1.



The report generated will display data specific to this query and show the certificates with Version equal to 1.

- **Is not**: This operator generates results if the condition is not matched. For example, version is not 1.



The report generated will display data that matches all criteria except the one that is selected and show certificates with Version not equal to 1.

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- **Exists**: A boolean operator is provided for narrowing down the search parameters so that the result is either True or False.



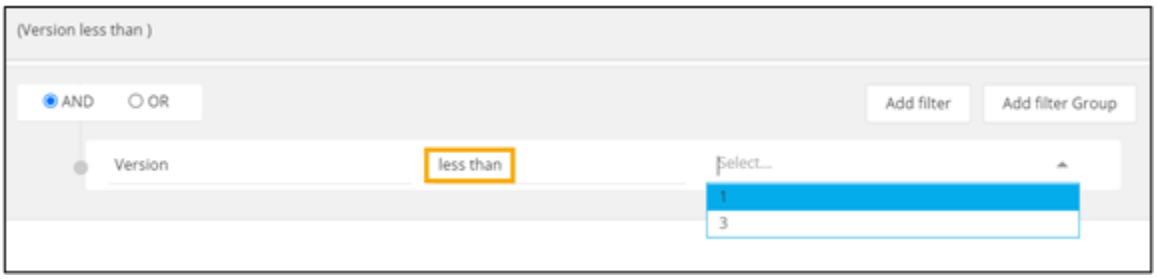
The report will display data after confirming if the selected field is available in the database or not. If the field is available, the result is True. If the field is not available, the result is False.

- **Greater than**: This operator is used to display records that match values greater than the selected value. For example, Version greater than 1.



The report generated will display certificates with version greater than 1.

- **Less than**: This operator is used to display records that match values less than the selected value. For example, Version less than 1.



The report generated will display certificates with version less than 1.

- **Greater than or is**: This operator is used to display records that match values greater than or equal to the selected value. For example, Version greater than or is 1.

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The report generated will display certificates with version greater than or equal to 1.

- **Less than or is**: This operator is used to display records that match values less than or equal to the selected value. For example, Version less than or is 1.

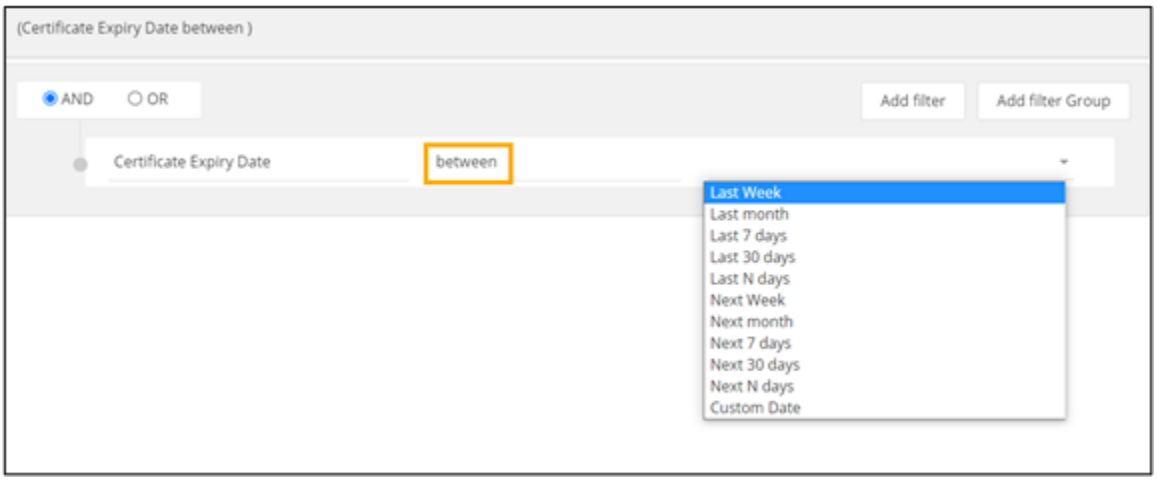


The report generated will display certificates with version less than or equal to 1.

Field Type: Date

When you choose the field type as Date, the values for the conditional operators are predefined and need to be selected from the dropdown list. The following conditional operators are available when you choose the field type as Date:

- **Between** - This operator allows users to select the duration for which reports will be generated.



The following table describes the date values supported by the **between** operator:

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Date Type	Description	Example
Last Week	Returns records within the previous selected time period, starting with the beginning of that time frame.	For example, a filter run on July 27, 2021 will return any records with a date range of July 18 to July 24, 2021.
Last Month		For example, a filter run on July 27, 2021 will return any records with a date range of 1 June to 30 June 2021.
Last 7 days		For example, a filter run on July 27, 2021 will return any records with a date range of July 21 to July 27, 2021.
Last 30 days		For example, a filter run on July 27, 2021 will return any records with a date range of 27 June to 26 July, 2021.
Last N days		For example, a filter run on July 27, 2021 will return any records with a date range of Nth day to July 27, 2021.
Next Week	Returns records within the next selected time period, including records with values up to the end of that time frame.	For example, a filter run on July 27, 2021 will return any records with a date range of August 1 to August 7, 2021.
Next Month		For example, a filter run on July 27, 2021 will return any records with a date range of August 1 to August 31, 2021.
Next 7 days		For example, a filter run on July 27, 2021 will return any records with a date range of July 27 to August 2, 2021.
Next 30 days		For example, on July 27, 2021 will return any records with a date range of July 27 to August 30, 2021.
Next N days		For example, a filter run on July 27, 2021 will return any records with a date range of July 27, 2021 to the Nth day.

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Date Type	Description	Example
Custom Date	Returns records within the defined custom date.	

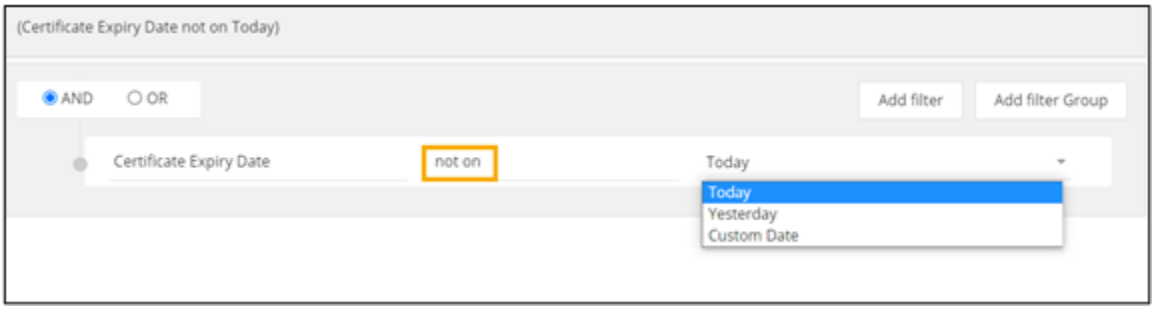
- **On** - This operator allows users to select a specific day for which the records will be generated.



The following table describes the date values supported by the **On** operator:

Date Type	Description	Example
Today	Returns records for the selected time period, including records with values up to the end of that time frame.	For example, a **Certificate Expiry Date** filter run on July 27, 2021 will return records for certificates expiring on July 27, 2021.
Yesterday		For example, a **Certificate Expiry Date** filter run on July 27, 2021 will return records for certificates expiring on July 26, 2021.
Custom Date	Returns records within the defined custom date.	For example, a **Certificate Expiry Date** filter run on a custom date, say August 1, will return records for certificates expiring on August 1, 2021.

- **Not on** - This operator allows users to select the time period for which the records should not be generated.



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The following table describes the date values supported by the **not on** operator:

Date Type	Description	Example
Today	Returns records for the time period other than the selected time period, including records with values up to the end of that time frame.	For example, a **Certificate Expiry Date** filter run on July 27, 2021 will return records for certificates not expiring on July 27, 2021.
Yesterday		For example, a **Certificate Expiry Date** filter run on July 27, 2021 will return records for certificates not expiring on July 26, 2021.
Custom Date	Returns records for the time period other than the defined custom date.	For example, a **Certificate Expiry Date** filter run on a custom date, say August 1, will return records for certificates not expiring on August 1, 2021.

- **After** - This operator allows users to generate records of dates after the selected time period.



The following table describes the date values supported by the **after** operator:

Date Type	Description	Example
Today	Returns records for the selected time period, including records with values up to the end of that time frame.	For example, a **Certificate Expiry Date** filter run on July 27, 2021 will return records for certificates expiring after July 27, 2021.
Yesterday		For example, a **Certificate Expiry Date** filter run on July 27, 2021 will return records for certificates expiring after July 26, 2021.
Custom Date	Returns records within the defined custom date.	For example, a **Certificate Expiry Date** filter run on a custom date, say August 1, will return records for certificates expiring after August 1, 2021.

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- **Before** - This operator allows users to generate records before the selected time period.



The following table describes the date values supported by the **before** operator:

Date Type	Description	Example
Today	Returns records for the selected time period, including records with values up to the end of that time frame.	For example, a **Certificate Expiry Date** filter run on July 27, 2021 will return records for certificates expiring before July 27, 2021.
Yesterday		For example, a **Certificate Expiry Date** filter run on July 27, 2021 will return records for certificates expiring before July 26, 2021.
Custom Date	Returns records within the defined custom date.	For example, a **Certificate Expiry Date** filter run on a custom date, say August 1, will return records for certificates expiring before August 1, 2021.

- **At or after** - This operator allows users to generate records at or after the selected time period.



The following table describes the date values supported by the on operator:

Date Type	Description	Example
Today	Returns records for the selected time period, including records with	For example, a **Certificate Expiry Date** filter run on July 27, 2021 will return records for certificates expiring at or after July 27, 2021.

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Date Type	Description	Example
Yesterday	values up to the end of that time frame.	For example, a **Certificate Expiry Date** filter run on July 27, 2021 will return records for certificates expiring at or after July 26, 2021.
Custom Date	Returns records within the defined custom date.	For example, a **Certificate Expiry Date** filter run on a custom date, say August 1, will return records for certificates expiring at or after August 1, 2021.

- **At or before** - This operator allows users to generate records at or before the selected time period.



The following table describes the date values supported by the on operator:

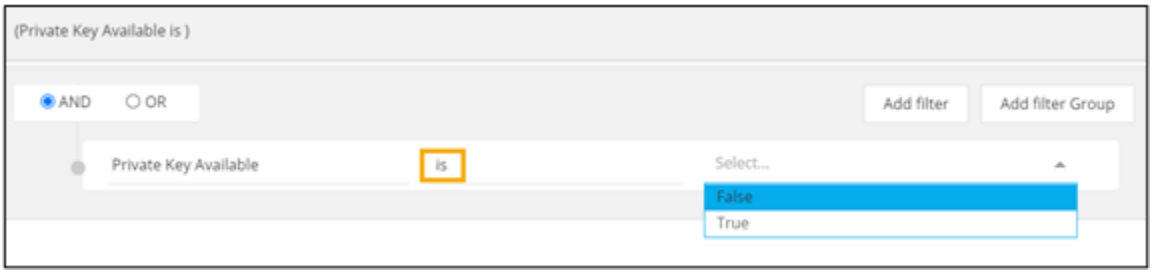
Date Type	Description	Example
Today	Returns records for the selected time period, including records with values up to the end of that time frame.	For example, a **Certificate Expiry Date** filter run on July 27, 2021 will return records for certificates expiring at or before July 27, 2021.
Yesterday		For example, a **Certificate Expiry Date** filter run on July 27, 2021 will return records for certificates expiring at or before July 26, 2021.
Custom Date	Returns records within the defined custom date.	For example, a **Certificate Expiry Date** filter run on a custom date, say August 1, will return records for certificates expiring at or before August 1, 2021.

Field Type: Boolean Variable

When you choose the field type as **Boolean**, the values for the conditional operator are either **true** or **false**. The conditional operator available when choosing the field type as Boolean is:

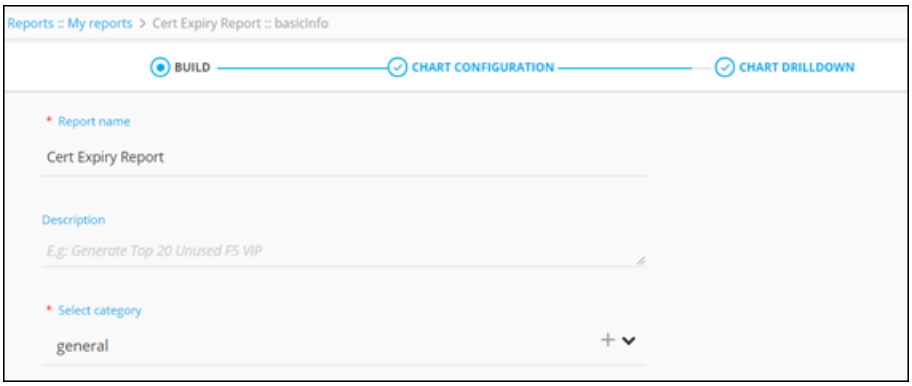
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- **Is** - The report will display data after confirming if the selected field is available in the database (**True**) or not (**False**).



Create a CERT Expiry Report using Query Explorer

1. On the Reports :: My Reports page, click **Create new Report**.
2. Under the **BUILD** section, enter or select the basic information on the report.

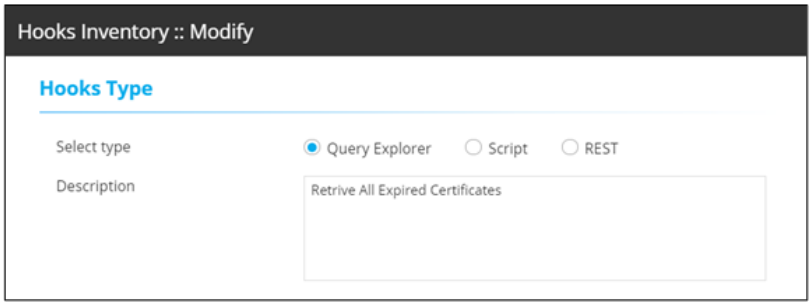


3. To modify a hook, hover your mouse over a hook from the pre-populated list and click  .



4. In the **Hooks Inventory::Modify** pop-up window that is displayed, under **Hooks Type**, enter or select the required field information.

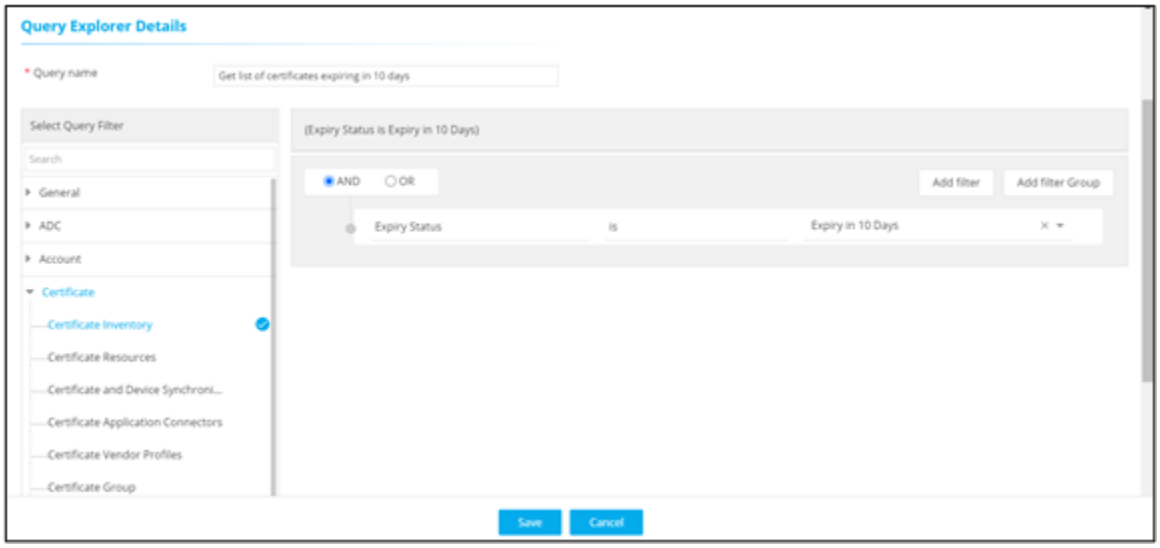
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This table describes the field information in this section:

Field	Description
Select type	Select hook type as **Query Explorer**.
Description	Enter a description of the hook.

5. In the **Query Explorer Details** section, enter or select the required field information.



The following table describes the various fields in this section:

Field	Description
***Query name**	Enter a valid Query name. For example: **Get list of certificates expiring in 10 days**.
Select Query Filter	Select an appropriate query filter.

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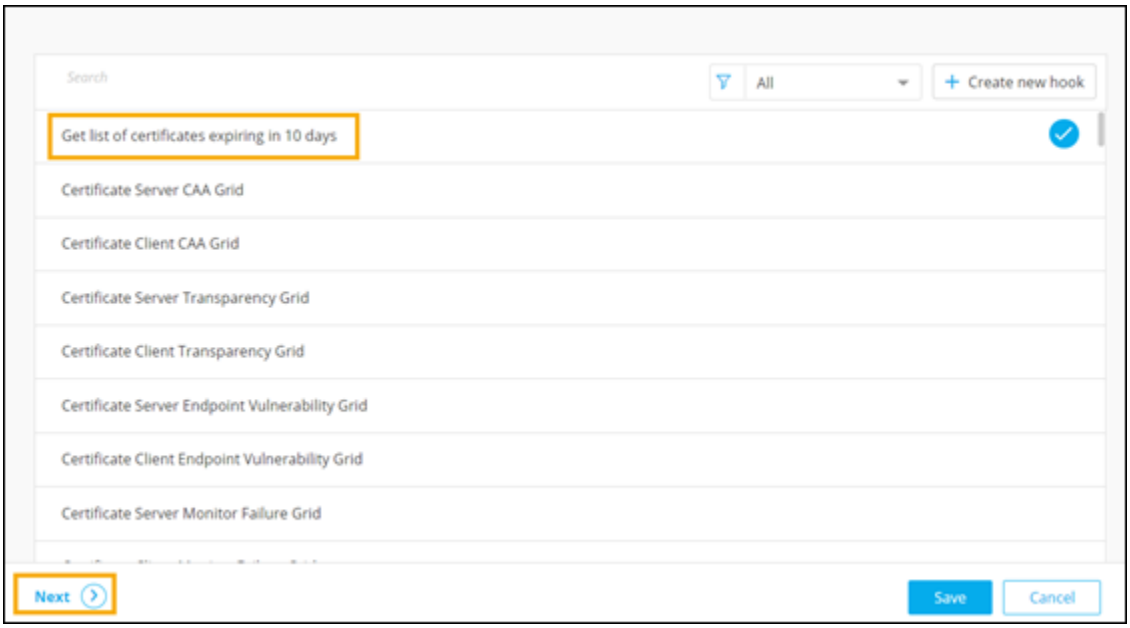
Field	Description
	For example:**Certificate Inventory** under **Certificate**, since this report is to get data on certificates.
Add filter	Add a filter and select appropriate fields from the predefined values. For example: **Expiry status is Expiry in 10 days**.
AND/OR	Select the appropriate conditional parameters depending on the type of output required in the report. **AND**: Report will reflect data satisfying all the filter conditions. **OR**: Report will reflect data satisfying either of the filter conditions.
** : Mandatory fields*	

Note:

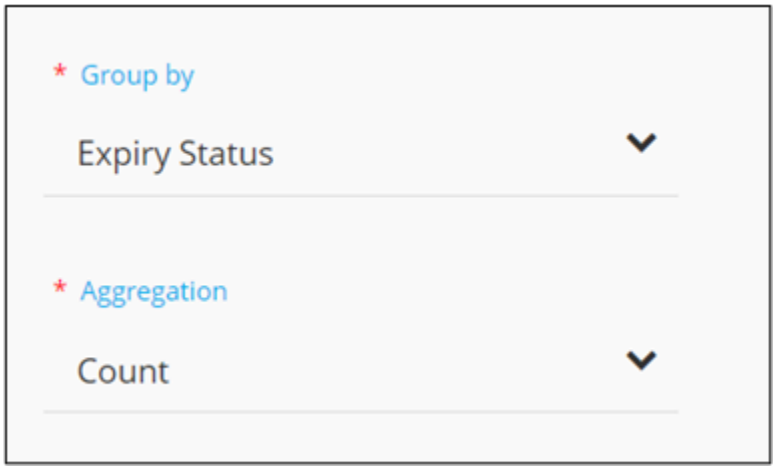
- Users can add more filters and apply conditional operators to generate different kinds of data in their reports. For example, add another filter to get data on **Compliance Status** of the certificates that are expiring in 10 days.
- Set the conditional parameter to **AND** to generate a report that satisfies both the defined conditions and display certificates that are both compliant and are expiring in 10 days. Setting the conditional parameter to **OR** will generate a report that reflects data satisfying either of the two defined conditions.

6. To create this new hook, click **Save**.
7. To save the basic information, click **Next**.
   The new hook is displayed in the list of hooks.

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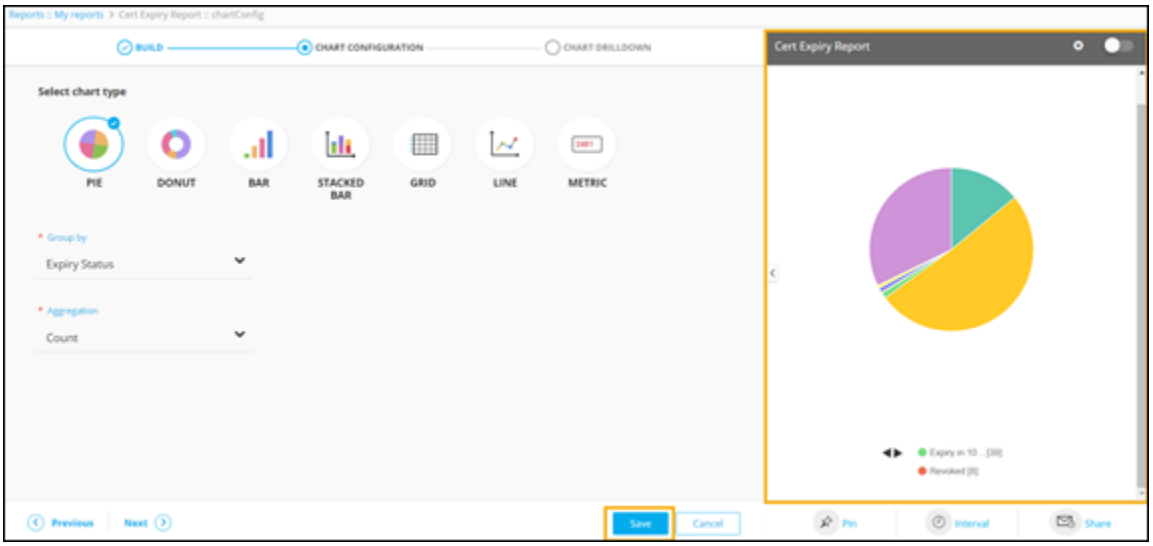
8. Under the **CHART CONFIGURATION** section, select the **PIE** chart.
9. Select the appropriate values for the various fields.



10. Click **Save**.

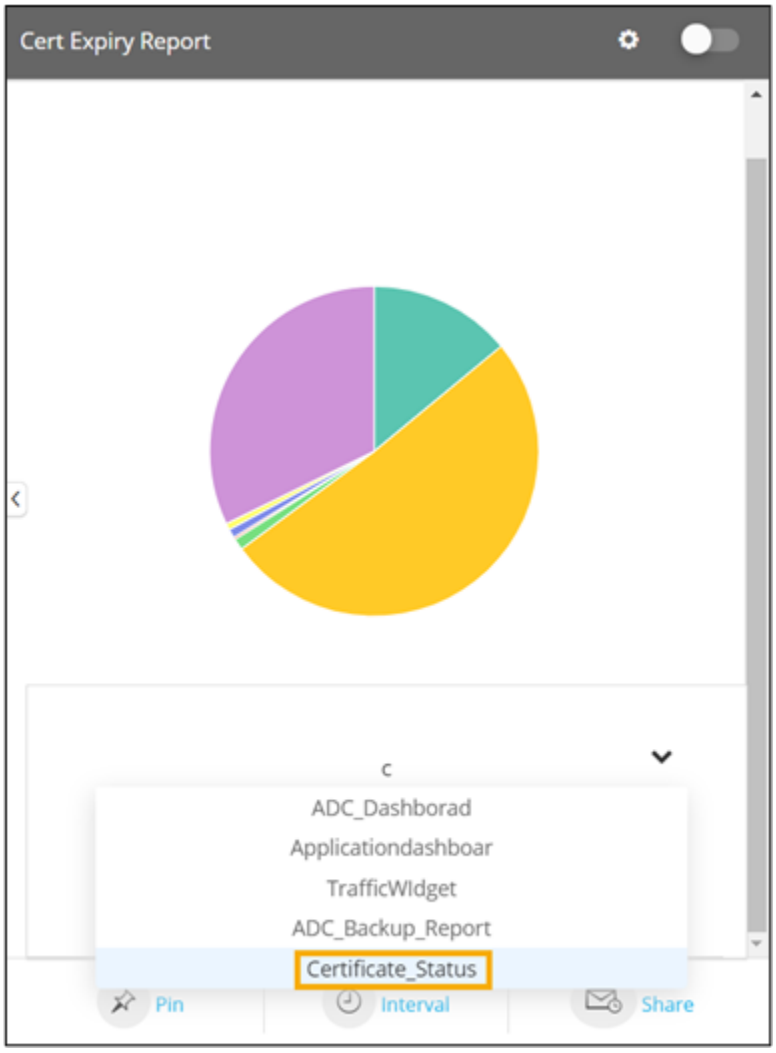
    A preview of the pie chart is displayed on the right side of the screen.

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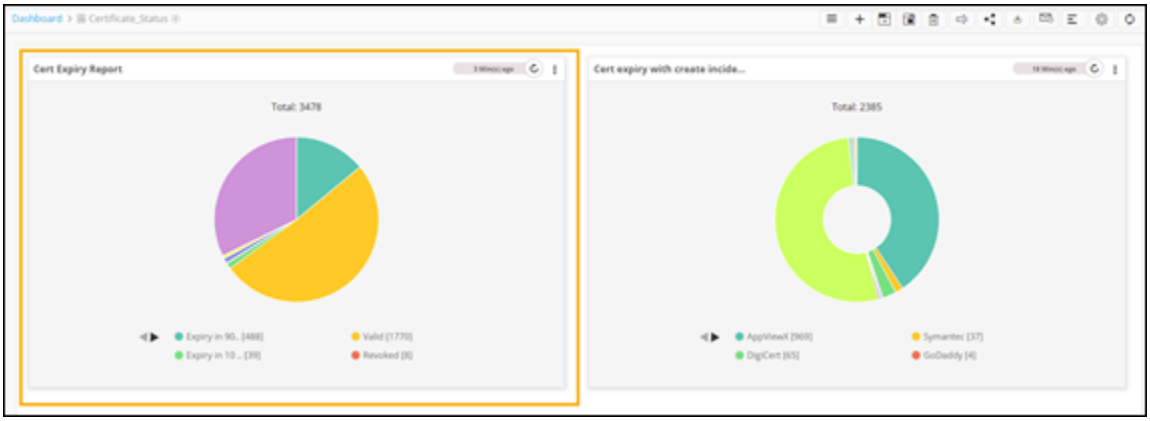
11. To pin the report to the dashboard, under the chart preview, click **Pin**.
12. From the options displayed, select **Existing dashboard**.
13. From the list of available dashboards, select the required dashboard and click **Save**.

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14. To pin this report to the new dashboard, click **Save**.
15. To enable the report, turn on the toggle.
16. To view this report on the dashboard, search for the dashboard in the dashboard inventory.

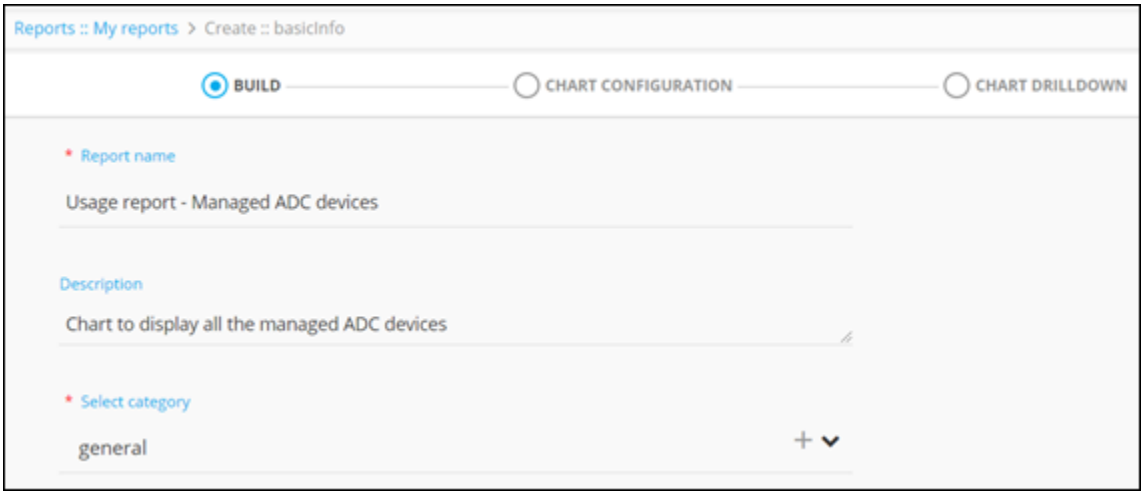
    The **Cert Expiry Report** can be seen on the dashboard.



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Create an ADC Usage Report using Query Explorer

1. On the Reports :: My Reports page, click **Create new Report**.
2. Under the **BUILD** section, enter or select the basic information on the report.

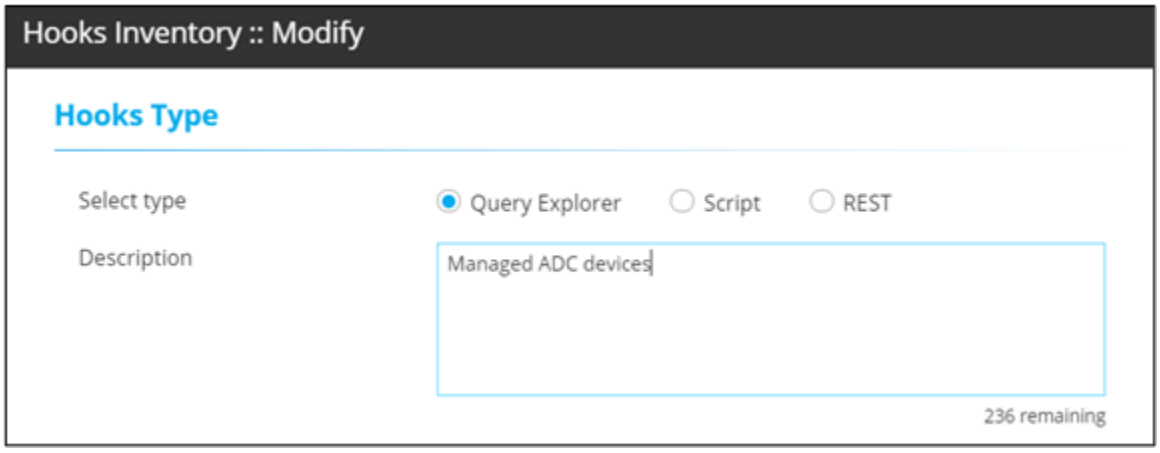


3. To modify the hook, select a hook from the pre-populated list and click .



4. In the **Hooks Inventory::Modify** pop-up window that is displayed, under **Hooks Type**, enter or select the field information.

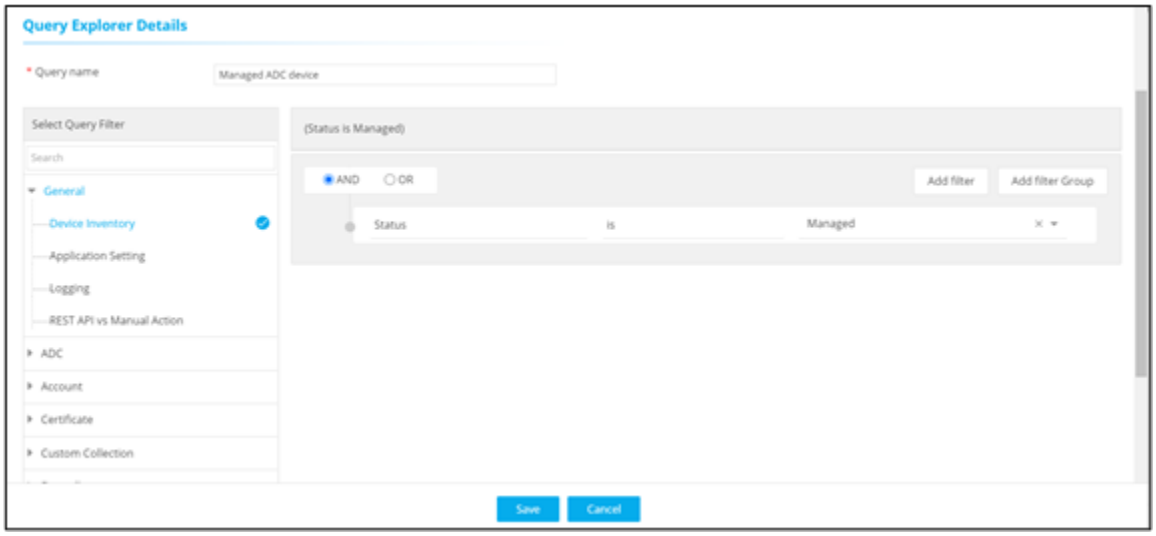
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This table describes the field information in this section:

Field	Description
Select type	Select hook type as **Query Explorer**.
Description	Enter a description of the hook.

5. In the **Query Explorer Details** section, enter or select the field information.



The following table describes the various fields in this section:

Field	Description
Query name	Enter a valid Query name. For example: **Managed ADC devices**.

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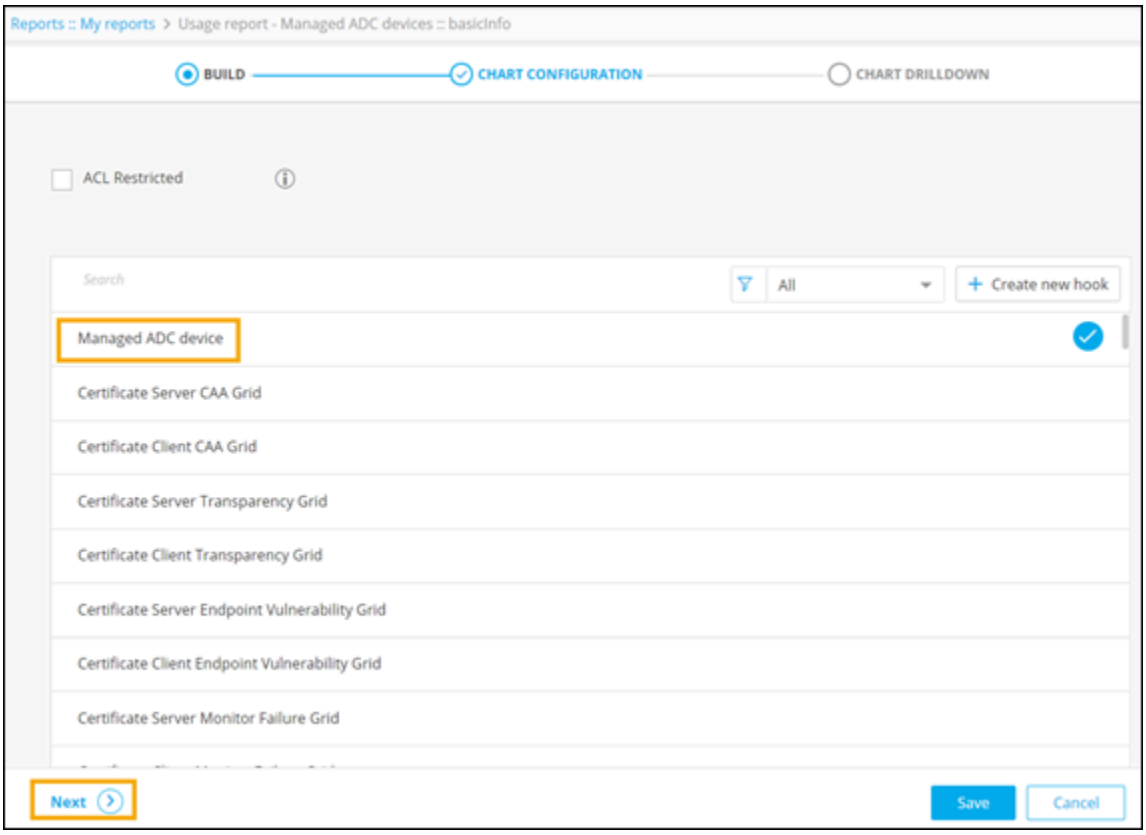
Field	Description
Select Query Filter	Select an appropriate query filter. For example: **Device Inventory** under **General**, since this report is to get data on devices.
Add filter	Select appropriate fields from the pre-defined values. For example: **Status is Managed**.
AND/OR	Select the appropriate conditional parameters depending on the type of output required in the report. **AND**: Report will reflect data satisfying all the filter conditions. **OR**: Report will reflect data satisfying either of the filter conditions.

Note:

- Users can add more filters and apply conditional operators to generate different kinds of data in their reports. For example, adding another filter to get data on credential type of the ADC devices that are managed.
- Set the conditional parameter to **AND** to generate a report that satisfies both the conditions and display devices that are both managed and required manual credentials entry. Setting it to **OR** will generate a report that reflects data satisfying either of these two defined conditions.

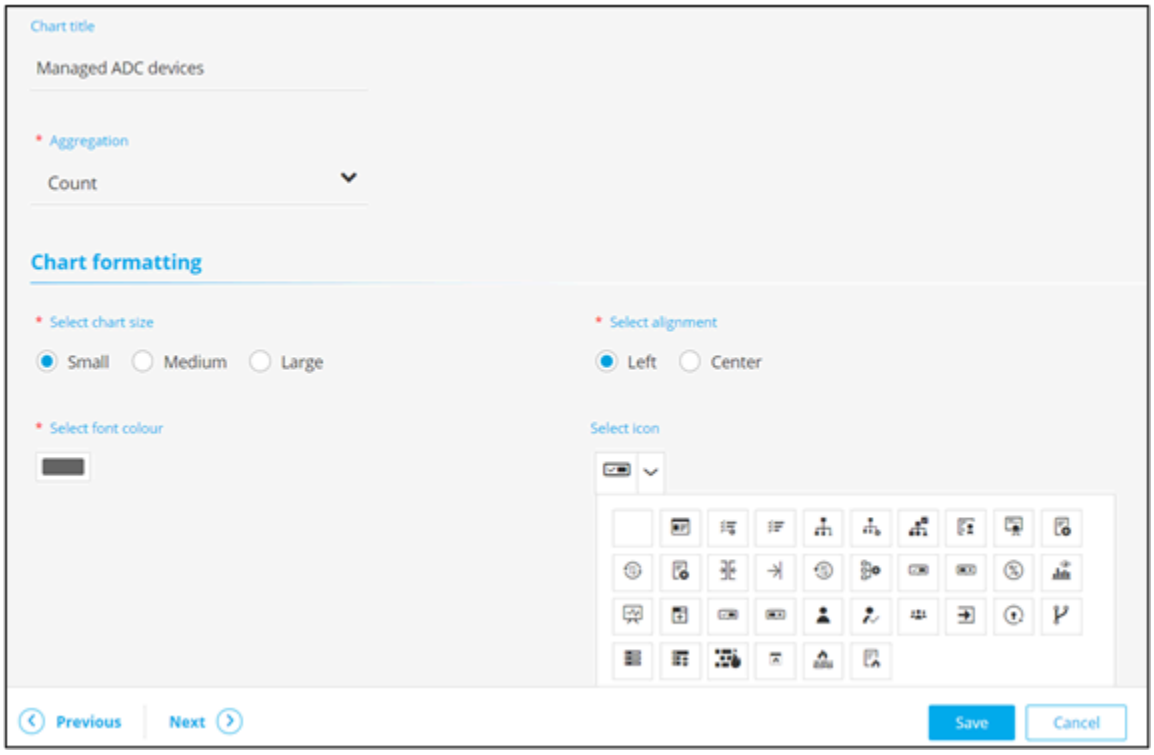
6. To create this new hook, click **Save**.
   The new hook can be seen in the list of hooks.

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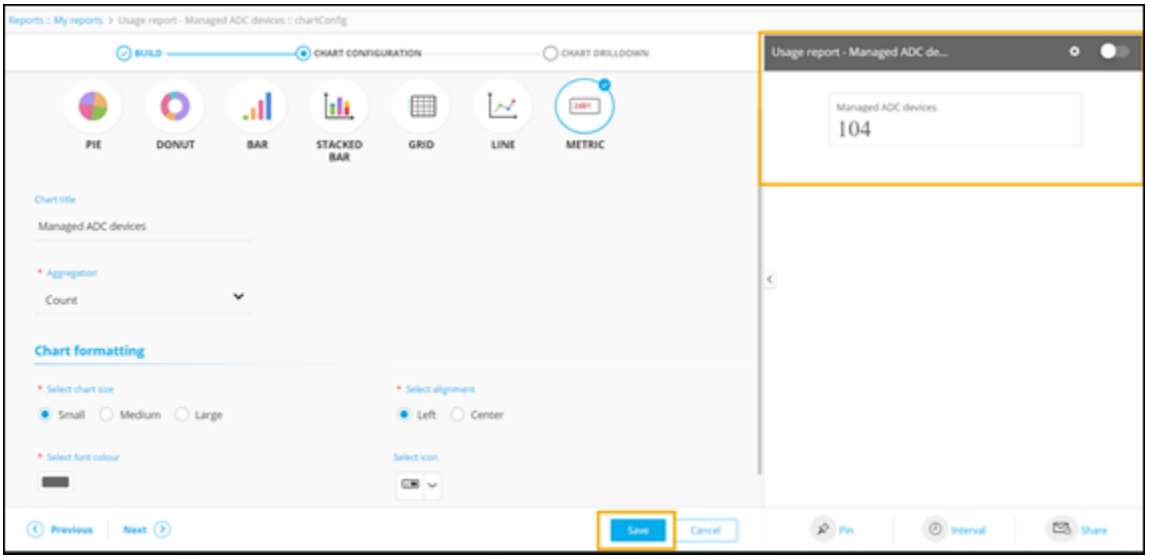
7. To save the basic information, click **Next**.
8. Under the **CHART CONFIGURATION** section that is displayed, select the chart type as **METRIC**.
9. Enter or select the required field information as shown here.

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10. Click **Save**.

    A preview of the metric is displayed on the right side of the screen.



Importing Custom Data in Query Explorer

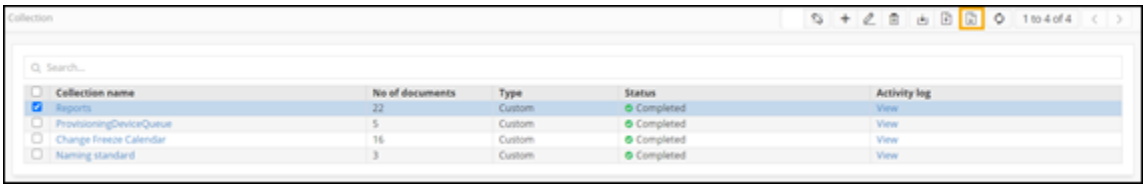
You can import data and upload it into the **Collection** module of the AppViewX platform and enable it to build custom queries to create reports.

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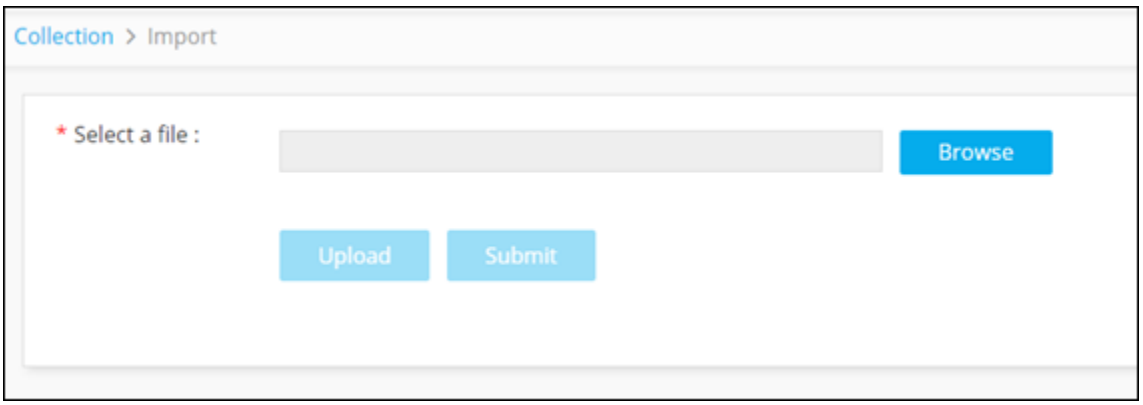
To import a collection into the Query Explorer:

New Menu	Old Menu
1. From the main navigation menu, select **Automation**. 2. In the **Automation** module, from the left menu, under **WORKFLOW**, click **Collection**. The **Collection** page is displayed.	From the main navigation menu, select **Collection**. The **Collection** page is displayed.
Note: For more information on how to switch between menus, click here.	

1. To import a collection, on the **Collection** page, from the command bar on top right corner, click  .



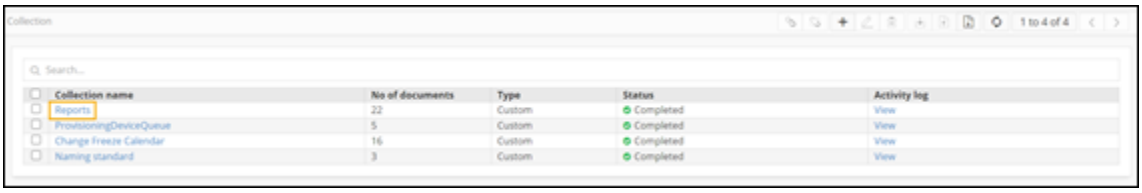
2. To select a file to be uploaded to the **Collection** module, click **Browse**.



3. Select the required file and click **Upload**.
4. Select the collection and click **Submit**.

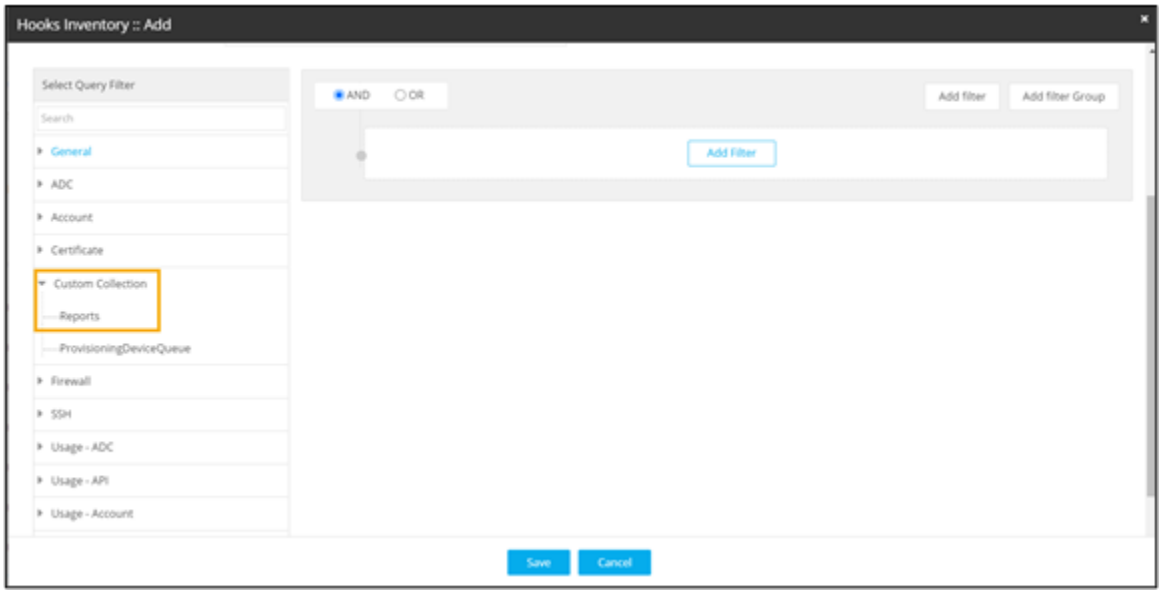
   The newly created collection can be seen on the **Collection** page under **Collection Name**.

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5. To enable the collection to build a custom query, select the collection and from the command bar click  .
6. On the Reports :: My Reports page, click **Create new report**.
7. Under the **BUILD** section, click **Create new hook**.

   The newly created collection is displayed in the **Hooks Inventory::Add** pop-up window in the **Custom Collection** category.



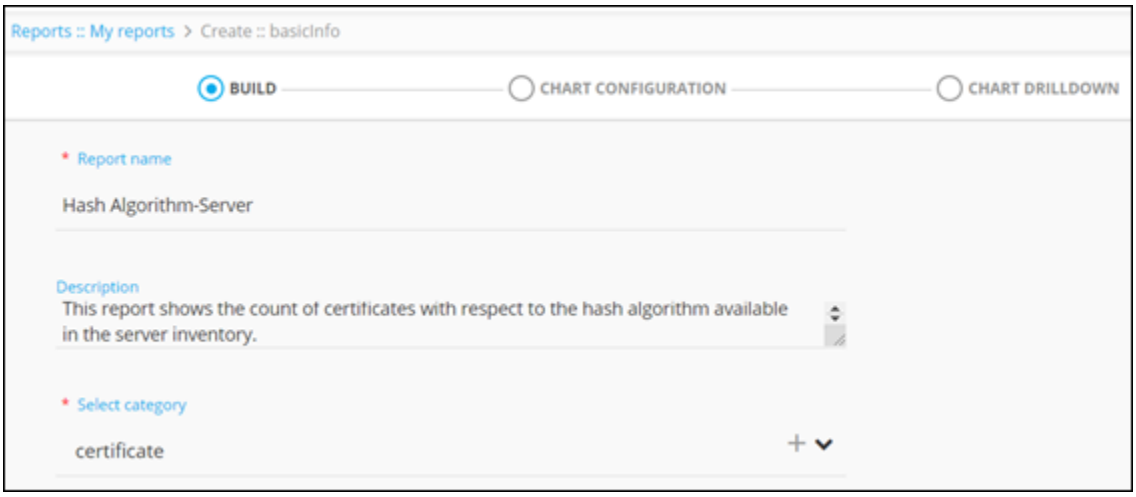
Using Scripts to build Reports

The report builder allows you to create reports using preexisting and custom scripts. You can add your own custom code to generate reports that meet your requirements.

Example 1

1. On the Reports :: My Reports page, click **Create new report**.
2. Under the **BUILD** section, enter or select the field information.

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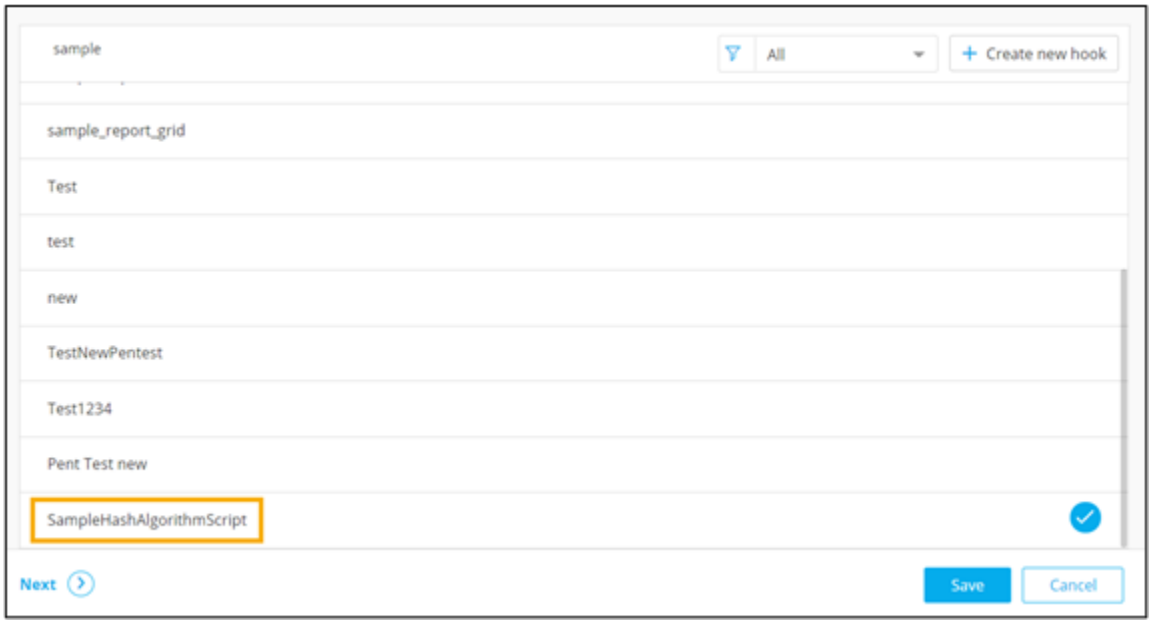


This table describes the field information under this section:

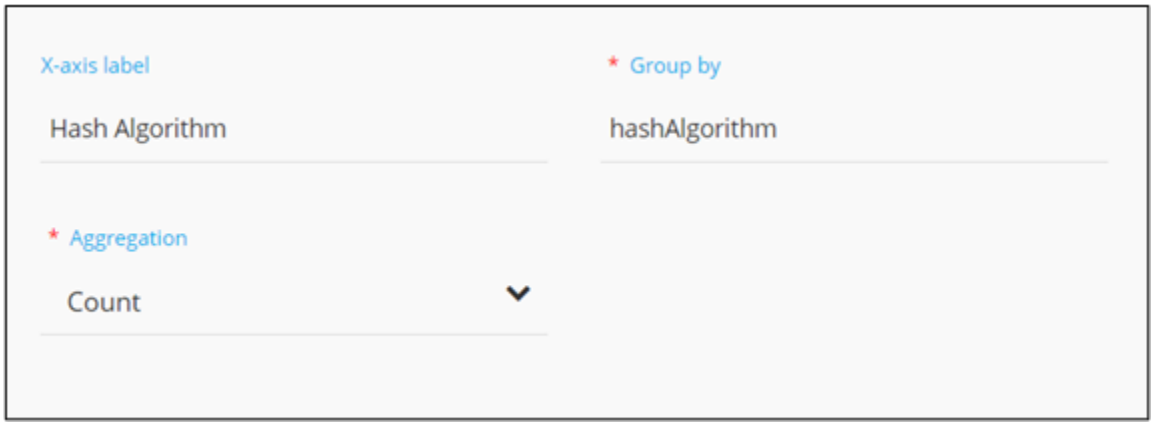
Field	Description
***Report name**	Enter a valid report name. For example, **Hash Algorithm-Server**.
Description	Enter a description of the report. For example: **This report shows the count of certificates with respect to the hash algorithm available in the server inventory.**
***Select category**	Select category as **certificate**.
** : Mandatory fields*	

3. Select the **ACL restricted** check box.
4. Select a sample script from the list of available hooks.

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5. To save your selections, click **Next**.
6. Under the **CHART CONFIGURATION** section, select the **BAR** chart.
7. Enter or select the required field information.



This table describes the field information under this section:

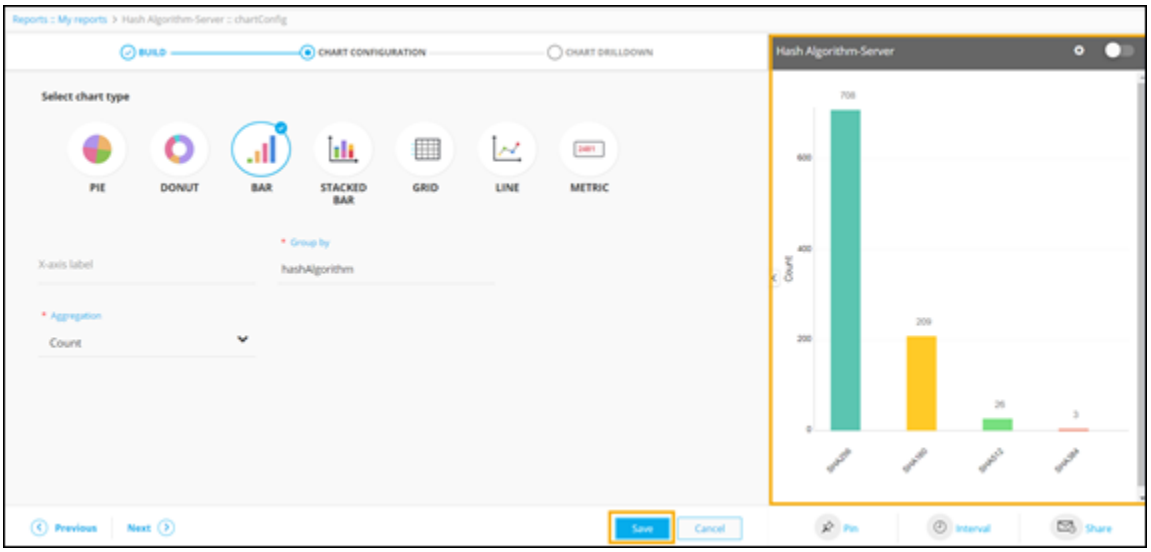
Field	Description
X-axis label	Enter the criteria for the X-axis label. For example, Hash algorithm.
***Group by**	Select a value from the dropdown menu on the basis of which report data will be grouped.

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Field	Description
	For example, hashAlgorithm.
***Aggregation**	Select the calculation to be done on the report data for the dropdown. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data.
** : Mandatory fields*	

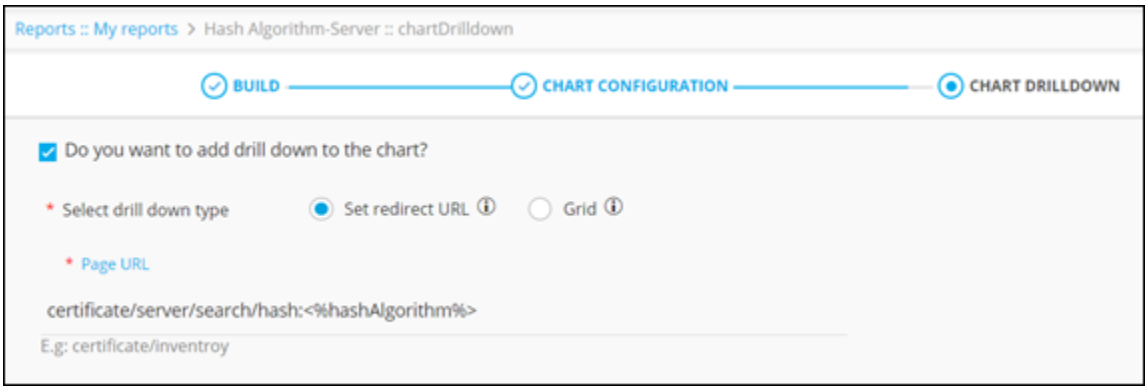
8. Click **Save**.

   A preview of the bar chart is displayed on the right side of the screen.



9. To add drill down to the report, click **Next**.
10. Under the **CHART DRILLDOWN** section, enter or select the required field information.

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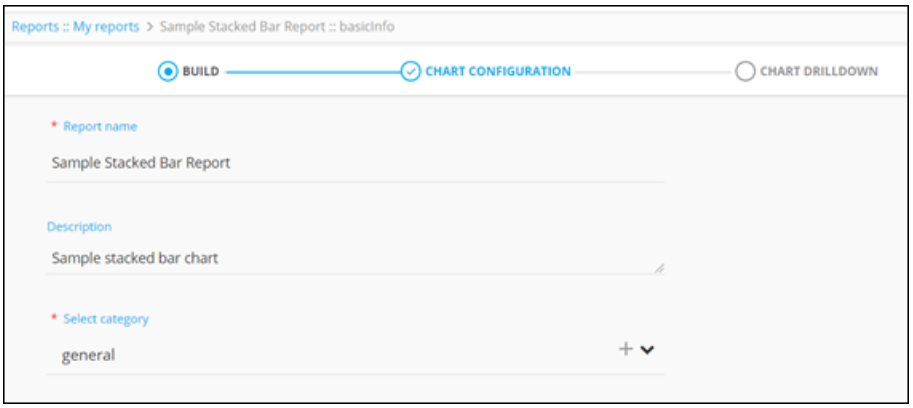
The following table describes the field information on this page:

Field	Description
***Select drill down type**	Select drill down type as redirect URL.
***Page URL**	Enter a valid URL.
** : Mandatory fields*	

11. To enable drill down, click **Save & Enable**.
    You will be redirected to the drill down URL, click on any of the bars on the bar chart.

Example 2

1. On the Reports :: My Reports page, click **Create new report**.
2. Under the **BUILD** section, enter or select the required field information.



This table describes the field information in this section:

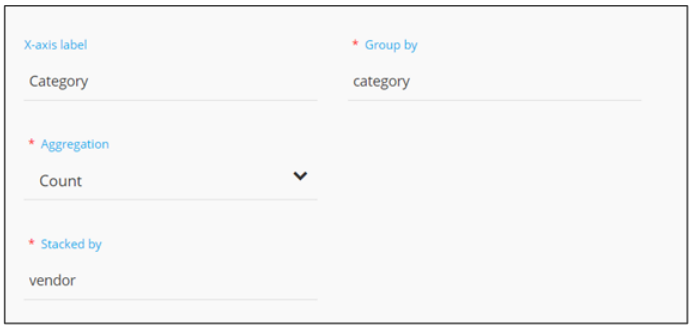
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Field	Description
***Report name**	Enter a valid report name.
Description	Enter a valid description of the report.
***Select category**	Select category as general.
** : Mandatory fields*	

3. Select the required hook from the list and click .



4. Click **Next**.
5. Under the **CHART CONFIGURATION** section, select the **STACKED BAR** chart.
6. Enter or select the field information on this page.



This table describes the fields in this section:

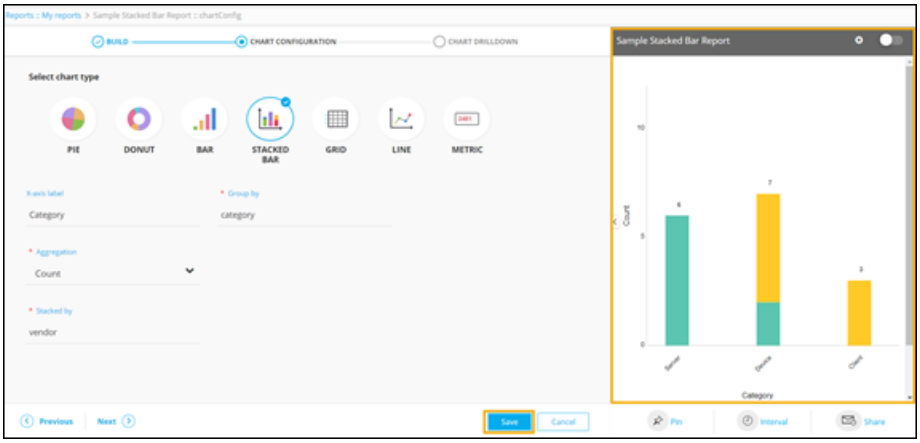
Field	Description
X-axis label	Enter the criteria for the X-axis label.

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Field	Description
***Group by**	Enter the criteria on the basis of which report data will be grouped. For example, **category**.
***Aggregation**	Select the calculation to be done on the report data for the dropdown. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data.
***Stacked by**	Enter the criteria on the basis of which report data will be stacked. For example, **vendor**.
** : Mandatory fields*	

7. Click **Save**.

   A preview of the stacked bar chart is displayed on the right side of the screen.



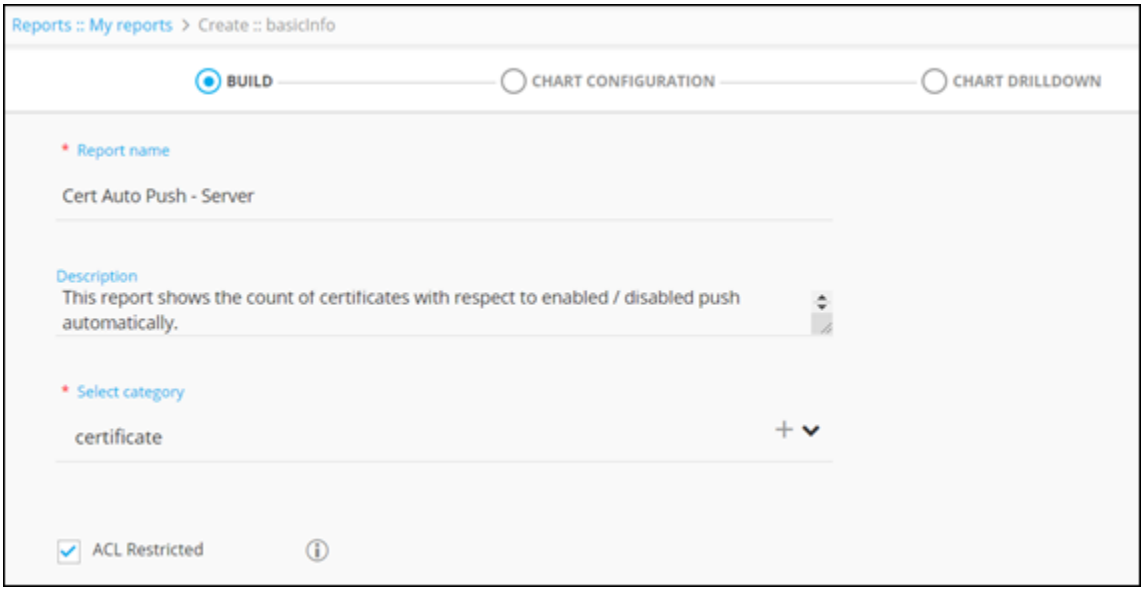
Using REST API to build Reports

You can also use the report builder to create reports using preexisting or custom APIs. You can integrate your internal APIs into this platform to generate customized reports.

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Creating a Report using Sample REST API

1. On the Reports :: My Reports page, click **Create new report**.
2. Under the **BUILD** section, enter or select the required field information.

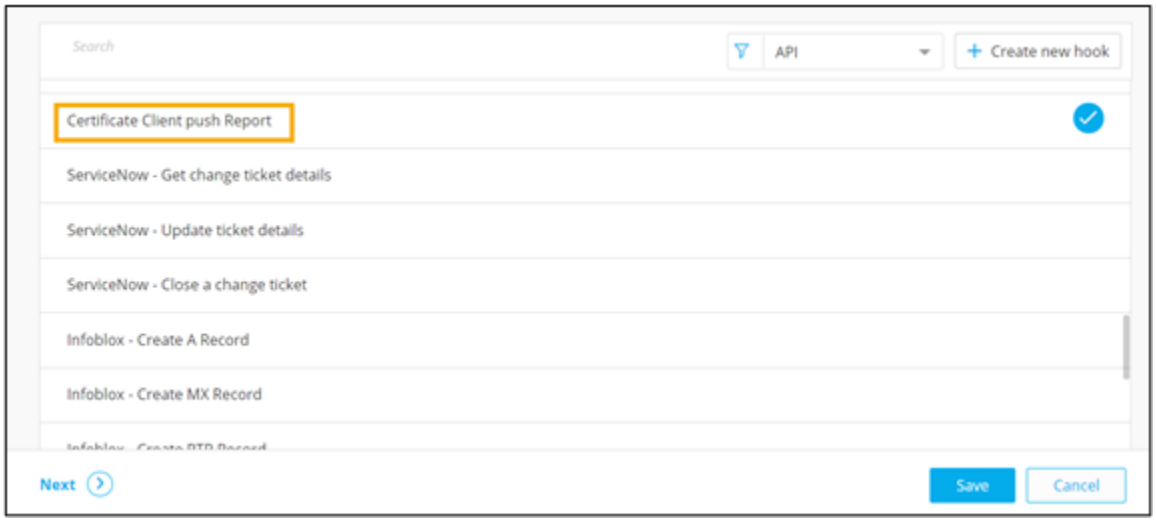


This table describes the field information under this section:

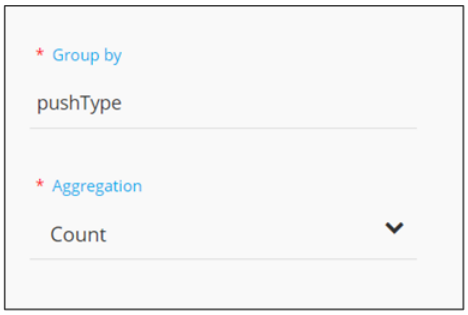
Field	Description
***Report name**	Enter a valid report name. For example, **Cert Auto Push server**.
Description	Enter a valid description for the report. For example: **This report shows the count of certificates with respect to enabled / disabled push automatically.**
***Select category**	Select category as certificate.
ACL restricted	Select this checkbox to query certificates based on role permission.
** : Mandatory fields*	

3. Select a sample API hook from the list of preexisting hooks.

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4. Click **Next**.
5. Under the **CHART CONFIGURATION** section, select the **PIE** chart.
6. Enter or select the required field information.



The following table describes the field information in this section:

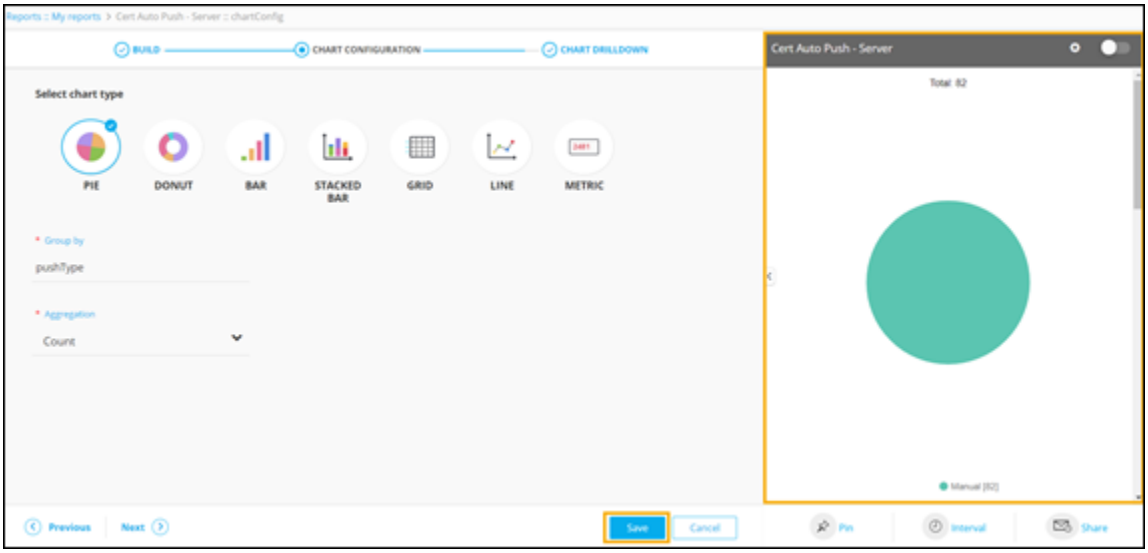
Field	Description
***Group by**	Enter the criteria on the basis of which report data will be grouped. For example: **pushType**.
***Aggregation**	Select the calculation to be done on the report data for the dropdown. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data.

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Field	Description
** : Mandatory fields*	

7. Click **Save**.

   A preview of the pie chart is generated on the right side of the screen.

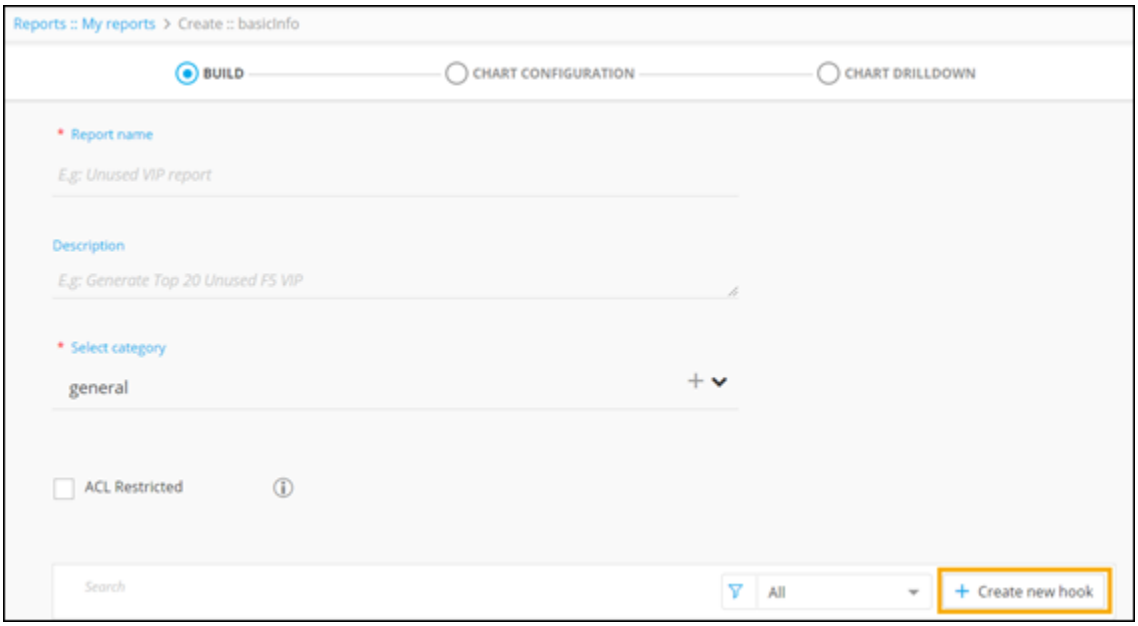


Creating a New Hook

To create a new hook for generating reports based on a specific category:

1. On the Reports :: My Reports page, click **Create new report**.
2. Under the **BUILD** section, click **Create new hook**.

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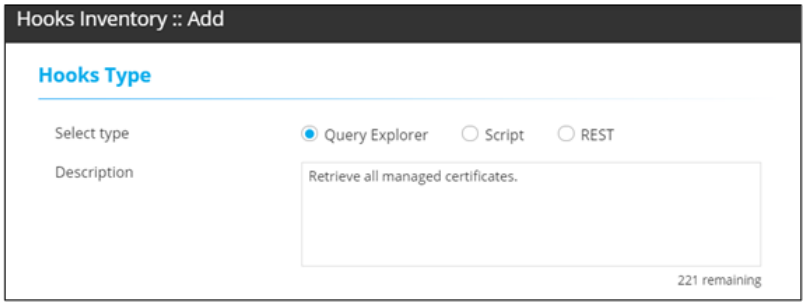


The **Hooks Inventory :: Add** window pops up. You can add/create a new hook according to your specific requirements.

Creating a Query Explorer Hook

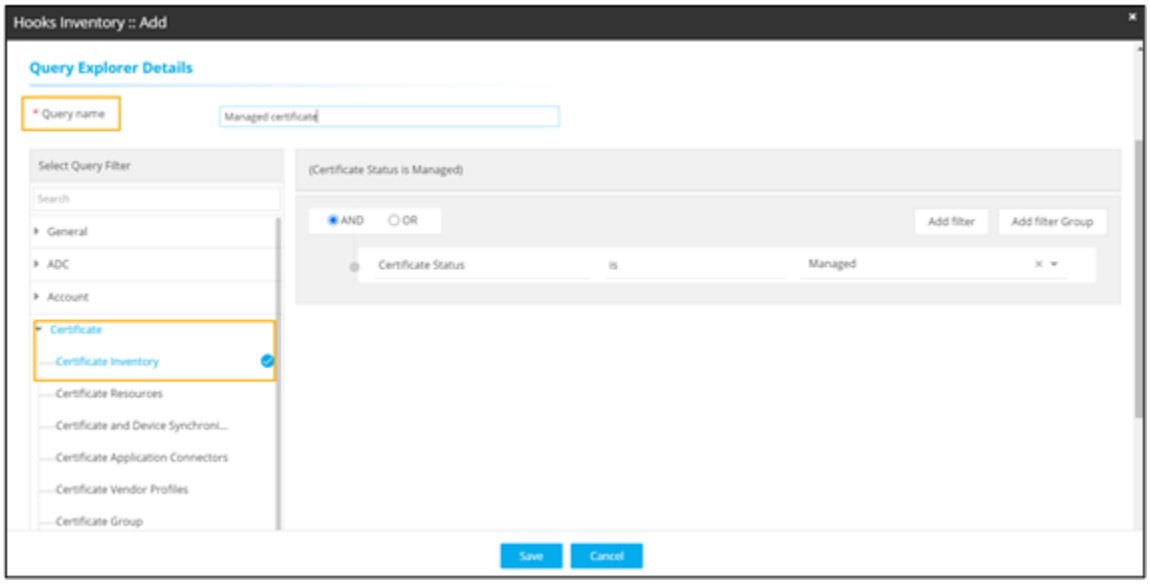
To create a hook based on Query Explorer:

1. In the **Hooks Inventory :: Add** window, under **Hooks Type**, select the **Query Explorer** option.
2. Add a description for the selected hook.



3. Under the **Query Explorer Details**section, enter or select the required field information.

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The following table describes the various fields in the **Query Explorer Details** section:

Field	Description
***Query name**	Enter a valid query name. For example: **Managed certificates**.
Select Query Filter	Select an appropriate query filter from the pre-populated list of filters. For example:**Certificate Inventory** under **Certificate section**.
Add Filter	Add a filter and select appropriate fields from the predefined values. For example: **Certificate Status is Managed**.
AND/OR	Select the appropriate conditional parameters depending on the type of output required in the report. **AND**: Report will reflect data satisfying all the filter conditions. **OR**: Report will reflect data satisfying either of the filter conditions.

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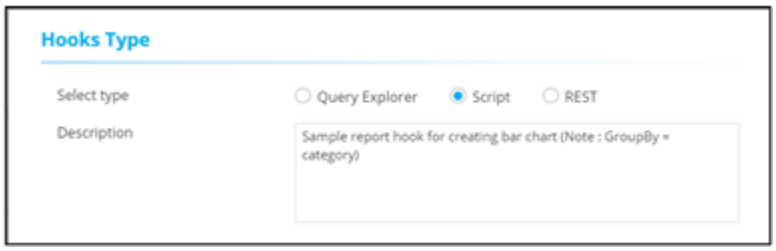
Field	Description
** : Mandatory fields*	

4. To add this new hook to the Hooks Inventory, click **Save**.

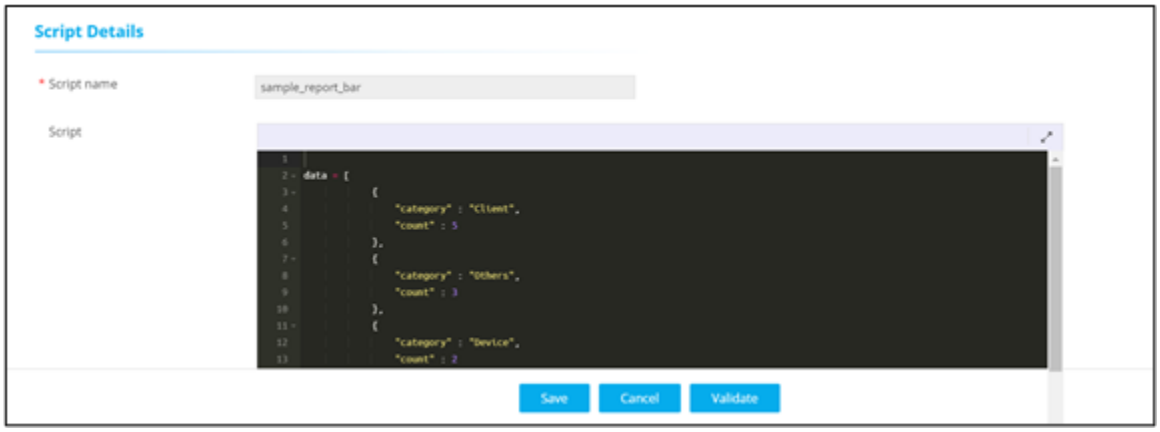
Creating a Script Hook

To create a hook based on Script:

1. In the **Hooks Inventory :: Add** window, under **Hooks Type**, select the **Script** option.
2. Add a description for the selected hook.



3. Under the **Script Details** section, enter a valid script name and define the script logic .

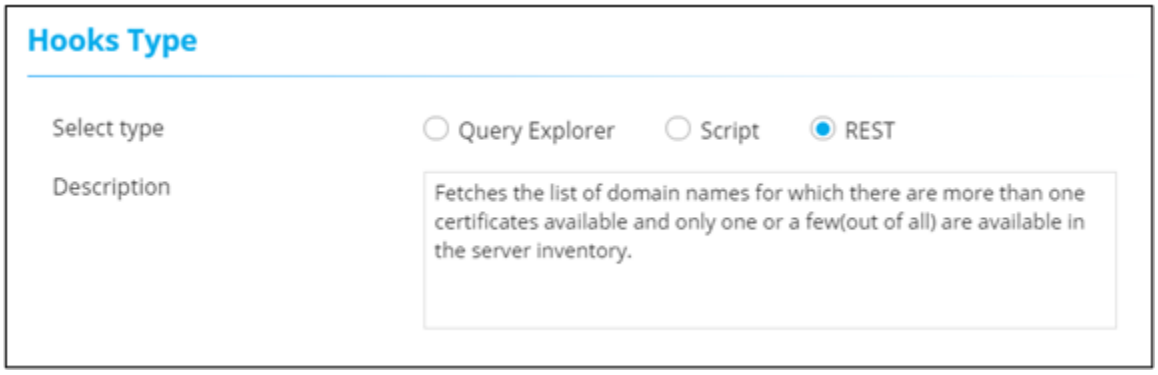


4. To add this new hook to the Hooks Inventory, click **Save**.

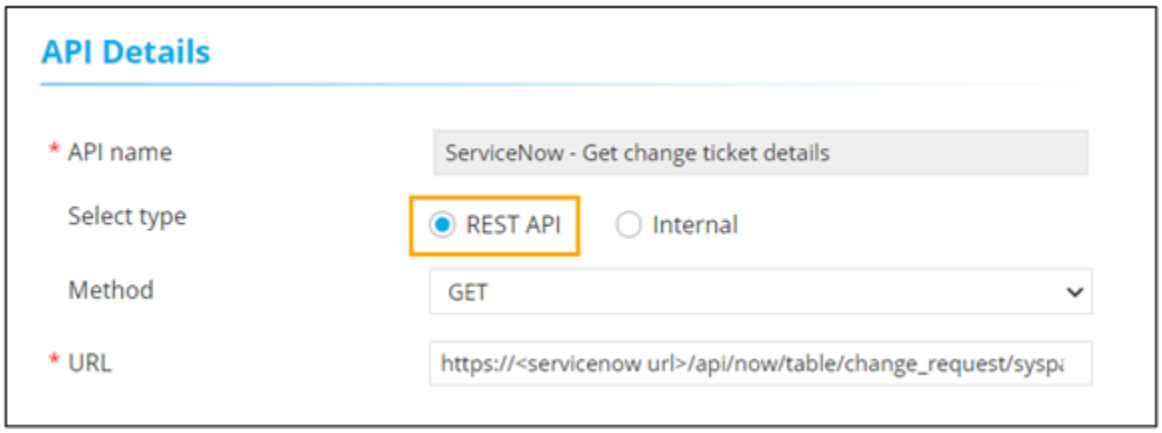
Creating a REST API Hook

1. In the **Hooks Inventory :: Add** window, under **Hooks Type**, select the **REST** option.
2. Enter a description for the selected hook.

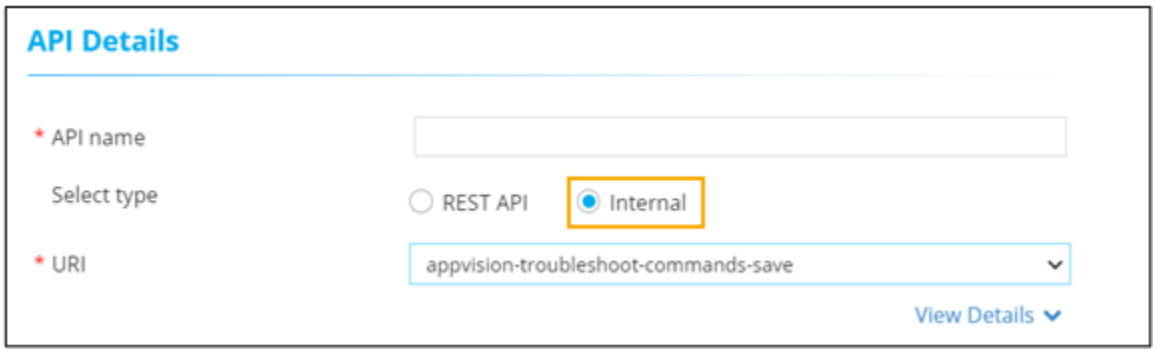
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3. Under **API Details**, enter or select the field information.
   - **Using REST API**



   - **Using Internal API**



The following table describes field description in this section:

Field	Description
API name	Enter a valid name for the API.

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Field	Description
Select type	You can select between REST API and Internal. • **REST API**: Use this to select external API and enter the URL. • **Internal**: Use this to select an internal API and select a URI (Uniform Resources Identifier) from the dropdown menu.
Path params	Parameters that are used to identify a specific resource(s).
Query params	Parameters that are used to filter resources.
** : Mandatory fields*	

4. Under **Request Body**, enter the payload and response mapping details.



The following table describes field description in this section:

Field	Description
Payload	Payload is the actual data that needs to be passed for the API.
Response mapping	Mapping an integration response from the backend.

5. To add this new hook to the Hooks Inventory, click **Save**.

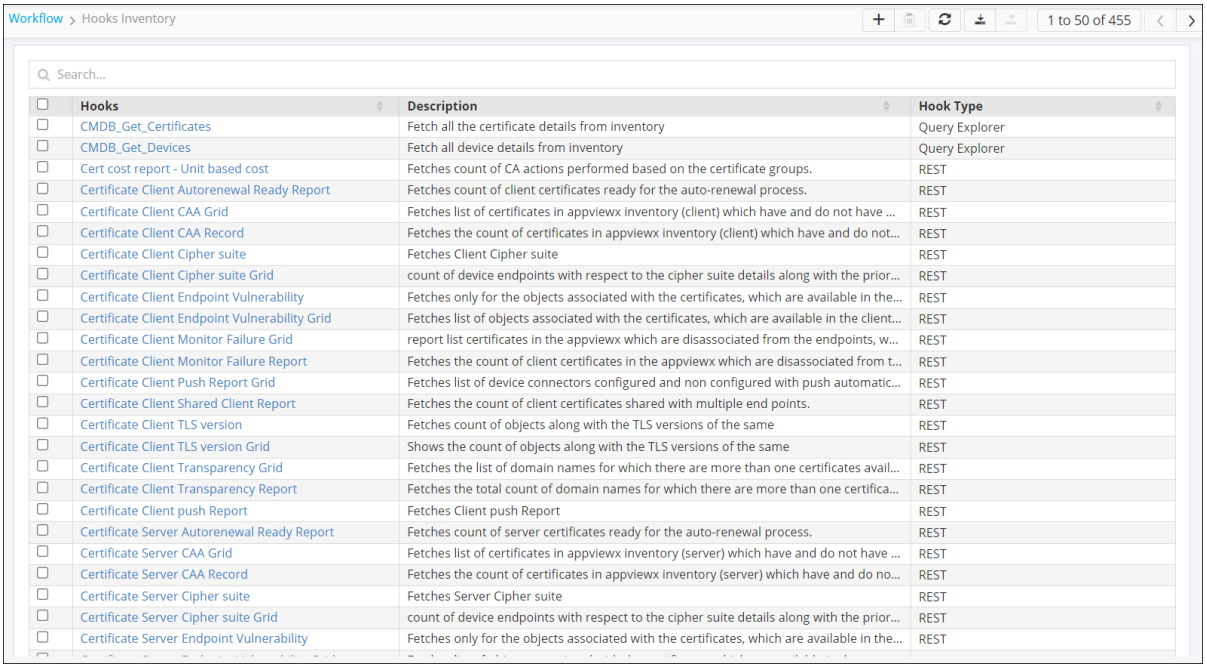
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Reusing Hooks

The **Hooks Inventory** lists all the hooks that are available to you for building reports. Any new hook created will be added to the **Hooks Inventory** and can be reused for creating reports.

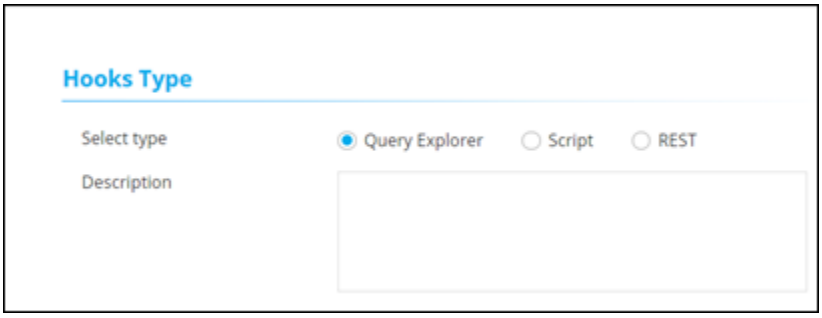
To create and reuse hooks:

1. Go to the Hooks Inventory in the **Automation** module.



> **Note:** For more information on the Hooks Inventory, refer to the Automation User Guide

2. To add a new hook, from the command bar at the top right corner of the screen, click +.
   The **Workflow > Hooks Inventory > Add** page is displayed.
3. Under the **Hooks Type** section, enter or select the required field information.

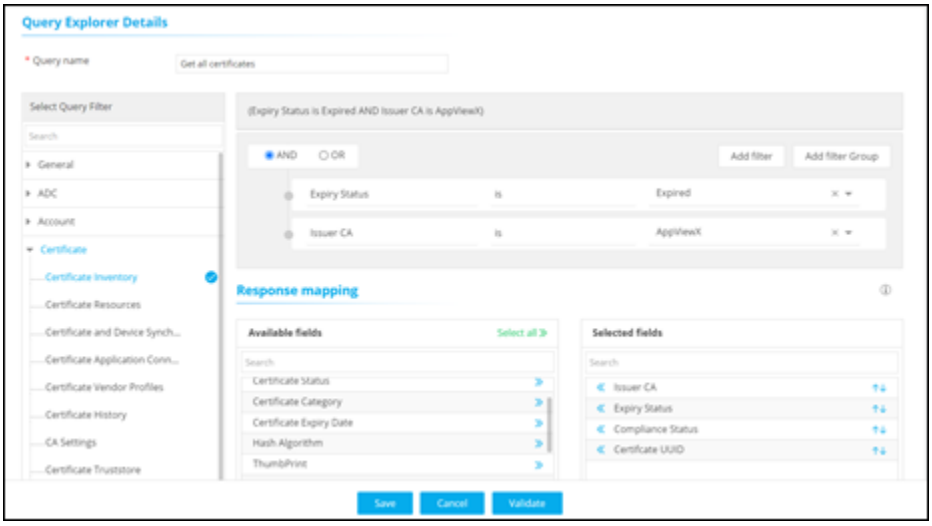


This table describes the field information in this section:

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Field	Description
Select Type	Select hook type as **Query Explorer**.
Description	Enter a valid description. For example: **Retrieve all certificates that have been managed or monitored.**

4. Under the **Query Explorer Details** section, enter or select the required field information.



This table describes the various fields in this section:

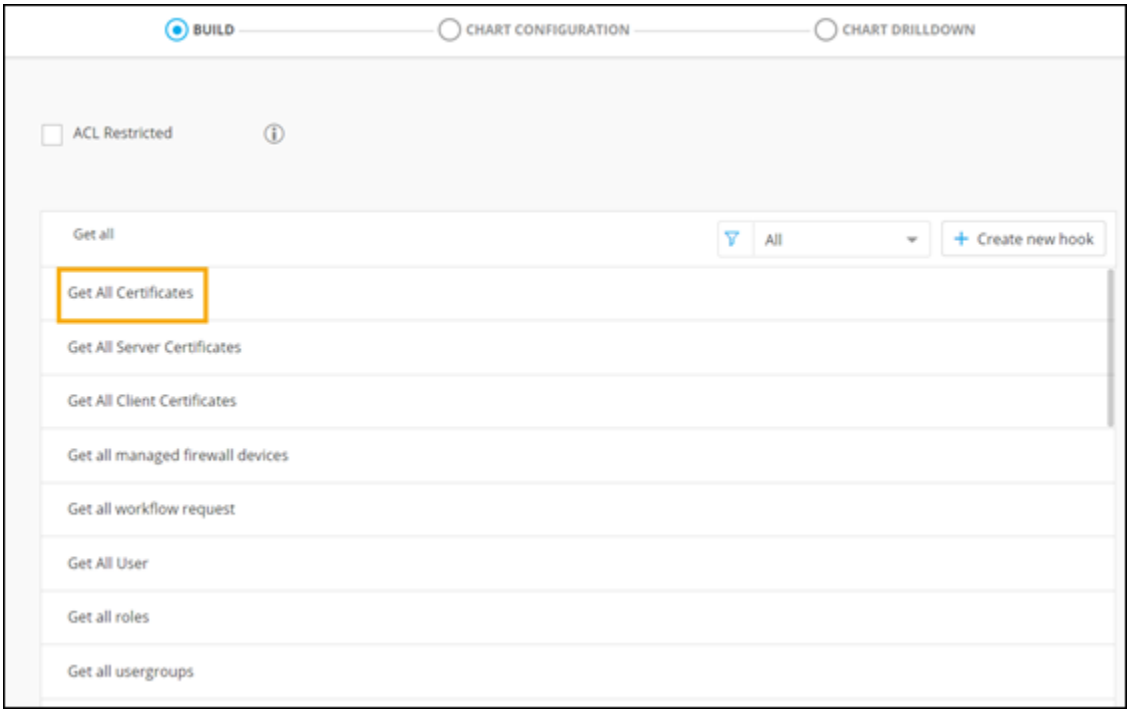
Field	Description
Query name	Enter a valid query name. For example: **Get all certificates**.
Select Query Filter	Select an appropriate query filter from the collection of hooks. For example: **Certificate Inventory** under the **Certificate section.**
Add filter	Add a filter(s) and select appropriate fields from the predefined values. For example: **Expiry Status is Expired and Issuer CA is AppViewX.**
AND/OR	Select the appropriate conditional parameters depending on the type of output required in the report. **AND**: Report will reflect data satisfying all the filter conditions.

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Field	Description
	OR: Report will reflect data satisfying either of the filter conditions.
Response Mapping	Select the fields from the available list to map the integration response. For example: Select **Issuer CA, Expiry Status, Certificate Status, Certificate UUID.** Selected fields appear on the right side.
** : Mandatory fields*	

5. To add this hook to the **Hooks Inventory**, click **Save**.
6. On the Reports :: My Reports page, click **Create new report**.

   The new hook is added to the list of hooks.



Report Widgets

You can create customized widgets, pin them to a dashboard, and also download report widgets to your device using the Report builder.

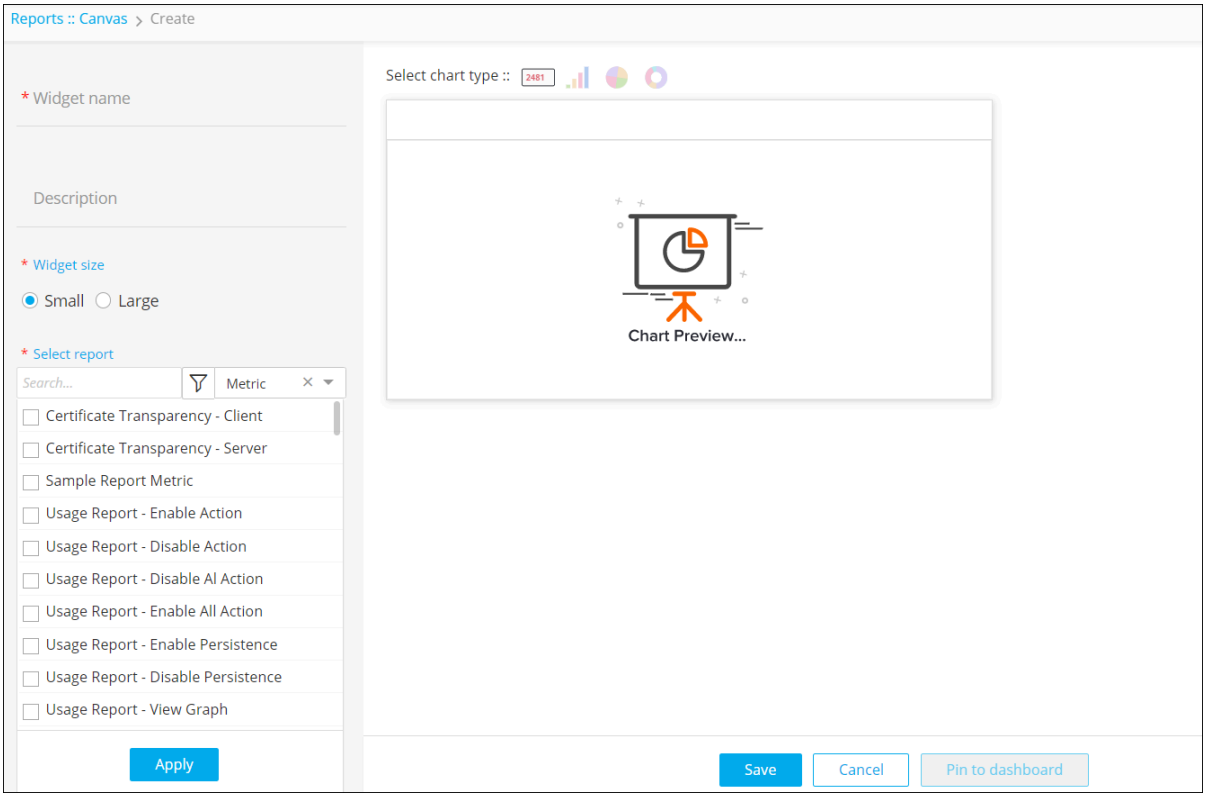
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Creating a Widget

Creating a User Summary Widget

To create a **User Summary** widget that displays the information on user groups, roles, and login summary:

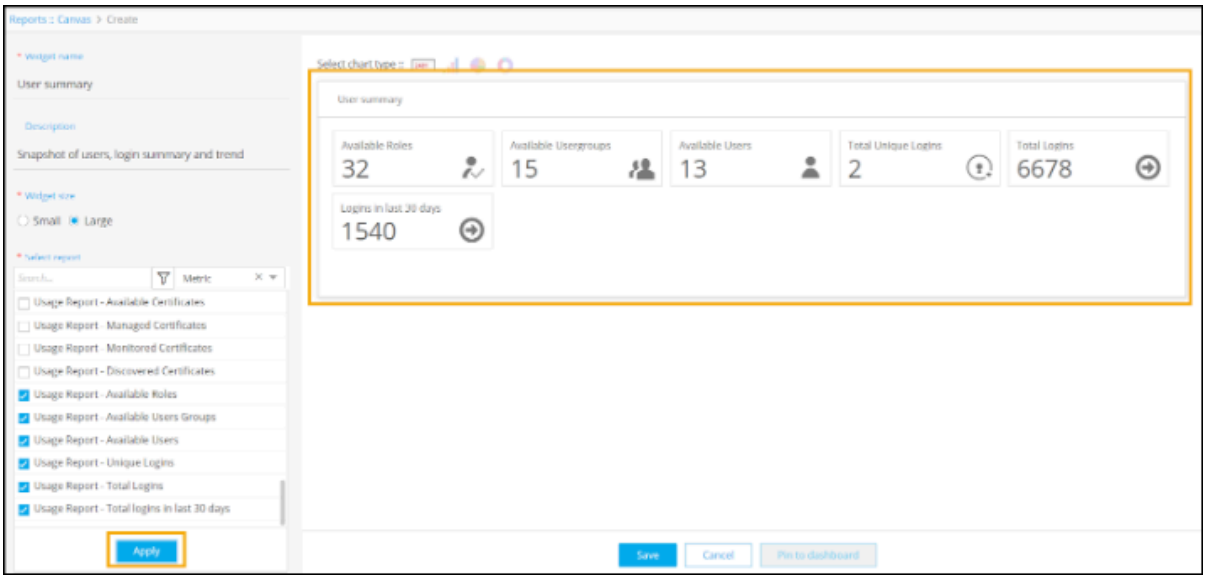
1. On the Reports :: Canvas page, click **Create new widget**.
2. On the **Reports::Canvas > Create** page, enter a **Widget name** (mandatory field) and **Description** (optional field).



3. Select the **Widget size** as **Small** or **Large**.
4. Select the report(s) to be displayed on the widget from the list of metric reports available.
5. To see a preview of the widget, click **Apply**.

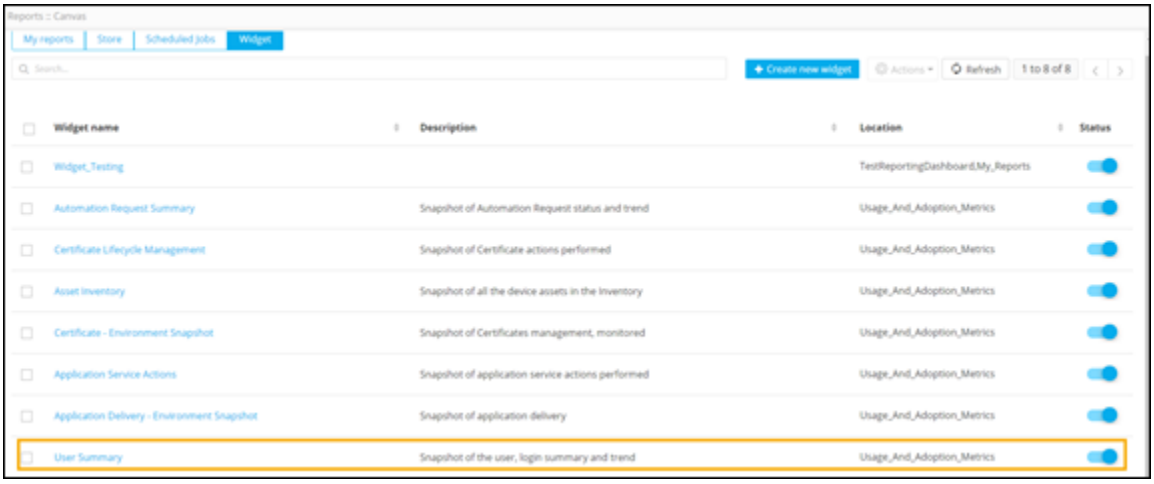
   The preview is displayed on the right side of the page.

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6. Click **Save**.
7. To enable the widget, turn on the **Status** toggle.

   The **User Summary** widget is displayed on the **Reports :: Canvas**page.



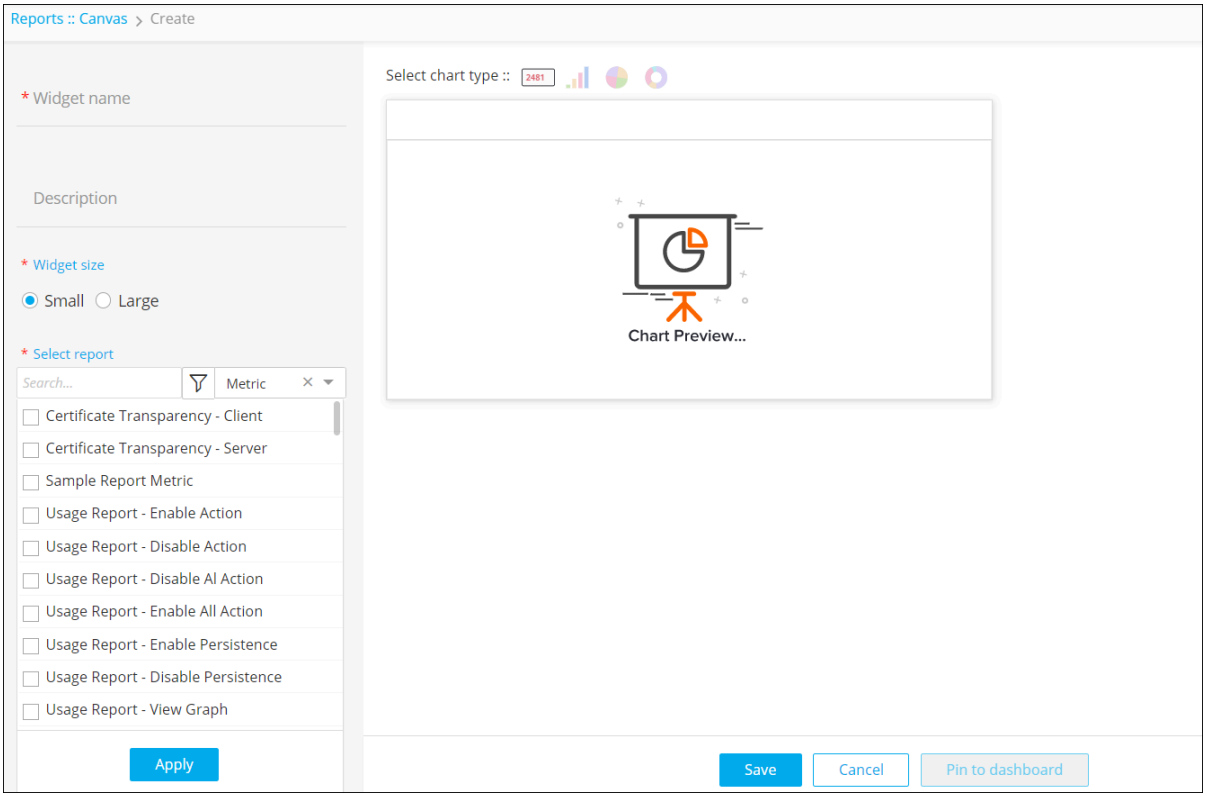
Important: Only enabled widgets are available on the **Reports :: Canvas** page.

Creating a Certificate Lifecycle Management Widget

To create a **Certificate Lifecycle Management** widget that displays a snapshot of certificate actions performed:

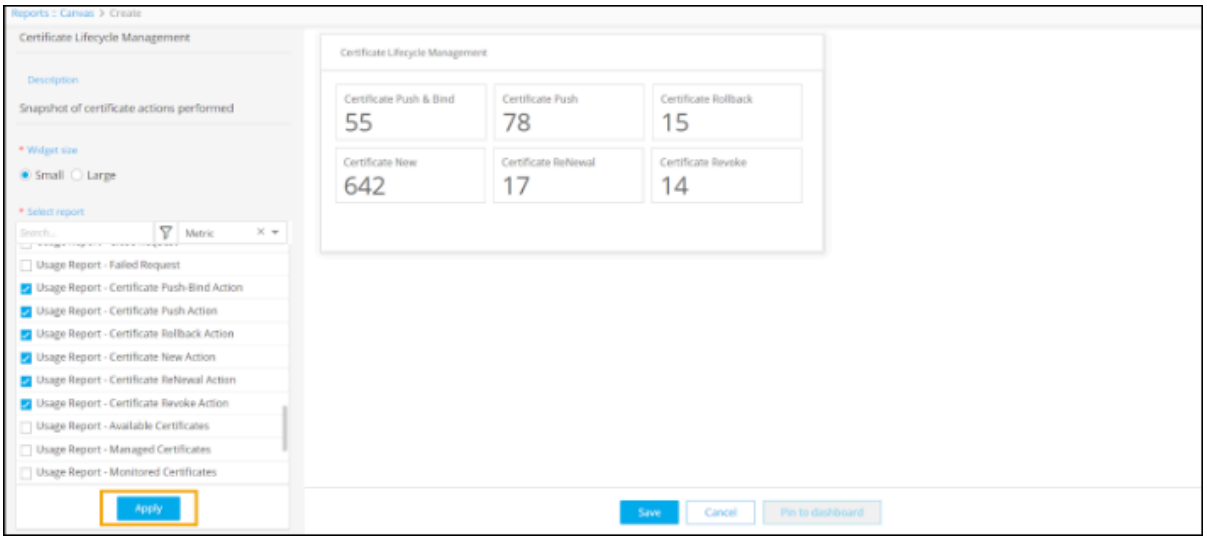
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1. On the Reports :: Canvas page, click **Create new widget**.
2. On the **Reports::Canvas > Create** page, enter a **Widget name** (mandatory field) and **Description** (optional field).



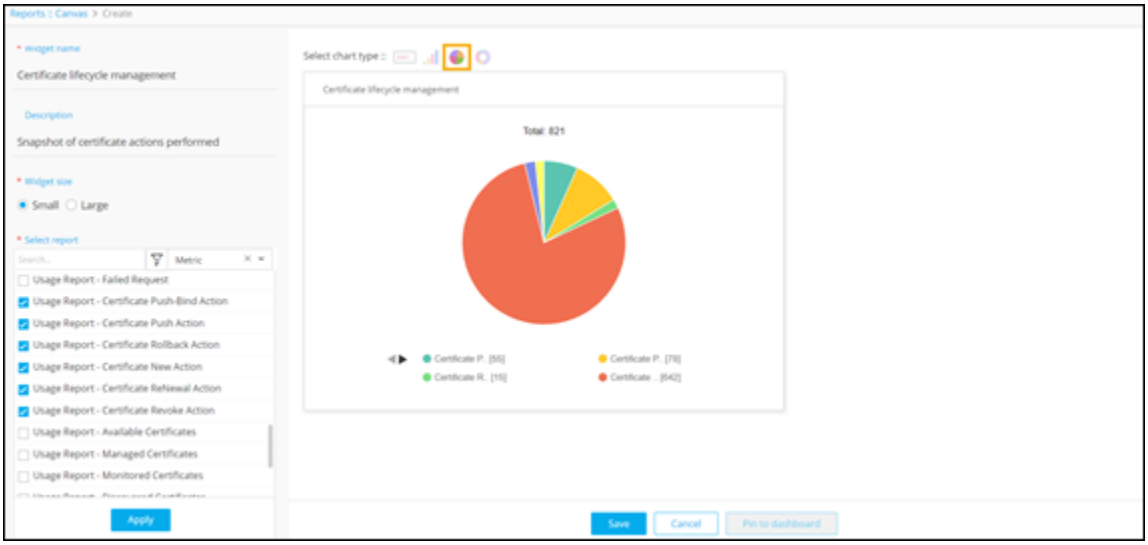
3. Select the **Widget size** as **Small** or **Large**.
4. Select the report(s) to be displayed on the widget from the list of metric reports available.
5. To see a preview of the widget, click **Apply**.

   The preview is displayed on the right side of the page.



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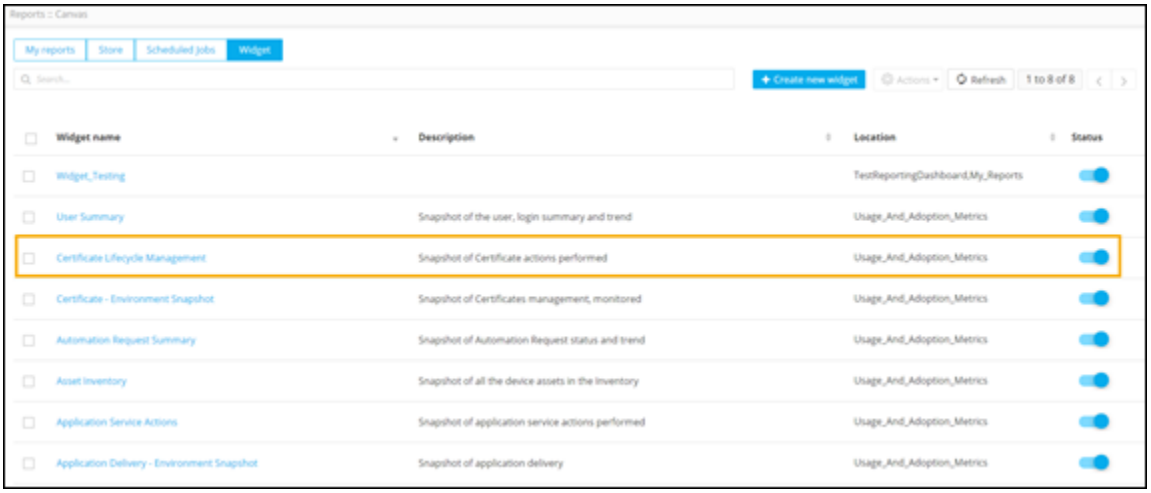
6. To view this widget as a pie chart, from the options available on top of the widget, click  .



Note: You can choose between four chart types: metric, bar, pie, and donut.

7. To save this widget, click **Save**.
8. To enable the widget, turn on the **Status** toggle.

   The **Certificate Lifecycle Management** widget is displayed on the **Reports :: Canvas** page.



Important: Only enabled widgets are available on the **Reports :: Canvas** page.

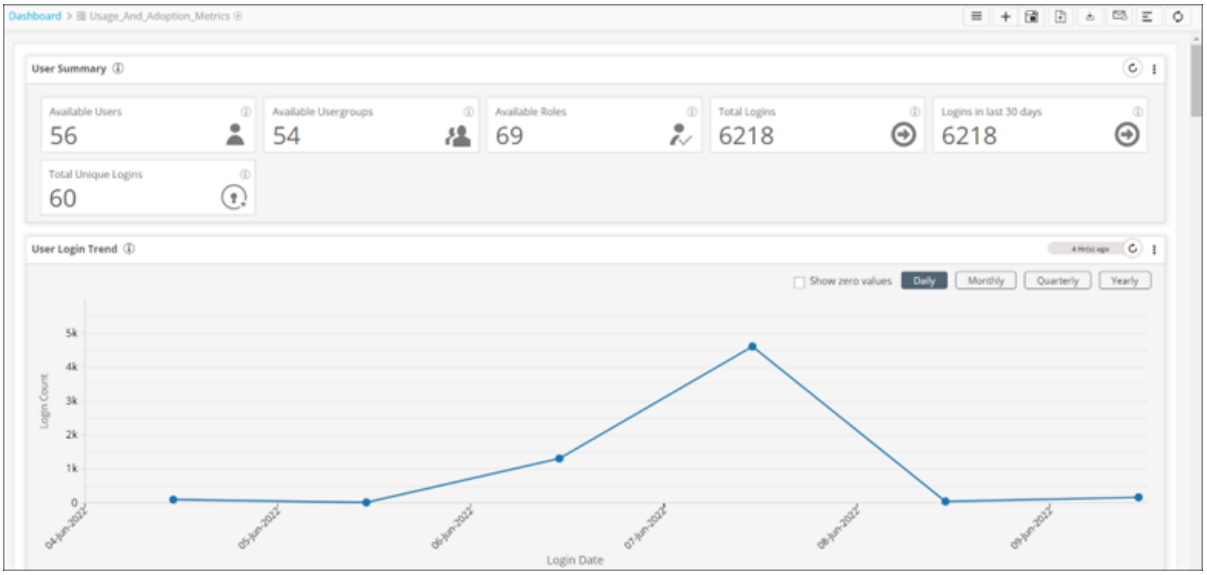
Downloading Report Widgets

Report widgets can also be downloaded to your device as a PDF or CSV file.

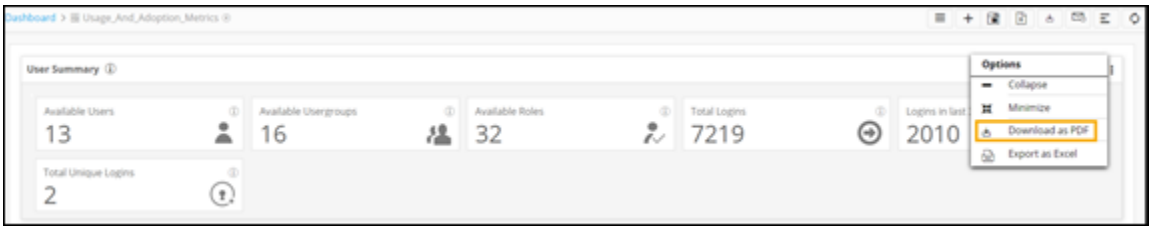
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To download the widget as PDF:

1. From the **Dashboard** inventory page, select the **Usage_And_Adoption_Metrics** dashboard.
   This dashboard displays all the widgets pinned to this dashboard.



2. To download a widget, from the top right corner of the widget, click ⋮.
3. From the options displayed, select **Download as PDF**.



   The widget is downloaded to your machine as a PDF file.

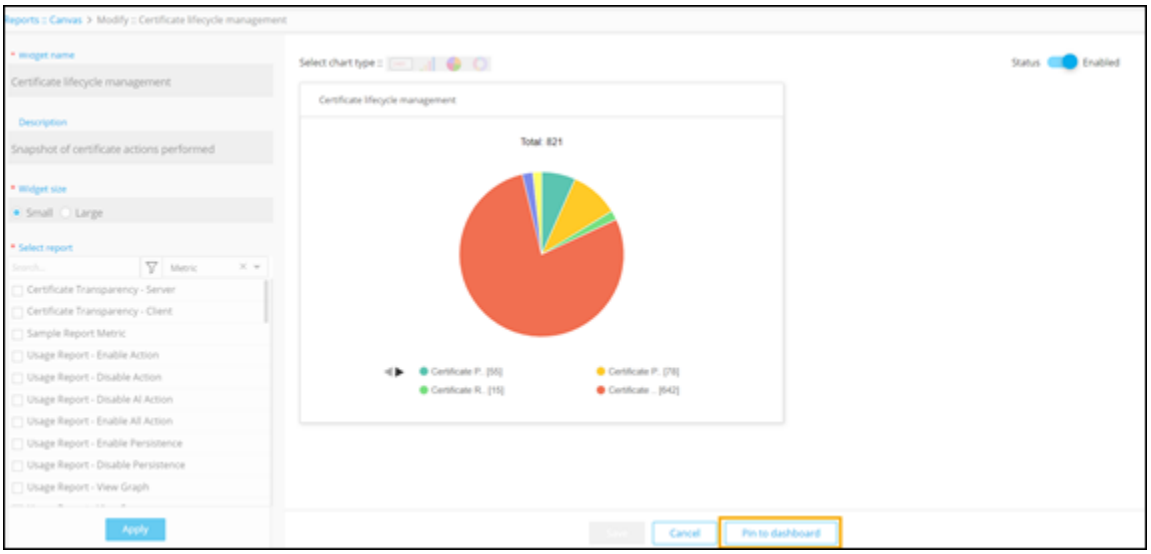
Pinning a Widget to a Dashboard

Once a widget has been created and saved, it can be pinned to a dashboard.

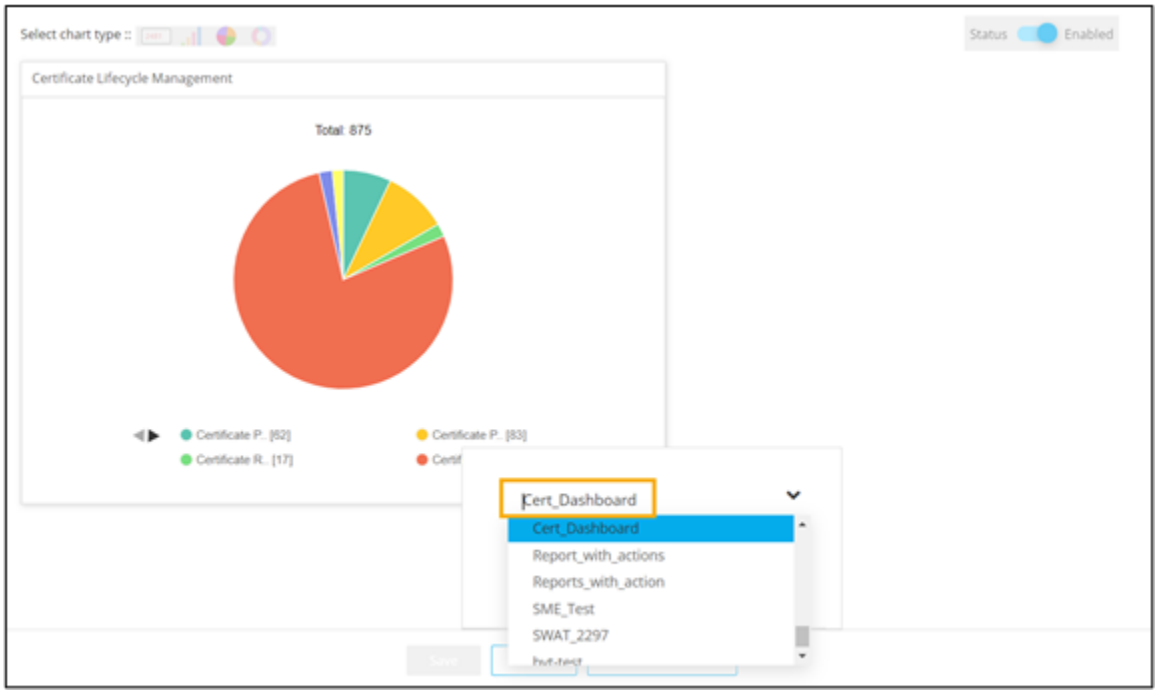
To pin a widget to a dashboard:

1. On the Report :: Canvas page, click on the widget to be pinned.
2. Click **Pin to dashboard**.

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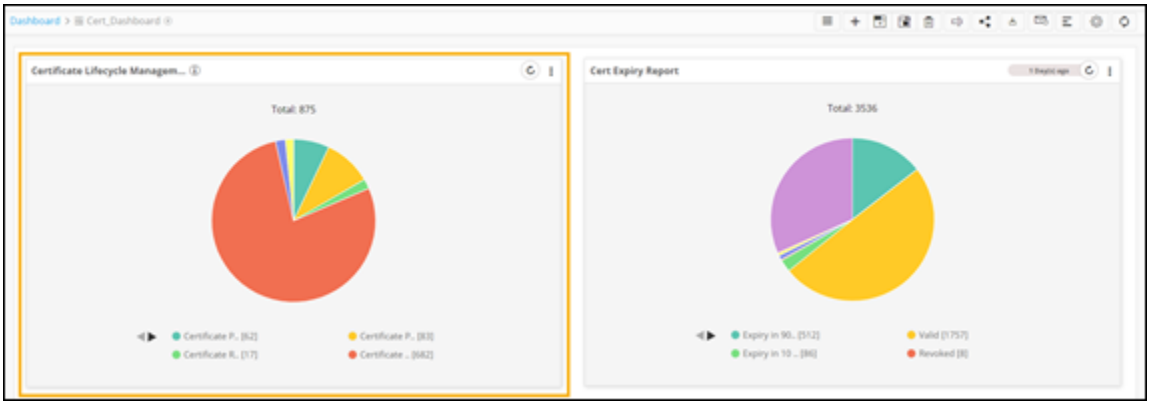
3. To pin the widget to an existing dashboard, click **Existing dashboard**.
4. Select a dashboard from the list of dashboards displayed in the dropdown.



5. To pin the widget to the selected dashboard, click **Save**.
6. On the Dashboard inventory page, click on the dashboard to which this widget was pinned.

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The widget is displayed on the dashboard.



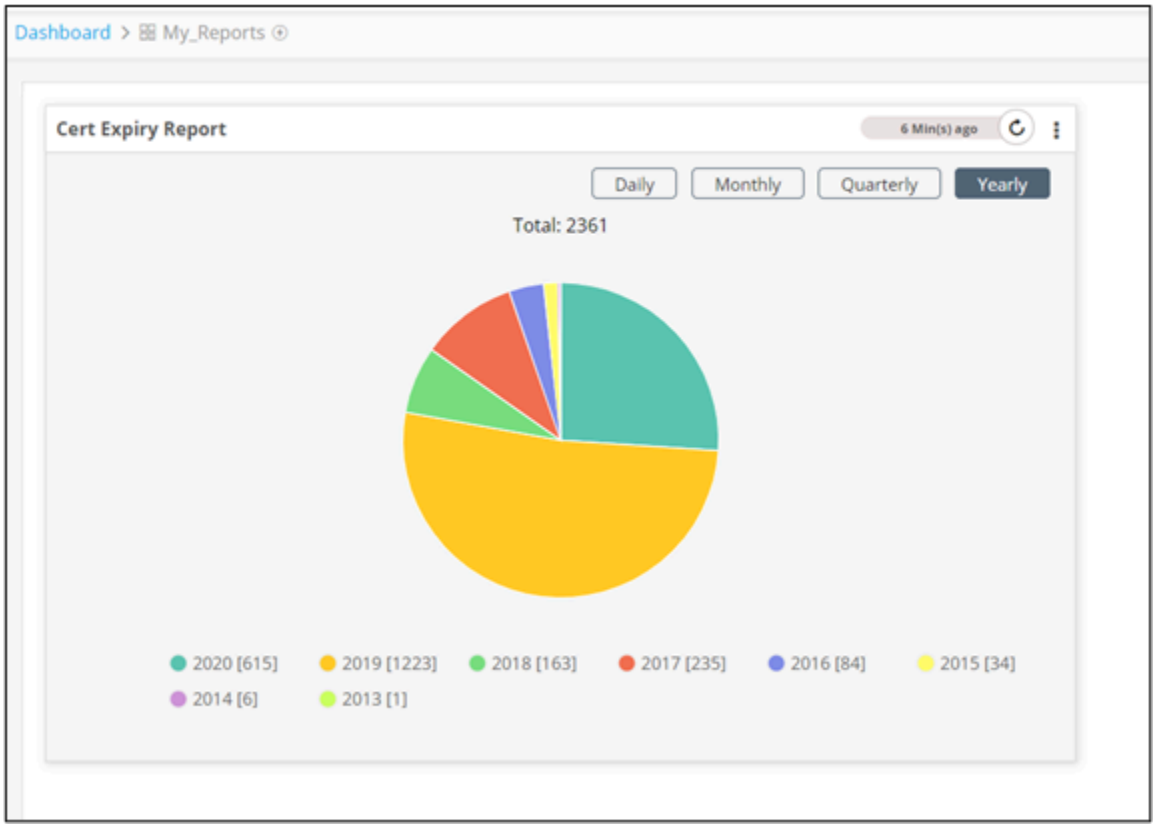
Downloading Reports

Once a report has been generated and pinned to a dashboard it can be downloaded in multiple formats (.pdf, .csv, and .xls).

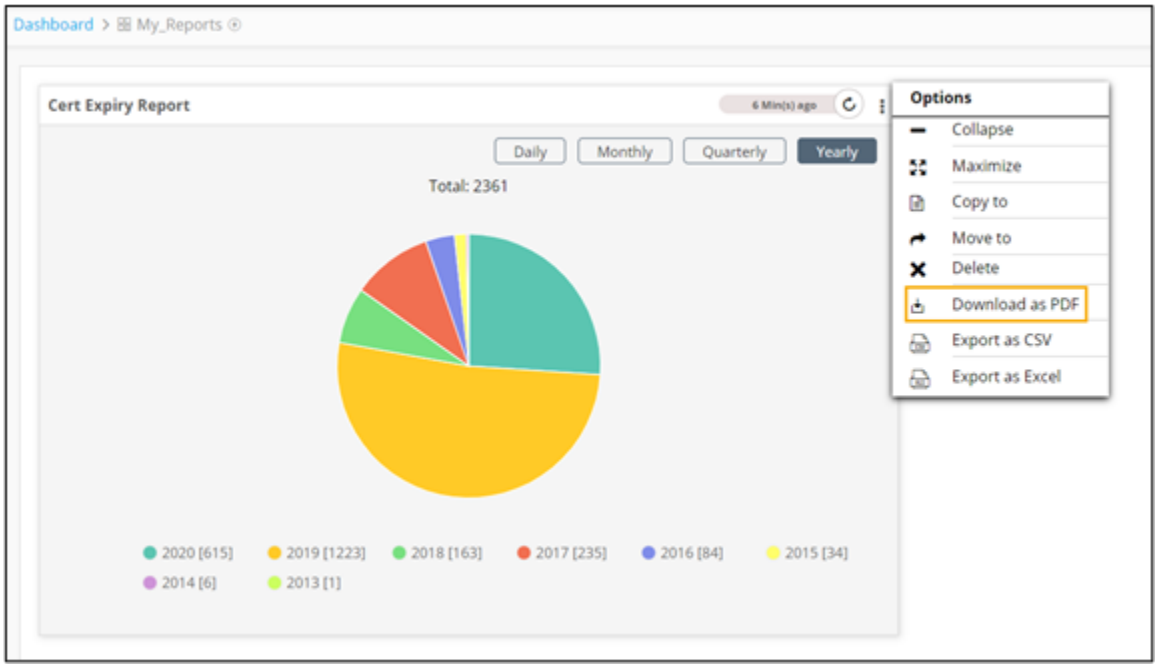
Downloading a Report in the PDF Format

1. From the Dashboard inventory page, select the dashboard on which the report that you want to download has been pinned.
   The pinned report can be seen on the dashboard.

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2. To download the report to your device as a PDF file, from the top right corner of the report, click ⋮.
3. From the **Options** dropdown menu, select **Download as PDF**.



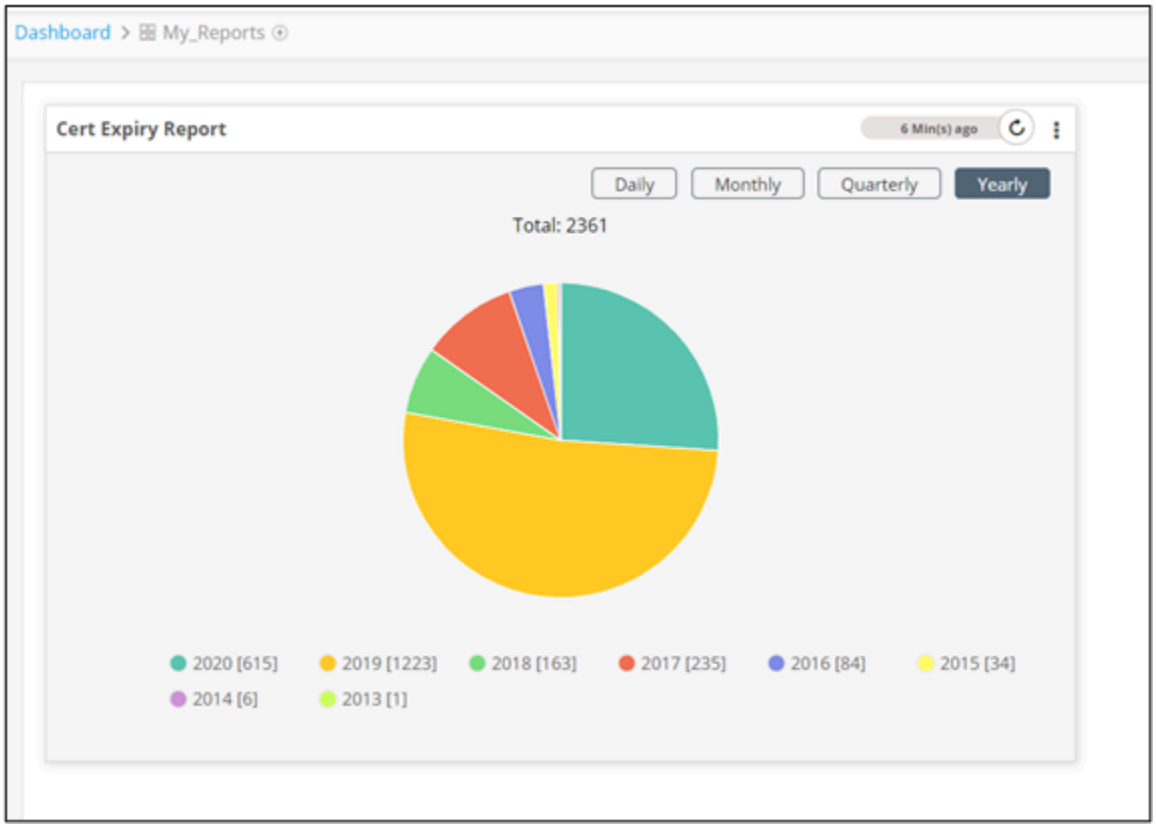
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The report will be downloaded to your machine as a PDF file.

Note: In the case of **Grid** reports, the PDF download only supports up to 1000 rows.

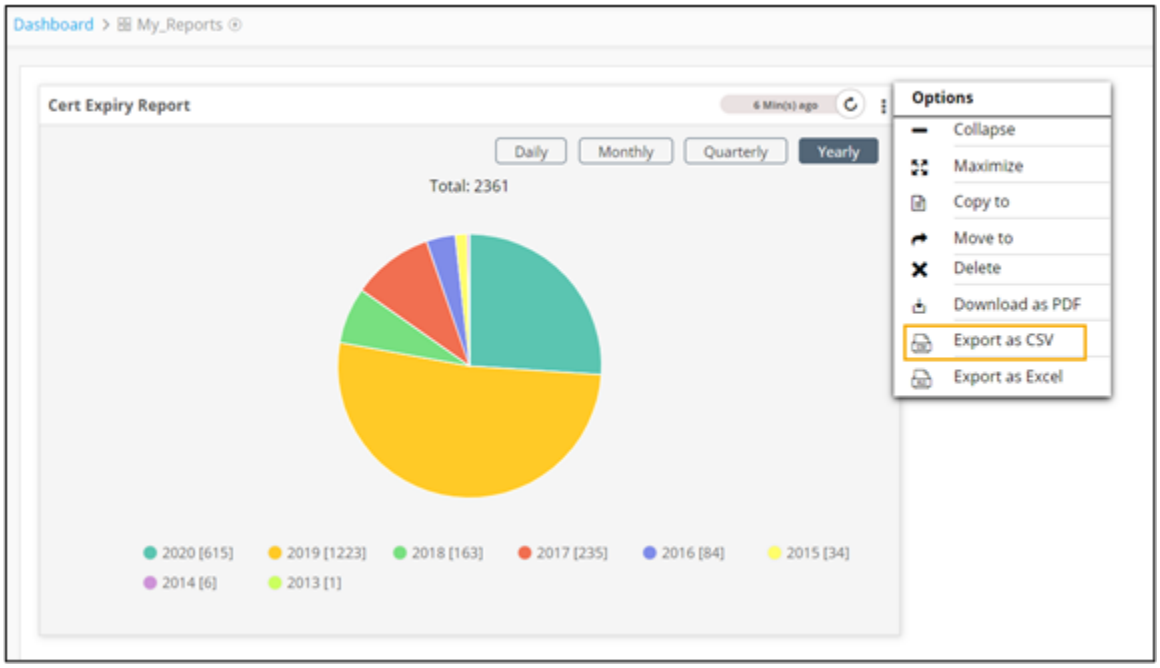
Downloading a Report in the CSV Format

1. From the Dashboard inventory page, select the dashboard on which the report that you want to download has been pinned.
   The pinned report can be seen on the dashboard.



2. To download the report to your device as a PDF file, from the top right corner of the report, click ⋮.
3. From the **Options** dropdown menu, select **Export as CSV**.

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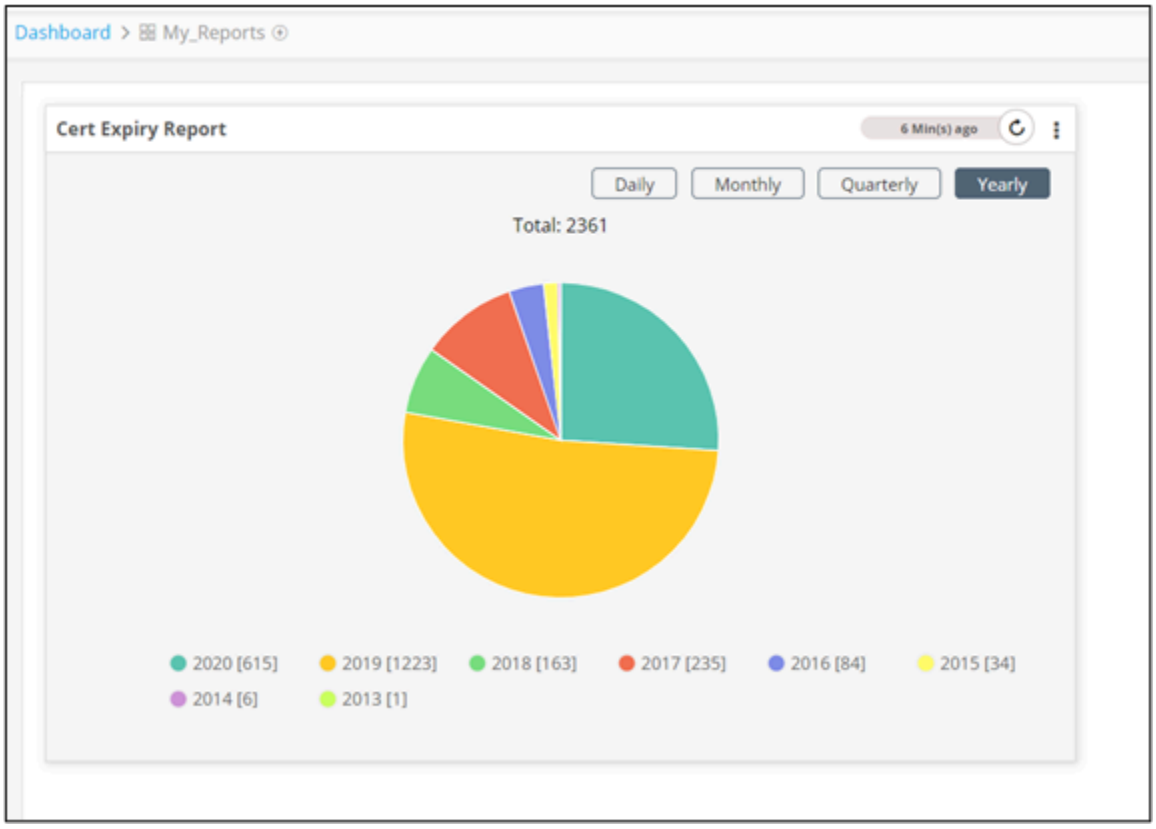
The report will be downloaded to your machine as a .csv file.

Note: In the case of **Grid** reports, the .csv file only supports up to 1,00,000 rows.

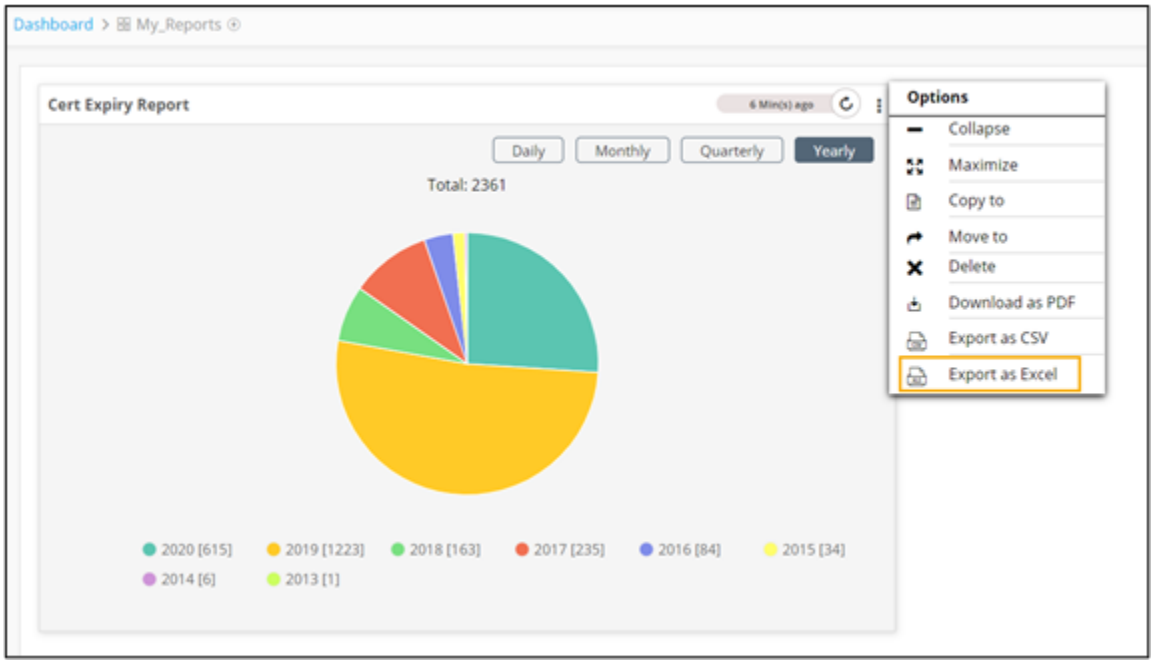
Downloading a Report as an Excel sheet

1. From the Dashboard inventory page, select the dashboard on which the report that you want to download has been pinned.
   The pinned report can be seen on the dashboard.

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2. To download the report to your device as a PDF file, from the top right corner of the report, click ⋮.
3. From the **Options** dropdown menu, select **Export as Excel**.



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The report will be downloaded to your machine as a .xls file.

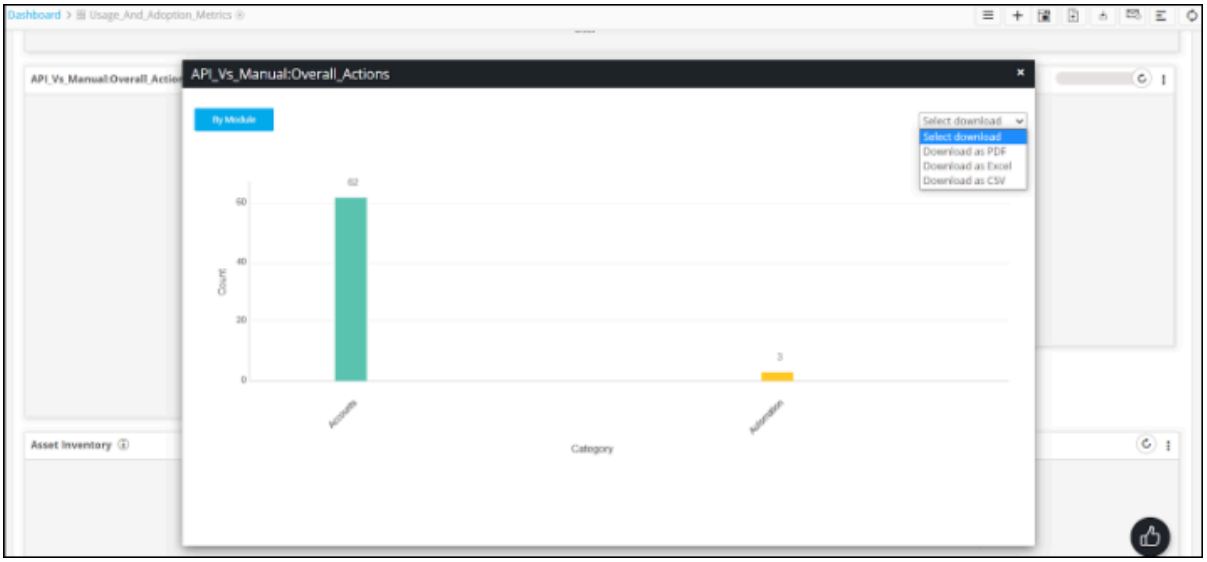
Note: In the case of **Grid** reports, the .xls file only supports up to 1,00,000 rows.

Downloading Drilldown Reports

You can download the drilldown reports from the OOB reports available on the Store page or any custom reports in the following formats:

- PDF
- Excel
- CSV.

1. Go to the Dashboard inventory page.
2. Select a report that has a drilldown report and open it.
3. In the drilldown report window, expand the **Select download** dropdown menu.



4. Select the download format from the options available.
   The report is downloaded to your machine in the format selected.

Performing Actions on Reports

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Pinning Reports

You can pin reports to a dashboard from the Reports :: My Reports page. A maximum of 20 reports can be pinned to a dashboard. Pinning a report to the dashboard allows you to visualize different reports in the same place.

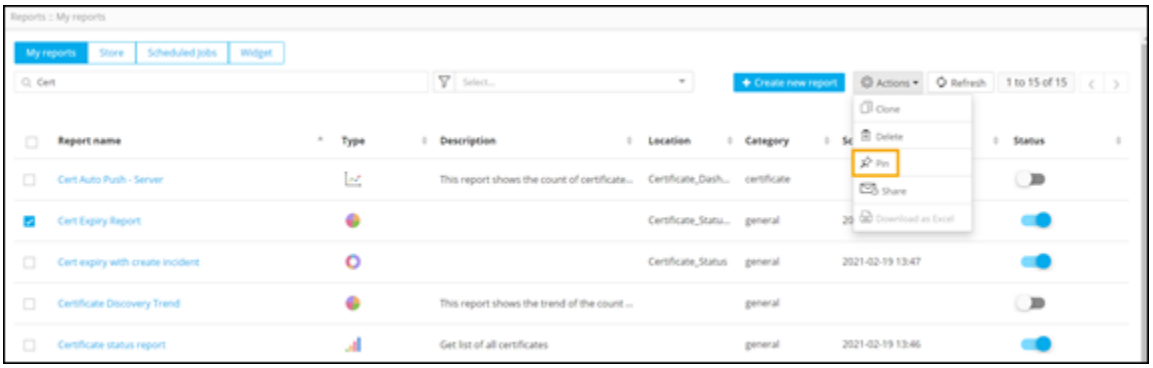
Note: Only reports that are enabled are visible on the dashboard to which they are pinned.

To pin a report to dashboard:

1. On the Reports :: My Reports page, select the report to be pinned.

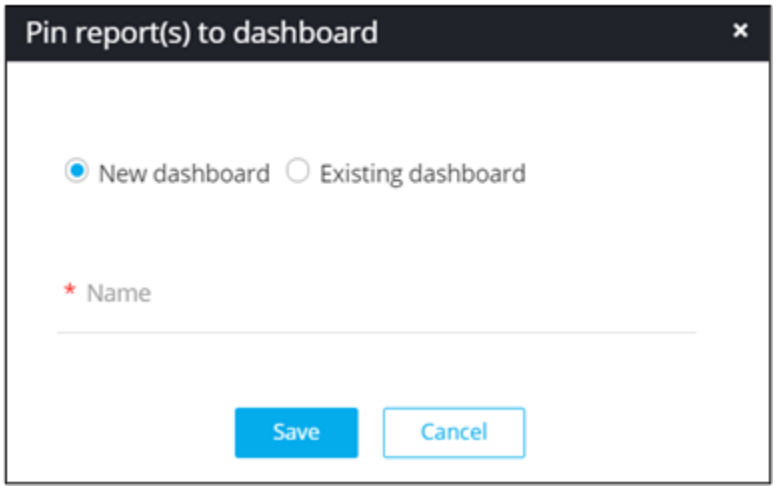
   Note: Ensure that the selected report is enabled. You can enable a report by turning on the toggle under the **Status** column.

2. From the command bar on the top right, click **Actions**.
3. From the list of available actions, select **Pin**.



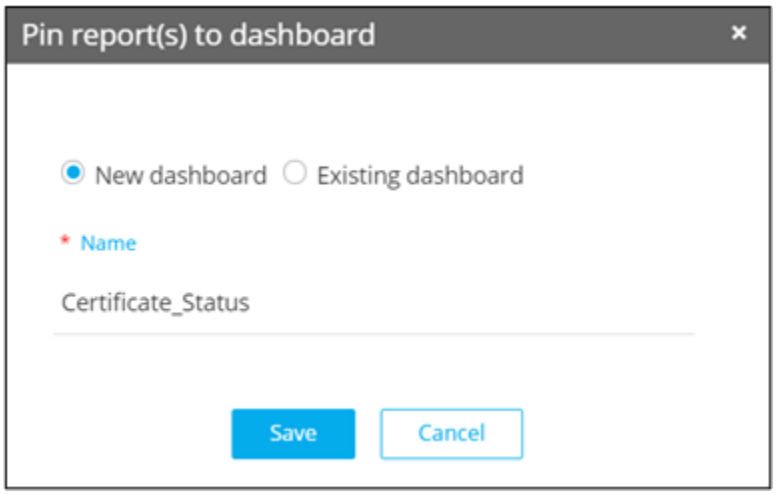
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4. In the **Pin report(s) to dashboard** window that is displayed, select if the report is to be pinned to a new or existing dashboard.



Pinning Reports to a New Dashboard

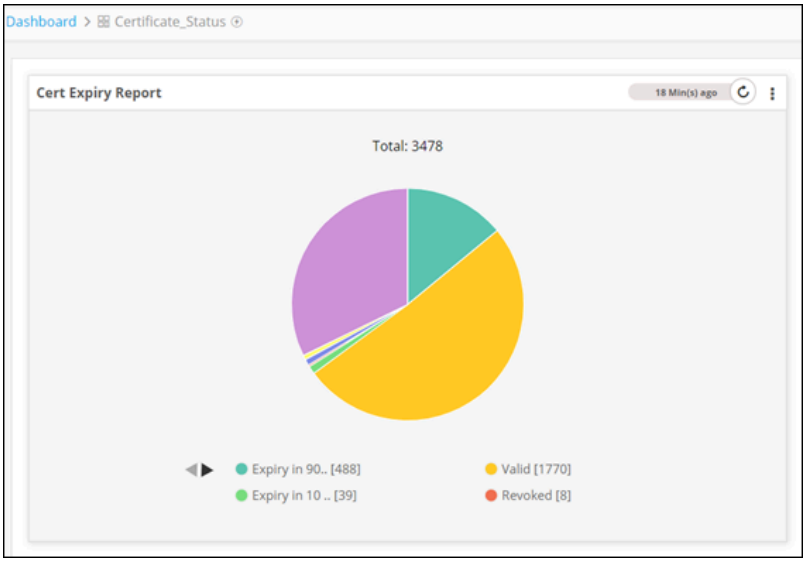
1. In the **Pin report(s) to dashboard** window, enter a **Name** for the dashboard.



2. To pin the report to the new dashboard, click **Save**.
   The new dashboard is listed on the Dashboard Inventory page.
3. To view the pinned report, click on the dashboard.

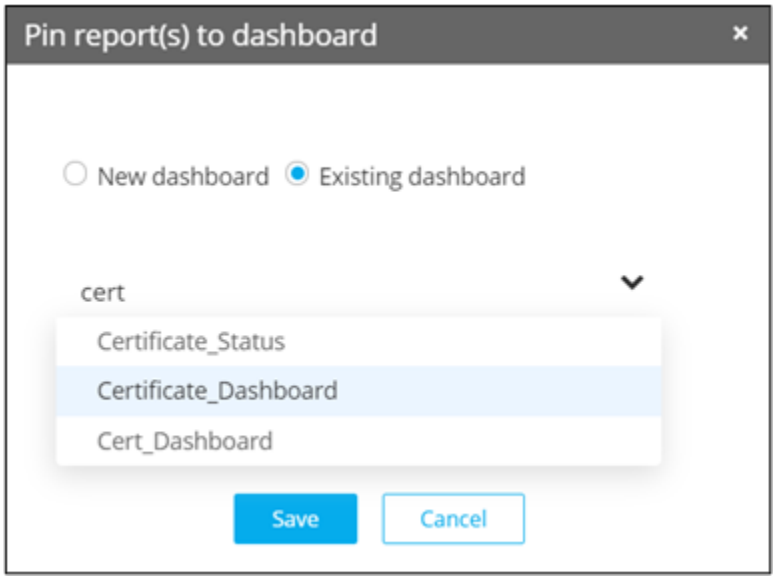
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The report is displayed on the dashboard.



Pinning Reports to an Existing dashboard

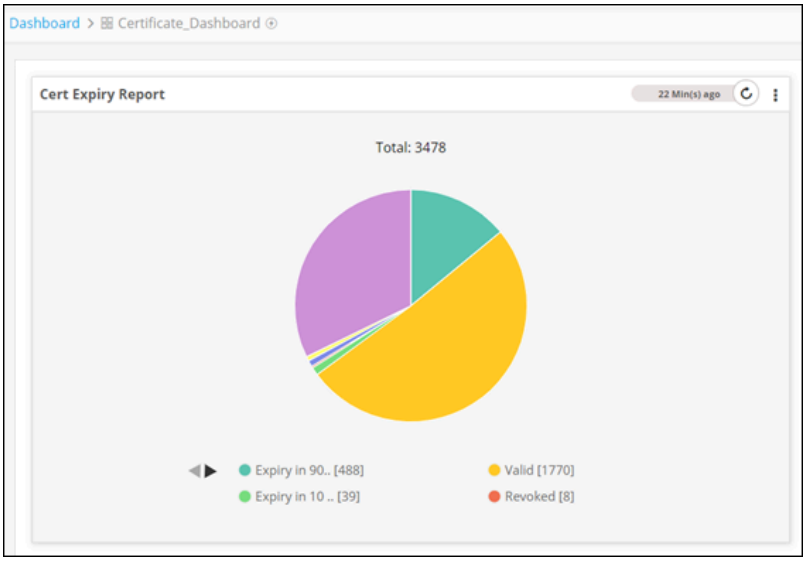
1. In the **Pin report(s) to dashboard** window, select the dashboard from the options available in the dropdown.



2. To pin the report to the selected dashboard, click **Save**.

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The report is displayed on the selected dashboard.

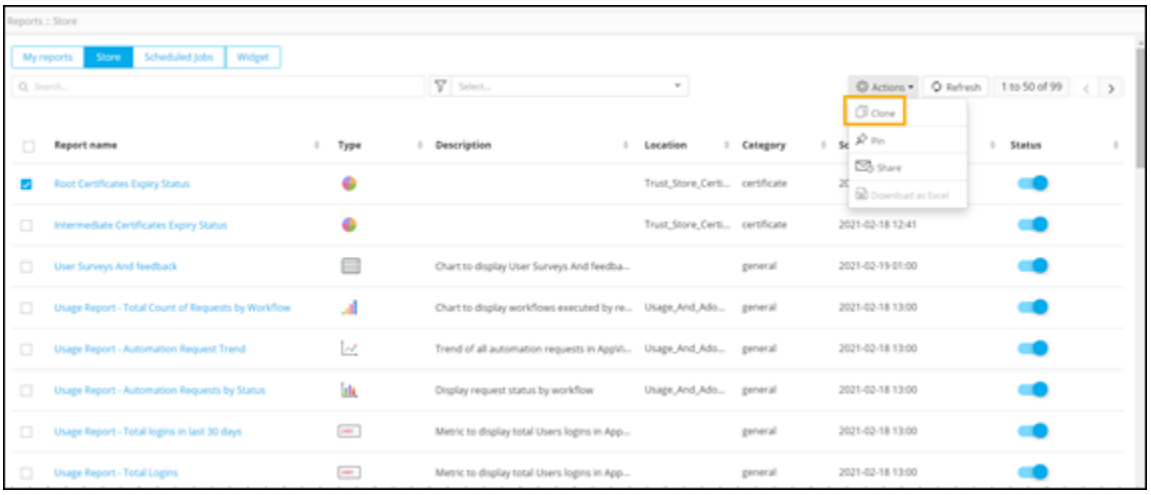


Cloning Reports

AppViewX's report builder allows you to clone a report. You can clone a report to make modifications, display additional data, and create additional levels of drilldown if not available in the previous report. Instead of creating a second report from scratch, you can clone an existing report and make the necessary changes.

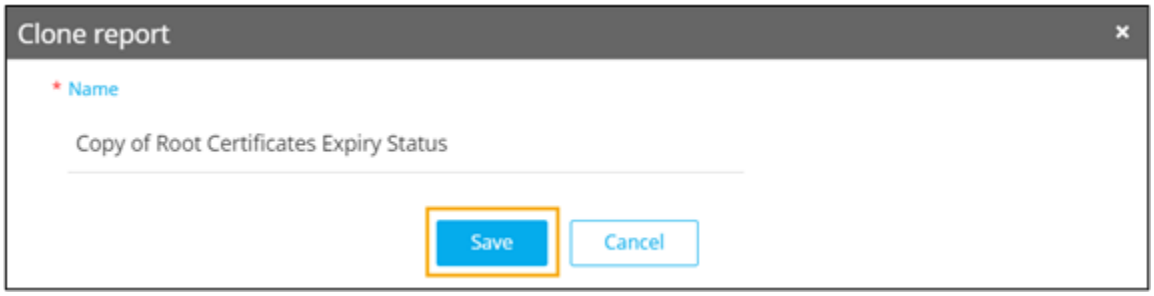
To clone a report:

1. From the Reports :: Store page, select the report to be cloned.
2. From the command bar, click **Actions**.
3. From the list of available actions, select **Clone**.



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4. In the **Clone report** pop-up window, change the name of the report (if required) and click **Save**.



The cloned report is added to the Reports :: My reports page.

Sharing Reports

Once a report is generated, it can be emailed either as inline content or as a PDF attachment to other users or user groups.

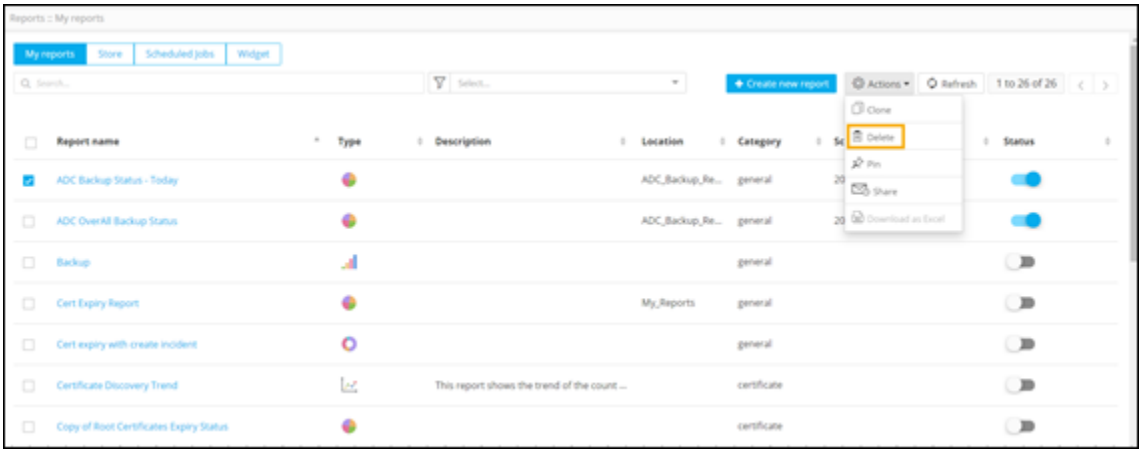
Note: For more information on sharing reports, click here.

Deleting Reports

AppViewX's report builder also allows you to delete reports.

To delete a report:

1. On the Reports :: My Reports page, select the report to be deleted.
2. From the command bar, click **Actions**.
3. From the list of available actions, select **Delete**.



4. To delete the selected report, click **Yes** in the **Confirm delete** pop-up window.

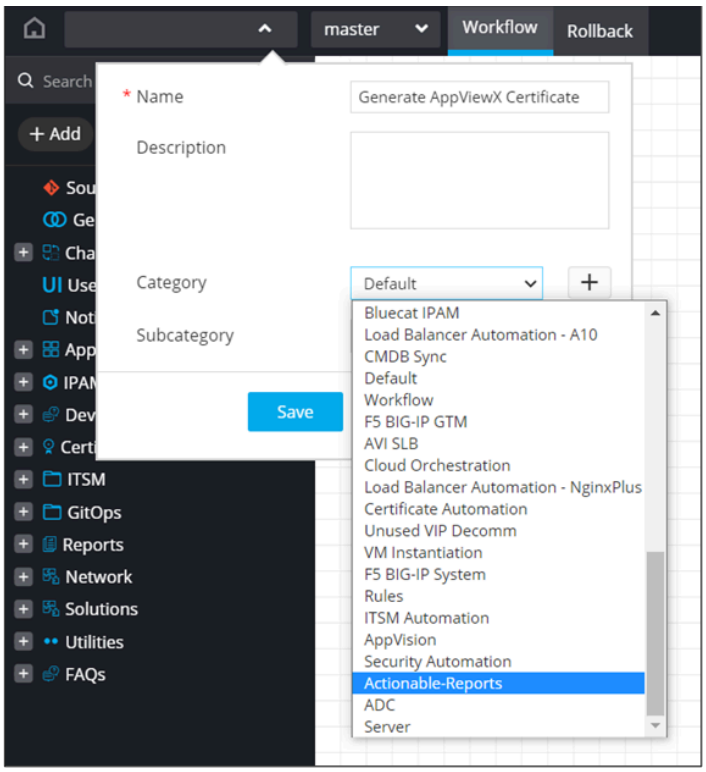
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BYOR with Actionable Workflow

You can build customized reports, pin them to the dashboard, and assign one or more closed loop workflows for quick actions. These workflows can be triggered at specific time intervals to gather data and integrate it into the reports. Assigning a workflow to your reports aids in elimination of redundant tasks, reduces processing time, improves efficiency, and gives greater visibility.

To assign an actionable workflow to your report:

1. Go to the Workflow page in the **Automation** module.
2. To create a new workflow, click **Create New**.
3. Enter or select the field information.



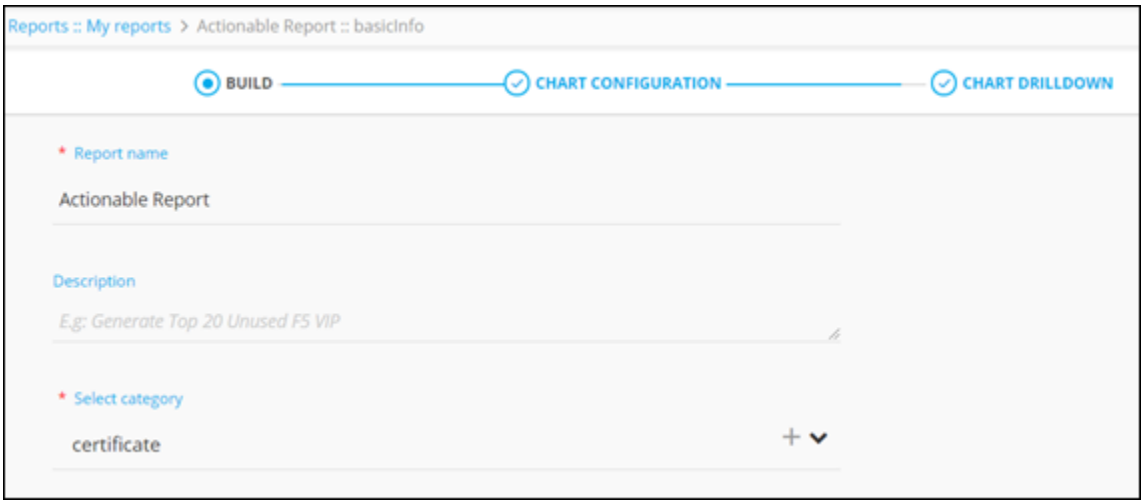
The following table describes the various fields in this section:

Field	Description
***Name**	Enter a valid name for the workflow. For example: **Generate AppViewX Certificate.**
Description	Enter a description for the workflow.
Category	Select the category as **Actionable-Reports** from the dropdown list.

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Field	Description
Subcategory	The subcategory is set to **default**.
** : Mandatory fields*	

4. Drag and drop the relevant workflow tasks and enable the workflow.
5. Go to the Reports :: My Reports page and click **Create new report**.
6. Under the **BUILD** section, enter or select the field information.

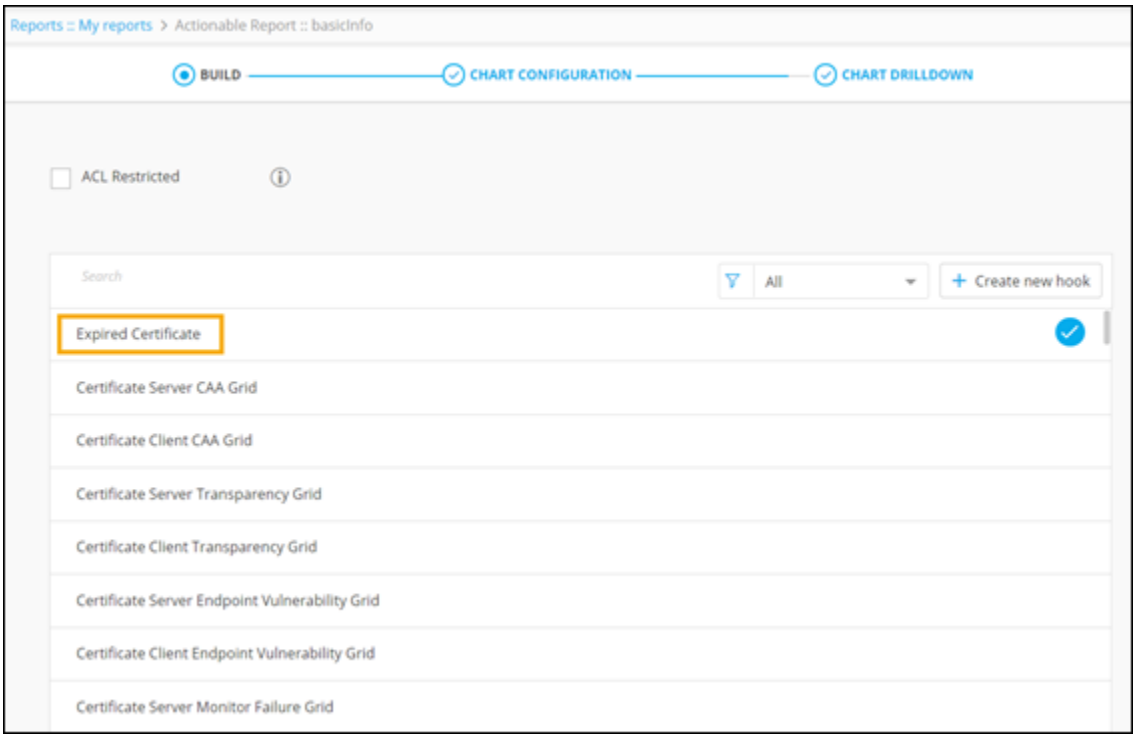


The following table describes the fields under this section:

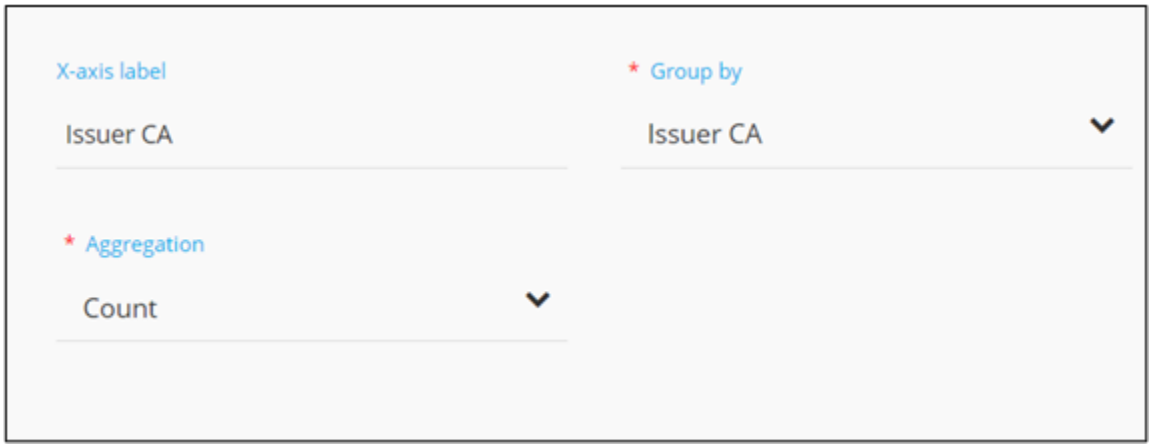
Field	Description
***Report name**	Enter a valid report name. For example: **Actionable Report.**
Description	Enter a description of the report.
***Select category**	Select the category as **certificate** from the dropdown.
** : Mandatory fields*	

7. Select the hook from the list and click **Next**.

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8. Under the **CHART CONFIGURATION** section, select the chart type as **BAR**.
9. Select the field information for creating the chart.



This table describes the field information in this section:

Field	Description
X-axis label	Enter the criteria for the X-axis label. For example: **Issuer CA.**
***Group by**	Select a value from the dropdown list on the basis of which report data will be grouped. For example: **Issuer CA.**

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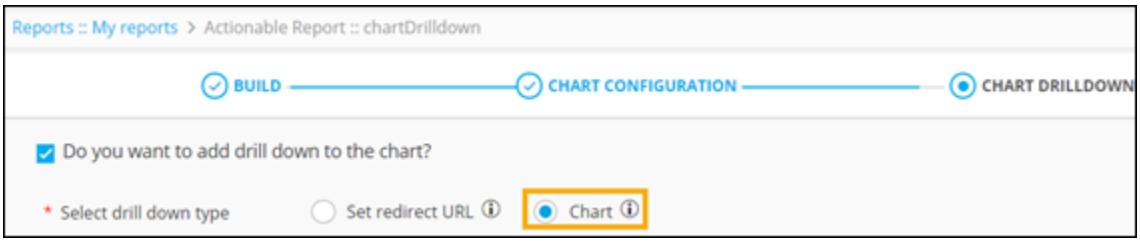
Field	Description
***Aggregation**	Select the calculation to be done on the report data for the dropdown. The following options are available: • **Average**: Calculates the average value of a given set of data. • **Sum**: Calculates the sum of all values in a given set of data. • **Count**: Calculates the total number of items in a given numeric field. • **Maximum**: Displays the maximum value in a given set of data. • **Minimum**: Displays the minimum value in a given set of data.
** : Mandatory fields*	

10. Click **Save**.

    A preview of the chart is generated on the right side of the screen.



11. To add **Chart Drilldown**, click **Next**.
12. Select drilldown type as **Chart**.



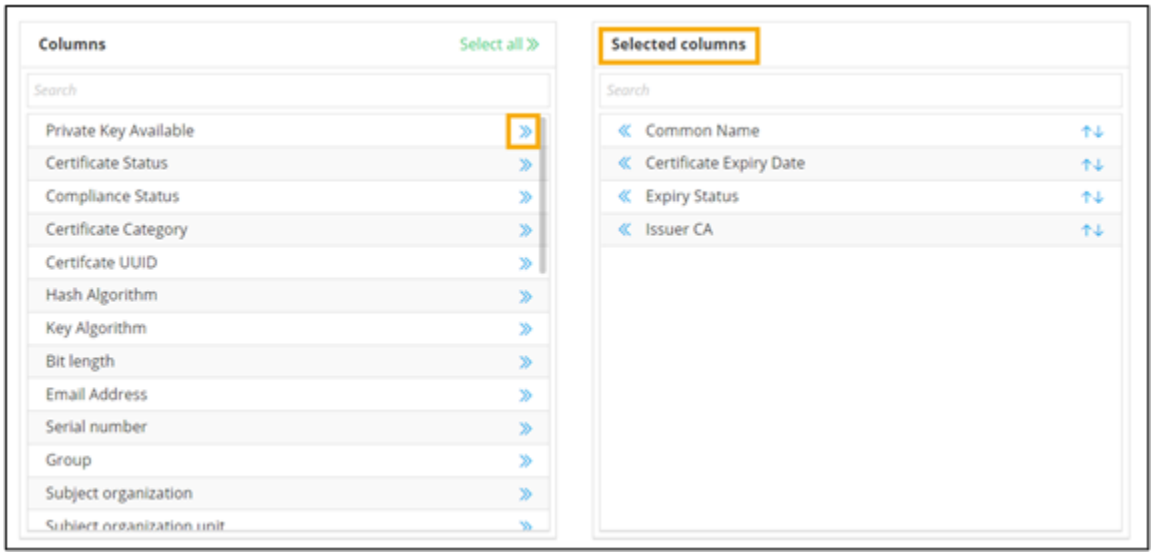
13. Select the chart type as **GRID** and enter the **Chart title** as **Generate Certificate**.

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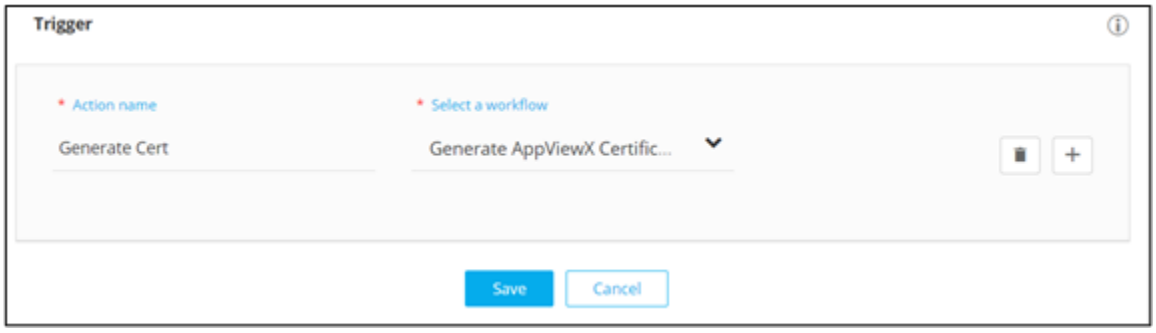


14. To configure the column headers to be displayed within the grid, click  .

    Selected columns are displayed on the right.



15. Enter or select the field information to associate a workflow with the report.



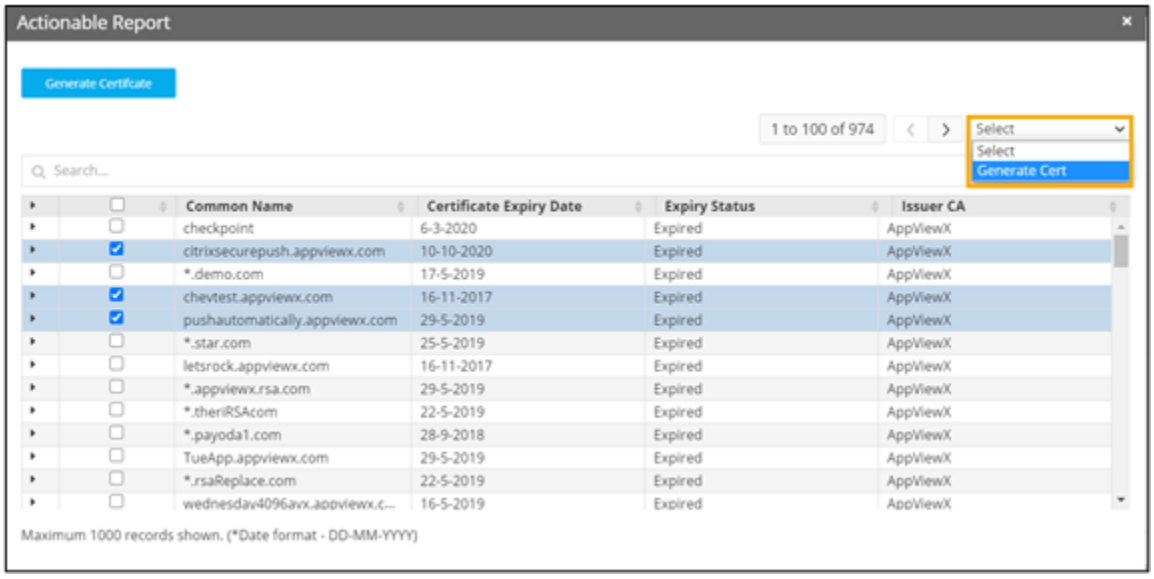
This table describes the field information in this section:

Field	Description
***Action name**	Enter a valid action name. For example: **Generate Cert**.

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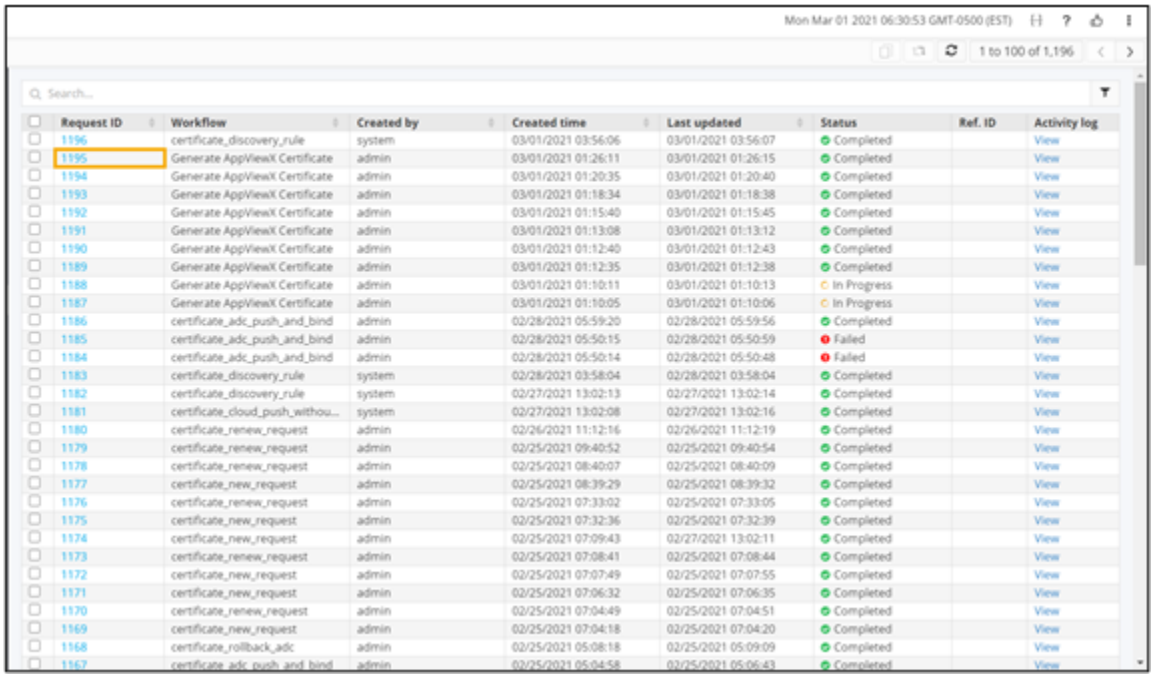
Field	Description
***Select a workflow**	Select the workflow that was created (Generate AppViewX Certificate) from the dropdown menu.
** : Mandatory fields*	

16. To enable the workflow, click **Save & Enable**.
17. To display the chart drilldown, click any of the bars in the graph.
18. Select the **Common Name** for the actionable workflow.
19. To trigger the workflow, select the workflow from the dropdown menu.

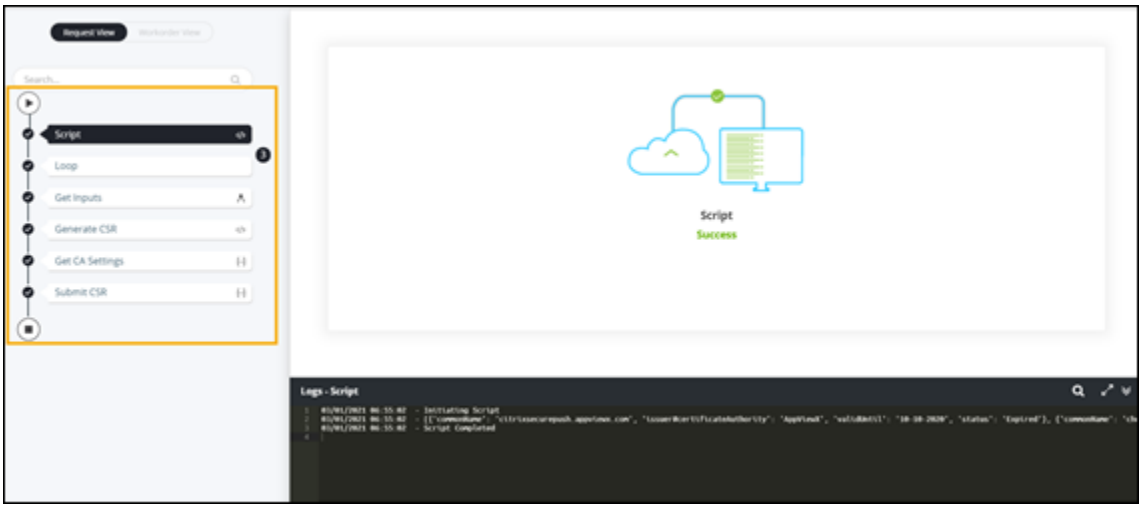


20. On the Request :: All page, select the workflow **Request ID**.

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A stage-wise view of the workflow is displayed.



21. To view the payload that was passed for the actionable workflow, click **Script**.
22. To see successful completion of the workflow, click **Submit CSR**.

Best Practices

Listed here are some best practices that will help you build visually engaging, insightful and effective reports:

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- **Identifying target audience and their requirements**

  Before you even start building reports, it is important to know who the target audience or end user is. Meeting with them to know about their specific requirements is crucial to build comprehensive reports that display complete and accurate information.

- **Choosing the right chart**

  The right chart or graph can help you display your data most efficiently and effectively. Pie charts can be used for fewer data points, while bar graphs can be used to show comparison among categories. Line charts, on the other hand, are most useful for showing changes over a period of time. Choosing the wrong chart can create confusion and the data might even be interpreted incorrectly. The Reports module offers seven different chart types to choose from.

- **Highlighting key areas**

  Using colors to highlight key areas is a powerful way to guide the end users to important data. However, the choice of colors is crucial and overuse of colors in your reports may be distracting. The **Reports** module offers color code mapping for pie charts, donut charts, bar charts, and stacked bar charts.

- **Grouping related metrics together on Dashboard**

  It is important to group related metrics together to help the end user quickly make connections between the data on a dashboard. The **Reports** module has a provision for moving widgets around on the dashboard so that you can keep related widgets/reports in one place.

- **Adding interactive elements**

  Using the **Chart Drilldown** feature in the **Reports** module is a great way to ensure that your reports are interactive. Displaying high level data first and allowing the user to drill down for further details keeps the user engaged.

- **Keeping it simple**

  Last, but not least, keep your reports simple. Do not clutter it with too much information and avoid using too many colors. Prioritize readability by making them visually appealing and easy to understand.

Troubleshooting

Following are the common issues you may face when working with the **Reports** module:

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Issue	Cause	Solution
There is something wrong with my Scheduled Job.	**Avx_platform_report_generator** plugin is disabled.	Check plugin status and enable it.
Report pinned to dashboard shows error message.	Report is not enabled.	Enable the report on My Reports page.
I am not able to edit a report in the **Store**.	Prebuilt reports in the **Store** cannot be edited .	Clone the report and customize it as per your need.
Schedule time elapsed error while defining the interval.	Time entered is the same as the current time.	Enter a time which is 1-2 minutes later than the current time.

In case of any other issues with the **Reports** module, users can access the following logs for further investigation:

- avx-subsystems log
- avx-commons log.

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