BeyondInsight for Unix & Linux 21.2
User Guide

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BeyondInsight for Unix & Linux User Guide

This guide shows system administrators and security administrators how to configure and use BeyondInsight for Unix & Linux. It provides an overview of how BeyondInsight for Unix & Linux works and instructions for its configuration and use.

BeyondTrust Product Name Conventions

This guide uses the following naming conventions for BeyondTrust products:

BeyondInsight for Unix & Linux (formerly PowerBroker Servers Management Console)	BIUL
Privilege Management for Unix and Linux (formerly PowerBroker for Unix and Linux)	PMUL
Solr (formerly PowerBroker Solr)	Solr
File Integrity Monitoring	FIM
Advanced Control and Audit	ACA
Role Based Policy	RBP

Overview

BeyondInsight for Unix & Linux is a web-based tool that you can use to:

- Manage software for AD Bridge, Privilege Management for Unix and Linux, and Solr.
- Remotely assess the suitability of a remote host's state by running a profile. After a profile is complete, installs, uninstalls, domain joins, and other actions can be performed on remote hosts.
- Manage Privilege Management for Unix and Linux licenses on Policy Servers.
- Manage Privilege Management for Unix and Linux Script, File Integrity Monitoring (FIM), and Role Based policies.
- Manage Sudo host groups and FIM policy host assignment.
- View, replay, and audit Privilege Management for Unix and Linux logs.

Core Features

- **Dashboard**: Provides visual insight into host and software metrics.
- **Host Discovery**: Is the first stage of adding any remote hosts to be managed by the console. Hosts available by SSH will be added.
- **Hosts Inventory**: Is the central page of the console. On the **Hosts > Hosts Inventory** page, you can profile targets, install and uninstall AD Bridge, Privilege Management for Unix and Linux, and Solr. Additionally, you can remove hosts, upgrade software, join hosts to domains, manage SSH fingerprints, and assign log servers to be indexed by Solr.
- **Credentials**: Manage user credentials for remote assets (typically SSH credentials).
- **SSH Fingerprints**: Manage SSH fingerprints for remote hosts.
- **Registry Name Service**: Manage Privilege Management for Unix and Linux Registry Name Service systems.

- **Policy Management**: Allows for management of Privilege Management for Networks, FIM, and Role Based and Script Based policies on Privilege Management for Unix and Linux Policy Servers.
- **Audit**: View Privilege Management for Unix and Linux event and IO logs. IO logs can be replayed as they occurred. Users can add comments on the logs.
- **Tasks**: Provides details about results and status of any remote actions performed by the console.
- **Settings**: Configuration settings available to the end user, including integration settings for products like Password Safe.

Install BeyondInsight for Unix & Linux

> 📌 **Note:** *You can install the console on Windows or Linux operating systems.*

Requirements

- System firewall configured to allow access on port 4443 (default)

Supported Operating Systems

The following operating systems are supported by BIUL:

- Windows 2012 or later
- Windows 2012 R2 or later
- RHEL/CentOS 5 or later
- Debian/Ubuntu 12.04 or later

Supported Browsers

The following browsers are supported:

- Safari 9 or later
- Chrome 52 or later
- FireFox 48 or later
- Edge

Prepare for the BeyondInsight for Unix & Linux Installation

- Run the install using an account with root or administrator privileges.
- Copy the installers for BeyondInsight for Unix & Linux, Privilege Management for Unix and Linux, and AD Bridge to the server.
- If deploying to an HP-UX server, make sure **gzip** is in **/usr/bin** or **/bin**. If it is not, create a symbolic link.

```
ln -s /usr/contrib/bin/gzip /usr/bin/gzip
```

Install BeyondInsight for Unix & Linux on Linux

Use the following syntax to install BeyondInsight for Unix & Linux.

RHEL and CentOS

```
# install, where {version} is the current version
rpm -i biul-{version}.rpm
# optional: verify software is running
service pbsmc status
```

```
# configure firewall using OS version appropriate command:
# RedHat Enterprise Linux/CentOS 7:
firewall-cmd --zone=public --add-port=4443/tcp --permanent
firewall-cmd --reload

# or, RedHat Enterprise Linux/CentOS 6:
iptables -A INPUT -p tcp -m tcp --dport 4443 -j ACCEPT
service iptables save
```

Debian and Ubuntu

```
# install, where {version} is the current version
dpkg -i biul-{version}.deb

# optional: verify software is running
service pbsmc status

# configure firewall using OS version appropriate command:
# for ubuntu 14+:
 ufw allow 4443

# or other versions:

iptables -A INPUT -p tcp -m tcp --dport 4443 -j ACCEPT
service iptables save
```

Install BeyondInsight for Unix & Linux on Windows

1. Run the msi package and follow the install wizard.
2. After you go through the wizard, configure the firewall.
3. Open **Control Panel > System and Security > Windows Firewall**.
4. Click **Advanced Settings**.
5. Click **Inbound Rules**.
6. Click **New Rule** in the **Actions** window.
7. Click **Rule Type of Port**, and then click **Next**.
8. On the **Protocol and Ports** page, click **TCP**.
9. Select **Specific Local Ports** and type a value of **4443**. Click **Next**.
10. On the **Action** page, click **Allow the connection**. Click **Next**.
11. On the **Profile** page, click the appropriate options for your environment and click **Next**.
12. On the **Name** page, enter a name for BeyondInsight for Unix & Linux. Click **Finish**.

Copy ISO Files to the Console Server

You must copy and extract the ISO files for the Privilege Management for Unix and Linux, and AD Bridge installers.

> **Note:** *The installer path folder structures must not be modified.*

AD Bridge

Windows:

C:\Program Files (x86)\BeyondTrust\PBSMC\software\pbis

Unix:

/usr/local/bin/software/pbis/

Privilege Management for Unix and Linux

Windows:

C:\Program Files (x86)\BeyondTrust\PBSMC\software\pmul

Unix:

/usr/local/bin/software/pmul/

Solr

Windows:

C:\Program Files (x86)\BeyondTrust\PBSMC\software\Solr

Unix:

/usr/local/bin/software/Solr/

Upload Software

Alternatively, you can upload software for Privilege Management for Unix and Linux, and AD Bridge installers on the **Settings** page.

> **Note:** *You cannot upload software on the BeyondTrust U-Series Appliance. Use BT Updater to update local packages.*

To upload software:

1. Click **Settings > Software**, and then click the upload icon.
2. Drag the file to the upload area.

   Optionally, click anywhere in the upload area to navigate to the file. The Privilege Management for Unix and Linux ISO files and AD Bridge zip files are large. The upload can take time. A progress bar shows the upload progress. You can resume an upload if an interruption occurs (for example, a session timeout occurs).

3. After the upload is complete, BeyondInsight for Unix & Linux unpacks the files, which can take a few minutes. The software is available after the unpacking is complete.
4. Click the refresh icon to update the status of available software.

Uninstall BeyondInsight for Unix & Linux

RHEL and CentOS

In an escalated shell session, enter:

```
# remove
rpm -e pbsmc

# optional: remove config and db
rm -rf /etc/pbsmc
rm -rf /usr/share/pbsmc/
```

Debian and Ubuntu

In an escalated shell session, enter:

```
# remove
dpkg -r pbsmc

# optional: remove config and db
rm -rf /etc/pbsmc
rm -rf /usr/share/pbsmc
```

Windows

1. Open **Control Panel**.
2. Click the **Add or Remove Software** icon.
3. Remove **BeyondInsight for Unix & Linux**. Configuration and database files can be manually deleted in the **%ProgramFiles%\PBSMC** directory.

Configure BeyondInsight for Unix & Linux

1. You can customize the console using the **pbsmc.toml.default** file located in:

   - Linux: **/etc/pbsmc**
   - Windows: **%ProgramFiles%\PBSMC**

2. Create a copy of the file using the name **pbsmc.toml**. You can include only the settings that you want to customize.

3. Be sure to include the section title in **pbsmc.toml**. For example, if you want to change the default port number, the text will look similar to the following:

```
[server]
port="4443"
```

> **Note:** *Apply proper security settings on the .toml file. The file owner requires **Read** and **Write** privileges.*

4. You can configure the following settings:

   - **SSL**: By default, the console supports encrypted HTTPS connections using automatically generated, self-signed certificates. The console serves only HTTPS traffic on the configured port, unless explicitly configured to fall back to insecure HTTPS in the **pbsmc.html** configuration file. A custom certificate pair may also be provided and placed in the configuration file.

   - **Port**: By default, the console runs on port **4443**. Before changing this value, stop the service.

   - **Database**: By default, the console creates a SQLite database in **/atc/pbsmc/pbsmc.sqlite** or in **%ProgramFiles%\pbsmc** on Windows. This can be changed to another location.

   - **Pool**: Console tasks are run in a concurrent pool of processes. The default number of processes running at a time is **20**. You can increase the pool size to allow jobs to complete faster. However, the server performance might lag, and decreasing the pool size will have the opposite affect.

   - **keys**: Encryption keys for BIUL use base64 encoded AES 256 encryption. The key secures sensitive data stored in the database. More than one key can be used at a time. The **Active** key in the **pbsmc.toml** file is the key currently in use. If you start BeyondInsight for Unix & Linux without an encryption key, one is generated for you. You can review the comments in the **pbsmc.toml.default** file.

> **Note:** *You must restart the service to apply changes.*

Run BeyondInsight for Unix & Linux

Log in to the console using a supported browser: https://localhost:4443. If this is your first time logging into the console, the first-run wizard starts.

> ⚠ **IMPORTANT!**
>
> *If the wizard starts and this is not the first time the console has been run, do not go through the wizard again. All data in the system will be lost. Contact BeyondTrust Technical Support.*

Set Up the Console Using the First-Run Wizard

If this is the first time you are logging on to the console, complete the wizard and configure system settings including:

- **Administrator account**: Create the account that you will use to log in to the console.
- **Active Directory connection**: Configure a connection to an Active Directory forest. Active Directory users and groups can be used in Privilege Management for Unix and Linux policy and can log in to the console.
- **Settings**: Configure default settings, including default policy type, authentication timeout values, and security level.
- **Credentials**: Create credentials for remote hosts. The credentials are used to connect to the remote hosts.

Review the settings and save. You are now able to log in to the console using the administrator account you created in the wizard.

View the BeyondInsight for Unix & Linux Home

The **Home** screen allows administrators to view BeyondInsight for Unix & Linux options on the landing page for easy access. The options include:

- **Host Inventory**: Discover, add, and manage hosts for BeyondInsight for Unix & Linux.
- **Settings**: Configure BeyondInsight for Unix & Linux.
- **Audit**: View, replay, and audit Privilege Management for Unix and Linux logs.
- **Policy Management**: Create, edit, and modify policies on managed Policy Servers.
- **Tasks**: View jobs executed by BeyondInsight for Unix & Linux.

View the BeyondInsight for Unix & Linux Dashboard

The dashboard provides an easy-to-read visual summary of the console data metrics.
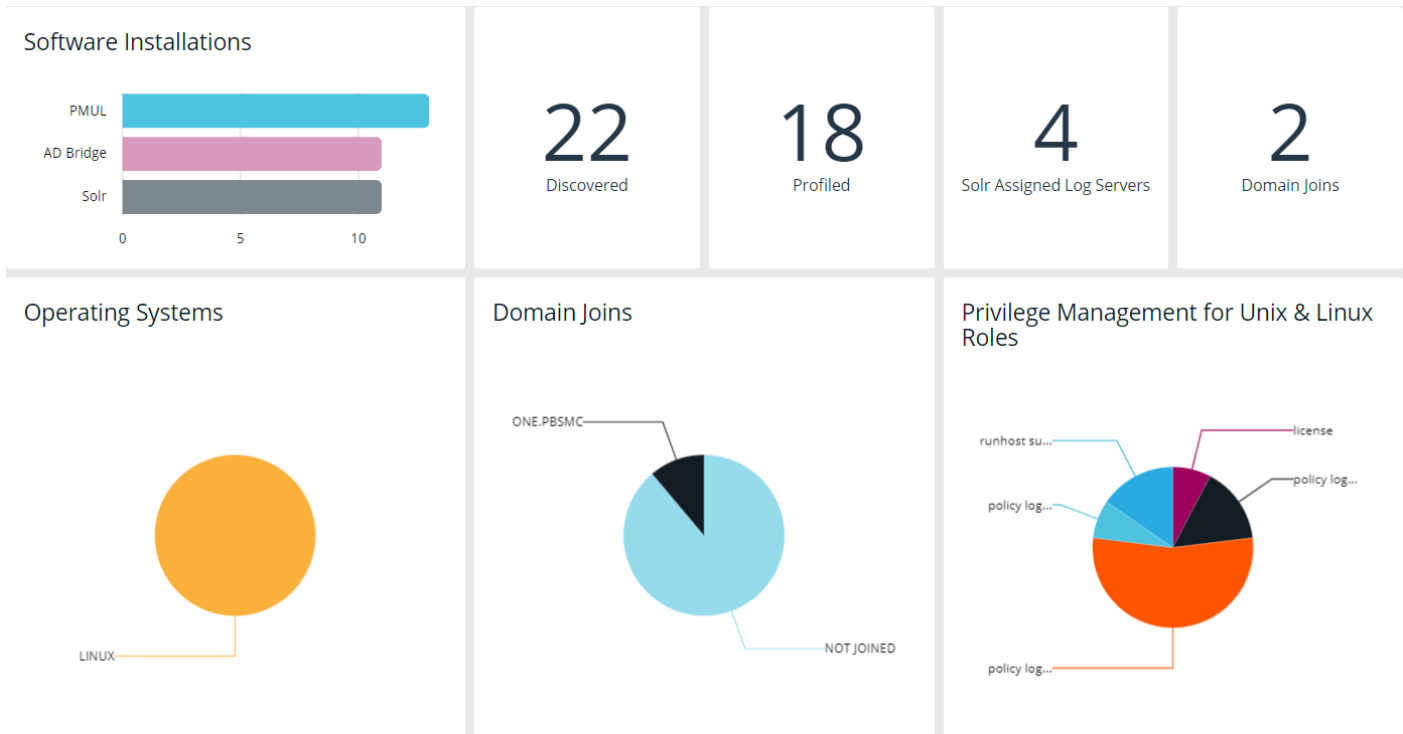
Summary Metrics

The top section of the dashboard displays the following details:

- **Software Installations**: Lists the products and the number of hosts where the product is installed.
- **Discovered**: The number of discovered and available hosts.
- **Profiled**: The number of successfully profiled hosts.
- **Solr Assigned Log Servers**: The number of log servers using Solr indexing.
- **Domain Joins**: The number of hosts joined to a domain.

Charts

The following statistics are provided:

- **Operating Systems**: Displays the most common operating systems discovered on the network.
- **Domain Joins**: Displays the most common domains joined by discovered hosts.
- **Privilege Management for Unix and Linux Roles**: Displays the most common PMUL roles discovered on hosts.

Hosts Inventory with BeyondInsight for Unix & Linux

On the **Hosts Inventory** page, you can find hosts that are accessible using SSH. Discovered assets are stored as hosts and can also be managed on the **Hosts Inventory** page.

This stage does not require a credential. It performs a port scan to test for an SSH connection.

Hosts are discovered in parallel batches to avoid saturating the network connection. The default size is **20**. This can be configured by changing the pool settings option.

> For more information, please see *"Configure BeyondInsight for Unix & Linux" on page 11*.

Discover Host Methods

Hosts are discovered through the following methods:

- Scan for Hosts
- Import Hosts
- Scan the Registry Name Service

To access any of these methods, on the **Host Inventory** page, **click** the **Add Hosts** dropdown menu.

> **Note:** *While using any of these methods, the grid refreshes automatically every 5 seconds.*

Scan for Hosts

IP addresses can be added using one of the following formats:

- **Single IP**: To discover a single host, type the IP address, 10.1.100.15.
- **IP Range**: Discover any hosts in the range, 10.1.100.15–10.1.100.20.
- **CIDR Notation**: Discover hosts in a CIDR block, 10.100.1.10/24.

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To manually discover hosts:

1. Enter the IP addresses using one of the accepted formats.
2. Enter an SSH port. The value should map to the SSH port for the host provided. If no SSH port is provided, the default port is **22**. Each discovery scan uses a single port regardless of the number of machines.

> 📌 **Note:** *To update the SSH port for the host, navigate to **Host Details**. The value can then be configured under **General > Connection Details**.*

3. When discovering a single host, you can enter an SSH fingerprint using SHA-256 format. If the value matches the received fingerprint, the host is automatically accepted. This is optional and only applies when performing single IP discovery.
4. Check the **Automatically accept SSH fingerprints** box to accept all SSH fingerprints for discovered hosts. If the host already exists in the system, the SSH fingerprint is ignored.
5. Click **Scan for Host**.

Scan for Hosts

Scan hosts using single IP addresses (10.100.1.0), hyphen-separated IP ranges (10.100.1.0-10.100.1.20), or CIDR notation ranges (10.100.1.0/24)

Address

SSH Port
22

SSH Host Public Key SHA256 Fingerprint (optional - single IP dis...

☐ Automatically accept SSH fingerprints

SCAN FOR HOST

> 💡 **Tip:** *Search for non sequential IP addresses at the same time by entering each IP address in their own field before clicking **Scan for Host**.*

Import Hosts

To import hosts, create a CSV file with a host address, port, and SSH fingerprint (optional) per line. Do not use headers in the file.

The contents of a valid file may look like the following:

```
"10.100.3.6",22,SHA256:HASHED-KEY
"10.100.3.7",22,SHA256:HASHED-KEY
"10.100.3.8",22,SHA256:HASHED-KEY
"10.100.3.9",22,SHA256:HASHED-KEY
```

> 📌 **Note:** *The CSV file can contain fingerprints in the SHA-256 format. If the fingerprint matches, the SSH fingerprint is accepted.*

To import a CSV file:

1. On the **Host Inventory** page, click the targeted area to upload a CSV file in the **Import Hosts** pane. Alternatively, drag the file into the targeted area.
2. Check the **Automatically accept SSH fingerprints from new hosts** box to automatically accept discovered fingerprints.
3. Locate the CSV file, and then click **Open**.

IMPORT HOSTS ✖

Import a CSV file to discover hosts. The format is IP, SSH port, and an optional SSH Fingerprint to authorize communication.

Example:
```
hosts.csv
    "10.100.3.6",22,SHA256:HASHED-KEY
    "10.100.3.7",22,SHA256:HASHED-KEY
    "10.100.3.8",22,SHA256:HASHED-KEY
    "10.100.3.9",22,SHA256:HASHED-KEY
```

☐ Automatically accept SSH fingerprints from new hosts

Drag CSV files here or click here to browse to upload.

Scan the Registry Name Service

The Registry Name Service can be scanned in order to discover hosts. This scans the servers listed in **Primary Registry Servers** for all of the hosts in the network, adding previously unknown hosts to the console as appropriate.

To scan the Registry Name Service:

1. In the **Registry Name Service** section, enter an **SSH Port**. The value should map to the SSH port for the host provided. If no SSH port is provided, the default port is **22**. Each discovery scan uses a single port regardless of the number of machines.
2. Check the **Automatically accept SSH fingerprints** box to accept all SSH fingerprints for discovered hosts. If the host already exists in the system, the SSH fingerprint is ignored.
3. Click **Scan Registry Name Service**.

SCAN REGISTRY NAME SERVICES ✖

Scan the Registry Name Service in order to discover hosts.

SSH Port
22

☐ Automatically accept SSH fingerprints

Primary Registry Servers
    pbsmc-centos6-02.one.pbsmc
    pbsmc-debian8-03.unix.symark.com

SCAN REGISTRY NAME SERVICE

ℹ️ *For more information on the Scan Registry Name Service action, please see the **Tasks > Task Details** page. Any new hosts found will appear on the **Hosts > Hosts Inventory** page.*

Use the BeyondInsight for Unix & Linux Hosts Inventory Grid

On the **Hosts > Hosts Inventory** page, you can manage hosts and software deployments. A smart form assists in generating actions to run on one or many hosts, and you are notified when actions are complete. Hosts can be filtered by **Hostname**, **IP Address**, **Operating System**, and **Tags**.

Most actions require credentials be provided so the console can authenticate with the selected host. Credentials are managed on the **Credentials** page.

> ℹ️ For more information, please see the following:
> - *"View Tasks and Task Details in BeyondInsight for Unix & Linux" on page 85*
> - *"Manage Credentials in BeyondInsight for Unix & Linux" on page 84*

Use the Hosts Inventory Grid

The **Hosts Inventory** page displays all the assets found during a discovery.

Click on the **Hostname** and **Updated** headers to sort and refresh the grid. When performing an action, you can quickly select all of the hosts in a grid by checking the box in the header row. To view more details about a host, select a host, and then at the far right, click the ellipsis menu icon and select **View Host Details**.

> ℹ️ For more information on adding hosts, please see *"Hosts Inventory with BeyondInsight for Unix & Linux" on page 14*.

Primary Server Columns

The following indicators are possible:

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Privilege Management for Unix and Linux License Primary		Indicates Primary License servers.
Registry Name Service Primary		Indicates Primary Registry Name Service servers.

Hostname Column

The DNS name of the host. This column also contains the host IP address, operating system, and version.

Alerts Column

The following indicators are possible:

Error		Indicates a critical issue with the host.
Warning		Indicates a problem with the host.

Install Status Columns

The following columns provide information on installed components. The available columns are:

AD Bridge

If AD Bridge is installed, the **AD Bridge** column displays the software version number, agent, and joined status.

- **Agent**: Indicates if the agent is installed.
- **Joined**: Indicates the domain joined status, which will either display it is not joined or the domain the host is joined to.

PMUL

If Privilege Management for Unix and Linux is installed, the **PMUL** column displays the version number and an icon for each feature and role the host has enabled.

- **Policy**: Policy server
- **Log**: Log server
- **Client**: Submit or run host
- **FIM**: FIM policy applied to the server
- **License**: License server
- **RNS**: Registry Name Service server

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Solr

- **Server:** Solr Server
- **Client:** Client (indexed machine)

Updated Column

The last time data related to the host changed.

Manage a Host

On the **Hosts > Hosts Inventory** page, access host actions for a server from the vertical ellipsis menu. Select **Peform Host Actions** from the menu to start the **Host Actions** wizard. Host actions include:

- Profile
- Install software for AD Bridge, Privilege Management for Unix and Linux, and Solr
- Manage Solr
- Join domain
- Deploy keyfile

Additionally, from the menu for each server, you can:

- View host details
- Delete hosts

When using the **Host Actions** wizard, only 25 hosts are displayed at a time. Select **Check All** to apply settings to all discovered hosts.

Apply Updates to Servers Using Bulk Actions

Alternatively, you can apply actions to more than server at a time. On the **Hosts > Hosts Inventory** page, you can select more than one host and select the **Actions** menu. The **Actions** menu is only displayed when more than one server is selected.

Use Privilege Escalation for BeyondInsight for Unix & Linux Credentials

Most actions require a credential be supplied in BeyondInsight for Unix & Linux. This is the account BIUL authenticates as on selected servers. However, this account might not have sufficient privileges to execute the required commands. The console allows users to choose a **Delegation Tool** to escalate user privileges. Selecting **sudo su** requires the user to choose a second credential to delegate to.

Profile Servers in BeyondInsight for Unix & Linux

Run a profile on a host to gather preinstall check information. This check ensures that a host is prepared for software installs. Profiling requires a credential that is a valid SSH user for a selected host. This credential does not require superuser privileges, but the credential must have **Write** permission on the host's **/tmp** folder.

> ℹ️ *You can configure a remote working directory. For more information, please see "Deployment Settings" on page 41.*

> 📌 *Note: To access the hosts, a valid SSH credential with administrative rights on the host is required.*

1. Go to the **Hosts > Host Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.
3. Select **Profile**, and then click **Next Step**.
4. On the **Credential Selection** page, select a logon credential to access the remote system. If you cannot log on as root, then select one of the following to run the action with escalated privileges: **pbrun**, **sudo**, or **sudo su**. This may require choosing a second credential.
5. Review the **Summary** page, and then click **Finish**.
1. Review the **Task** page, and verify the completed status of attempted actions under **Task Summary**.
2. Click **Task Details** to view more information about **Task Status**.

Profile a Host using a Credential Rule

Configure a credential rule to avoid requiring password authentication when you run a host profile. You can use default credentials to run a profile on one or many hosts.

1. Go to the **Hosts > Hosts Inventory** page.
2. Select the hosts you want to profile:
   - One host: Select the host, and then at the far right, click the ellipsis menu icon and select **Profile Host with Default Credentials**.
   - More than one host: To select the hosts to profile, check the boxes on the left of the hostnames. From the **Actions** menu, select **Profile Host with Default Credentials**.

> *For more information on setting up default credentials, please see "Use Host Credential Rules" on page 34.*

Manage AD Bridge Hosts

> **Note:** *To access the hosts, a valid SSH credential with administrative rights on the host is required.*

Install and Upgrade AD Bridge

To install or upgrade AD Bridge hosts:

1. Go to the **Hosts > Host Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.
3. On the **Primary Action** page, select **Active Directory Bridge**.
4. On the **Secondary Action** page, select one from the following:
   - **Install**: Install AD Bridge software.
   - **Upgrade**: Upgrade AD Bridge software to the version loaded in the console. If you select **Upgrade**, you can skip to step 6.
5. If you select **Install**, you can configure the Active Directory information on the **Action Requirements** page. By default, the **Use Domain Browser** toggle is turned on. To manually enter the information, click the toggle to turn it off.
   - **Perform optional Domain join**: Select to join the Active Directory host to the domain. The join action occurs after the AD Bridge software installation completes. The toggle is turned on by default. Click the toggle if you do not want to join the host to the domain at this time.

- **Forest**: Select the forest from the list. The forest listed here is the directory service connection already configured from the **Settings > Directory Services** menu.
- **Domain**: Select a domain from the list.
- **OU**: Click **Browse** to search for the OU.
- **AD Credential**: Select the credential you want to use to access Active Directory. This credential is added when you create the directory services connection.
- **Additional Arguments**: Add domain-join cli arguments.

6. On the **Credential Selection** page, select a logon credential to access the remote system. If you cannot log on as root, then select one of the following to run the action with escalated privileges: **pbrun**, **sudo**, or **sudo su**. This may require choosing a second credential.

7. Review the **Summary** page, and then click **Finish**.

1. Review the **Task** page, and verify the completed status of attempted actions under **Task Summary**.

2. Click **Task Details** to view more information about **Task Status**.

Join the Host to an Active Directory Domain

To join selected AD Bridge hosts to a domain:

1. Go to the **Hosts > Host Inventory** page.

2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.

3. On the **Primary Action** page, select **Active Directory Bridge**.

4. On the **Secondary Action** page, select **Domain join**.

5. On the **Action Requirements** page, select the Active Directory information. By default, the **Use Domain Browser** toggle is turned on. To manually enter the information, click the toggle to turn it off.

- **Forest**: Select the forest from the list. The forest listed here is the directory service connection already configured from the **Settings > Directory Services** menu.
- **Domain**: Select a domain from the list.
- **OU**: Click **Browse** to search for the OU.
- **AD Credential**: Select the credential you want to use to access Active Directory. This credential is added when you create the directory services connection.
- **Additional Arguments**: Add **domain-join cli** arguments.

6. On the **Credential Selection** page, select a logon credential to access the remote system. If you cannot log on as root, then select one of the following to run the action with escalated privileges: **pbrun**, **sudo**, or **sudo su**. This may require choosing a second credential.

7. Review the **Summary** page, and then click **Finish**.

1. Review the **Task** page, and verify the completed status of attempted actions under **Task Summary**.

2. Click **Task Details** to view more information about **Task Status**.

> ℹ️ *For more information about the Domain Join Tool commands, please see the AD Bridge Linux Administration Guide at https://www.beyondtrust.com/docs/ad-bridge/getting-started/linux-admin/index.htm.*

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Remove the Host from an Active Directory Domain

You can remove an Active Directory host from a domain.

To remove a joined domain:

1. Go to the **Hosts > Host Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.
3. On the **Primary Action** page, select **Active Directory Bridge**.
4. On the **Secondary Action** page, select **Domain Leave**.
5. On the **Action Requirements** page, check the box **Delete Computer account in Active Directory**, and then select an Active Directory credential from the list.
6. On the **Credential Selection** page, select a logon credential to access the remote system. If you cannot log on as root, then select one of the following to run the action with escalated privileges: **pbrun**, **sudo**, or **sudo su**. This may require choosing a second credential.
7. Review the **Summary** page, and then click **Finish**.

Uninstall AD Bridge

When you uninstall AD Bridge, you can also choose to leave the domain and delete the Active Directory account.

1. Go to the **Hosts > Host Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.
3. On the **Primary Action** page, select **Active Directory Bridge**.
4. Select **Uninstall**.
5. On the **Action Requirements** page, select one of the following:
   - **Uninstall**: Select to uninstall AD Bridge software from the host.
   - **Leave and Uninstall**: Select to remove the host from the domain and uninstall AD Bridge software.
   - **Leave Domain, Delete Account, and Uninstall**: Select to remove the host from the domain, delete the Active Directory account in Active Directory, and remove the AD Bridge software.
   - **AD Credential**: Select the credential to use to access Active Directory. The setting is required when you select **Leave Domain, Delete Account, and Uninstall**. This credential is added when you create the directory services connection.
6. On the **Credential Selection** page, select a logon credential to access the remote system. If you cannot log on as root, then select one of the following to run the action with escalated privileges: **pbrun**, **sudo**, or **sudo su**. This may require choosing a second credential.
7. Review the **Summary** page, and then click **Finish**.

Manage Privilege Management for Unix and Linux Hosts

> *Note: To access the hosts, a valid SSH credential with administrative rights on the host is required.*

To manage Privilege Management for Unix and Linux hosts:

1. Go to the **Hosts > Host Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.

3. Choose the action to perform, and then follow the procedures in this section.

Software is installed with default configuration values, unless **RNS Primary and All Components** is selected. If not detected during installation, the installer generates network and REST encryption keys. All future Privilege Management for Unix and Linux installations will use these keys. The keys can be managed on the **Settings** page.

Install the Privilege Management for Unix and Linux Policy Server

To install Privilege Management for Unix and Linux Policy Server:

1. Go to the **Hosts > Host Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.
3. Select **Privilege Management for Unix and Linux**, and then select **Next Step**.
4. Select **Install**, and then click **Next Step**.
5. On the **Action Requirements** page, select an installation template. The features enabled in the template affect the options available. The following list displays default templates.
   - **All Components**: All Privilege Management for Unix and Linux components will be installed except for RNS server.
   - **License Server Only**: Only the Privilege Management for Unix and Linux license server will be installed.
   - **Policy and Log Server Only**: All server components of Privilege Management for Unix and Linux will be installed except for RNS server.
   - **Submit and Run Host Only**: The client components of Privilege Management for Unix and Linux will be installed.
   - **Primary Registry Server and All Components**: All Privilege Management for Unix and Linux components will be installed including RNS server.
6. After selecting a template, you can choose to use client registration. Note that some features selected in installation templates may require or disallow using client registration. To use client registration select a **Client Registration Server**, and then select a **Client Registration Profile**.
7. If you choose not to use client registration, you can manually select multiple policy, log, and license servers if your Installation template allows it. If you are installing a new primary policy, log, or license server click the toggle switch to indicate that this host will become a new primary policy, log, or license server.
8. On the **Credential Selection** page, select a logon credential to access the remote system. If you cannot log on as root, then select one of the following to run the action with escalated privileges: **pbrun**, **sudo**, or **sudo su**. This may require choosing a second credential.
9. Review the **Summary** page, and then click **Finish**.
1. Review the **Task** page, and verify the completed status of attempted actions under **Task Summary**.
2. Click **Task Details** to view more information about **Task Status**.

> *For more information please see the following:*
>
> - *On installation templates, "Privilege Management for Unix and Linux Installation Templates" on page 51*
> - *On client registration profiles, "Manage Client Registration Profiles" on page 29*

Upgrade the Privilege Management for Unix and Linux Policy Server

To upgrade the Policy Server to the version loaded in the console:

1. Go to the **Hosts > Host Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.
3. Select **Privilege Management for Unix and Linux**, and then click **Next Step**.
4. Select **Upgrade**, and then click **Next Step**.
5. On the **Credential Selection** page, select a logon credential to access the remote system. If you cannot log on as root, then select one of the following to run the action with escalated privileges: **pbrun**, **sudo**, or **sudo su**. This may require choosing a second credential.
6. Review the **Summary** page, and then click **Finish**.
1. Review the **Task** page, and verify the completed status of attempted actions under **Task Summary**.
2. Click **Task Details** to view more information about **Task Status**.

Uninstall the Privilege Management for Unix and Linux Policy Server

To remove the Policy Server:

1. Go to the **Hosts > Host Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.
3. Select **Privilege Management for Unix and Linux**, and then click **Next Step**.
4. Select **Uninstall**, and then click **Next Step**.
5. On the **Credential Selection** page, select a logon credential to access the remote system. If you cannot log on as root, then select one of the following to run the action with escalated privileges: **pbrun**, **sudo**, or **sudo su**. This may require choosing a second credential.
6. Review the **Summary** page, and then click **Finish**.
1. Review the **Task** page, and verify the completed status of attempted actions under **Task Summary**.
2. Click **Task Details** to view more information about **Task Status**.

Install and Manage Solr

Solr Connectivity

Certificates must be used to communicate between the Solr server and the log servers.

BeyondInsight for Unix & Linux is a certificate signing authority. The console can generate and distribute the required certificates.

> **Note:** *Solr must be installed using BeyondInsight for Unix & Linux; otherwise, there is no way to communicate with the Solr server.*

Install Solr

To install Solr:

1. Go to the **Hosts > Host Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.
3. Select **Solr**, and then click **Next Step**.
4. Select **Install**, and then click **Next Step**.

5. Solr tries to detect the location of the Java environment on the server. Otherwise, you can enter the Java Home details.

6. On the **Credential Selection** page, select a logon credential to access the remote system. If you cannot log on as root, then select one of the following to run the action with escalated privileges: **pbrun**, **sudo**, or **sudo su**. This may require choosing a second credential.

7. Review the **Summary** page, and then click **Finish**.

1. Review the **Task** page, and verify the completed status of attempted actions under **Task Summary**.

2. Click **Task Details** to view more information about **Task Status**.

Uninstall Solr

To remove Solr:

1. Go to the **Hosts > Host Inventory** page.

2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.

3. Select **Solr**, and then click **Next Step**.

4. Select **Uninstall**, and then click **Next Step**.

5. On the **Credential Selection** page, select a logon credential to access the remote system. If you cannot log on as root, then select one of the following to run the action with escalated privileges: **pbrun**, **sudo**, or **sudo su**. This may require choosing a second credential.

6. Review the **Summary** page, and then click **Finish**.

1. Review the **Task** page, and verify the completed status of attempted actions under **Task Summary**.

2. Click **Task Details** to view more information about **Task Status**.

Assign a Log Server

The log servers selected are indexed by the Solr server.

To assign a log server:

1. Go to the **Hosts > Host Inventory** page.

2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.

3. Select **Solr**, and then click **Next Step**.

4. Select **Assign Solr Indexing Server**, and then click **Next Step**.

5. Select a Solr server from the **Solr Server** list, and then click **Next Step**.

6. On the **Credential Selection** page, select a logon credential to access the remote system. If you cannot log on as root, then select one of the following to run the action with escalated privileges: **pbrun**, **sudo**, or **sudo su**. This may require choosing a second credential.

7. Review the **Summary** page, and then click **Finish**.

1. Review the **Task** page, and verify the completed status of attempted actions under **Task Summary**.

2. Click **Task Details** to view more information about **Task Status**.

Adopt a Solr Server

You can create a connection to a Solr server instance not deployed by BeyondInsight for Unix & Linux.

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1. Go to the **Hosts > Hosts Inventory** page.
2. Select the Solr server you want to establish a connection to, and then at the far right, click the ellipsis menu icon, and then select **Perform Host Actions**. Optionally, select more than one Solr server, and then select **Actions > Perform Host Actions**.
3. Select **Solr**, and then click **Next Step**.
4. Select **Adopt Solr server for management by BeyondInsight for Unix & Linux**, and then click **Next Step**.
5. On the **Credential Selection** page, credential rules are automatically used if any are configured for the selected host. Otherwise, enter a credential, and then click **Next Step**.
6. Review the settings on the **Summary** page, and then click **Finish**.

Rotate the Certificate on the Solr Server

Deploy host certificates for selected Solr hosts. If the Solr host name matches a certificate name in the BeyondInsight for Unix & Linux certificate store then that certificate is deployed.

You can update the certificate at any time.

1. Go to the **Hosts > Hosts Inventory** page.
2. Select a Solr server where you want to rotate certificates, then at the far right, click the ellipsis menu icon, and then select **Perform Host Actions**. Optionally, select more than one Solr server, and then select **Actions > Perform Host Actions**.
3. Select **Solr**, and then click **Next Step**.
4. Select **Rotate TLS server certificates for Solr server**.
5. On the **Credential Selection** page, credential rules are automatically used if any are configured for the selected host. Otherwise, enter a credential, and then click **Next Step**.
6. Review the settings on the **Summary** page, and then click **Finish**.

Deploy Keyfiles

The **Deploy Keyfile** action uses the network and encryption keys configured on the **Settings > Integration** page.

To deploy keyfiles:

1. Go to the **Hosts > Host Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and select **Perform Host Actions**.
3. Select Privilege Management for Unix and Linux, and then select **Next Step**.
4. Select **Deploy keyfiles**, and then click **Next Step**.
5. On the **Credential Selection** page, select a logon credential to access the remote system. If you cannot log on as root, then select one of the following to run the action with escalated privileges: **pbrun**, **sudo**, or **sudo su**. This may require choosing a second credential.
6. Review the **Summary** page, and then click **Finish**.
1. Review the **Task** page, and verify the completed status of attempted actions under **Task Summary**.
2. Click **Task Details** to view more information about **Task Status**.

Delete Hosts

The **Delete Host** action can be selected from the menu on the **Hosts > Hosts Inventory** page. It removes the selected hosts from the console database. No action is taken on the host nor on any credentials the console may have stored for it.

To delete more than one host, select the hosts in the list, and then select **Delete Hosts** from the **Actions** list.
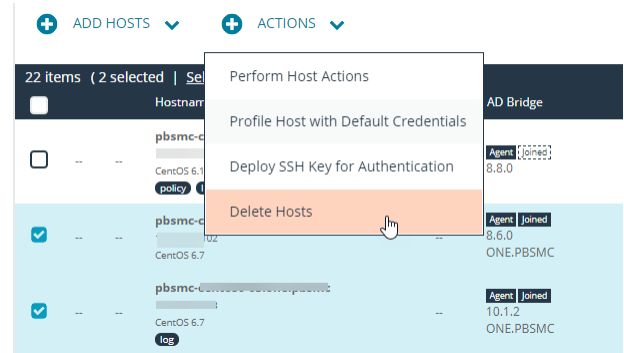
View Host Details

You can view more information about host servers including errors and warnings for particular products deployed.

On the **Host Details** pane, you can manage the following settings:

- Configure the Privilege Management for Unix and Linux **Rest API Time Correction**, which is the acceptable time offset between BeyondInsight for Unix & Linux and the Privilege Management for Unix and Linux host in seconds.
- Apply licenses and view license details.

To view more information about a host:

1. On the **Hosts > Host Inventory** page, select a server, and then at the far right, click the ellipsis menu icon and then select **View Host Details**. General host details are displayed, including:
   - **Discovered**
   - **Last Profiled**
   - **IP**
   - **Operating System**
   - **Architecture**
   - **Default Gateway**
   - **Tags**
2. Select a product name in the **Host Details** list to view details about the host collected by BeyondInsight for Unix & Linux. Details on errors and warnings are included here.

PBSMC-CENTOS6-01.ONE.PBSMC

Discovered:	**November 21, 2019**	Last Profiled:	**37 minutes ago**	IP:	
Operating System:	**Linux CentOS 6.10**	Architecture:	**x86_64**	Default Gateway:	
Tags:	policy log dmay				

Host Details | Client Registration Profiles

HOST DETAILS

- General
- Credential Rules
- Privilege Management for Unix & Linux
- PMUL Settings
- Registry Name Service
- PMUL Licensing
- AD Bridge
- Solr
- Errors & Warnings

GENERAL DETAILS

Tags
Add tags

× policy   × log   × dmay   × ▾

Connection Details
Hostname and IP address are determined by profiling the relevant host. You can profile a host on the Host Inventory page.

Hostname
pbsmc-centos6-01.one.pbsmc

IP Address
172.20.31.101

Port
22

SAVE HOST

REST API Connectivity

BeyondInsight for Unix & Linux automatically configures a REST connection to Privilege Management for Unix and Linux Policy Servers.

Note the following when using the REST API:

- REST API connections can only be made to a Policy Server with Privilege Management for Unix and Linux v 9.4 or later.
- REST connectivity does not open any firewall ports. This must be done by the user.
- By default, Privilege Management for Unix and Linux uses self-signed certificates. BeyondInsight for Unix & Linux does not verify a certificate authority.

To assist in sourcing errors and troubleshooting connections, a task displays on the **Tasks** page. Additional troubleshooting information may be available on the **Host Details** page.

Tag a Discovered Host

Tags are user-defined values that can be assigned to hosts to aid in filtering the discovered hosts in the **Hosts Inventory** grid. Tags are freely entered and as such allow the user to navigate to and manage hosts quickly.

> *Example:* *You can create a tag for all hosts in a group such as* ***Log Servers****. Assign that tag to the log servers in your environment. Tags can then be used for filtering throughout the application. To find the log servers in the* ***Hosts Inventory*** *grid, simply filter by the* ***Log Servers*** *tag.*

Create a New Tag

To create a new tag for a discovered host:

1. Go to **Hosts > Hosts Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and then select **View Host Details**.
3. Under **General Details**, type the desired tag name in the **Add tags** field, and press **Enter**.

Assign Tags to Hosts

To assign an existing tag to a discovered host:

1. Go to **Hosts > Hosts Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and then select **View Host Details**.
3. Under **General Details**, click the **Add tags** field and scroll till you find the desired tag.
4. Select the tag to apply it to the host.

Filter Hosts by Tags

To filter discovered hosts by a specific tag:

1. Go to **Hosts > Hosts Inventory** page.
2. Click the **Tags** dropdown menu at the top of the **Host Inventory** grid.
3. Enter the tag name in the **Search Term** field and click **Update** to filter the results.

Delete an Existing Tag

To delete an existing tag on a discovered host:

1. Go to **Hosts > Hosts Inventory** page.
2. Select a host, and then at the far right, click the ellipsis menu icon and then select **View Host Details**.
3. Under **General Details**, click the **Add tags** field, and scroll till you find the desired tag.
4. Click the **X** that appears beside the tag name to delete it from the list.

Manage Client Registration Profiles

Client Registration Profiles (CRP) simplify PMUL deployments by allowing the user to configure some environmental settings during an installation. For example, a profile might be used to copy encryption keys from machine to machine to enable communication, to copy a settings file, or to immediately join RNS groups. Without using CRP, administrators must manually provision files, keys, etc. on every host. CRP provides a centralized, customizable definition of what an installation looks like and handles that provisioning. A Client Registration Profile editor is available for policy and RNS servers on the **Client Registration** page.

> 📌 **Note:** *Client Registration Profiles can optionally be used with any PMUL install, but must be used with RNS.*

To manage Client Registration Profiles go to **Hosts > Hosts Inventory > View Host Details > Client Registration Profiles**. A new Client Registration Profile can be created by selecting **Add New Registration Profile**, entering a **Profile name**, and clicking **Create**.

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Update a Profile

Existing Client Registration Profiles can be edited by selecting an entry from the **Client Registration Profiles** list. As necessary, configure the following options and select **Save** to save your changes or **Reset** to undo all changes.

Settings File

Provide the path to a **pb.settings** file to copy to clients. Set destination to save the file to an alternative location.

The following options are available:

- **Setting File Source**
- **Setting File Destination**

File Deployment Operations

Provide paths to files to copy from server to client. Set **Destination** to save files to an alternative location.

The following options are available:

- **Filename**
- **Destination**

Settings Controlled File Deployment Operations

Copy files pointed to by **pb.settings** keys to copy said files from server to client. Set destination to save files to an alternative location.

The following options are available:

- **Setting name**
- **To**

Certificate Deployment Operations

Copy certificates from the server to the client. If only **Destination** is set, a certificate will be saved to the provided path. If **Setting Name** is provided, a certificate will be saved to the value of that setting. If **Setting Name** and **Key** are provided, a certificate pair is saved to the value of those settings.

The following options are available:

- **Setting name**
- **Key setting name**
- **Destination**

Role Registration

Assign Registry Name Services groups and roles within. Select a **Category** and **Group Name** and **Role** options for the category will become available.

The following options are available:

- **Category**
- **Group name**

- **Role**

Post-Install Scripts

Provide paths to scripts to be executed on the client after installation. Configure the paths to scripts in the **Filename** field.

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Use SSH Keys

SSH keys can be used for authentication rather than user names and passwords. At startup, BeyondInsight for Unix & Linux creates a new keypair if there isn't one in the system.

BeyondInsight for Unix & Linux maintains one active key at a time.

Deploy an SSH Key

You can deploy a key to one server or select more than one server and use the Actions menu to deploy the key.

> **Note:** *Credentials imported from Password Safe cannot use the BeyondInsight for Unix & Linux SSH key for authentication.*

To deploy SSH keys:

1. Go to the **Hosts > Host Inventory** page.
2. Select one or more servers.
3. From the Actions menu, select **Deploy SSH Key For Authentication**.
4. Select a credential from the list. The current active SSH key is added to the user's authorized keys (**~/.ssh/authorized_keys file**) on the selected hosts.

Download a Public Key

You can download the public key to use external to BeyondInsight for Unix & Linux, for instance, by adding the key to a virtual machine template.

1. Go to the **Hosts > SSH Keys** page.
2. Click **Manage SSH Keys**, and then select **Download Public Key**.

Rotate a Public Key

You can rotate the SSH key and push to known hosts already using a key.

1. Go to the **Hosts > SSH Keys** page.
2. Click **Manage SSH Keys**, and then select **Rotate SSH Key**.
3. Select one of the following:
   - **Deploy To Latest**: Push the new key to hosts that are known by BeyondInsight for Unix & Linux to be using the most recent active key.
   - **Deploy To All**: Push this key to all hosts that BeyondInsight for Unix & Linux has pushed keys to before.
4. Click **Rotate SSH Key**.

Disable a Key

You can disable the SSH key.

1. Go to the **Hosts > SSH Keys** page.
2. Select one or more keys in the list.
3. From the **Actions** menu, select **Disable Keys**.

Manage SSH Fingerprints

You can accept or reject SSH fingerprints. When BeyondInsight for Unix & Linux connects to a host, fingerprints are retrieved. Communication is not established with the host until a fingerprint is accepted.

A fingerprint can be in one of the following states:

- **Unknown**: The fingerprint must be reviewed.
- **Allowed**: The fingerprint passed review.
- **Denied**: The fingerprint was rejected, and the host is not trusted.

To manage SSH fingerprints:

1. From the menu, select **Hosts > SSH Fingerprints**.
2. Click a fingerprint to open **Fingerprint Details**.
3. Click **Allow** to trust the fingerprint or **Deny** to reject it.

Use Host Credential Rules

Use credential rules to apply default credentials to hosts either directly or using a range of IP addresses. When a credential rule is applied to a host, administrators no longer need to enter a user name / password credential; instead, the system evaluates the rules and applies a rule to the host.

There are two types of rules: host and network.

Multiple rules can apply to a single host. In terms of rule precedence, a host specific rule (bound by host ID) is used in preference to all others rules that might be applied to that host.

For either host or network rules, a privilege escalation method can be saved with the authentication credential. Actions that require elevated privilege take advantage of this saved method. Applying delegation to a host is optional.

Credentials must already be created on the **Credentials** page so they are available to select when creating a rule.

> *For more information, please see "Manage Credentials in BeyondInsight for Unix & Linux" on page 84.*

One-click Actions

Using default credentials enables one-click actions; you can select an action on a host without entering a user name and password. Running a host profile is an example of an action that can be selected without providing the host credential.

> *For more information, please see "Profile a Host using a Credential Rule" on page 20.*

Add a Network Credential Rule

A network credential rule applies to an IP range added using CIDR notation.

1. Go to the **Hosts** page, and then select **Credential Rules**.
2. Click the **Network Rules** tab.
3. Click **Add New Credential Rule.**
4. Enter the IP address range following the CIDR notation format. For example, 10.100.1.0/24.
5. Select a logon credential from the list.
6. Select a delegation strategy and corresponding credential.
7. Click **Create Credential Rule**.

Add a Host Credential Rule

A host credential rule applies to specific hosts. Add the host name or IP address of the host. A credential rule is created for each host. A host using a default credential configured does not require a credential when running actions.

1. Go to the **Hosts** page, and then select **Credential Rules**.
2. Click the **Host Rules** tab.
3. Click **Create New Credential Rule**.
4. Search for hosts using either host name or IP address filters.
5. Select a login credential from the list.

6. Select a delegation strategy and corresponding credential.
7. Click **Create Credential Rule**.

Delete a Credential Rule

You can delete a credential rule when it is no longer required.

1. Go to the **Hosts** page, and then select **Credential Rules**.
2. Click the tab for the credential rule type.
3. Select the rule, and then click **Delete Credential Rule**.

> **Note:** *If you remove a credential from the **Host Credentials** page, then any credential rules using that credential are also deleted.*

View Credential Rules on a Host

You can view a list of all credential rules assigned to a host on the **Host Details** page. You can also create and change the host rule. Only one host rule is permitted for a host.

> *For more information, please see* *"View Host Details" on page 27*.

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Manage the Registry Name Service

To manage service groups, the user must select the primary registry server on which the service groups reside, and then choose the service group to manage the hosts joined to that group and their roles within. Hosts can be filtered by **Hostname** and **IP Address**.

> ℹ️ *For more information on the registry name service (RNS), please see the Privilege Management for Unix and Linux Administration Guide at https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm.*

To manage service groups, navigate to **Hosts > Registry Name Service**. Membership can be managed on the **Service Group** page with options to add, promote, and remove hosts.

The following **Service Group Categories** are available:

- **Registry**
- **Policy**
- **File Integrity Monitoring**
- **Privilege Management for Networks**
- **Log**
- **Log Archive**

Manage Registry Name Service Groups

RNS groups allow clients to discover the services provided by RNS. To manage RNS groups, select **Registry** from the **Service Group Categories** list and choose a service group entry.

Add a Server

To add an available host to the service group:

1. On the **Service Group** page, click **Add Servers**.
2. In the **Add Servers** list, select **Add** to add a host to the service group.

Promote a Server

To promote a secondary RNS server in the service group, click **Promote**. The server's role will be set as a **Primary** RNS server and the previous primary will be set to the **Secondary** role.

Remove a Server

To remove a server from the service group, select **Remove** on a server entry and confirm by clicking **OK**.

> 📌 *Note: A Primary RNS server must be demoted to a Secondary role before it can be removed.*

Manage Policy Service Groups

Policy service groups define the policy sources and clients for Privilege Management for Unix and Linux policy. To manage policy service groups, select **Policy** from the **Service Group Categories** list and choose a service group entry.

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A new policy service group can be added by clicking **Add Service Group**, entering a **Service group name**, and clicking **Create**.

An existing policy service group can be deleted by clicking the trash bin icon and confirming by clicking **Delete**.

Add a Server

To add an available host to the service group:

1. On the **Service Group** page, click **Add Servers**.
2. In the **Add Servers** list, select **Add** to add a host to the service group.

Add a Client

To add an available host to the service group:

1. On the **Service Group** page, click **Add Clients**.
2. In the **Add Clients** list, select **Add** to add a host to the service group.

Promote a Server

To promote a secondary RNS server in the service group, click **Promote**. The server's role will be set as a **Primary** RNS server and the previous primary will be set to the **Secondary** role.

Remove a Server or Client

To remove a server or client from the service group, select **Remove** on a server or client entry and confirm by clicking **OK**.

> **Note:** *A Primary RNS server must be demoted to a Secondary role before it can be removed.*

Manage File Integrity Monitoring Service Groups

File Integrity Monitoring (FIM) service groups define the policy sources and clients for FIM policy. To manage FIM service groups, select **File Integrity Monitoring** from the **Service Group Categories** list and choose a service group entry.

A new policy service group can be added by clicking **Add Service Group**, entering a **Service group name**, and clicking **Create**.

An existing policy service group can be deleted by clicking the trash bin icon and confirming by clicking **Delete**.

Add a Server

To add an available host to the service group:

1. On the **Service Group** page, click **Add Servers**.
2. In the **Add Servers** list, select **Add** to add a host to the service group.

Add a Client

To add an available host to the service group:

1. On the **Service Group** page, click **Add Clients**.
2. In the **Add Clients** list, select **Add** to add a host to the service group.

Promote a Server

To promote a secondary RNS server in the service group, click **Promote**. The server's role will be set as a **Primary** RNS server and the previous primary will be set to the **Secondary** role.

Remove a Server or Client

To remove a server or client from the service group, select **Remove** on a server or client entry and confirm by clicking **OK**.

> **Note:** *A Primary RNS server must be demoted to a Secondary role before it can be removed.*

Manage Privilege Management for Networks Service Groups

Privilege Management for Networks (PMN) service groups define the policy sources and clients for PMN policy. To manage PMN, select **Privilege Management for Networks** from the **Service Group Categories** list and choose a service group entry.

A new policy service group can be added by clicking **Add Service Group**, entering a **Service group name**, and clicking **Create**.

An existing policy service group can be deleted by clicking the trash bin icon and confirming by clicking **Delete**.

Add a Server

To add an available host to the service group:

1. On the **Service Group** page, click **Add Servers**.
2. In the **Add Servers** list, select **Add** to add a host to the service group.

Add a Client

To add an available host to the service group:

1. On the **Service Group** page, click **Add Clients**.
2. In the **Add Clients** list, select **Add** to add a host to the service group.

Promote a Server

To promote a secondary RNS server in the service group, click **Promote**. The server's role will be set as a **Primary** RNS server and the previous primary will be set to the **Secondary** role.

Remove a Server or Client

To remove a server or client from the service group, select **Remove** on a server or client entry and confirm by clicking **OK**.

> **Note:** *A Primary RNS server must be demoted to a Secondary role before it can be removed.*

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Manage Log Server Service Groups

Log Server service groups define where audit and event logs are recorded. To manage Log Server service groups, select **Log** from the **Service Group Categories** list and choose a service group entry.

A new policy service group can be added by clicking **Add Service Group**, entering a **Service group name**, and clicking **Create**.

An existing policy service group can be deleted by clicking the trash bin icon and confirming by clicking **Delete**.

Add a Server

To add an available host to the service group:

1. On the **Service Group** page, click **Add Servers**.
2. In the **Add Servers** list, select **Add** to add a host to the service group.

Add a Client

To add an available host to the service group:

1. On the **Service Group** page, click **Add Clients**.
2. In the **Add Clients** list, select **Add** to add a host to the service group.

Promote a Server

To promote a secondary RNS server in the service group, click **Promote**. The server's role will be set as a **Primary** RNS server and the previous primary will be set to the **Secondary** role.

Remove a Server or Client

To remove a server or client from the service group, select **Remove** on a server or client entry and confirm by clicking **OK**.

> **Note:** *A Primary RNS server must be demoted to a Secondary role before it can be removed.*

Manage Log Archive Service Groups

Log Archive service groups define where audit and event logs are archived. To manage Log Archive service groups, select **Log Archive** from the **Service Group Categories** list and choose a service group entry.

A new policy service group can be added by clicking **Add Service Group**, entering a **Service group name**, and clicking **Create**.

An existing policy service group can be deleted by clicking the trash bin icon and confirming by clicking **Delete**.

Add a Server

To add an available host to the service group:

1. On the **Service Group** page, click **Add Servers**.
2. In the **Add Servers** list, select **Add** to add a host to the service group.

Add a Client

To add an available host to the service group:

1. On the **Service Group** page, click **Add Clients**.
2. In the **Add Clients** list, select **Add** to add a host to the service group.

Promote a Server

To promote a secondary RNS server in the service group, click **Promote**. The server's role will be set as a **Primary** RNS server and the previous primary will be set to the **Secondary** role.

Remove a Server or Client

To remove a server or client from the service group, select **Remove** on a server or client entry and confirm by clicking **OK**.

> **Note:** *A Primary RNS server must be demoted to a Secondary role before it can be removed.*

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Configure Settings and Manage Software

From the **Settings** menu option, you can configure the following:

- **Console Access**: Add new users and groups to BeyondInsight for Unix & Linux.
- **Roles**: Manage the assignment of roles to users.
- **Software**: Manage BeyondTrust software versions.
- **System**: Manage BeyondInsight for Unix & Linux settings.
- **Directory Services**: Manage directory services connections.
- **Integration**: Manage integration settings for external BeyondTrust integrations.
- **Certificates**: Manage certificates.

Manage BeyondInsight for Unix & Linux Settings

Deployment Settings

To configure deployment settings:

1. Select the **Settings** menu.
2. Click **System**.
3. Set the **Remote Working Directory** for deployments. For example, **/tmp**.
4. Enable or disable **Verify SSH Fingerprints** to verify if a host is trusted by BeyondInsight for Unix & Linux by default upon discovery.
5. Click **Save Settings**.

Authentication Timeout Settings

The following options are available to configure **Authentication Timeout Settings** for the BeyondInsight for Unix & Linux console. The settings are specified in minutes.

- **Total Session Length**
- **Session Timeout Warning**
- **Total Idle Length**
- **Idle Timeout Warning**

Application Settings

Configure application settings if you want to use the password reset feature available on the BeyondInsight for Unix & Linux logon page.

> 📌 *Note: Enforce Email Verification is not available if there are no users with the **sysadmin** role or **accountadmin** role with a verified email, or if the currently logged on user has not verified their address. This is to prevent a lockout.*

1. Enter the base URL for BeyondInsight for Unix & Linux. For a standalone deployment with default port, the URL is https://<hostname>:4443/. On the BeyondTrust appliance, the URL is https://<hostname>/pbsmc/. The BeyondInsight for Unix & Linux URL is required for password reset and email verification; the URL is used to format links in emails.

2. (Optional). Turn on **Enforce Email Verification**. When this setting is turned on, BeyondInsight for Unix & Linux users must have verified email addresses to authenticate. When the email account is verified and authenticated, the password reset link on the logon page is available to the user.

User Lockout Settings

A user can try to log on five times (the default value) before the account is locked out. The default lockout period is 30 minutes. You can change the default settings

Lockout settings are on by default.

To change default lockout settings:

1. Select the **Settings** menu.
2. Click **System**.
3. Set the number of attempts the user can try to logon. The default is 5.
4. Set the authentication window for logon attempts. This is the length of time the user can try to logon. The default is 5 minutes.
5. Set the user lockout period. The default is 30 minutes.
6. Click **Save Settings**.

An administrator can unlock a user account on the **User Details** page in the Console Access. Select the user and click **Unlock User**.

> ℹ️ For more information, please see .

Set up Password Reset

A **Reset Password** link is available on the BeyondInsight for Unix & Linux logon page. A local user must verify their email address to use the password reset feature. Verifying the email address must be completed (regardless of whether the account verification is enabled).

> 📌 *Note:* The password reset feature is not available to directory service users.

To use the **Reset Password** link for local accounts, the following must be in place:

- SMTP settings must be configured for your mail server. If the SMTP server is not configured the **Send Verification Email** option is not available.
- Application settings must be configured.
- The email address for your BeyondInsight for Unix & Linux account must be verified and authenticated. Only after the address is verified can it be used to reset a password.

A BIUL administrator can send a verification email.

To send an email verification:

1. Click the **Settings** menu, and then click **Console Access**.
2. Click the **Users** tab.
3. Click the edit icon for a local user account to display the **User Details** page.
4. Click **Send Verification Email**.

The user receiving the verification email must click the link and provide credentials to authenticate the account. After this authentication the email account is verified and can be used in a password reset.

Configure Role-Based Access

Access control provides a role-based system to authenticate users in BeyondInsight for Unix & Linux. Users are assigned roles based on the level of access they need to do their BeyondInsight for Unix & Linux job functions.

Areas in the console require certain permissions. If a user is not assigned those permissions, then they cannot access those features in the console. For example, the **policyadmin** role is required for an authenticated user to interact with policy.

Roles can be assigned to either a user account or a group.

> **Note:** *The account created during the first run wizard is assigned the **sysadmin** role. This role has full privileges in the system.*

The following roles are available:

- **sysadmin**: All roles; can do everything
- **policyadmin**: Full access to policy management
- **softwareadmin**: Full access to software management (deploy software, remove, etc.)
- **auditor**: Full access to log features
- **accountadmin**: Full access to controlling console access
- **apiuser**: Full access to using the public REST API

Full access to the entitlement gives the user or group the following permission attributes: **create**, **view**, **update**, and **delete**.

You can assign roles in two ways:

- On the **Settings > Console Access > Users** page. Provision roles on the details page for users and groups.
- On the **Settings > Roles > Users** page. See the following sections for details.

> *For more information on provisioning roles for users, please see .*

Assign a Role to User Accounts

1. Click **Settings > Roles**.
2. Select a role from the list.
3. Click the **Users** tab or **Groups** tab.
4. Click the toggle **Show users with/without this role** to see users not currently in the role. Check the boxes for users you want to add.
5. Click **Add Selected Users**.
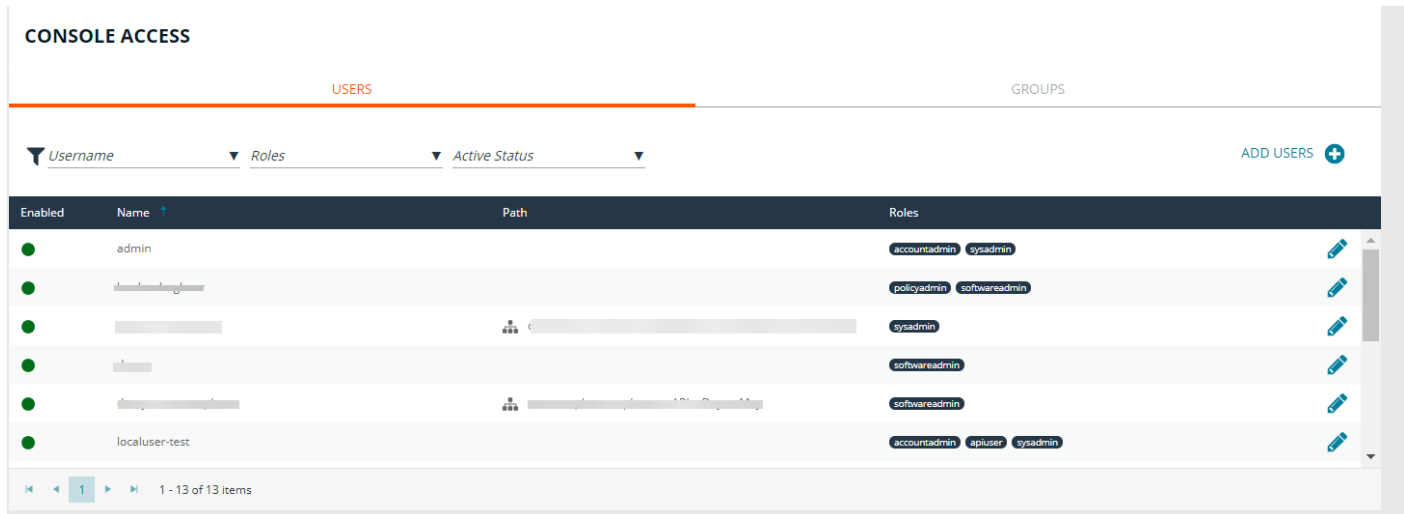
Assign a Role to Groups

1. Select **Settings > Roles**.
2. Select a role from the list.
3. Click the toggle **Show groups with/without this role** to see groups not currently in the role.

4. Check the boxes for groups you want to add.

5. Click **Add Selected Groups**.

Manage BeyondInsight for Unix & Linux Console Access

You can add and manage user accounts and groups in the console.

Add a Local User Account

1. Select the **Settings** menu.

2. Click the **Console Access** tile.

3. Click the **Users** tab, and then click **Add Users**.

4. Click **Add > Local User**.

5. Enter the following information:

    - **Enabled**: Enable or disable the user account.
    - **Username:** This will be used to authenticate the account in the console and must be unique in the system. Once the **Username** has been saved, it cannot be changed.
    - **First Name:** The user's first name.
    - **Last Name:** The user's last name.
    - **Email:** The user's email address.
    - **Password:** The user's password. Used to authenticate the account in the console. Must be at least 8 characters.
    - **Confirm Password:** Must match the **Password** value.

6. Click **Create User**.

Assign a Role to a User Account

1. Select the **Settings** menu.
2. Click the **Console Access** tile.
3. In the **Console Access** list, click the **Users** tab.
4. Click the edit icon for a local user account to display the **User Details** page.
5. Click the **Roles** tab.
6. Select from the following roles:
   - **System Administrator**
   - **API User**
   - **Auditor**
   - **Account Administrator**
   - **Policy Administrator**
   - **Software Administrator**

> For more information about role-based access, please see *"Configure Role-Based Access" on page 43*.

Update a Local User Account

1. Select the **Settings** menu.
2. Click the **Console Access** tile.
3. In the **Console Access** list, click the **Users** tab.
4. Click the edit icon for a local user account to display the **User Details** page.
5. The following configuration options are available:
   - **Enabled**: Enable or disable the user account.
   - **First Name**: The user's first name.
   - **Last Name**: The user's last name.
   - **Email**: The user's email address.
6. Click **Save User**.

Update Password for a Local User Account

1. Select the **Settings** menu.
2. Click the **Console Access** tile.
3. In the **Console Access** list, click the **Users** tab.
4. Click the edit icon for a local user account to display the **User Details** page.
5. Click **Authentication**.
6. Change the password, and then click **Update Password**.

Delete a Local User Account

1. Select the **Settings** menu.
2. Click the **Console Access** tile.
3. In the **Console Access** list, click the **Users** tab.
4. Click the edit icon for a local user account to display the **User Details** page.
5. Click the trashcan, and then click **OK** to confirm the deletion.

Add a Directory Services User

1. Select the **Settings** menu.
2. Click the **Console Access** tile.
3. In the **Console Access** list, click the **Users** tab.
4. Click **Add Users**.
5. From the **Add** menu, select **Directory services**.
6. Select the Directory services **Forest** and **Domain**.
7. To search in an organizational unit (OU), click **Browse** and select an OU.
8. In the **Search for** box, enter the search criteria for the Directory services object.
9. Click **Search Directory service**. Search results are displayed.
10. Select the user or group from the search results and it is added to the **Console Access** list.

📌 **Note:** *The user is enabled or disabled depending on the Directory services configuration. The object configuration must be updated using Directory services.*

Add a Directory Services Group

You can only add a group already created in Directory services. The group is enabled or disabled depending on the Directory services configuration. The object configuration must be updated using Directory services.

1. Select the **Settings** menu.
2. Click the **Console Access** tile.
3. In the **Console Access** list, click the **Groups** tab.
4. Click **Add Groups**.
5. Select the Directory services **Forest** and **Domain**.
6. To search in an organizational unit (OU), click **Browse** and select an OU.

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7. In **Search for**, enter the search criteria for the Directory Services object.

8. Click **Search Directory service**. Search results are displayed.

9. Select the group from the search results and it is added to the **Console Access** list.

Assign a Role to a Group

1. Select the **Settings** menu.

2. Click the **Console Access** tile.

3. In the **Console Access** list, click the **Groups** tab.

4. Click the edit icon for a group to display the **Group Details** page.

5. Select the **Roles** tab.

6. Select from the following roles:
    - **System Administrator**
    - **API User**
    - **Auditor**
    - **Account Administrator**
    - **Policy Administrator**
    - **Software Administrator**

> *For more information about role-based access, please see "Configure Role-Based Access" on page 43.*

Delete a Directory Services User or Group

1. Select the **Settings** menu.

2. Click the **Console Access** tile.

3. In the **Console Access** list, click the **Users** or **Groups** tab. The update section is displayed.

4. From the update section, select the user or group and click the trashcan.

5. Click **OK** to confirm the deletion.

Unlock a User Account

1. Select the **Settings** menu.

2. Click the **Console Access** tile.

3. In the **Console Access** list, click the **Users** tab.

4. Find the user account in the list, and then click the edit icon.

5. Click **Unlock User**.

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Integrate Password Safe with BeyondInsight for Unix & Linux

Use Password Safe to Manage Credentials

You can use Password Safe to manage credentials. Then, when you run actions on your hosts, passwords are retrieved at runtime from Password Safe rather than storing the passwords locally.

This section provides Password Safe configuration information within the console.

> **ℹ️** *For more information on configuring Password Safe, please see BeyondTrust Password Safe Guides at https://www.beyondtrust.com/docs/beyondinsight-password-safe/ps/index.htm.*

Configure Password Safe

Configure the settings for the Password Safe server. To configure the Password Safe integration:

1. In the console, select the **Settings** menu.
2. Click **Integration**.
3. Enter the following information:
   - **Password Safe Server:** The location of the Password Safe server. Do not add a trailing slash. For example, https://pbps_server.
   - **API Key:** The API key generated in BeyondInsight.
   - **RunAs User:** The BeyondInsight account under which the requests will be made. This Password Safe user must be in a **User Group** with API access and with an access policy that has auto-approve enabled for access.
   - **Description:** A text entry to provide any additional details (optional).
   - **Verify certificate:** Disabling this option bypasses certificate validation.
4. (Optional). Click **Test Settings** to ensure the connection works.
5. Click **Save Settings**.

Import Password Safe Managed Accounts

A Password Safe managed account must be imported as a BeyondInsight for Unix & Linux credential.

> **📌** *Note: Password Safe account details such as **username** and **password** cannot be changed in BIUL. These details are read-only values. The password is managed by Password Safe and retrieved dynamically.*

To import a managed account:

1. In the console, go to **Hosts > Host Credentials**.
2. Click **Manage Credentials** and select **Import from Password Safe**.

3. Select the managed accounts from the list of results the console can access and click **Import Selected**. The managed accounts can be filtered by **Username** and **Description**. Imported accounts are displayed on the **Credentials** page.

> *Note: A status 200 might be displayed if the selected managed account already exists as a console credential.*

The following example is intended to provide a high-level configuration and is provided only as an overview.

> *Example: In this example, the goal is to use an account called **biul_user** on a host at 10.100.10.10 to perform a **Profile Servers** action. BeyondInsight/Password Safe is running at https://my_pbps.*
>
> 1. *Enable **biul_user** in the Password Safe API.*
>
>   - *In BeyondInsight, add the 10.100.10.10 asset if required, and then choose the **Add/ Edit Password Safe** option for 10.100.10.10 in the **Assets** grid.*
>   - *On the **Local Accounts** tab, select **Add**, and then provide the details for **biul_user**. Ensure the **Enable for API Access** option is selected.*
>
> 2. *Get an API Key and whitelist **BeyondInsight for Unix & Linux**:*
>
>   - *In BeyondInsight, go to **Configure > Password Safe > Application API Registration**.*
>   - *Create a new registration.*
>   - *Add the BeyondInsight for Unix & Linux IP address to the source addresses list.*
>   - *Disable the certificate required option.*
>   - *An API key is generated when the registration is saved. This key is used in console.*
>
> 3. *Configure an Access Policy in BeyondInsight:*
>
>   - *Go to **Configure > Password Safe > Access Policies**.*
>   - *Create a policy.*
>   - *In the **Access** section, ensure **Approvers** is set to auto-approve.*
>
> 4. *Configure an API User Group in BeyondInsight:*
>
>   - *Go to **Configure > Accounts**.*
>   - *Create a group. Ensure **Enable API Application** is selected and the registered application is selected.*
>   - *In **Smart Rules**, select the **Roles** option for the **All Managed Accounts** rule.*
>   - *Choose **Requestor** under **Password Safe**.*
>   - *Select the access policy created earlier as the access policy.*
>
> 5. *Create an API User in BeyondInsight:*
>
>   - *Go to **Configure > Accounts**, and add an account. Ensure it belongs to the group created earlier.*
>
> 6. *Configure Password Safe in BeyondInsight for Unix & Linux:*
>
>   - *Go to **Settings > Integration**.*
>   - *Enter the details for the Password Safe server. The **API Key** was obtained in step 2 and the **RunAs User** is the account created in step 5. The URL would be https://my_pbps.*
>
> 7. *Add **biul_user** to BeyondInsight for Unix & Linux:*
>
>   - *Go to **Hosts > Credentials**.*
>   - *Click **Add Credential** and select **Import from Password Safe**.*

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> - *In the list, select **biul_user**.*
> - *Click **Import Selected**. The imported account is displayed on the **Credentials** page.*
>
> 8. *Use the **biul_user** in the console:*
>   - *From the **Hosts > Host Inventory** page, choose **Perform an Action > Profile Servers**, select a host, and select **Perform Host Actions** from the menu.*
>   - *Select **Privilege Management for Unix and Linux**, and then select **Profile**.*
>   - *On the Credential Management page, select the **biul_user**.*
>   - *Go through the remaining pages on the Perform Host Actions wizard.*

Configure the Privilege Management for Unix and Linux Integration

Upload key files to confirm the files on the host are synchronized with the keys used by the console.

> **Note:** *If no key files are present, the console creates them during the next installation of Privilege Management for Unix and Linux for versions 9.4.5 and later.*

To configure Privilege Management for Unix and Linux:

1. In the console, select the **Settings** menu, then click **Integration**.
2. Turn on **Bypass SSL certificate validation** if you do not want to verify certificates.
3. Choose whether to enable or disable **Role entitlement reporting by default**.
4. Choose whether to enable or disable **Prevent role entitlement reporting override**. When the toggle is enabled, all new role based policies will default to entitlement reporting enabled, or vice versa if set to **false**. The setting can be locked so the default value is both set and unchangeable per policy. This is for new policies only; disabling entitlement reporting will not change the values for existing policies.
5. Upload network or REST key files to the console.

Manage Software

View Software Managed by BeyondInsight for Unix & Linux

The **Settings > Software** page lists the software managed by BeyondInsight for Unix & Linux. Basic information includes:
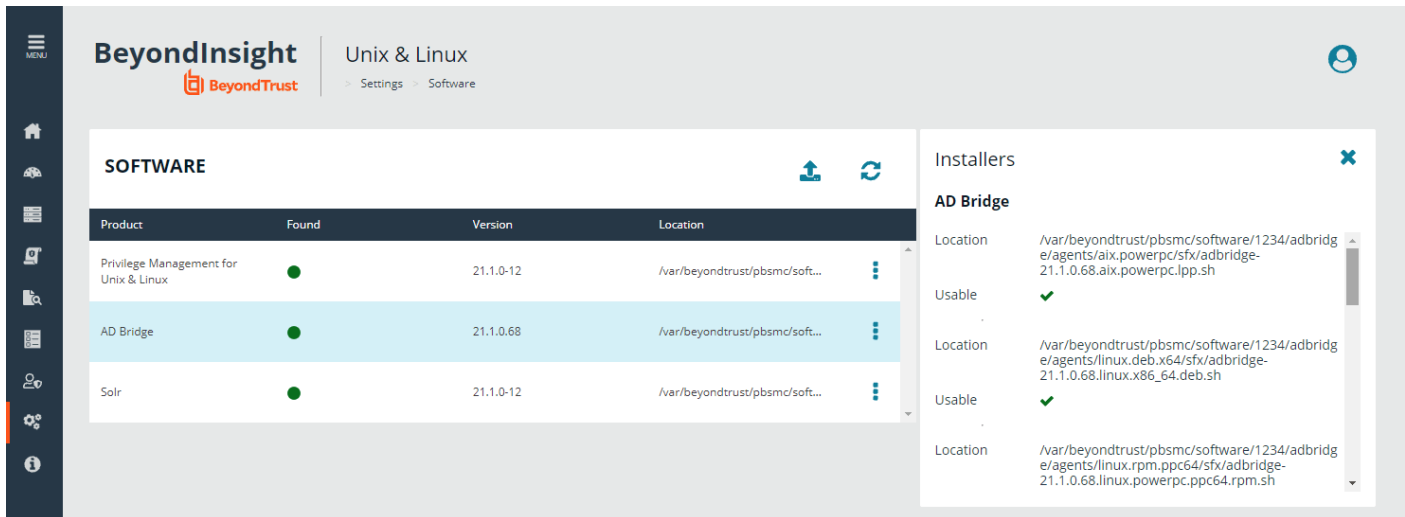
- Product name
- Visual indication the software is present (green dot) or not (gray dot)
- Version currently installed
- Location of the software

Click the **Refresh** icon to update the list.

View Software Details

On the **Settings > Software** page, you can get more detailed information for each software product listed. To view details on specific software, at the far right of the software listing, click the vertical ellipsis menu icon, and then select **View Details**. The **Installers** side panel

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appears at the right of the software product table. The panel list is scrollable.

To view details for a different product, click the **vertical ellipsis** on that product's row. The **Installers** side panel displays the new product information.

To close the panel, at the top-right of the panel, click the **X** button.

Upload Software Packages

You can upload Privilege Management for Unix and Linux and AD Bridge software packages on the Software page.

> For more information, please see *"Upload Software" on page 9*.

Privilege Management for Unix and Linux Installation Templates

Use installation templates to apply different components to a PMUL server.

There are templates available that are ready-only:

- All components
- License Server only
- Policy and Log Server
- Submit and Run Host Only
- Primary Registry Server and All Components

Apply an installation template when running the Host Actions wizard for a PMUL install.

> For more information, please see *"Install the Privilege Management for Unix and Linux Policy Server" on page 23*.

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Create an Installation Template

You can create a custom installation template. For example, you might want a template to only install the log server feature. Create a template called **Log Server** and select only **Install Log Server**.

You can select an existing template and click **Clone** to start with a base configuration for a new template.

To create an installation template:

1. Select **Settings > Software**.
2. At the far right of a product row, click the vertical ellipsis menu icon, and then select **Manage Installation Templates**.
3. Click **Add New Template**.
4. Enter a meaningful name for the template, and then click **Create**.
5. Select the template options. The template settings are automatically saved.

Add a Directory Service Connection

BeyondInsight for Unix & Linux supports connections to the following directory service providers:

- Active Directory
- Red Hat Identity Management (IdM)/FreeIPA
- OpenLDAP

More than one directory service provider can be configured in the same deployment.

In some cases, the connection type might be set to **Unknown**. This can occur if the data existed previous to BIUL 9.4. The connection will work. However, we recommend selecting the appropriate connection type from the list.

To add a connection:

1. Select the **Settings** menu, and then click **Directory Services**.
2. Click **Add Connection**.
3. Select the connection type from the list.
4. Select the settings for the connection, including domain, user credentials, and port. Ensure the correct format is used for the user names.
   - Active Directory: Enter the user name in the user principal name (UPN) format (admin@domain) or in the sAMAccountName format (domain@admin).
   - IDM and OpenLDAP: Enter the user name in bind DN format (cn=admin,dc=domain,dc=tes).
5. (Optional). Click **Test Settings** to ensure the connection between BIUL and the directory service works.
6. Click **Save Directory Service Settings**.

Delete a Directory Connection

1. Select the **Settings** menu, and then click **Directory Services**.
2. Select a connection.
3. Click **Delete Connection**.
4. Click **Delete** to confirm.

Add SMTP Server Connection

Add SMTP server details if you want to provide local BIUL users access to the **Reset Password** link on the BeyondInsight for Unix & Linux logon page. Using the password reset feature requires a verified email address.

1. Select the **Settings** menu.
2. Click the **Integration** tile.
3. Enter the information for the mail server, including: server address, port, and user credentials.
4. (Optional). Click **Test Settings** to ensure there is a connection to the mail server.
5. Click **Save Settings**.

> *For more information on setting up a local account to use password reset, please see* .

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Manage Privilege Management for Unix and Linux Policies

The **Policy Management** section allows the user to manage creating, updating, and deleting Privilege Management for Unix and Linux policies for the following:

- Sudo
- FIM
- Script Policy
- Role-Based Policy
- Privilege Manage for Networks

To manage policies, the user must select the policy server on which the policy resides, and then choose the type of policy they wish to manage. Hosts can be filtered by **Hostname** and **IP Address**. The policy server list is made of known policy servers with working REST connections. If a server is listed in grey, the server has an unsupported version of Privilege Management for Unix and Linux installed and should be upgraded to enable policy management.

> *Note: If the host is configured as a client in the Registry Name Service, you must edit policy on the primary registry server.*

> *For more information on policies, please see the Privilege Management for Unix and Linux Administration Guide and the Privilege Management for Unix and Linux Policy Language Guide at https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm.*

Role Based vs. Script Based Policies

A Privilege Management for Unix and Linux policy server is either in Role-Based or Script-Based policy mode. A server in Role-Based mode only uses role-based policy and ignores all script policies. A server in Script-Based policy mode only uses script policies.

When accessing the **Policy Management** page for a selected host, the landing page indicates the policy mode the host is using: Role-Based or Script-Based. The other policy shows as not configured. As shown in the following screen capture, you can click the **configured** link to go to **Policy Settings** and change the policy type.

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Manage Policy Server Mode

To manage a script policy on a server which is in role-based mode, you can switch the server mode. You can also switch from Script Policy mode to Role-Based mode.

> 📌 **Note:** *Switching modes disables the previously configured mode and policies are no longer available to requesting clients. Policies are not removed when switching modes. This option can be changed at any time.*

To manage Policy Server mode:
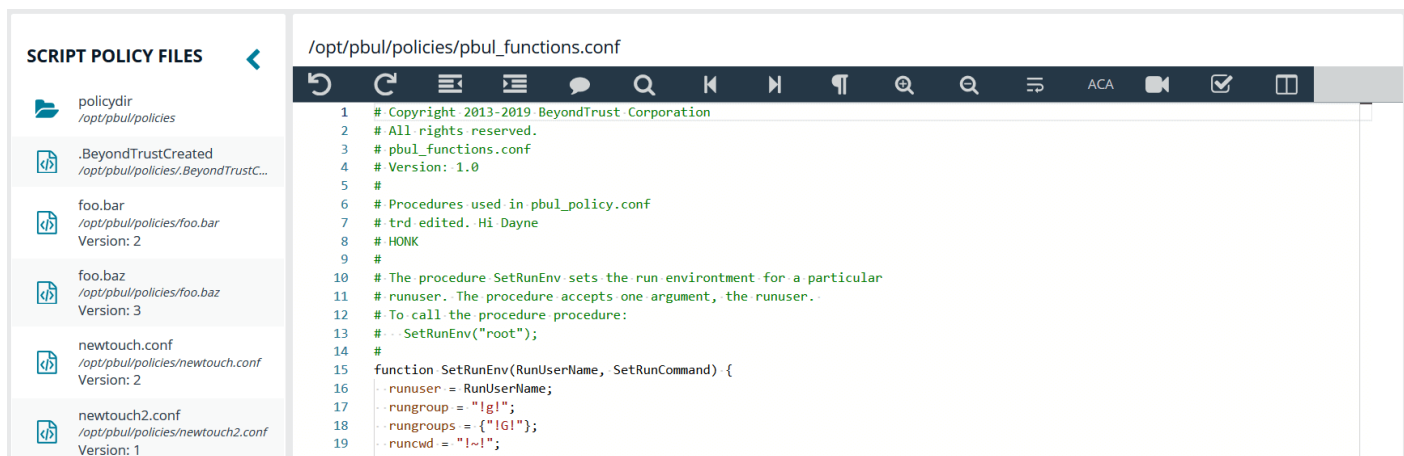
1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the vertical ellipsis menu icon and select **Server Details**.
3. On the **Server Details** page, select **Quick Actions > Configure Privilege Management for Unix & Linux Settings**.
4. In the **Policy Mode** section, click **Enable Script Based Policy** or **Enable Role Based Policy** to enable the preferred policy mode.

BeyondInsight for Unix & Linux Code Editor

BeyondInsight for Unix & Linux provides an editor component with a number of features to assist with writing code.

- Syntax highlighting
- Line numbering
- Font size control
- Formatting
- Find and replace tools
- Soft wrapping
- Diff tool

Different toolbar options may be available based on the type of script in the editor. Most of the features are available in the toolbar, and keyboard shortcuts can also be used. The editor is used in the **Policy Management** section where applicable.

Using the Diff Tool

Use the diff tool to compare different versions of a policy. The policy must have change management turned on and versions of the policy must exist in the database.

To use the diff tool:

1. Select the policy, and then click the **Versions** toolbar button.

2. Select a version to compare. The differences are calculated and highlighted. Change the content in the current policy, if needed.

3. Click **Close Diff Editor**.
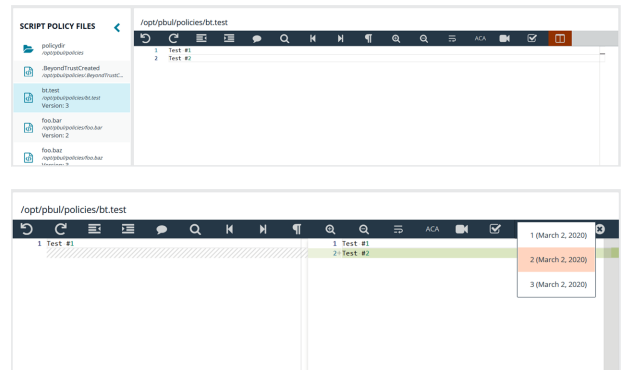
Version Control

Some policy types support version control. Each time a policy is changed, its version is incremented. The policy with the highest version is the one that is applied.

For policies that support version control, a **Versions** menu is available to allow the user to choose a specific version to edit.

> 📌 **Note:** *Saving a policy makes it the most recent version, which makes it the active policy. Take this into consideration when saving older versions of the files.*

Change Management

BeyondInsight for Unix & Linux allows users to enable Change Management in the console.

If Change Management is not enabled on the selected server, the option to enable change management is available in the console.

> ⚠ **IMPORTANT!**
>
> *Once Change Management is enabled, it cannot be disabled.*

To enable Change Management:

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the vertical ellipsis menu icon and select **Server Details**.
3. On the **Server Details** page, select **Quick Actions > Configure Privilege Management for Unix & Linux Settings**.
4. Click the **Enable Change Management** button.

Manage Privilege Management for Unix and Linux Role Based Policies

> **Note:** *Role-based policy management is disabled on hosts configured to use script-based policy. For more information, please see "Role Based vs. Script Based Policies" on page 54.*

A Privilege Management for Unix and Linux role-based policy defines which users can use commands and when they can perform these actions on hosts. These role entities are then associated to a role. A **User**, **Host**, **Command**, and **Schedule** entity can be used in multiple roles, allowing the user to create a single definition and share it. The role-based policy editor is divided into sections allowing for the management of roles and each of the role entities.

Choose the Privilege Management for Unix and Linux role-based policy option and an appropriate policy server from the selection lists to load the **Role Based Policy** menu.

ROLES	WHO	WHAT	WHERE	WHEN	BACKUP & RESTORE
Roles define core policy behaviour and represent combinations of Users, Hosts, Commands and Schedules to which the policy applies	Users and User Groups determine who the role will be applied to	Command Groups determine which commands will be allowed or rejected	Host Groups determine where the roles will be applied	Schedule Groups determine when the roles will be applied	Backup, restore, or revert to a specific policy version

> **Note:** *Fields may be disabled during policy configuration when the options are not available for the installed version of Privilege Management for Unix and Linux.*

Entitlement Reporting

PMUL hosts running 10.1 and later in **Role Based Policy Mode** can take advantage of Entitlement reporting to discover who is able to do what, where, and when.

Entitlement reporting can be enabled per policy or to all role-based policies.

A default value for reporting can be configured in **Settings**; if enabled, all new role-based policies defaults to entitlement reporting enabled, or vice versa if set to **false**. Additionally, this setting can be locked so the default value is both set and unchangeable per policy. This is for new policies only; disabling entitlement reporting does not change the values for existing policies.

> *For more information, please see the following:*
> - *"Configure the Privilege Management for Unix and Linux Integration" on page 50.*
> - *"View Entitlement Reports" on page 81.*

Manage Role Based Policy Roles

A list of available roles shows the existing entities. This list is searchable and can be filtered by **Enabled**, **Disabled**, or all options. Selecting the **Add Role** option creates a role. To edit an existing role, select an entry from the **Roles** list and click **Edit**. To delete an existing role, select an entry from the **Roles** list and click **Delete**.

Role Ordering

The order in which role-based policies are applied can be set by ordering the roles in the list of available roles. Click and drag a role entry up or down in the **Roles** list to establish the priority order. Changes to role order is saved automatically.

General

The following options are available:

- **Role name**: This should be unique on the policy server.
- **Tag**: Add a tag to the role. Once added, tags function as a filter and can be used to sort through policy roles.
- **Description**: A brief description to identify the role.
- **Comment**: The admin can add a comment here. These are only visible to the admin.
- **Role Risk Level**: The perceived risk level of the policy.
- **Request Type**: Allows the administrator to specify which request types this policy will apply to. For example, a policy might apply to commands issued only by **pbrun** invocations. Use the dropdown to select the appropriate request type, or select **Any**. The default value is to allow any request type.
- **Policy Enabled**: Whether or not the role is active (default **Enabled**).
- **Action**: Whether this should trigger an accept or reject action (default **Accept**).
- **Entitlement Reporting**: Whether or not Entitlement Reporting is enabled (default **Disabled**).

Assignments

Assign allowed users, hosts, commands, and schedule to a role. Each role can have zero to many relationships with each entity type. This is managed using the lists matching the appropriate entity. The following configuration sections are available:

- **Who**: Defines which users the policy applies to. This item is divided into two user types:

    - **Submit Users**
    - **Run Users**

    These lists contain the user entities.

    Select **Use Default Group and Working Directory** to automatically populate the run users in a script block on the **Script Policy** page. Changing the block properties is not recommended.

- **What**: Defines which commands the policy applies to. This list contains the command entities.

- **Where**: Defines which hosts the policy applies to. This item is divided into two user types:

    - **Submit Hosts**
    - **Run Hosts**

    These lists contain the host entities.

- **When**: Defines which schedule the policy applies to. This list contains the schedule entities.
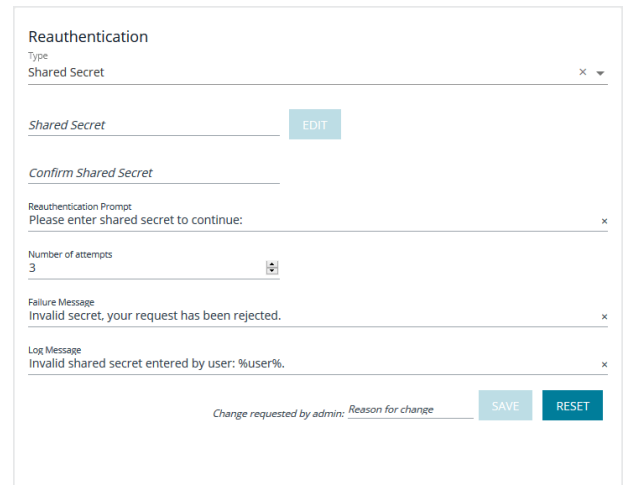
Reauthentication

If configured, this feature requires users to reauthenticate themselves when this policy is invoked. Only one reauthentication method can be configured per policy. Most reauthentication options allow for customization of messages and prompts to be displayed to the user as well as logs. Reauthentication can be enabled in a number of configurations:

- **None:** Reauthentication is not required.
- **Shared Secret**: Create a shared secret value. The user must provide it to reauthenticate.
- **PAM:** A number of PAM modules can be selected, or a custom one can be provided. Additionally, most options allow the user to configure where the authentication will occur. To enable reauthentication, choose the **Type** from the dropdown menu; this opens an appropriate editor for the selected type.
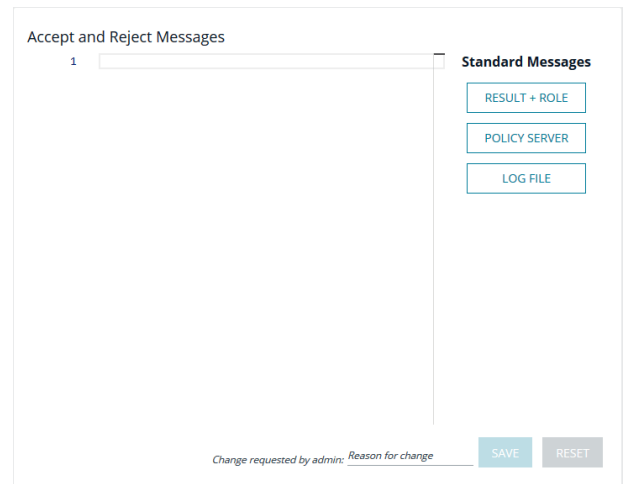
To configure this option:

1. Use the **Type** dropdown to select the desired type of reauthentication. Depending on the selected type, fill in the requested information.

2. Type in a message to prompt the user on how to proceed.

3. Enter the number of retries before reauthentication locks up.

4. Enter the message the user sees if reauthentication fails.

5. Enter the message that is recorded in the log when reauthentication fails.

6. In the **Change requested by [loggedInUserName]** field, enter a reason for the assignment or change.

7. Click **Save**.

Messages

Enables the administrator to output a message to the user when this policy is processed. This field can interpolate variables to provide a custom, context specific message using the PMUL template syntax of **%<variable>%**. A few options are available using buttons to quickly insert the most popular options. Values can also be entered freely.

Session Replay

Generate a file location for session replay logs and configure **Path Options**.The **Session Replay Location** field allows for the use of variables in the file name. BIUL provides a template builder to assist with creating the path; select the build option, provide a path to save the file, and select the desired variable options. Values can also be entered freely.

Script Policy

A configuration area to include a custom script. Script policy can be entered into the code editor to set the script content.

Manage Role Based Policy Users and User Groups

Users and user groups determine who the role will be applied to.

Enabled	Name	Type	Description	Read-only
●	Administrator	Active Directory	Built-in account for administering the computer/domain	
●	Everyone	Secure	All Users	✔
●	PBSMC_API	Active Directory		
●	PBSMC_CLIENT	Active Directory		
●	Steve	Secure		
●	TestGroup1	Active Directory		
●	TestGroup3	Active Directory		
●	abrt	System		
●	adm	System		
●	audio	System		
●	bin	System		

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> **Note:** *Role-based policy management is disabled on hosts configured to use script-based policy. For more information, please see* *"Role Based vs. Script Based Policies" on page 54*.

User and User Group Types

There are three types of users and user groups:

- **Secure**: A user or group not associated with any system. The name and credential are added to the policy.
- **System**: The users and groups are retrieved from the selected host. System roles are only available with Privilege Management for Unix and Linux versions 9.4.4 or later.
- **Directory Service**: The users and groups are retrieved from Directory Service. Create a connection to Directory Service on the **Settings > Integration** page.

> **Note:** *If a wildcard character (*) is in the username, the user is treated as a group.*

Add a Secure User

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.
3. Click **Policy**.
4. Click **Who**.
5. Click **Add User / Group** and select **Secure User**.
6. Enter **Username**, **Description**, and choose to enable or disable the entry.
7. Click **Save Changes**.

Add a Secure Group

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.
3. Click **Policy**.
4. Click **Who**.
5. Click **Add User / Group** and select **Secure Group**.
6. Enter **Group name**, **Description**, and choose to make the group active or inactive.
7. In the **Group members** section, enter existing secure users in the **Username** field to add them to the group.
8. Click **Save Changes**.

Delete a Secure User or Group

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.
3. Click **Policy**.
4. Click **Who**.

5. Select a secure user or group entry from the **Users** list.

6. On the **Users and Groups** pane, click **Delete User** or **Delete Group** to delete the entry.

Add a System User or Group

1. Go to the **Policy Management** page.

2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.

3. Click **Policy**.

4. Click **Who**.

5. Click **Add User / Group** and select **System User** or **System Group**. A list of available entries is displayed on the **Users and Groups** pane.

6. On the **Users and Groups** pane, check the box to import users or user groups. The imported users or user groups are displayed in the **Users** list.

Remove a System User or Group

1. Go to the **Policy Management** page.

2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.

3. Click **Policy**.

4. Click **Who**.

5. Select a system user or group entry from the **Users** list.

6. On the **Users and Groups** pane, click **Remove User** or **Remove User Group** to remove the entry.

Add a Directory Service User or Group

1. Go to the **Policy Management** page.

2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.

3. Click **Policy**.

4. Click **Who**.

5. Click **Add User / Group** and select **Directory Service Users and Groups**.

6. On the **Users and Groups** pane, select the **Search Type** to **Find Users** or **Find Groups**.

7. Enter the **Forest** and **Domain**.

8. Click **Browse** to filter by organizational unit (OU) and enter criteria in the **Search for** field.

9. Click **Search Directory Service**.

10. Check the box to import Directory Service users or user groups. The imported users or user groups are displayed in the **Users** list.

Remove a Directory Service User or Group

1. Go to the **Policy Management** page.

2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.

3. Click **Policy**.

4. Click **Who**.

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5. Select a Directory Service user or group entry from the **Users** list.

6. On the **Users and Groups** pane, click **Remove User** or **Remove Group** to remove the entry.

Manage Role Based Policy Command Groups

Command Groups determine which commands will be allowed or rejected.

COMMAND GROUPS		
Enabled ▼	Name ▼	Description ▼	ADD COMMAND GROUP ⊕

Enabled	Name	Description
●	basic commands	simple commands for demo
●	smancon	smancon
●	test commands	the group
●	trdtest	

> 📌 **Note:** Role-based policy management is disabled on hosts configured to use script-based policy. For more information, please see *"Role Based vs. Script Based Policies" on page 54*.

Add a Command Group

1. Go to the **Policy Management** page.

2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.

3. Click **Policy**.

4. Click **What**.

5. Click **Add Command Group**.

6. Enter **Command Group Name**, **Command Group Description**, and choose whether the Command Group is enabled or disabled.

7. Enter **Commands**. When adding a command to the list, you must enter **Command**, which is the command a Privilege Management for Unix and Linux user types. Optionally, you can enter **Executed**, which is executed in place of the **Command**.

8. Click **Save**.

Delete a Command Group

1. Go to the **Policy Management** page.

2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.

3. Click **Policy**.

4. Click **What**.

5. Select an existing entry from the **Command Groups** list.

6. Click **Delete**.

Manage Role Based Policy Host Groups

Host Groups determine where the roles are applied.

HOST GROUPS

Enabled	Name	Description	Read-only
●	All Hosts	All Hosts	✓
●	PBSMC servers		
⊖	Rob's Servers		
●	newhostname	newhostdesc	
●	search engines		
●	smosts		

ADD HOST GROUP ⊕

|◀ ◀ **1** ▶ ▶|

> **Note:** *Role-based policy management is disabled on hosts configured to use script-based policy. For more information, please see "Role Based vs. Script Based Policies" on page 54.*

Add a Host Group

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.
3. Click **Policy**.
4. Click **Where**.
5. Click **Add Host Group**.
6. Enter **Host Group Name**, **Host Group Description**, and choose whether the Host Group is enabled or disabled.
7. Enter **Matching Hosts**.
8. Click **Save**.

Delete a Host Group

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.
3. Click **Policy**.
4. Click **Where**.
5. Select an existing entry from the **Host Groups** list.
6. Click **Delete**.

Manage Role Based Policy Schedule Groups

Schedule Groups determine when roles are applied. When adding a schedule, there are two types of dates you can create in your schedule:

- **Fixed Schedule**: Choose a specific date range. If the end date is not specified, the range defaults to continuous. If the start date is not specified, the default starts immediately.
- **Recurring Schedule**: Choose active blocks of time per day. Choose a range of 15 minute blocks per each day for a full calendar week.

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SCHEDULE GROUPS

Enabled	Name	Description	Read-only
Enabled ▼	Name ▼	Description ▼	Read Only ▼

ADD SCHEDULE GROUP ⊕

Enabled	Name	Description	Read-only
●	Any Time	Any Time	✓
⊖	Hello Schedule	Multiple Configured	
●	Working Day	Working Day	✓

|◄ ◄ **1** ► ►|

> 📌 *Note: Role-based policy management is disabled on hosts configured to use script-based policy. For more information, please see "Role Based vs. Script Based Policies" on page 54.*

Add a Schedule Group

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.
3. Click **Policy**.
4. Click **When**.
5. Click **Add Schedule Group**.
6. Enter **Schedule Group Name**, **Schedule Group Description**, and choose whether the Schedule Group is enabled or disabled.
7. Configure schedules using **Recurring Schedule** and **Fixed Schedule** options.
8. Click **Save**.

Delete a Schedule Group

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **Server Details**.
3. Click **Policy**.
4. Click **When**.
5. Select an existing entry from the **Schedule Groups** list.
6. Click **Delete**.

Manage Role Based Policy Backup and Restore

Role-based policy data can be managed in this section. Use the **Backup Role Based Policy** option to download a copy of the policy database on the selected policy server. Use the **Restore Role Based Policy** action to upload and set the current policy to the provided backup. **Version Control** can be used to restore the database to a particular version by selecting the desired version from the **Version** list and clicking **Restore Version**.

> 📌 *Note: Role-based policy management is disabled on hosts configured to use script-based policy. For more information, please see "Role Based vs. Script Based Policies" on page 54.*

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Backup Role Based Policy	Restore Role Based Policy	Version Control
Download the Role Based Policy database for later restoration	Import a Role Based Policy database to restore a previously saved state	Restore the Role Based Policy database to a specific version. All roles and group data will be reset to the selected version.
		Version ▼
	Drag JSON file to upload (or click to open file browser)	
BACKUP ROLE BASED POLICY DATABASE		RESTORE VERSION

Manage Privilege Management for Networks Policies

Privilege Management for Networks policy is managed from the **Policy Management > Server Details > Privilege Management for Networks** section. From here, you can add, delete, or clone a policy, as well as configure the settings for Privilege Management for Networks.

Privilege Management for Networks management is divided into sub-sections, which allow you to edit settings according to your specific parameters.

DEMO

- Initialization
- Variables
- Key Mappings
- Autocomplete
- Macros
- **Rules**

Rules
Execute actions based on configured matches.

➕ ADD NEW RULE

Rule title not set *Rule comment not set*	1 match	3 actions	🗑 ❯
prevent prompt reset *prevent the user from changing the prompt and inform them of the policy violation.*	1 match	1 action	🗑 ❯
Rule title not set *Rule comment not set*	1 match	1 action	🗑 ❯
Rule title not set	1 match	1 action	🗑 ❯

Initialization

Configure core policy options, including sections for login sequence and policy-wide defaults.
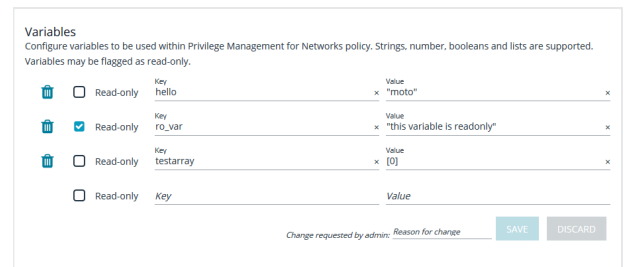
Initialization
Core policy configuration options.

Core Policy Configuration Options

Prompt
$

Remote Prompt
##prompt##:

Command wait
5000

Prompt wait
2000

Login Sequence Configuration Options

☑ Input Allowed

Successful login message
*** Login sequence successful ***

Unsuccessful login message
*** Failed login sequence - access denied ***

Successful Login Search Strings

The following configuration options are available:

- **Core Policy Configuration Options**: Enter a name for the policy, a symbol for the prompt you want to display, and a remote prompt. The remote prompt is what the system waits to see before letting the user type. Enter the time (in seconds) for the command and prompt wait.
- **Login Sequence Configuration Options**: Select whether input is allowed or not, and then type in a message to display when the login sequence is successful or unsuccessful.
- **Successful Login Search Strings**: This is what the device outputs when a login is successful. For example, the search string output can be set to *last login*. In this scenario, when you log in to your machine, the last login message is displayed to indicate you have successfully authenticated.
- **Password Matching Search Strings**: These are values to look for, should the user be prompted to enter a password. The policy will read the output from the remote system, such as a router, and if the output matches one of these configured values, this means the system is asking for authentication.
- **Prerun Commands**: These are run before the policy is executed. For example, if the policy sets the value of prompt to **Prompt**, then you know you are ready for input when you receive the prompt message.

Variables

Variables must be defined within a policy. This section is used to configure variables, set defaults, and mark variables as read-only. Strings, numbers, booleans, and lists are supported. Variables may be flagged as read-only. When finished, click **Save**.

Key Mappings

This section enables configuration of keyboard input. To set a key mapping, use the **Default $Editor** dropdown to choose the policy's default editor type (**vi** or **emacs**), and then click the **+** option next to the keyboard action. A message displays, indicating the system is waiting for input. While BIUL is listening for keystrokes, input the key or key combination you want to set. Key bindings can be cleared by selecting the **X** next to the binding. When finished, click **Save**.
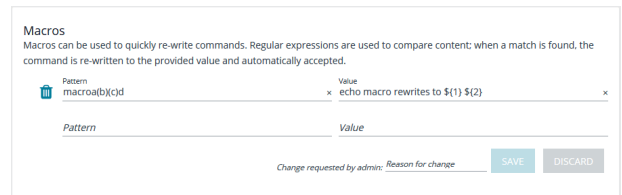

Autocomplete

In this section, you can configure word completion to assist policy end users. The configured value is compared against provided words and lines and enables autocomplete if a match is found. The user can then use the autocomplete key (**Tab**) to accept the matching value. When finished, click **Save**.
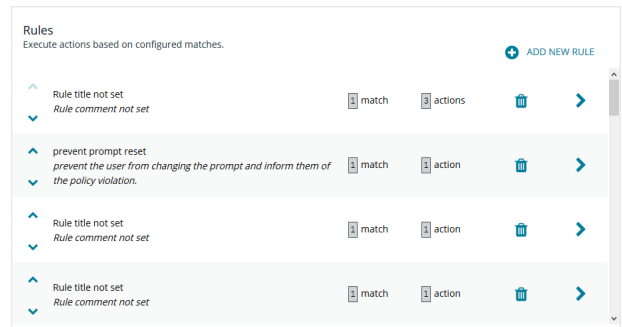
Macros

Macros can be used to quickly rewrite commands. Regular expressions are used to compare content. When a match is found, the command is re-written to the provided value and is automatically accepted. When finished, click **Save**.
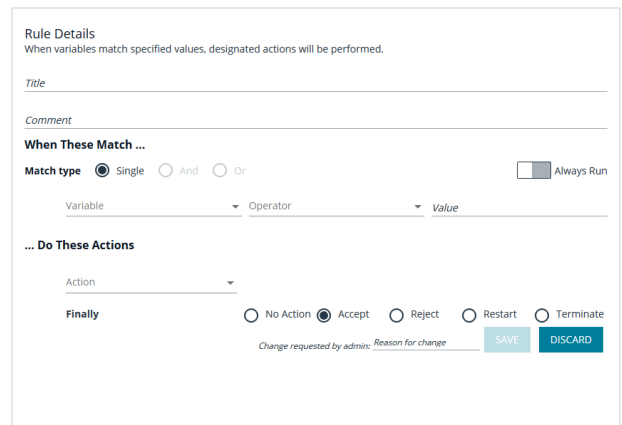
Rules

The core of Privilege Management for Networks is handled in this section. The **Rules** summary page allows you to create a new **Rule** or reorder them.

To add a new item, click **Add New Rule**. This brings up the **Rule Details** page. This is the same page that displays when you click on the chevron icon to edit an existing rule.

Within the editor one or more matches can be created where a match is a check of some sort. For example, variable equality or a regular expression result. More than one match can be joined together using either a logical *and* or logical *or*. If a match is found, the associated actions that are invoked can be configured using editor. Matches can have zero to many actions.

Add a Policy

To add a policy:

1. On the **Privilege Management for Networks** page, click **Create New Policy**.
2. Enter the **Policy name**.
3. In the **Change requested by [loggedInUserName]** field, enter a reason for the assignment or change.
4. Click **Create**.

Delete a Policy

On the **Privilege Management for Networks** page, click the trash bin icon on the policy you want to remove. Click **OK** to confirm.

Clone a Policy

You may want to clone a policy in order to make a backup, or use it as a template to create a new one. On the **Privilege Management for Networks** page, click the clone icon on an existing policy, enter a unique **Policy name**, and click **Clone**.

> *Note: Each policy requires a unique name. In order to clone a policy, you must give it a new name; otherwise, the **Clone** button does not activate.*

Configure Privilege Management for Networks

To configure Privilege Management for Networks, the path to a valid Password Safe runfile script and certificate must be provided, as well as a list of Password Safe servers that can provide credentials.

To configure Privilege Management for Networks:

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the vertical ellipsis menu icon and select **Server Details**.
3. Click the **Quick Actions** menu and select **Configure Privilege Management for Networks**.
4. Configure the following options:
   - **Password Safe Runfile**
   - **Certificate path**
   - **Password Safe Servers**
5. In the **Change requested by [loggedInUserName]** field, enter a reason for the assignment or change.
6. Click **Save**.

Manage File Integrity Monitoring Policies

Create file integrity policy definitions to monitor for file changes. A policy definition includes a target that identifies the type of object that you want to monitor. Some of the target types include directory, device, symbolic link, script, and executable.

You can assign attributes to the target type. An attribute is an action you want to monitor and includes the following examples:

- File moves
- File ownership changes

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- Date and time changes

A policy definition can contain more than one target.

Create a FIM Policy

To create a FIM policy:

1. On the **Home** page, click **Policy Management**.
2. Using the filtering options (or from the list), select a **server**.
3. At the right of the server hostname row, click the vertical ellipsis menu icon, and then select **FIM**.
4. Click **Policies**.
5. At the right, click **Create New FIM Policy**.
6. In the **Create New Policy** panel, and enter a name for the policy.
7. In the **Change requested by [loggedInUserName]** field, enter a reason for the change.
8. Click **Create**.

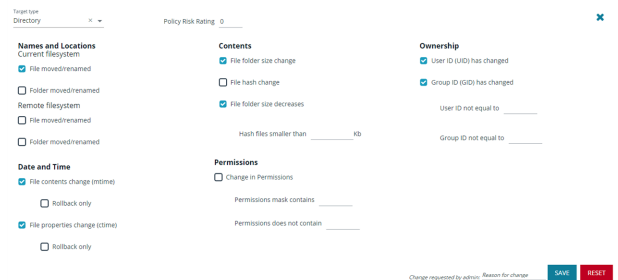To create a FIM rule for the policy:

1. In the list, click the **Policy name** you have just created.
2. On the **Policy Details** page, at the right, click **Add New FIM Rule**.
3. In the **Create new FIM rule** panel, enter a **Rule name**.
4. In the **Change requested by [loggedInUserName]** field, enter a reason for the change.
5. Click **Create**.

> 📌 **Note:** To delete an FIM Rule, click the appropriate FIM policy to navigate to **Policy Details > Rules**. Click the trash bin icon to delete the FIM Rule for the policy.

To add a FIM target:

1. On the **Policy Details** page, click on the rule name you have just created.
2. On the **Rules Definition Editor** page, click **Add New FIM Target** to add a target to the definition.
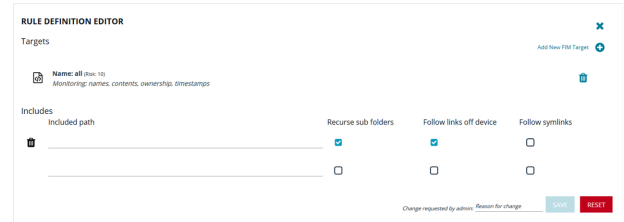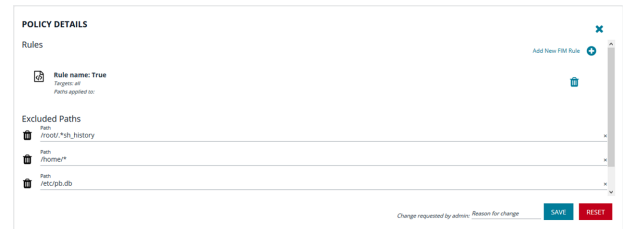3. Select a **Target type**, and then set attributes you want to monitor.

4. You can assign a policy risk rating. The accepted values are between **1** to **10**. A risk rating weighs the severity of the monitored actions configured for the targets.
5. In the **Change requested by [loggedInUserName]** field, enter a reason for the change.
6. Click **Save**.
7. On the **Policy Details** page, click on the rule you just created.

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8. On the **Rule Definition Editor** page, enter **Included path** entries. Optionally, check the boxes:

   - **Recurse sub folders**
   - **Follow symlinks**
   - **Follow links off device**

   The policy applies to all files in the path.

9. In the **Change requested by [loggedInUserName]** field, enter a reason for the change.

10. Click **Save**.

11. In the **Exclude Paths** section, enter paths that you do not want to monitor.

12. In the **Change requested by [loggedInUserName]** field, enter a reason for the change.

13. Click **Save**.

Clone a FIM Policy

You may want to clone a policy in order to make a backup, or use it as a template to create a new one. On the **File Integrity Monitoring** page, select the clone icon on an existing policy, enter a unique **Policy name**, and click **Clone**.

> **Note:** *Each policy requires a unique name. In order to clone a policy, you must give it a new name; otherwise, the **Clone** button does not activate.*

Delete a FIM Policy

To delete a FIM policy:

1. Go to the **Policy Management** page.
2. Using the filtering options (or from the list), select a **server**.
3. At the right of the server hostname row, click the vertical ellipsis menu icon, and then select **FIM**.
4. Click **Policies**.
5. In the **FIM Policies** list, click the trash bin icon at the right of the policy you want to remove, and then click **Delete** to confirm.

Manage FIM Policy Assignment

To manage FIM policy assignment:

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry.
3. Click the **Quick Actions** menu and select **Manage FIM policy assignment**.
4. Select a **Policy name** from the dropdown menu.
5. Use the check boxes to select servers for FIM policy assignment.
6. Click **Apply**.

> **Note:** If you want to remove an **Assigned FIM Policy**, select the **Policy name** called **No policy assignment** and apply it to the server.

File Integrity Monitoring Reports

File Integrity Monitoring (FIM) reports are available within the BeyondInsight for Unix & Linux (BIUL) console, in addition to being available from a command line. FIM reports are stored on policy servers and are available under the **Policy** section of the console.

To access FIM reports:

1. On the **Home** page, click **Policy Management**.
2. Using the filtering options (or from the list), select a **server**.
3. At the right of the server hostname row, click the vertical ellipsis menu icon, and then select **FIM**.
4. On the **FIM** page, click **Reports**.
5. On the **FIM Reports** page, do either of the following:

   - Use the filtering options to find a specific report
   - Find it directly in the list.

6. To view the details of the report, at the far right of the report summary line, click the **right-facing arrow** icon.
7. To view more specific information, on the **FIM Report Details** page, use the filtering options to narrow down your information search.

8. To view the file's **Policy Violation Details**, double-click on a file information row, and consult the details panel on the right.

9. When done with the details of that file, you can click another information row in the table and view its details, or click the **X** at the top-right of the panel to close it.

To go to a different report for the *same* server, on the breadcrumbs line at the top of the page, click **FIM Reporting**.

To view **FIM Reports** for a *different* server, on the left menu, click **Policy** and start again.

File Integrity Monitoring Clients

The **File Integrity Monitoring Clients** page lists all known endpoints that use a selected policy server. This information is obtained via the Profile action in the **Hosts Inventory** section, by reading each endpoints **pb.settings** file. This section allows the administrator to perform the actions detailed in this topic.

> For more information on the Profile action, please see the following:
>
> - *Profile Hosts*, in the *BIUL RNS Deployment Guide*
> - *"Profile Servers in BeyondInsight for Unix & Linux" on page 19*

Policy Assignment

By selecting *one or more* endpoints in the list, endpoints can be configured to use specific File Integrity Monitoring (FIM) policies, which themselves are managed in the **Policies** section. A list of available policies are then displayed. An endpoint can be assigned only one FIM policy at a time; changing the assigned policy removes any previous assignment.

To assign or change the currently assigned FIM policy:

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1. On the **Home** page, click **Policy Management**.
2. Using the filtering options (or from the list), select a **server**.
3. At the right of the server hostname row, click the vertical ellipsis menu icon, and then select **FIM**.
4. On the **FIM** page, click **Clients**.
5. On the **FIM Clients** page, do either of the following:
   - Use the filtering options to find a specific client.
   - Find it directly in the list.
6. To select a FIM client, at the left of its hostname, check the box.

> 📌 **Note:** *If you want to make the same assignment or change in assignment for multiple clients, you can. To do so, select multiple clients at this step. Once you click **Apply** at step 10, the change applies to all clients selected.*

7. At the far right, click the **Actions** menu, and then select **FIM Policy Assignment**.
8. On the **Policy Assignment** panel, at the right of the **Policy name** field, click the dropdown arrow, and then select a policy to assign or reassign.
9. In the **Change requested by [loggedInUserName]** field, enter a reason for the assignment or change.

> 📌 **Note:** *The step above is only available if you have enabled **Change Management** on the FIM Policy server.*

10. Click **Apply**.
11. To close the **Policy Assignment** panel, click the **X** at the top-right of the panel.

FIM Reports Execution

By selecting *one or more* endpoints in the list, endpoints can execute the assigned FIM report. The time it takes to complete the task varies based on a number of factors, including hardware, complexity, and scope of the FIM policy. **FIM Report Execution** requires credentials to authenticate into the endpoint to execute the task.

> 💡 **Tip:** *You can also use default credentials that you set up under **Hosts > Credential Rules**. For more information, please see "Use Host Credential Rules" on page 34.*

An option to update the base file state from which further reports would compare against, is available (the **Update the report database** option at Step 8, which can be toggled **ON** or **OFF**).

To run FIM reports:

1. On the **Home** page, click **Policy Management**.
2. Using the filtering options (or from the list), select a **server**.
3. At the right of the server hostname row, click the vertical ellipsis menu icon, and then select **FIM**.
4. On the **FIM** page, click **Clients**.
5. On the **FIM Clients** page, do either of the following:
   - Use the filtering options to find a specific client.
   - Find it directly in the list.

6. To select a FIM client, at the left of its hostname, check the box.

> 📌 *Note: If you want to run a FIM report for multiple clients using the same credentials, you can. To do so, select multiple clients at this step. Once you click **Apply** at step 13, the reports are run for all clients selected.*

7. At the far right, click the **Actions** menu, and then select **FIM Reports Execution**.
8. On the **Run FIM Reports** panel, if you want to update the report database, click the **Update the report database** toggle to **ON**. Turning it on changes the baseline to the results of the report that you are about to run. As a result, any future report will be reported in terms of a *deviation* or *difference* from this one.

> 📌 *Note: Steps 9-11 are optional fields, if you have defined Credential Rules for the hosts selected. Steps 10 and 11 are also optional, based on the **permissions of the user** selected at Step 9, and the **strategy** selected at Step 10.*

9. At the right of the **Login Credential** field, click the dropdown arrow and select a credential.
10. At the right of the **Delegation Strategy** field, click the dropdown arrow and select a strategy.
11. Depending on the option you select, you might need to enter a delegated credential. If so, at the far right of the **Delegated Credential** field, click the dropdown arrow and select a delegated credential.
12. In the **Change requested by [loggedInUserName]** field, enter a reason for the change.
13. Click **Apply**.
14. To close the **Policy Assignment** panel, click the **X** at the top-right of the panel.

> 📌 *Note: You can view the current status of the task in the **Tasks** section.*

Manage Privilege Management for Unix and Linux Script Policies

> 📌 *Note: Script Policy Management will be disabled on hosts configured to use role based policy. For more information, please see "Role Based vs. Script Based Policies" on page 54.*

To manage script policies:

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the vertical ellipsis menu icon and select **PMUL Policy**.
3. Select an existing script file to open it in the editor. Alternatively, click **Create New Script** and provide a **Filename** to create a script policy.
4. After you edit the script, select the **Validate** button from the toolbar. This will verify script syntax is correct. If an error is found, a notification displays in red stating the file syntax is invalid.

> 📌 *Note: When **Validate** is selected, only the syntax is verified. This does not verify the policy definition or included policies.*
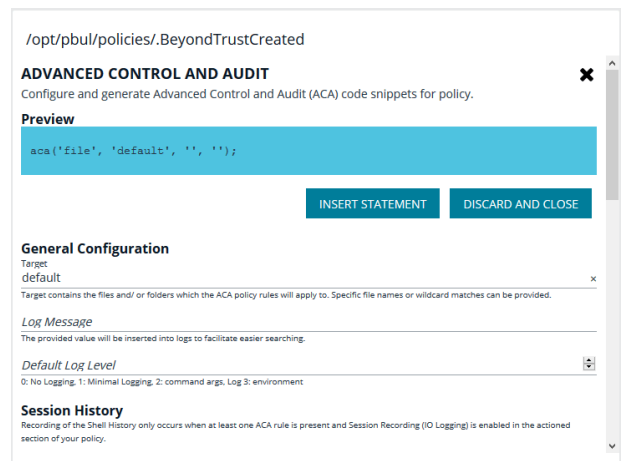
> **Note:** *Script policies can reside in either the file system under the folder defined as the **policydir** in Privilege Management for Unix and Linux settings or as objects in the change management database. Files that are in the database support version control. Files that are not in the database can be added by choosing the **Import to Database** option under the **Script Editor**.*

The Script Policy editor uses the code editor to assist the user managing the policy. **Discard** will revert the document to its original state. **Save** will write the file changes to either the file system or the database.

Advanced Control and Audit

The Advanced Control and Audit (ACA) editor allows users to configure an ACA statement. It is available on the code editor toolbar.

1. Select the **ACA** button in the script editor. This will open the ACA editor.
2. Define the following:

   - **Target**: The target contains the files and folders the ACA policy rules will apply to.
   - **Log Message**: The provided value will be inserted into logs to facilitate easier searching.
   - **Default Log Level**: Assign a number for the log level to use as a default.
   - **Session History**: If either **Audit command History** or **Continue On Error** are enabled, **Enable Session History** is added to the ACA statement.
   - **File System Operations**: Check the box for the file system operation you want to audit. Selecting an operation allows you to set whether the operation is allowed or blocked. Additionally, a log level can be configured for an operation. System operations that are not assigned a log level are automatically assigned the default log level.

> **Note:** *File operations that are not selected are not audited.*

After configuring your ACA policy, click the **Insert Statement** button under the ACA policy preview to add the statement to the policy.

> For more information on ACA, please see the *Privilege Management for Unix and Linux Policy Language Guide* at *https://www.beyondtrust.com/docs/privilege-management/unix-linux/index.htm*.

View Privilege Management for Unix and Linux Settings

1. Go to the **Hosts > Host Inventory** page, select a server entry, and then at the far right, click the ellipsis menu icon and select **View Host Details**.
2. On the **Host Details** page, select **PMUL Settings**. **Privilege Management for Unix & Linux Settings** are displayed.

> **Note:** *Values entered in the **Policy Submit Servers (submitmasters)**, **Policy Accept Servers (acceptmasters)**, and **Log Servers** fields are freely entered and as a result are not verified.*

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PBSMC-

Discovered:	**October 17, 2019**	Last Profiled:	**2 days ago**	IP:	1	
Operating System:	**Linux CentOS 6.7**	Architecture:	**x86_64**	Default Gateway:		
Tags:						

Host Details | Client Registration Profiles

HOST DETAILS

General

Credential Rules

Privilege Management for Unix & Linux

PMUL Settings

Registry Name Service

PMUL Licensing

AD Bridge

Solr

Errors & Warnings

PRIVILEGE MANAGEMENT FOR UNIX & LINUX SETTINGS

REST API Time Correction sets the acceptable time variance between the PMUL and BIUL Host.

REST API Time Correction
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Policy Submit Servers (submitmasters)
pbsmc-   ×

Policy Accept Servers (acceptmasters)
pbsmc-   ×

Log Servers
pbsmc-   ×

SAVE   DISCARD

```
1    # This file was reformatted by pbconfigd on 2021/04/21 11:38:02
2
3    ### Global.
4    databasedir                    /opt/pbul/dbs
5    #tempfilepath                  /tmp
```

Audit Activity Using BeyondInsight for Unix & Linux

From the **Audit** page, you can access:

- Privilege Management for Unix and Linux recorded sessions
- Privilege Management for Unix and Linux events
- Privilege Management for Unix and Linux entitlement reports

> 📌 *Note:*
> - *As of Privilege Management for Unix and Linux 10.3, event log information is retrieved from databases. Previous versions of Privilege Management for Unix and Linux support log files.*
> - *A minimum version of Privilege Management for Unix and Linux 10.0 is required to view log contents. In earlier versions, the log must be downloaded to view.*

View PMUL Events

1. Go to the **Audit** page.
2. Find the host name in the list. Use the **Hostname**, **IP Address**, and **Tags** filters to refine the list of results displayed.
3. At the far right of the server entry row, click the arrow.
4. On the **Server Details** page, click the tile for the detail you want to view.

   - **Sessions**: View and play the I/O log sessions.
   - **Event Log**: Provides a detailed list of events that occurred on the server. Use the filters available to sort through events. Select an event to view more information on the **Event Details** pane.
   - **Entitlement Reports**: View entitlement reports for Privilege Management for Unix and Linux role-based policies.

> ℹ️ *For more information, please see the following:*
> - *"View Entitlement Reports" on page 81*
> - *"Play a Recorded Session" on page 80*

Search Events

You can search for Privilege Management for Unix and Linux events.

1. Go to the **Audit** page.
2. Find the host name in the list. Use the **Hostname**, **IP Address**, and **Tags** filters to refine the list of results displayed.
3. At the far right of the server entry row, click the arrow, and then click the **Event Log** tile.
4. To find a specific event, use the filters at the top of the columns to refine the list of results displayed.
5. To display event details, click on the event row.
6. To close the **Event Details** panel, click the **X** icon.

View Console Audit Activities

You can view user session information, such as user name, session ID, session time, user roles, and IP address.

1. Go to the **Console Audit** page.
2. On the **Console Audit** page, use the filters to refine the list of user sessions displayed.
3. At the far right of the session row, click the arrow.
4. On the **Session Details** page, view more information, such as user name, user roles, HTTP method, and URL. Use the filters at the top of the columns to refine the list of results displayed.

Replay Sessions in BeyondInsight for Unix & Linux

Using session replay, you can view and replay I/O logs.

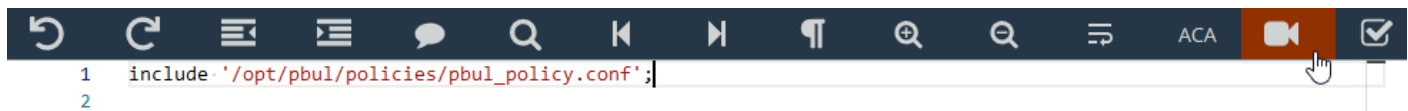**Enable Session Recording in Script Policy Mode**

> **⊘ IMPORTANT!**
>
> To turn on session recording, Solr must be installed using BeyondInsight for Unix & Linux and log servers must be assigned to a Solr server. For more information, please see *"Install and Manage Solr" on page 24*.

To turn on session recording in Script Policy Mode:

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the ellipsis menu icon and select **PMUL Policy**.
3. Select a script policy file to edit. The file is displayed in an editor.
4. Click the **Session Replay Path** button from the toolbar.
5. Enter a **Base Path** for the log file.
6. (Optional). In the **Filename Options** area, use the variables to build a file path and name for the session to be written to. Select from the suggested variables to add unique properties to the path or file name.
7. (Optional). In the **Session Replay Options** area, use the variables to generate a command history list in the replay viewer. Select from the following: **Include Command History**, **Display Warnings**, and **Limit Size**. If you create an Advanced Control and Audit (ACA) statement, you can add command history to the statement.
8. Click the **Insert Location** option to add the logs to the script policy file.
9. Click **Save** in the editor to save the script policy file.

```
1  include '/opt/pbul/policies/pbul_policy.conf';
2
```

> **ⓘ** For more information about ACA statements, please see *"Advanced Control and Audit" on page 76*.

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Enable Session Recording in Role-Based Policy Mode

IMPORTANT!

To turn on session recording, Solr must be installed using BeyondInsight for Unix & Linux and log servers must be assigned to a Solr server. For more information, please see "Install and Manage Solr" on page 24.

To turn on session recording in Role-Based Policy Mode:

1. Go to the **Policy Management** page.
2. In the **Hostname** list, select a server entry, and then at the far right, click the vertical ellipsis menu icon and select **PMUL Policy**.
3. Click the **Roles** tile.
4. On the **Roles** page, select a role entry, then at the far right, click the vertical ellipsis menu icon and select **Edit Role**.
5. On the **Edit Role** page, select **Session Replay**.
6. Enter a **Base Path** for the log file.
7. (Optional). In the **Path Options** area, use the variables to build a file path and name for the session to be written to. Select from the suggested variables to add unique properties to the path or file name.
8. (Optional). In the **Session Replay Options** area, use the variables to generate a command history list in the replay viewer. Select from the following: **Include Command History**, **Display Warnings**, and **Limit Size**.
9. Click **Save**.

Play a Recorded Session

To play an I/O log session:

1. Go to the **Audit** page.
2. Find the host name in the list. Use the **Hostname**, **IP Address**, and **Tags** filters to refine the list of results displayed.
3. At the far right of the server entry row, click the arrow.
4. On the **Server Details** page, click the **Sessions** tile. Logs indexed by BeyondInsight for Unix & Linux are displayed.
5. As necessary, use filters and **Search** to locate a log. Click on an entry to display activity and user feedback.
6. Select the **Playback** icon to start the log player.
7. On the **Session Replay** page, select one of the following modes:
   - **File**: File displays the contents of an I/O log immediately.
   - **Playback**: Replays the I/O log in real time as the events occurred, so an administrator can view what the user entered.
8. On the **Session Replay** page, you can play, pause, stop, set the speed of the session, zoom in and out, and use full screen.
9. If ACA policy is enabled and configured, a command history is displayed, allowing you to navigate to specific events in an I/O log. The command history indicates if the ACA status is allowed or rejected.
10. Optionally, enter a **Comment** and **Audit Status** on a log. For example, you can enter a comment or set a flag to provide warnings of a problem or to approve the content.

View Entitlement Reports

PMUL hosts running 10.1 and later in **Role Based Policy Mode** can take advantage of entitlement reports to discover who is able to do what, where, and when.

Turn on Entitlement reporting when you configure a role-based policy. Entitlement reporting can be enabled per policy or to all role-based policies.

> ℹ️ *For more information, please see the following:*
>
> - *"Configure the Privilege Management for Unix and Linux Integration" on page 50*
> - *"Manage Privilege Management for Unix and Linux Role Based Policies" on page 57*

To view Entitlement reports:

1. Go to the **Audit** page.
2. Find the host name in the list. Use the **Hostname**, **IP Address**, and **Tags** filters to refine the list of results displayed.
3. At the far right of the server entry row, click the arrow.
4. Click the **Entitlement Reports** tile.
5. Use the filters to change the report details: **Run User**, **Run Host**, **Submit User**, **Submit Host**, **Commands**, and **Report Level**. Report levels provide varying levels of detail, with higher numbers providing more details.

> ℹ️ *For more information, please see "Manage Privilege Management for Unix and Linux Role Based Policies" on page 57.*

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Manage Certificates

On the **Manage Certificates** page, you can:

- Add certificate authorities (CA) to the BeyondInsight for Unix & Linux trusted certificate pool
- Upload server and client certificates for remote connections
- Generate certificate signing requests

Add a Certificate Authority

An uploaded CA is added to the BeyondInsight for Unix & Linux trusted certificate pool.

When BeyondInsight for Unix & Linux connects to a remote service, a trusted CA in the BIUL database is added to the trusted certificate pool for that connection.

To add a CA:

1. Go to **Settings > Certificates**.
2. Click **Add Certificate > Upload a Certificate Authority**.
3. Click the upload arrow and navigate to the .PEM file location.
4. Click **Upload File**.

A CA can be removed when no longer required.

An uploaded CA is added to Solr during deployment or adoption actions for the Solr instance.

> *For more information, please see "Install and Manage Solr" on page 24.*

Upload Certificates

When deploying a Solr instance or assigning a log server, BeyondInsight for Unix & Linux searches the host for a certificate with the same name (wildcards supported). If found, that certificate is used for the host. Otherwise, BeyondInsight for Unix & Linux generates a certificate using the BeyondInsight for Unix & Linux CA.

1. Go to **Settings > Certificates**.
2. Click **Add Certificate > Upload Existing Certificate**.
3. Select the host to copy the certificate to.
4. Select a certificate type.
5. Click the upload arrow and navigate to the certificate file location.
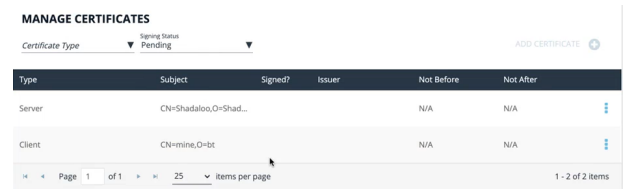6. Click **Upload Files**.

Create a Certificate Signing Request

You can create a request to sign a certificate by a CA. After the certificate is signed, you can upload to the host.

To request a signed certifcate:

1. Go to **Settings > Certificates**.
2. Click **Add Certificate > Create Certificate Signing Requests**.

3. Fill out the form with details, including host, common name, organization, and organization email.

4. Select a certificate type: client or server.

5. Select a SAN type: DNS Name, IP address, or email address.

6. Click **Create**.

7. After the request is created, you can view the **Pending** status for the request.

8. At the far right of the certificate row, click the vertical ellipsis menu icon and select **Certificate Details**.

9. Click **Download as PEM**. After the certificate is signed, upload the certificate to complete the request.

Certificate Expiry

A warning icon indicates a certificate is expiring soon or is already expired.

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Manage Credentials in BeyondInsight for Unix & Linux

On the **Hosts > Host Credentials** page, you can manage remote host access credentials. A credential is locally persisted account information (local or domain account) that can be used to authenticate a remote session on a given host, usually in the form of Secure Shell (SSH) credentials. Console credentials and remote credentials are not synchronized. Changes to credentials in the console are not propagated to hosts. When an action runs, an error is displayed on the **Tasks** page when console credentials and credentials on the host do not match.

Types of credentials:

- **Host credentials**: Credentials that can access a host. Username and password are saved locally, typically SSH credentials.
- **Password Safe credentials**: You cannot change the Password Safe credentials on the **Credentials** page. Passwords are not saved in the console.

> *For more information on Password Safe credentials, please see "Import Password Safe Managed Accounts" on page 48.*

Add Credentials

On the **Credentials** page:

1. Click **Manage Credentials > Create Credential**.
2. Enter the following required information:
   - **Username**
   - **Description**
   - **Password**
   - **Confirm Password**
3. Click **Save**.

Update Credentials

On the **Credentials** page:

1. In the **Credentials** list, select the credential to be updated. Use the filter options to shorten the list of credentials to select from. The **Update Credential** section is displayed.
2. Update any of the following information:
   - **Description**
   - **Password**
   - **Confirm Password**
3. Click **Save**.

Delete Credentials

On the **Credentials** page:

1. In the **Credentials** list, select the credential to be removed. Use the filter options to shorten the list of credentials to select from. The **Update Credential** section is displayed.
2. Select **Delete Credential** and confirm by clicking **OK**.

View Tasks and Task Details in BeyondInsight for Unix & Linux

Host actions are organized and grouped on the **Tasks** page. Tasks can be filtered by the following options:

- **Task Type**
- **Date Range**
- **Username**
- **Pending Status**
- **Success Status**
- **Failure Status**

View Tasks

The task details grid includes the following:

- **Type**: The type of task that was run. Options include:
    - **Profile**
    - **Discovery**
    - **Install**
    - **Upgrade**
    - **Uninstall**
    - **Assign Log Server**
    - **Domain Join**
    - **Encryption Keyfiles Deployment**
- **Tasks**: The number of hosts the operation was performed on.
- **Pending**: The number of tasks that have yet to be run.
- **Succeeded**: The number of tasks completed successfully.
- **Failed**: The number of tasks completed unsuccessfully.
- **Username**: The user who executed the task.
- **Updated**: The last time the task entry was updated.

To view task details:

1. Go to the **Tasks** page.
2. Use the filtering options to reduce the list of tasks to choose from. For example, tasks can be listed by date range finding only those tasks that occurred in the selected time frame.
3. Select a task. A **Task Summary** is displayed.
4. From the **Task Summary**, click **View Task Details**.

Task Details

The **Task Details** page provides detailed output of individual tasks. Information is presented in an easy to read manner to help with troubleshooting.

Troubleshoot Common Issues with BeyondInsight for Unix & Linux

Application Logs

Application logs are available. The location differs based on the operating system:

- For systemd machines, use **systemd run journalctl -u pbsmc**.
- For SysV or Upstart machines, the log is located in **/var/log/pbsmc.log**.
- For Windows machines, the log is located in **ProgramFiles (x86)\PBSMC\pbsmc.log**.

Common Error Messages

Hosts section displays credential error when selecting actions

If there are no credentials stored and an action is chosen requiring authentication, an error is displayed.

Oops, No Products Found **displayed on Management page**

BeyondInsight for Unix & Linux cannot locate either the Privilege Management for Unix and Linux or BeyondInsight for Unix & Linux software to deploy.

> ℹ️ *For more information, please see* "Copy ISO Files to the Console Server" on page 8.

Unable to install PMUL, and AD Bridge

> ℹ️ *For more information, please see the* **Tasks** *page.*

Discover does not locate a host

Verify the host is available, reachable from the network, and from an SSH-enabled port.

Unable to connect to PMUL using REST

> ℹ️ *For more information, please see the* **Tasks** *page. In most cases, the port is not available. Check the* **REST** *port on the* **Host Details** *page, and verify your firewall is accepting connections.*

Troubleshoot Password Safe Issues

Certificates

Password Safe is installed with a self-signed certificate. If this is not changed to a trusted issuer, the certificate should be added to the BeyondInsight for Unix & Linux systems certificate store to be trusted. The following provides high-level steps on importing certificates.

1. Copy the public certificate from the Password Safe server to the BeyondInsight for Unix & Linux server. This should be a .crt file.
2. Install the .crt file to the system key store. The process is different depending on the operating system.

macOS

1. Open **Keychain Access**, and drag the .crt file into the **System** node.
2. Double-click to open and expand the **Trust** leaf.
3. Select **Always Trust**.

Windows

1. Click **Start** and type **MMC**.
2. From the **File** menu, select **Add/Remove Snap-In > Certificates > Add**.
3. Select **Computer Account**, and click **Next**.
4. Select **Local Computer**.
5. After the snap-in is added, expand **Certificates** and right-click **Trusted Root Certification Authorities**.
6. Select **All Tasks > Import** and add the .crt file.

CentOS and Red Hat Linux

If not available, install ca-certificates

```
yum install ca-certificates
```

Enable dynamic configuration

```
update-ca-trust force-enable
```

Copy the .crt

```
cp <cert.crt> /etc/pki/ca-trust/source/anchors/
```

Update the trusted list

```
update-ca-trust extract
```

Debian and Ubuntu

Copy the .crt file

```
cp <cert.crt> /usr/local/share/ca-certificates
```

Update the cert list

```
sudo update-ca-certificates
```

Refresh the cert list

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```
sudo update-ca-certificates --fresh
```

i *For more in-depth system information, please see the appropriate operating system documentation.*

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