Pulse One Appliance Administration Guide
Supporting Pulse One Appliance 2.0.1901
END USER LICENSE AGREEMENT

The Pulse Secure product that is the subject of this technical documentation consists of (or is intended for use with) Pulse Secure software. Use of such software is subject to the terms and conditions of the End User License Agreement (“EULA”) posted at http://www.pulsesecure.net/support/eula/. By downloading, installing or using such software, you agree to the terms and conditions of that EULA.
Contents

PREFACE ........................................................... 1
DOCUMENT CONVENTIONS ....................................... 1
TEXT FORMATTING CONVENTIONS .............................. 1
COMMAND SYNTAX CONVENTIONS ............................... 1
NOTES AND WARNINGS .......................................... 2
REQUESTING TECHNICAL SUPPORT ............................ 2
SELF-HELP ONLINE TOOLS AND RESOURCES .................. 2
OPENING A CASE WITH PSGSC ................................. 3

GETTING STARTED WITH PULSE ONE ............................ 5
OVERVIEW OF PULSE ONE ....................................... 5
LOGGING INTO PULSE ONE ....................................... 6
CHANGING THE USER PASSWORD ................................. 8
ADDING PULSE ONE LICENSES .................................... 9
WHITELISTING IP ADDRESSES FOR ADMIN LOGIN ............ 9

WORKING WITH PULSE ONE DASHBOARDS ..................... 13
INTRODUCTION ................................................... 13
VIEWING OVERALL SYSTEM HEALTH ............................ 13
VIEWING METRICS FOR APPLIANCES ........................... 14
CUSTOMIZING DASHBOARDS AND WIDGETS ..................... 16
  ADDING A NEW WIDGET ....................................... 17
  EDITING THE DASHBOARD LAYOUT ........................... 18
  EDITING WIDGET CONFIGURATION ............................ 20

APPLIANCE MANAGEMENT ........................................ 21
REGISTERING AN EXISTING PCS/PPS APPLIANCE ............... 21
EDITING APPLIANCE INFORMATION .............................. 24
LAUNCHING THE USER INTERFACE FOR AN APPLIANCE .... 24
CONFIGURING AN APPLIANCE TO CONNECT TO PULSE ONE .. 25
COMPLETING REGISTRATION OF AN APPLIANCE ............... 25
CONFIGURING LOG SETTINGS ON THE APPLIANCE .......... 26
CONFIGURING ActiveSync HANDLER ............................ 27
CREATING AND REGISTERING A PCS APPLIANCE VM on vSphere ................................................... 29
CREATING AN APPLIANCE MASTER TEMPLATE on vSphere ................................................... 36
CREATING AND REGISTERING A PCS APPLIANCE VM on AWS .......................................................... 41
IDENTIFYING THE REQUIRED ROUTE 53 ZONES ............... 42
<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifying the Required VPC ID and Subnet IDs</td>
<td>44</td>
</tr>
<tr>
<td>Identifying the EC2 Deployment Key and AMI ID</td>
<td>46</td>
</tr>
<tr>
<td>Creating the PCS Appliance VM on AWS</td>
<td>49</td>
</tr>
<tr>
<td>Configuring CPU, Memory and Disk Utilization</td>
<td>55</td>
</tr>
<tr>
<td>Backing up and Restoring Appliance Configurations</td>
<td>56</td>
</tr>
<tr>
<td>Backing up the Configuration of an Appliance</td>
<td>56</td>
</tr>
<tr>
<td>Deleting the Configuration Backup for an Appliance</td>
<td>59</td>
</tr>
<tr>
<td>Restoring the Configuration of an Appliance</td>
<td>59</td>
</tr>
<tr>
<td>Working with Appliance Groups</td>
<td>61</td>
</tr>
<tr>
<td>Creating an Appliance Group</td>
<td>61</td>
</tr>
<tr>
<td>Adding Appliances to an Appliance Group</td>
<td>65</td>
</tr>
<tr>
<td>Distributing a Master Configuration</td>
<td>67</td>
</tr>
<tr>
<td>Upgrading Managed Appliances</td>
<td>71</td>
</tr>
<tr>
<td>Uploading an Appliance Software Package to Pulse One</td>
<td>71</td>
</tr>
<tr>
<td>Checking DMI Settings</td>
<td>73</td>
</tr>
<tr>
<td>Upgrading an Appliance</td>
<td>75</td>
</tr>
<tr>
<td>Upgrading All Target Appliances in a Group</td>
<td>77</td>
</tr>
<tr>
<td>Upgrading All Appliances in a Cluster</td>
<td>79</td>
</tr>
<tr>
<td>Scheduling Upgrade-Related Tasks</td>
<td>79</td>
</tr>
<tr>
<td>Viewing the Activities Log for an Appliance</td>
<td>87</td>
</tr>
<tr>
<td>Viewing the Configuration Change History for an Appliance</td>
<td>88</td>
</tr>
<tr>
<td>Comparing Appliances</td>
<td>89</td>
</tr>
<tr>
<td>Rebooting an Appliance</td>
<td>91</td>
</tr>
<tr>
<td>Removing an Appliance from Pulse One</td>
<td>92</td>
</tr>
<tr>
<td>Preparing a Target Appliance</td>
<td>93</td>
</tr>
<tr>
<td>Preparing an RSA Agent Instance for the Target Appliance</td>
<td>93</td>
</tr>
<tr>
<td>Removing an Appliance from an Appliance Group</td>
<td>93</td>
</tr>
<tr>
<td>Editing an Appliance Group</td>
<td>94</td>
</tr>
<tr>
<td>Deleting an Appliance Group</td>
<td>96</td>
</tr>
<tr>
<td>Viewing Analytics and Reports</td>
<td>97</td>
</tr>
<tr>
<td>Viewing the Login Attempts Report</td>
<td>97</td>
</tr>
<tr>
<td>Viewing the Appliance Health Report</td>
<td>98</td>
</tr>
<tr>
<td>Viewing the Profiled Devices Report</td>
<td>99</td>
</tr>
<tr>
<td>Viewing the Appliance Activities Report</td>
<td>101</td>
</tr>
<tr>
<td>Viewing the User Activities Report</td>
<td>102</td>
</tr>
<tr>
<td>Viewing Log Aggregation and Analysis</td>
<td>103</td>
</tr>
<tr>
<td>Viewing Appliance Activities</td>
<td>104</td>
</tr>
<tr>
<td>User Management</td>
<td>107</td>
</tr>
<tr>
<td>Adding an Admin User</td>
<td>107</td>
</tr>
</tbody>
</table>
Preface

- Document conventions ................................................................. 1
- Requesting Technical Support ..................................................... 2

Document conventions
The document conventions describe text formatting conventions, command syntax conventions, and important notice formats used in Pulse Secure technical documentation.

Text formatting conventions
Text formatting conventions such as boldface, italic, or Courier font may be used in the flow of the text to highlight specific words or phrases.

<table>
<thead>
<tr>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>bold text</strong></td>
<td>Identifies command names</td>
</tr>
<tr>
<td></td>
<td>Identifies keywords and operands</td>
</tr>
<tr>
<td></td>
<td>Identifies the names of user-manipulated GUI elements</td>
</tr>
<tr>
<td></td>
<td>Identifies text to enter at the GUI</td>
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<tr>
<td><strong>italic text</strong></td>
<td>Identifies emphasis</td>
</tr>
<tr>
<td></td>
<td>Identifies variables</td>
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<tr>
<td></td>
<td>Identifies document titles</td>
</tr>
<tr>
<td><strong>Courier Font</strong></td>
<td>Identifies command output</td>
</tr>
<tr>
<td></td>
<td>Identifies command syntax examples</td>
</tr>
</tbody>
</table>

Command syntax conventions
Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>bold text</strong></td>
<td>Identifies command names, keywords, and command options.</td>
</tr>
<tr>
<td><strong>italic text</strong></td>
<td>Identifies a variable.</td>
</tr>
<tr>
<td>[ ]</td>
<td>Syntax components displayed within square brackets are optional.</td>
</tr>
<tr>
<td></td>
<td>Default responses to system prompts are enclosed in square brackets.</td>
</tr>
</tbody>
</table>
Notes and Warnings

Note, Attention, and Caution statements might be used in this document.

**Note:** A Note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

**ATTENTION**
An Attention statement indicates a stronger note, for example, to alert you when traffic might be interrupted or the device might reboot.

**CAUTION**
A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

Requesting Technical Support

Technical product support is available through the Pulse Secure Global Support Center (PSGSC). If you have a support contract, file a ticket with PSGSC.

- Product warranties—For product warranty information, visit [https://support.pulsesecure.net/product-service-policies/](https://support.pulsesecure.net/product-service-policies/)

Self-Help Online Tools and Resources

For quick and easy problem resolution, Pulse Secure provides an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: [https://support.pulsesecure.net](https://support.pulsesecure.net)
- Search for known bugs: [https://support.pulsesecure.net](https://support.pulsesecure.net)
- Find product documentation: [https://www.pulsesecure.net/techpubs](https://www.pulsesecure.net/techpubs)
- Download the latest versions of software and review release notes: [https://support.pulsesecure.net](https://support.pulsesecure.net)
- Open a case online in the CSC Case Management tool: https://support.pulsesecure.net
- To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: https://support.pulsesecure.net

For important product notices, technical articles, and to ask advice:
- Search the Pulse Secure Knowledge Center for technical bulletins and security advisories: https://kb.pulsesecure.net
- Ask questions and find solutions at the Pulse Community online forum: https://community.pulsesecure.net

Opening a Case with PSGSC

You can open a case with PSGSC on the Web or by telephone.

- Use the Case Management tool in the PSGSC at https://support.pulsesecure.net.
- Call 1-844 751 7629 (Toll Free, US).

For international or direct-dial options in countries without toll-free numbers, see https://support.pulsesecure.net/support/support-contacts/
Overview of Pulse One

Pulse One provides unified management of Pulse Connect Secure and Pulse Policy Secure in a single easy-to-use console.

Pulse One, a single, comprehensive management console, offers the superior administrative end-to-end control and visibility needed to manage remote, local and mobile access to any corporate applications. Administrators use its intuitive, role-based console to monitor system health, manage security policies, troubleshoot issues, report on the appliance and device health, and publish appliance and mobile device configuration.

FIGURE 1 Pulse One Unified Management

It controls enterprise access to data center and cloud from a single console.

- **Role-based access** - Grants console access and privileges based on IT role and credentials.
- **Group-based management** - Publish software updates, policy changes and configuration provisioning by custom-defined groups.
- **Centralized administration** - Collectively administers multiple appliances without logging into them on a box-by-box basis.
- **Built-in Mobility Management** - Provides basic EMM functionality for iOS and Android devices and management of BYOD and corporate-owned workspaces.
• **System Dashboard** - Assesses the collective health of all appliances and provides security alerts and appliance alarms.

• **Appliance Dashboard** - Provides appliance status with analytics for connectivity, capacity, utilization, and uptime.

• **Administrator Audit Logging** - Tracks administrator changes to appliance configuration.

• **Monitor and Reporting** - Monitors system activity and provides historical reporting.

• **Deployment** - Introduces new features and scales without data center logistics and planning.

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**Logging Into Pulse One**

This section details the steps to log in to Pulse One as an administrator.

Use the Pulse One admin URL to launch the Pulse One Admin Console.

- If you are an existing user, enter the user name and password. Click **Sign In** to log in to Pulse One.
- If Enterprise SSO is configured for your user ID, then click **Sign In with Enterprise SSO**. For details about the Enterprise SSO configuration, see “**Enterprise Connection Properties**” on page 114.

**FIGURE 2** Pulse One Login Page

If you are a new user, you will have received a welcome mail from Pulse One to your registered mail ID. Click the **Set your password** link in the welcome mail. In the Pulse One login page that appears, provide a strong password and confirm the password. On successful login, the **End User License Agreement (EULA)** page appears.
If you have forgotten your Pulse One password, click the **Forgot password?** link. In the page that appears, enter your user id and click **Request reset**.

An email that contains a **Reset your password** link will be sent to your registered mail id. Use this link to launch Pulse One and provide your new password and confirm the new password.

**Note:** The **Reset your password** link has an expiration time of 1 hour. Beyond this time, you should make a new request for reset.

If you are a new user logging into Pulse One for the first time, then in the EULA page use the scroll bar to read through the terms of the agreement and then click **Agree**.

The Welcome wizard appears. This provides you a brief overview of Pulse One, appliance management and Bring Your Own Devices (BYODs).

**FIGURE 3** Pulse One Welcome Wizard

In the Welcome wizard, click the right-arrow button until the **Get Started** option appears. If required, select the **Don't show this to me again** check box and then click **Start Now**.

**Note:** You can view the Welcome wizard any time by clicking the **Settings** icon on the top right corner of the page and selecting **Show Welcome Wizard**.
The Pulse One Home page appears:

**FIGURE 4  Pulse One Home Page**

Select the appropriate tab, settings icon or user icon, and get started with the administration.

**Changing the User Password**

To change the user password:

1. Click the **User** icon on the top-right corner of the page.

2. From the menu, click **Change Password** to change your login password.

**FIGURE 5  Change Password**
An email that contains **Set new password** link will be sent to your registered mail id. Use this link to launch Pulse One and provide your new password.

**Note:** The **Set new password** link that you received in the email has an expiration time of 1 hour. Beyond this time, you will have to make a new request for setting the new password.

3. To log out of the admin console, click **Logout**.

### Adding Pulse One Licenses

To view and install licenses, access the Command-Line Interface (CLI) and use the following commands:

- `licenses show`
- `licenses add <license key>`

Refer to the Pulse One Command Reference for full details of CLI commands.

### Whitelisting IP Addresses for Admin Login

When Pulse One is installed, admins can log into the Pulse One console from any IP address.

If you want to restrict the IP addresses from which admins can log into Pulse One, you can *whitelist* one or more IP addresses and ranges. All IP addresses outside the whitelist are then blocked from accessing Pulse One.

Whitelisting is disabled by default. It is enabled when you add your first IP address/range to the whitelist, *which must include your current IP address*. After you have added your first whitelist item, all other IP addresses/ranges are automatically blacklisted. You can then continue to add all other required IP addresses/ranges until you have added all IP addresses/ranges from which admins can log in.

To whitelist IP addresses/ranges:

1. Log into Pulse One as an administrator.
2. Click the **Settings** icon on top-right-corner of the page.
3. Select **Pulse One Properties**.

   The **Pulse One Properties** page appears.

   ![Pulse One Properties](image)

   **FIGURE 6**  Pulse One Properties

4. Click the **Whitelist** tab to view the **Add to Whitelist** page.

   ![Add to Whitelist Page](image)

   **FIGURE 7**  Add to Whitelist Page

5. Add your first whitelist item:

   - Enter an IP address/range (with CIDR netmask suffix) that includes the IP address from which you are currently logged in.
   - Click the (+) icon.

   The IP address/range is added to the whitelist. For example:

   ![First Whitelist Entry](image)

   **FIGURE 8**  First Whitelist Entry
6. Repeat step 5 to add additional IP addresses/ranges to the whitelist. For example:

**FIGURE 9**  Additional Whitelist Entries

7. (Optional) Delete a whitelist entry by clicking its **Delete** (🗑️) icon.

**Note:** You cannot delete the whitelist item that includes your current login IP address. You can only delete this once all other whitelisted items are deleted. When you do this, whitelisting is then disabled, and admins will be able to login from any IP address.

**Note:** If your IP address changes, it is possible for you to be locked out of Pulse One. In this case, log into the Command-Line Interface (CLI) and perform the **p1 domain whitelist reset** command. This clears all items from the whitelist, and disables the whitelisting feature so that all incoming IP addresses are valid. You can then log into Pulse One again and create a new whitelist.
Working with Pulse One Dashboards

- Introduction ................................................................. 13
- Viewing Overall System Health ........................................ 13
- Viewing Metrics for Appliances ........................................ 14
- Customizing Dashboards and Widgets .............................. 16

Introduction
Dashboards give the administrator access to health and performance metrics:

- Pulse One system health, see “Viewing Overall System Health” on page 13.
- Appliances registered on Pulse One, see “Viewing Metrics for Appliances” on page 14.

You can also customize the widgets on the dashboards, see “Customizing Dashboards and Widgets” on page 16.

Viewing Overall System Health
To view metrics for system health, select the Dashboard tab, and then select the Overall tab.

FIGURE 10 Overall System Health Dashboard

Each widget that can be refreshed by clicking Reload Widget Content ( reloading icon) and collapsed by clicking Collapse/Expand Widget ( collapse icon).

The administrator can view the following information in separate widgets in the Overall tab:

- Overall appliance statistics.
- Appliance health for individual appliances.
- VPN realm usage.
• Role usage.
• Frequent user logins.
• Logins in the past 24 hours.
• Critical appliance events with timestamps.
• Resource dial.
• Pulse Connect Secure versions.
• Pulse Policy Secure versions.

**Viewing Metrics for Appliances**

To view metrics for appliances, select the **Dashboard** tab, and then select the **Appliances** tab:

**FIGURE 11** Appliances Dashboard
The administrator can view the following information in separate widgets in the **Appliances** tab:

- The total number of appliances. In this example, 72.
- Individual appliances are displayed as tabs around the central circle.
  - These are sorted into *Pulse Connect Secure* appliances and *Pulse Policy Secure* appliances.
  - The color of the individual tabs indicates the status of the appliance.
  - Hover over any tab to see its name.
- Details for each appliance can be viewed by clicking its tab. This includes:
  - The appliance **Version**.
  - The appliance **Model**. For example: *PSA-300*.
  - **Serial Number**.
  - **Last Config Upload**. A timestamp.
  - **IF-MAP Federation**. Boolean.
  - **Using License Server**. Boolean.
- Summary metrics are also displayed:
  - The number of Active Sync Connections for the appliances.
  - The number of concurrent users.
  - The number of authorization failures.
  - The throughput of data.
  - CPU utilization.
  - Disk utilization.
  - Memory utilization.
Customizing Dashboards and Widgets

The Overall Dashboard and Workspaces Dashboard views are customizable. You can change the dashboard layout, add/remove widgets, and rearrange the widgets.

To customize the widgets on a Dashboard tab:

1. Display the required dashboard tab. That is, either the Overall tab or the Workspaces tab.

![Customizing the Dashboard](image)

2. Click the Enable Edit mode icon ( Modiﬁcation Mode) on the top-right of the tab.

A widget layout summary for the dashboard appears. For example, for the Overall tab:

![Dashboard Widget Layout](image)
3. (Optional) Click Add New Widget (/fw) to add a widget to the current layout, see “Adding a New Widget” on page 17.

4. (Optional) Click Edit Dashboard (kd) to select a new layout, see “Editing the Dashboard Layout” on page 18.

5. (Optional) Rearrange the current widgets by dragging a widget using its Change Widget Location (kw) handle.

6. (Optional) Change the settings for a widget by clicking its Edit Widget Configuration (kh), see “Editing Widget Configuration” on page 20.

7. (Optional) Remove a widget by clicking its Remove Widget () control.

8. (Optional) Click Undo Changes (kn) to reset all unsaved changes and close the layout summary.

9. Click Save Changes (kp) to save all changes and close the layout summary.

Adding a New Widget

To add a new widget to a dashboard tab:

1. Display the required dashboard tab. That is, either the Overall tab or the Workspaces tab.

2. Click the Enable Edit mode icon (ke) on the top-right of the tab.

   A widget layout summary for the dashboard appears.

3. Click the Add New Widget (fw) control.

   A list of widgets appears.

FIGURE 14 Add New Widget

![Add New Widget](image)
4. Select the required widget.
   The selected new widget is added to the top of the layout summary.

5. (Optional) On the widget layout, change the settings for the widget by clicking its Edit Widget Configuration (🗂) control, see “Editing Widget Configuration” on page 20.

6. (Optional) Click Undo Changes (撤销) to reset all unsaved changes and close the layout summary.

7. Click Save Changes (保存) to save all changes and close the layout summary.

### Editing the Dashboard Layout
To change the layout of a dashboard tab:

1. Display the required dashboard tab. That is, either the Overall tab or the Workspaces tab.

2. Click the Enable Edit mode icon (编辑) on the top-right of the tab.

   A widget layout summary for the dashboard appears. For example, for the Overall tab:

   ![Dashboard Widget Layout](image)
3. Click the **Edit Dashboard** ( ) icon and select the required layout from the displayed list.

   **FIGURE 16**  Edit Dashboard Layout

![Edit Dashboard Layout](image)

The widget layout is rearranged to reflect the new layout. For example, to a two-column layout.

   **FIGURE 17**  Updated Dashboard Widget Layout

![Updated Dashboard Widget Layout](image)

4. (Optional) Click **Undo Changes** ( ) to reset all unsaved changes and close the layout summary.

5. Click **Save Changes** ( ) to save all changes and close the layout summary.

The dashboard layout updates to reflect the selected layout.
Editing Widget Configuration
To change the configuration of a widget:

1. Display the required dashboard tab. That is, either the Overall tab or the Workspaces tab.
2. Click the Enable Edit mode icon ( ) on the top-right of the tab.
   A widget layout summary for the dashboard appears.
3. Locate the widget you want to configure.
4. Click the Configure Widget ( ) control for the widget. For example:

   ![Appliance Health Widget](image)

   A dialog appears which displays all configurable options for the widget.
5. Make the required changes and click Apply.
6. (Optional) Click Undo Changes ( ) to reset all unsaved changes and close the layout summary.
7. Click Save Changes ( ) to save all changes and close the layout summary.
Registering an Existing PCS/PPS Appliance

After Pulse One is installed and configured, the next step is to register one or more PCS/PPS appliances.

**Note:** This process requires sufficient appliance licensing capacity.

**Note:** You can also create and register a virtual PCS appliance for either AWS (see “Creating and Registering a PCS Appliance VM on AWS” on page 41) or vSphere (see “Creating and Registering a PCS Appliance VM on vSphere” on page 29).

To register an existing appliance:

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Appliances** tab.

   The **Appliances** tab displays all current appliances.
3. Click **Add Appliance**.
   
The **Add Appliance** dialog box appears.

   ![Add Appliance](image)

   **FIGURE 19** Add Appliance

4. Select **Register existing appliance** and click **Next**.
   
The **Register Appliance** dialog appears.

   ![Register New Appliance](image)

   **FIGURE 20** Register New Appliance

5. Enter the required **Name** for the appliance. For example: `appliance.pcs`. 
6. Enter the management interface address of the appliance as the **Appliance URL**. Typically, this URL will end with “/admin”.

7. (Optional) If you want the appliance to support Device Management Interface (DMI) software upgrades directly from Pulse One:
   - For **IP Address**, specify the IP Address on which the appliance is configured to receive DMI requests. This is either the internal interface or the management interface.
   - For **Port**, specify the port on which the appliance is configured to receive DMI requests. Typically, this is 830.
   - Specify the required admin **Username** and **Password** for the appliance. This will be used to receive DMI requests.

   **Note:** You must record this information for when you configure software upgrades. For full details of software upgrades on registered appliances, see “Upgrading Managed Appliances” on page 71.

8. Click **Save**.

A dialog displays the required **Registration Host** and a **Registration Code**. For example:

![Registration Required](image)

9. Record the **Registration Host** and **Registration Code** and close the dialog.

10. Switch to the appliance application (for example, PCS) and enter the **Registration Host** and a **Registration Code** in the appliance’s panel, see “Configuring an Appliance to Connect to Pulse One” on page 25.

When the auto-registration process is complete, Pulse One console displays the appliance status as **Connected** in the appliances list.
Editing Appliance Information

To edit appliance information:

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Appliances** tab. The **Appliances** tab displays all current appliances.
3. Select the required appliance from the list and click its **Actions** icon ( ).
4. From the menu options, select **Edit Appliance Info**.
5. In the **Edit Appliance Info** dialog, make the required changes.

![Edit Appliance Info](image)

**FIGURE 22** Edit Appliance Information

- **Note**: If you want the Launch Appliance UI option to be available on the **Actions** menu for the appliance, specify the **Appliance URL**. This URL typically ends with “/admin”.
6. Click **Save** to update the appliance.

Launching the User Interface for an Appliance

You can launch the administration user interface for a registered appliance directly from the **Appliances** tab.

To support this, ensure that you have specified an **Appliance URL** property for the appliance. Where no **Appliance URL** is specified for an appliance, you can manually edit the appliance properties to specify one, see “**Editing Appliance Information**” on page 24.

To launch the admin UI for an appliance.

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Appliances** tab. The **Appliances** tab displays all current appliances.
3. Select the required appliance from the list and click its **Actions** icon ( ).

4. From the menu options, select **Launch Appliance UI**.

The graphical user interface for the appliance starts in a new tab of your browser.

### Configuring an Appliance to Connect to Pulse One

After you have added an appliance record into Pulse One:

- Complete the Pulse One registration from the appliance, see “**Completing Registration of an Appliance**” on page 25.
- Configure the appliance to send logs to Pulse One, see “**Configuring Log Settings on the Appliance**” on page 26.
- Configure the ActiveSync handler on the appliance as required, see “**Configuring ActiveSync Handler**” on page 27.

### Completing Registration of an Appliance

To complete registration of an appliance in Pulse Connect Secure:

1. Log into the PCS/PPS appliance.

2. Select the **System > Configuration > Pulse One > Settings** tab.

3. Enter the **Registration Host** and **Registration Code**.

   **Note:** These were displayed during “**Registering an Existing PCS/PPS Appliance**” on page 21.

4. Click **Save Changes**.

The **Status Information** displays the **Registration Status** in green.

**FIGURE 23**  Pulse Connect Secure: Pulse One Settings
Configuring Log Settings on the Appliance

You must then perform the following steps on each PCS/PPS appliance that will use the syslog server:

1. Log into the PCS/PPS appliance.
2. Navigate to System > Log/Monitoring > Events > Settings.
3. Under Select Events to Log, select all options that need tracking. For example:

   ![Log Events Settings](image)

   FIGURE 24 Log Events Settings

4. Under Syslog Servers:

   - **Server name/IP**: Enter the FQDN or IP address of the Pulse One appliance.
   - **Facility**: Select an option from the list. This will identify this log type.
     
     **Note**: To distinguish between different log types (Events, User Access, Admin Access), you must select a different **Facility** for each type.
   - **Type**: Select **TCP**.
   - **Client Certificate**: Select **Select Client Cert**.
   - **Filter**: Select **WELF: WELF**.
5. Click the **Add** button to add this external syslog server.

6. Click **Save Changes** to save the configuration.

7. Navigate to **System > Log/Monitoring > User Access > Settings**.

8. Under **Syslog Servers**:
   - **Server name/IP**: Enter the FQDN or IP address of the Pulse One appliance.
   - **Facility**: Select an option from the list. This will identify this log type.
     - **Note**: To distinguish between different log types (Events, User Access, Admin Access), you must select a different **Facility** for each type.
   - **Type**: Select *TCP*.
   - **Client Certificate**: Select *Select Client Cert*.
   - **Filter**: Select *WELF: WELF*.

9. Navigate to **System > Log/Monitoring > Admin Access > Settings**.

10. Under **Syslog Servers**:
    - **Server name/IP**: Enter the FQDN or IP address of the Pulse One appliance.
    - **Facility**: Select an option from the list. This will identify this log type.
      - **Note**: To distinguish between different log types (Events, User Access, Admin Access), you must select a different **Facility** for each type.
    - **Type**: Select *TCP*.
    - **Client Certificate**: Select *Select Client Cert*.
    - **Filter**: Select *WELF: WELF*.

11. Select the **Advanced Settings** tab and enable **Fault Tolerance** for the Pulse One syslog server.

After you have completed this procedure, the appliance will send all configured logs to the Pulse One syslog server.

**Configuring ActiveSync Handler**

The Pulse Connect Secure gateway can act as an ActiveSync proxy for Mobile devices that are onboarded through Pulse Workspace Server. Pulse Connect Secure gateway will:

- Filter out and reject ActiveSync connection requests coming from unauthorized Mobile devices.
- Allow only those devices that have been successfully provisioned on Pulse Workspace Server.
To configure ActiveSync handler, in the Connect Secure Device screen:

1. Start the appliance user interface.
2. Select the **System > Configuration > Pulse One > Command Handlers** tab.

   The **Pulse Workspace Handler** screen appears.

   ![Pulse Workspace Handler Screen](image)

   **FIGURE 25** Pulse Connect Secure: Command Handlers

3. Select a role where secure email is enabled.
4. Select authentication servers to use for group look up and click **Add**.
5. (Optional) To delete the device records set by the Pulse Workspace Console Server, click **Clear Active Sync Device Records**.
6. Click **Save Changes**.

**Note:** To create a user rule, refer to the Pulse Connect Secure Administration Guide available at: [https://www.pulsesecure.net/techpubs](https://www.pulsesecure.net/techpubs).
After you register a PCS appliance, it regularly sends the following information to Pulse One:

- Non-Hardware-specific PCS XML configuration. (Sent to On-Prem/Appliance and SaaS/Cloud)
- Hardware-specific PCS XML configuration. (Sent to On-Prem/Appliance and SaaS/Cloud)
  
  **Note:** Hardware-specific PCS XML configuration is not shared during configuration distribution.

- General information. That is, PCS health, statistics (such as CPU, network throughput), licensing details, cluster information and so on. (Sent to On-Prem/Appliance and SaaS/Cloud)

- User sign-in history. That is, logins from both web and the Pulse client. (Sent to On-Prem/Appliance only)

- User and System binary configuration. (Sent to On-Prem/Appliance only)

### Creating and Registering a PCS Appliance VM on vSphere

You can create and register a PCS appliance as a vSphere Virtual Machine from Pulse One directly. This process will create the VM appliance and perform all required registration activities on the appliance automatically.

**Note:** You can also create and register a virtual PCS appliance for AWS, see “Creating and Registering a PCS Appliance VM on AWS” on page 41.

**Note:** This process requires sufficient appliance licensing capacity on Pulse One.

**Note:** Before beginning this process, ensure that your vSphere host is synced to an NTP server. Failure to do this may result in certificate verification issues that cause auto-registration of any resulting PCS appliance to fail. Refer to the *VMware vSphere* documentation for details of this operation.

**Note:** During this process, you can optionally use a master appliance template. A master template encapsulates an existing deployed appliance, and enables the re-use of many configuration settings on any appliance that is deployed using the template. To create a master template, see “Creating an Appliance Master Template on vSphere” on page 36.

To create and register a PCS appliance as a VM on vSphere:

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Appliances** tab.
   
   The **Appliances** tab displays all current appliances.
3. Click **Add Appliance**.

   The **Add Appliance** wizard starts.

   **FIGURE 26**   Add Appliance

4. Select **Create virtual appliance in VMware vSphere** and click **Next**.

   The **vSphere Credentials** panel of the wizard appears.

   **FIGURE 27**   vSphere Credentials
5. You must then specify vCenter credentials. Either:
   - Select Add New for Account, then:
     - For Account, select Add New.
     - For Hostname, enter the FQDN or IP address of your vCenter host.
     - For Username and Password, enter your vSphere credentials.
     - Select an existing vCenter Account.

6. Click Next.

The Appliance Configuration panel of the wizard appears.

FIGURE 28 Appliance Configuration

7. Enter the Appliance Name. This will be the displayed name in the list of appliances and will also be used to automatically populate the Internal FQDN and External FQDN properties on subsequent wizard panels.

8. Specify additional information for the appliance:
   - A Company Name.
   - The Appliance Username, Password (and Confirm Password) for a required user on the appliance. This user will be created after the appliance is created.
   - (Optional) A License Auth Code can be entered if required.
9. Click Next.

The **Appliance Network Configuration** panel of the wizard appears.

**FIGURE 29** Appliance Network Configuration: Servers

10. Specify the **Primary DNS** and the **Secondary DNS** for your network.

   **Note:** The displayed values are examples, and not defaults.

11. Expand the **Internal Network Settings** panel.

   **FIGURE 30** Appliance Network Configuration: Internal Network Settings
12. In the **Internal Network Settings**:

- For **Private Domain Name**, enter the internal domain name for your appliance.

  **Note:** When you shift focus away from this property, the **Private Domain Name** setting is displayed as a suffix to **Internal FQDN**.

- The **Internal FQDN** property is populated automatically using the **Appliance Name** you specified in the **Appliance Configuration** wizard panel, with the **Private Domain Name** used as a suffix. Change the **Internal FQDN** as required.

- For **Internal Network Name**, enter a name for the vSphere network. For example, VM Network.

- For **IP Address**, enter the required internal IP address of the appliance.

- For **Subnet** and **Gateway**, enter the required subnet mask and gateway IP address.

- (Optional) For **VLAN**, enter your numeric VLAN identifier.

13. Expand the **External Network Settings** panel.

**FIGURE 31** Appliance Network Configuration: External Network Settings
14. In the **External Network Settings**:

   - For **Public Domain Name**, enter the external (Internet) domain name for your appliance.
     
     *Note:* When you shift focus away from this property, the **Public Domain Name** setting is displayed as a suffix to **External FQDN**.

   - The **External FQDN** property is populated automatically using the **Appliance Name** you specified in the **Appliance Configuration** wizard panel, with the **Public Domain Name** used as a suffix. Change the **External FQDN** as required.

   - For **External Network Name**, enter a name for the vSphere network. For example, VM Network.

   - For **IP Address**, enter the required external IP address of the appliance.

   - For **Subnet** and **Gateway**, enter the required subnet mask and gateway IP address.

   - (Optional) For **VLAN**, enter the numeric value you used for the **Internal Network Settings** panel.

15. Expand the **Management Network Settings** panel.

FIGURE 32  Appliance Network Configuration: Management Network Settings
16. In the **Management Network Settings**:
   - For **Management Network Name**, enter a name for the vSphere network. For example, VM Network.
   - For **IP Address**, enter the required management IP address of the appliance.
   - For **Subnet** and **Gateway**, enter the required subnet mask and gateway IP address.
   - (Optional) For **VLAN**, enter the numeric value you used for the **External Network Settings** panel.

17. Click **Next**.

   The **vSphere Configuration** wizard panel appears.

![FIGURE 33  vSphere Configuration](image)

18. Complete the properties for this panel of the wizard:
   - For **Data Center**, enter your required vSphere data center. Data centers are listed on the **Storage** tab on vSphere.
   - For **Data Store**, enter the required vSphere data store from your selected data center. Data stores are listed under each data center on the **Storage** tab on vSphere.
   - For **Resource Pool**, enter the required vSphere resource pool from your selected data center. Resource pools are listed under each data center on the **Hosts and Clusters** tab on vSphere.
   - (Optional) Enter an **Appliance Master Template**. Templates are listed under the data center on the **VMs and Templates** tab on vSphere. For details of how to create an appliance master template, see “Creating an Appliance Master Template on vSphere” on page 36.

19. Click **Save**.

   The wizard closes, and the new **Unregistered** vSphere appliance is added to the list of appliances.

20. Click the **Actions** icon ( ) for the appliance and select **Start Appliance**.
21. The status of the new appliance goes through a series of states until it successfully running.
   - **Unregistered**
   - **Creating**
   - **Starting**
   - **Started**

22. (Optional) During the creation of the appliance, you can monitor progress from the vSphere **Recent Tasks** tab.

   ![vSphere Appliance Creation In Progress](image)

   ![vSphere Appliance Creation Complete](image)

23. Wait until vSphere allocates all IP addresses to the new appliance (see the vSphere **Summary** tab for a selected appliance).

   **Note:** The appliance is auto-registered. That is, you do not need to manually complete the registration of the appliance from the appliance GUI.

The creation and registration of the virtual PCS appliance on vSphere is now complete.

**Creating an Appliance Master Template on vSphere**

Pulse Connect Secure is delivered as a pair of OVF/VMDK template files for use on vSphere. You deploy these OVF template files in vSphere to create a virtual PCS appliance.

You can create a master appliance template which encapsulates the configuration for the appliance.

Appliances that are created from the master template will use the encapsulated configuration, and require less configuration after deployment.
To create a master appliance template:

1. Obtain the Pulse Connect Secure template files from Pulse Secure Support and store the files in an accessible location in your network.

2. Log into the vSphere Web Client.

3. Right-click and an existing host and click **Deploy OVF Template**. For example:

   ![vSphere Web Client Deploy](image)

   The **Deploy OVF Template** wizard appears.

   ![vSphere Deploy OVF Template Wizard 1](image)

   4. Select the **Local file** option and click **Browse**.

   5. Locate and multi-select the OVF and VMDK template files. For example:

   ![vSphere Deploy OVF Select Template Files](image)
6. Click **Next** to proceed to the next panel of the wizard. For example:

**FIGURE 39**  vSphere Deploy OVF Template Wizard 2

7. Enter a **Name** and select a data center for the deployment.

In this example, the **Name** of the appliance is *pcs_import*.

8. Click **Next** to proceed to the next panel of the wizard. For example:

**FIGURE 40**  vSphere Deploy OVF Template Wizard 3

9. Click **Next** to proceed to the next panel of the wizard.

10. Review the displayed details and step back through the wizard to correct these if required.

11. Click **Next** to proceed to the next panel of the wizard. For example:

**FIGURE 41**  vSphere Deploy OVF Template Wizard 5
12. Click **Next** to proceed to the next panel of the wizard. For example:

**FIGURE 42** vSphere Deploy OVF Template Wizard 6

13. Select appropriate network interfaces for each of the PCS interfaces.

14. Click **Next** to proceed to the next panel of the wizard.

**FIGURE 43** vSphere Deploy OVF Template Wizard 7

15. Make no changes to this wizard page.

16. Click **Next** to proceed to the final panel of the wizard.

17. Review the displayed details and step back through the wizard to correct these if required.
18. Click **Finish** to complete the wizard and deploy the appliance.

After the appliance is deployed, it appears in the main page of the vSphere Web Client. For example:

**FIGURE 44** vSphere Web Client Clone

![vSphere Web Client Clone](image)

19. Right-click on the appliance and then click **Clone > Clone to Template**.

The **Clone Virtual Machine to Template** wizard starts. For example:

**FIGURE 45** vSphere Clone VM to Template Wizard

![vSphere Clone VM to Template Wizard](image)

20. Specify a name and select a location for the required template.

21. Click **Next** to proceed to the next panel of the wizard. For example:

**FIGURE 46** vSphere Clone VM to Template Wizard 1b

![vSphere Clone VM to Template Wizard 1b](image)

22. Select the required compute resource.
23. Click **Next** to proceed to the next panel of the wizard. For example:

![FIGURE 47  vSphere Clone VM to Template Wizard 1c](image1)

24. Set **Select virtual disk format** to **Same format as source**.

25. Click **Next** to proceed to the next panel of the wizard. For example:

![FIGURE 48  vSphere Clone VM to Template Wizard 1d](image2)

26. Click **Next** to proceed to the final panel of the wizard.

27. Review the displayed details and step back through the wizard to correct these if required.

28. Click **Finish** to complete the wizard and create the master appliance template.

After you have a master appliance template, you can optionally use it on the **vSphere Configuration** page of the **Add Appliance Wizard**, see “Creating and Registering a PCS Appliance VM on vSphere” on page 29.

## Creating and Registering a PCS Appliance VM on AWS

You can create and register a PCS appliance as an AWS Virtual Machine from Pulse One directly. This process will create the VM appliance and perform all required registration activities on the appliance automatically.

**Note:** This process requires sufficient appliance licensing capacity on Pulse One.

**Note:** You can also create and register a **Virtual Machine appliance** for vSphere, see “Creating and Registering a PCS Appliance VM on vSphere” on page 29.
Perform the following tasks:

1. Before you begin, you must locate and record the following information:
   - The required Route 53 zones, see “Identifying the Required Route 53 Zones” on page 42.
   - The required VPC ID and Subnet IDs, see “Identifying the Required VPC ID and Subnet IDs” on page 44.
   - The required EC2 deployment key, see “Identifying the EC2 Deployment Key and AMI ID” on page 46.

2. You can then create the appliance, see “Creating the PCS Appliance VM on AWS” on page 49.

Identifying the Required Route 53 Zones

Both a private and a public Route 53 zone are required during the creation of a virtual machine PCS appliance. To locate this information:

1. Login to the AWS Management Console.
2. On the AWS top bar, select the required Region. For example, EU (London).
3. On the AWS top bar, click Services and then locate the Network & Content Delivery options.
4. Under Network & Content Delivery, select Route 53.

The AWS Route 53 Management Console appears.

Identifying the Required Route 53 Zones

Both a private and a public Route 53 zone are required during the creation of a virtual machine PCS appliance. To locate this information:

1. Login to the AWS Management Console.
2. On the AWS top bar, select the required Region. For example, EU (London).
3. On the AWS top bar, click Services and then locate the Network & Content Delivery options.
4. Under Network & Content Delivery, select Route 53.

The AWS Route 53 Management Console appears.
5. Select **Hosted Zones**.

The hosted zones panel appears. This lists all domain names (zones) that are available to you.

**FIGURE 51**  AWS Route 53 Hosted Zones

In the domain name list:

- Zones that have a **Type** of Public have externally-facing (Internet) domain names. The external FQDN that is required when you create the PCS appliance VM will use the external domain name as a suffix.

- Zones that have a **Type** of Private have internally-facing domain names. The internal FQDN that is required when you create the PCS appliance VM will use an internal domain name as a suffix.

For example:

**FIGURE 52**  AWS Public and Private Zones

6. Select the required Public zone and record its Domain Name.

7. Locate the required Private zone and record its Domain Name.

You can then perform any remaining preparations, and then continue to create and register the PCS appliance virtual machine on AWS.
Identifying the Required VPC ID and Subnet IDs

A VPC identifier is required during the creation of a virtual machine PCS appliance. To locate this information:

1. Login to the AWS Management Console.
2. On the AWS top bar, select the required **Region**.
3. On the AWS top bar, click **Services** and then locate the **Network & Content Delivery** options.
4. Under **Network & Content Delivery**, select **VPC**.

The **AWS VPC Dashboard** appears.

![AWS VPC Dashboard](image)

5. Select **Your VPCs**.

A list of available VPCs appears.

![AWS Available VPCs](image)

6. Locate the required VPC and record its **VPC ID**. For example:

![AWS VPC ID](image)
7. In the **Filter by VPC** filter, select the required VPC. For example:

![AWS Select VPC](image)

**FIGURE 56** AWS Select VPC

8. Click **Subnets**.

A list of all subnets in the selected VPC appears.

This list must include three different subnets that are in the same **Availability Zone**. Each will be used for one of the standard PCS interfaces in a later procedure (see “Creating the PCS Appliance VM on AWS” on page 49). The interfaces requirements are:

- Internal interface - This must be a **private** subnet.
- External Interface - This must be a **public** subnet.
- Management Interface - This can be either a **public** or **private** subnet, depending on your requirements.

Where the required subnets do not exist, you must create them before proceeding.

9. Select a public subnet and record its **Subnet ID** from the bottom panel. For example:

![AWS Select Public Subnet](image)

**FIGURE 57** AWS Select Public Subnet

This subnet be used for the internal interface of the PCS appliance in a later procedure.
10. Select a private subnet (in the same Availability Zone as step 9) and record its Subnet ID from the bottom panel. This subnet be used for the external interface of the PCS appliance in a later procedure.

11. Select a third subnet (either private or public, and in the same Availability Zone as step 9) and record its Subnet ID from the bottom panel. This subnet be used for the management interface of the PCS appliance in a later procedure.

You can then perform any remaining preparations, and then continue to create and register the PCS appliance virtual machine on AWS.

Identifying the EC2 Deployment Key and AMI ID

An EC2 key pair (deployment key) and an AMI ID are required during the creation of a virtual machine PCS appliance. To locate this information:

1. Login to the AWS Management Console.
2. On the AWS top bar, select the required Region.
3. On the AWS top bar, click Services and then locate the Compute options.

The AWS EC2 Dashboard appears, showing Key Pairs.

**FIGURE 58** AWS EC2 Dashboard
5. In the **Resources** panel, click **Key Pairs**.

A list of defined key pairs appears.

**FIGURE 59** AWS EC2 Key Pairs

![AWS EC2 Key Pairs](image)

6. Select the required key pair and record its **Key pair name** from the bottom panel. This name is used as the “deployment key” during installation. For example:

**FIGURE 60** AWS Select EC2 Key Pair

![AWS Select EC2 Key Pair](image)
7. On the EC2 dashboard menu, under **Images** select **AMIs**.

A list of defined AMIs appears. For example:

**FIGURE 61  AWS EC2 AMIs**

8. Select the required AMI and record its **AMI-ID** from the bottom panel. For example:

**FIGURE 62  AWS EC2 AMIs**

You can then perform any remaining preparations, and then continue to create and register the PCS appliance virtual machine on AWS.
Creating the PCS Appliance VM on AWS

After you have identified all required information (see “Creating and Registering a PCS Appliance VM on AWS” on page 41), you can start the process to create and register a PCS appliance as a VM on AWS:

1. Log into Pulse One as an administrator.
2. Click the Appliances menu and then the Appliances tab.
   The Appliances tab displays all current appliances.
3. Click Add Appliance.
   The Add Appliance wizard starts.

![Add Appliance](image)

4. Select Create virtual appliance in Amazon Web Services and click Next.
   The AWS Credentials panel of the wizard appears.

![AWS Credentials](image)

5. You must then specify AWS credentials. Either:
   - Select Add New for Account, then enter your AWS Access Key and Secret Key, OR
   - Select an existing AWS Account.
6. Click **Next**.

The **Appliance Configuration** panel of the wizard appears.

![Appliance Configuration](image)

7. Enter the **Appliance Name**. This will be the displayed name in the list of appliances and will also be used to automatically populate the **Internal FQDN** and **External FQDN** properties on subsequent wizard panels.

8. Specify additional information for the appliance:

   • A **Company Name**.

   • (Optional) A **License Auth Code** can be recorded if required.

   • The **Appliance Username, Password** (and **Confirm Password**) for a required user on the appliance. This user will be created after the appliance is created.
9. Click **Next**.

The **Appliance Network Configuration** panel of the wizard appears.

**FIGURE 66**  Appliance Network Configuration: Servers

10. Specify the **Primary DNS** and the **Secondary DNS** for your network.

   **Note:** The displayed values are examples, and not defaults.

11. Expand the **Internal Network Settings** panel.

   **FIGURE 67**  Appliance Network Configuration: Internal Network Settings
12. In the **Internal Network Settings**:

- For the **Hosted Zone**, enter the internal domain name (internal Route 53 hosted zone) for your appliance. See “Identifying the Required Route 53 Zones” on page 42.

  **Note:** When you shift focus away from this property, the internal **Hosted Zone** setting is displayed as a suffix to **Internal FQDN**.

- For the **Internal FQDN**, complete the FQDN by adding a unique appliance identifier to the left-hand side of the internal domain name in this field. Typically, you will specify the **Appliance Name** you specified in the **Appliance Configuration** dialog, and the internal **Hosted Zone** is used as a suffix.

13. Expand the **External Network Settings** panel.

14. In the **External Network Settings**:

- For the **Public Domain Name**, enter the external domain name (external Route 53 hosted zone) for your appliance. See “Identifying the Required Route 53 Zones” on page 42.

  **Note:** When you shift focus away from this property, the external **Hosted Zone** setting is displayed as a suffix to **External FQDN**.

- For the **External FQDN**, complete the FQDN by adding a unique appliance identifier to the left-hand side of the external domain name in this field. Typically, you will specify the **Appliance Name** you specified in the **Appliance Configuration** dialog, and the external **Hosted Zone** is a suffix.
15. Expand the Management Network Settings panel.

**FIGURE 69** Appliance Network Configuration: Management Network Settings

16. In the Management Network Settings:

- For **Management Domain Name**, enter a name for the AWS network.

  *Note:* When you shift focus away from this property, the Management Domain Name setting is displayed as a suffix to Management FQDN.

- For the **Management FQDN**, complete the FQDN by adding a unique appliance identifier to the left-hand side of the external domain name in this field. Typically, you will specify the Appliance Name you specified in the Appliance Configuration dialog, and the Management Domain Name is a suffix.
17. Click **Next**. The **AWS Configuration** panel of the wizard appears.

18. Specify the following properties:

- **Amazon Machine Image (AMI)** is the AMI ID that you identified in “Identifying the EC2 Deployment Key and AMI ID” on page 46.
- **VPC ID** is the value that you identified in “Identifying the Required VPC ID and Subnet IDs” on page 44.
- **Region** is automatically populated from your chosen region.
- **Private Subnet ID, Public Subnet ID, and Management Subnet ID** are the three subnet IDs that you identified in “Identifying the Required VPC ID and Subnet IDs” on page 44.
- **Deployment Key** is the key pair that you identified in “Identifying the EC2 Deployment Key and AMI ID” on page 46.

19. Click **Save**.

The wizard closes, and the new **Unregistered** AWS appliance is added to the list of appliances. For example:
20. Click the **Actions** icon ( ) for the appliance and select **Start Appliance**.

21. The status of the new appliance goes through a series of states until it successfully created.
   - **Unregistered**
   - **Creating**
   - **Starting**
   - **Started**

22. Wait until the appliance is created.

23. Go to the **EC2 Dashboard** in AWS and view **Instances**.

24. The new appliance is listed and reports a **Status Check** of Initializing. For example:

   ![AWS Initializing Appliance](image)

   **FIGURE 72** AWS Initializing Appliance

   **Note:** The appliance is auto-registered. That is, you do not need to manually complete the registration of the appliance from the appliance GUI.

The creation and registration of a PCS appliance as a virtual machine on AWS is now complete.

**Configuring CPU, Memory and Disk Utilization**

The **Appliances** tab displays all the added appliances. When you select an online appliance, a detailed panel shows the health of the appliance.

The panel shows the following status:

- CPU, memory and disk utilization.
- The number of concurrent users connected.
- The throughput of the appliance.
- The number of authentication failures.
To view the health of an appliance:

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Appliances** tab.
   The **Appliances** tab displays all current appliances.
3. Select an appliance whose **Pulse One Status** is **Connected**.
   The panel on the right gives a pictorial representation of the CPU, memory, and disk usage information. For example:

   ![Appliance Health](image)

### Backing up and Restoring Appliance Configurations

Pulse One supports the backup and restore of the configuration of any managed appliance of v9.0R2 or later.

Each appliance can have a single configuration backup only.

When a new backup for an appliance is started, the previous backup (if present) is deleted.

#### Backing up the Configuration of an Appliance

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Appliances** tab.
The **Appliances** tab displays all current appliances.

**FIGURE 74**  Pulse One Appliances Tab

3. Locate the appliance that you want to backup and click its **Actions** icon ( ).

**FIGURE 75**  Appliance Menu

In this example, the **pcs-174** appliance is at version 9.0R2. As a result, its menu includes the **Backup Configuration** option.

4. Click **Backup Configuration**.

The **Backup Appliance** dialog appears.

5. Specify a **Description** for the configuration backup and click **Save**.

The configuration backup is initially marked as **Backup Pending** in the **Task Status** column.

**FIGURE 76**  Monitoring a Pending Backup
The **Task Status** changes to *Backup in Progress Cancellable* after the configuration backup starts. After the configuration backup completes, the **Task Status** entry for the appliance is cleared.

6. (Optional) If required, you can cancel the configuration backup while it is in progress. To do this, click the **Actions** icon (֕) for the appliance, and then click **Cancel Backup**.

**FIGURE 77** Canceling a Backup

The cancellation is then confirmed.

7. After the configuration backup completes, click the **Backup-Restore** tab.

The **Backup-Restore** tab lists all configuration backups taken, plus a total size of all backups. For example:

**FIGURE 78** Viewing Backup Files

In this example:

- The configuration backup for *Ade_Pulse-106* is at the top of the list.
- The total size of all backups is 1 MB.
Deleting the Configuration Backup for an Appliance

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Backup-Restore** tab.

   The **Backup-Restore** tab lists all configuration backups taken. For example:

   ![FIGURE 79 Viewing Backup Files Before Delete](image)

   In this example, the configuration backup for *Ade_Pulse-106* is at the top of the list.

3. Locate the configuration backup that you want to delete.
4. Click the **Actions** icon ( ![ ] ) for the appliance, and then click **Delete Configuration**.

   A confirmation dialog appears.

5. Confirm the deletion.

   The configuration backup is deleted and removed from the list of configuration backups.

Restoring the Configuration of an Appliance

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Backup-Restore** tab.

   The **Backup-Restore** tab lists all configuration backups taken. For example:

   ![FIGURE 80 Viewing Backup Files](image)

   In this example, the configuration backup for *pcs-174* is at the top of the list.

3. Locate the configuration backup that you want to restore.
4. Click the **Actions** icon ( ) for the appliance, and then click **Restore Configuration**.

   The **Select Appliance to Restore** dialog appears. This dialog lists all appliances for which there is a configuration backup file, and which are also in a connected state. For example:

   ![Select Appliance to Restore](image)

   **Note:** This dialog also lists the ESAP Package version and the Pulse Desktop version that must be installed on the appliance manually before initiating the restore.

5. Select the required appliance and click **Select**.

   The configuration restore for the selected appliance is scheduled.

6. Click the **Appliances** tab.

   The **Task Status** for the selected appliance is shown as **Restore Pending**. For example:

   ![Monitoring a Configuration Restore for an Appliance](image)

   The **Task Status** changes to **Restore in Progress Not Cancellable** after the configuration restore starts.

   After the configuration restore completes, the **Task Status** for the appliance is cleared.

   **Note:** During a configuration restore of an appliance, you cannot schedule a backup. This restriction clears after the restore completes.

7. (Optional) While the **Task Status** for a selected appliance is **Restore Pending**, you can cancel the restore process. To do this, click the **Actions** icon ( ) for the appliance, and then click **Cancel Restore**.

8. (Optional) View the activities for an appliance to see the results of backup and restore operations, see “Viewing the Activities Log for an Appliance” on page 87.
Working with Appliance Groups

Two or more appliances can be collected into an appliance group to enable group operations:

- “Creating an Appliance Group” on page 61.
- “Adding Appliances to an Appliance Group” on page 65.
- “Distributing a Master Configuration” on page 67.

Creating an Appliance Group

An Appliance Group uses a single base configuration from a master appliance in Pulse One and applies that configuration to all the other target appliances in the group. This master appliance is always used to change the configuration settings for the group. You can add appliances to the group or remove appliances from the group at any time.

All appliances in a group must run the same firmware version and must be the same appliance type as the master. However, the appliance group may contain member appliances using any form factor.

Examples:

- If the master is a Pulse Connect Secure appliance running firmware version 8.2R5, all other appliances in the group must also be Pulse Connect Secure – either virtual appliances or hardware appliances (PSAs, MAGs, and SAs) - that also run firmware version 8.2R5.
- If the master is Pulse Policy Secure, all other appliances in the group must also be Pulse Policy Secure.

To create an appliance group:

1. Select the Appliances menu.
2. Select the Config Groups tab.
3. Click Create Appliance Group.

FIGURE 83  Create Appliance Group
The **Create Appliance Group Wizard** appears.

**FIGURE 84** Create Appliance Group Wizard

4. Click **Next**.

The **Group name and description** panel of the wizard appears.

**FIGURE 85** Group Name and Description Wizard Panel
5. In this wizard panel:

- Enter the **Group name** and a **Description**.
  
  **Note:** The **Group name** should be at least 3 characters and not more than 50 characters.

- Enter a common admin **Username** and **Password** for all the appliances under this group, with which all appliances can receive DMI requests from Pulse One.
  
  **Note:** These credentials must be valid for all group members.

- Specify a common **Port** number on which all appliances under this group will receive DMI requests. The default value is 830.

For full details of appliance upgrades, see “Upgrading Managed Appliances” on page 71.

6. Click **Next**.

The **Group configuration settings** panel of the wizard appears.

7. In this panel:

- For **Select master appliance**, select an appliance to be the master appliance.
  
  **Note:** An appliance can be configured as master appliance in one or more groups.

- Enter the **Master appliance URL**. This is the Internet-facing admin login URL. For example: https://<ip_address>/admin

- Select configuration settings that must be shared between all group members in the bottom list.
8. Click **Next**.

The **Summary** panel of the wizard appears. For example:

**FIGURE 87** Summary Wizard Panel

![Summary Wizard Panel](image)

9. (Optional) If you want to make any changes, click on the corresponding **Edit** link and make the changes.

10. Click **Finish**.

The new appliance group is listed in the **Appliances** page. For example:

**FIGURE 88** New Appliance Group

![New Appliance Group](image)

You can now add appliances to the group as target appliances, see “Adding Appliances to an Appliance Group” on page 65.
Adding Appliances to an Appliance Group

To add an appliance into an appliance group as a target appliance:

1. Select the **Appliances** menu.
2. Select the **Config Groups** tab.
3. Select the appliances group to which you want to add the appliance.
   
   The right-hand panel updates to show group details.
4. Select the **Target Appliances** tab. For example:

   ![Target Appliances Empty](image)

5. Click **Add Appliance**. A dialog appears.

   ![Select Target Appliance](image)

6. In this dialog, select an appliance to be added as a target appliance to the selected group.
   
   **Note**: Group configuration is only supported for appliances that are of same security appliance type and running the same software version.
7. Click **Save** to add the appliance to the group.
8. Repeat steps 5, 6 and 7 until the group contains all required target appliances. For example:

FIGURE 91   Target Appliances Added
Distributing a Master Configuration
This section details the steps to distribute the configuration of the master appliance to all target appliances.

- “Viewing Configuration Changes” on page 67.
- “Publishing Configuration Changes Manually to Group Members” on page 67.
- “Publishing Configuration Changes to Group Members as a Scheduled Task” on page 70.

Viewing Configuration Changes
To view configuration changes between the master appliance and target appliances, click the View Changes button. The button changes to Close Changes. The configuration changes will be displayed on the same page.

FIGURE 92  View Configuration Changes

To close the configuration changes view, click Close Changes.

Publishing Configuration Changes Manually to Group Members
If the configuration of the master appliance differs from the configuration of the target appliances in its group, a Publish Required notification is displayed, and the Publish All button is enabled.

Note: Publishing to a group can also be performed as a scheduled task for groups. See “Publishing Configuration Changes to Group Members as a Scheduled Task” on page 70.
To manually publish a configuration to all appliances in a group:

1. Select the **Appliances** menu and then the **Config Groups** tab.

2. In the Appliance Group panel, click **Publish All**.

   ![Publish All](image)

   The **Configuration Changes** view closes if it is open.

   A confirmation dialog appears.

3. In the confirmation dialog, click **Yes** to confirm the publication.

   Pulse One then publishes the master appliance configuration to the target appliances within the group.

4. To view configuration mismatch scenarios, click the **View Changes** button and then click the **Apply Group Config** button. The **Publish All** button will be disabled.

![Configuration Change in Member Appliance](image)

   The **Configuration Changes** panel shows the changes in the member appliance configuration compared to the master configuration.
5. You can either:

- Retain the changes by clicking **Keep Non-compliant**, OR
- Apply the group configuration by clicking **Apply Group Config**

In either case, the compliance conflict is ignored, and the configuration will be published.

6. If you choose to remain non-compliant, then the *Configuration Mismatch* notification changes to a *Mismatch Ignored* notification, indicating that it is intentionally being kept out of compliance.

**FIGURE 95**  Configuration Mismatch
Publishing Configuration Changes to Group Members as a Scheduled Task

If the configuration of the master appliance differs from the configuration of the target appliances in its group, a Publish Required notification is displayed.

To publish configuration changes at a specific time, you can create a scheduled task to perform this action.

**Note:** Publishing configuration changes to an appliance group can also be performed manually, see “Publishing Configuration Changes Manually to Group Members” on page 67.

To publish configuration changes from a master appliance to all target appliances as a scheduled task:

1. Select the **Appliances** menu and then the **Config Groups** tab.
2. Click the **Actions** icon ( ) for the appliance group you want to upgrade, and then click **Schedule Task**.
   - The **Create Task** dialog appears.

   **FIGURE 96**  Create Publish Configuration Task

3. In the **Create Task** dialog, for **Task Type**, select **Publish configuration**.
4. For **Scheduled Time**, select the required start time for the task.
5. (Optional) Add **Comments** as required. These appear on the **Scheduled Tasks** list.
6. Click **Save**.
   - The new task is added to the list of scheduled tasks in the **Scheduled Tasks** tab.

   **FIGURE 97**  Scheduled Publish Configuration Task

7. (Optional) You can edit the details for a scheduled task by clicking the **Edit** icon ( ) for the task.
8. (Optional) You can cancel a scheduled task by clicking the **Delete** icon for the task.

9. (Optional) You can monitor the progress of scheduled tasks using one of the following methods:
   - On the **Scheduled Tasks** tab. Here, the **Task Status** updates as a task starts and proceeds through to completion.
   - From the **Appliance Activities** panel. To access this, click the **Administration** tab, and then the **Appliance Activities** option.
   - From the **Config Group** tab, you can see status updates for the group as a whole.
   - From the **Appliances** tab, you can see status updates for each appliance group member.
   - From the **Activities** panel for an individual appliance on the right side of the **Appliances** tab.

### Upgrading Managed Appliances

After an appliance is registered on Pulse One, several software upgrade operations are supported. You can:

- Upload one or more appliance software packages on Pulse One, see “Uploading an Appliance Software Package to Pulse One” on page 71.
- You must ensure that each appliance has its DMI enabled and configured correctly, see “Checking DMI Settings” on page 73.
- Upgrade a single appliance, see “Upgrading an Appliance” on page 75.
- Upgrade all appliances in an appliance group, see “Upgrading All Target Appliances in a Group” on page 77.
- Upgrade both appliances in a cluster, see “Upgrading All Appliances in a Cluster” on page 79.
- Schedule the upgrade of an appliance in two stages:
  - First, schedule the upload of an image to a staging area on an appliance.
  - Second, schedule the installation of a staged software package on an appliance.

For details, see “Scheduling Upgrade-Related Tasks” on page 79.

### Uploading an Appliance Software Package to Pulse One

Before you can perform any software upgrade operations on PPS/PCS appliances, you must upload one or more appliance software packages to Pulse One.

You can upload up to three PPS appliance software packages and up to three PCS software packages.

To upload an appliance software package:
1. Log into Pulse One as an administrator.

2. Click the **Appliances** menu and then the **Software** tab.

   The **Software** tab lists all **Available Software** packages present on Pulse One. For example:

   ![Available Software](image)

3. (Optional) If you do not have the required software images, click **Download Appliance Software** and download them from Pulse Support.

   **Note:** Any software package downloaded from the Pulse Support site should be available in local storage (not in Pulse One). It is the responsibility of the admin to upload packages to Pulse One.

4. Click **Add Software**.

   The **Upload Software** dialog appears.

   ![Upload Software](image)

5. In the **Upload Software** dialog:
   - For **Software Type**, select whether your software package is for **Pulse Policy Secure** or **Pulse Connect Secure**.
   - Enter a **Version** number and a **Description** for the software package.

   **Note:** The version number is case sensitive and should use capital letters.
• Enter the MD5 Hash value for the software package.

You can get the MD5 value from the Pulse Support site. Alternatively, log into any LINUX machine where the file is downloaded, locate the software package file, and run the `md5<package_file_name>` command from the command line.

• For Select Software, click Browse and locate the software package file.

6. Click Upload.

The upload may take several minutes.

After the upload completes, the new package is added to the Available Software list. For example:

**FIGURE 100** Appliance Software Package Added

7. (Optional) If required, you can edit the details for an uploaded software package.

   To do this, click the Actions icon ( ) for the software package, and then click Edit Software.

8. (Optional) If required, you can delete an uploaded software package.

   To do this, click the Actions icon ( ) for the software package, and then click Delete Software.

You can now perform one or more appliance software upgrades.

**Checking DMI Settings**

Before you can upgrade an appliance from Pulse One, you must ensure that the appliance has Device Management Interface (DMI) enabled and configured correctly.

To check DMI settings:

1. Log into the appliance as an administrator.
2. Access the DMI Agent settings for the appliance.
For example, on Pulse Policy Secure, click the **System** menu, then **Configuration > DMI Agent**.

**FIGURE 101** Accessing Pulse Policy Secure DMI Agent Settings

3. The **DMI Agent** settings appear. For example, on Pulse Policy Secure:

**FIGURE 102** Pulse Policy Secure DMI Agent Settings

4. Ensure that inbound DMI connections are enabled. For example, on Pulse Policy Secure:

**FIGURE 103** Pulse Policy Secure DMI Agent Settings
5. Ensure that inbound DMI connections are received on the correct port type and port number.

To do this, you need the DMI settings that you used when you registered the appliance, see “Registering an Existing PCS/PPS Appliance” on page 21. Specifically, you need the choice of whether to perform DMI over the internal port or the management port.

- For the **Accept connections on** setting, select the required interface type. That is, either the **Internal Port** or the **Management Port**.
- The **TCP port** number. The default is 830.

6. The DMI settings on the appliance are now configured correctly for software upgrades from Pulse One.

### Upgrading an Appliance

You can perform an immediate software upgrade on any registered appliance.

**Note:** Alternatively, you can schedule one or more upgrade processes for a later time, see “Scheduling Upgrade-Related Tasks” on page 79.

Before you can perform an immediate software upgrade on an appliance, you must upload the required appliance software package, see “Uploading an Appliance Software Package to Pulse One” on page 71.

**Note:** The appliance will continue to operate while it uploads the software package, but it will then reboot. The appliance will be offline until the upgrade completes. After the appliance is online again the upgrade is complete, but it may take several more minutes for the appliance to reconnect to Pulse One.

To perform a software upgrade for an appliance:

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Appliances** tab.

The **Appliances** tab lists all appliances on Pulse One. For example:

#### FIGURE 104  Available Appliances
3. Click the **Actions** icon ( ) for the appliance you want to upgrade, and then click **Upgrade Software**.

The **Upgrade Software** dialog appears. For example:

**FIGURE 105** Upgrade Software

![Upgrade Software Dialog]

4. For **Select Software**, choose the required software package for the upgrade.

Full details for the selected package are displayed.

5. To start the upgrade, click **Upgrade**.

The **Task Status** of the appliance updates to show that the upgrade of the appliance is pending. For example:

**FIGURE 106** Upgrade Pending

![Upgrade Pending]

The **Task Status** changes as the process continues.

**Note:** The entire upgrade process may take up to an hour.

**Note:** All appliance configuration is preserved during this process.

- After the software update begins, the appliance uploads the specified software package. At this point, the appliance is still operational.

  **Note:** Do not log into an appliance during an upgrade using the credentials used for DMI. This may cause the upgrade to fail.
- After the software package upload is complete, the appliance reboots to complete the upgrade, and the connection between Pulse One and the appliance is lost. For example:

**FIGURE 107  Appliance Rebooting**

- After the appliance reboots, the upgrade is complete, but it may take several minutes to reconnect to the appliance from Pulse One.

### Upgrading All Target Appliances in a Group

You can perform an immediate software upgrade on the master appliance in an appliance group.

The target appliances in the group are upgraded automatically.

**Note:** Alternatively, you can schedule one or more upgrade tasks for the master appliance at a later time, see “Scheduling a Full Upgrade of an Appliance Group” on page 85.

To upgrade all members of an appliance group:

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Config Groups** tab.

The **Appliance Configuration Groups** tab lists all appliance groups on Pulse One. For example:

**FIGURE 108  Available Appliance Groups**
3. Click the **Actions** button for the appliance group you want to upgrade, and then click **Upgrade Software**.

The **Upgrade Software** dialog appears. For example:

**FIGURE 109** Appliance Group Upgrade Software

4. For **Select Software**, choose the required software package for the upgrade.

   Full details for the selected package are displayed.

5. To start the upgrade, click **Upgrade**.

6. Click the **Appliances** tab.

   The **Task Status** of each appliance updates to show that the upgrade of the appliance is pending.

   The **Task Status** of each appliance changes as the process continues.

   **Note:** The entire upgrade process for an appliance may take up to an hour.

   **Note:** All appliance configuration is preserved during this process.

   - After an appliance software update begins, the appliance uploads the specified software package. At this point, the appliance is still operational.

     **Note:** Do not log into an appliance during an upgrade using the credentials used for DMI. This may cause the upgrade to fail.

   - After the software package upload to an appliance is complete, the appliance reboots to complete the upgrade, and the connection between Pulse One and the appliance is lost.

   - After the appliance reboots, the upgrade of the appliance is complete, but it may take several minutes to reconnect to the appliance from Pulse One.

After all members of the group (master and target appliances) have been upgraded, the upgrade of the group is complete.
Upgrading All Appliances in a Cluster
Upgrading all appliances in a cluster is similar to the upgrade of a single appliance, see “Upgrading an Appliance” on page 75.

You can perform an immediate software upgrade on one of the appliances in a cluster, as follows:

- For Active/Active clusters, you can only upgrade the Leader node. All other nodes upgrade automatically.
- For Active/Passive clusters, you can only upgrade the Passive node. The Active node upgrades automatically.

In both cases, all nodes will be offline for some time during the upgrade.

Note: Alternatively, you can schedule the upgrade processes for a later time, see “Scheduling Upgrade-Related Tasks” on page 79.

Scheduling Upgrade-Related Tasks
You can schedule upgrade-related tasks so that they are performed automatically at specified times.

There are three types of scheduled task:

1. The publication of configuration changes from a master appliance to all group members.
   
   Note: This scheduled task type is only supported for appliance groups. It is not a requirement to publish all configuration changes before performing an upgrade, but you can optionally publish your configuration as part of your workflow if required.

2. The upload of a software package to a staging area on an appliance.
   
   No installation is performed, and there is no loss of service.

3. The upgrade of an appliance based on a pre-staged software package.
   
   There is a loss of service during the upgrade as the appliance must be rebooted.

To perform a full upgrade on an appliance or an appliance group, you must perform both task types.

The scheduling of these tasks can be suited to your network requirements.

The scheduling of tasks is supported for:

- Single appliances.
- Appliance groups. You schedule the tasks against the group, and all group members will automatically perform the designated task.
Appliance clusters:

- For **Active/Active** clusters, you can only schedule tasks for the Leader node. After both the upload and the installation tasks are complete, all other nodes upgrade automatically.

- For **Active/Passive** clusters, you can only upgrade the Passive node. After both the upload and the installation tasks are complete, the Active node upgrades automatically.

You can initiate appliance upgrades using scheduled tasks as follows:

- “Scheduling a Full Upgrade from the Scheduled Tasks Tab” on page 80.
- “Scheduling a Full Upgrade from the Appliances Tab” on page 83.
- “Scheduling a Full Upgrade of an Appliance Group” on page 85.

### Scheduling a Full Upgrade from the Scheduled Tasks Tab

To schedule an upgrade of an individual appliance using a pair of tasks from the Scheduled Tasks tab:

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Scheduled Tasks** tab.

   The **Scheduled Tasks** tab lists all scheduled tasks on Pulse One. For example:

   ![Scheduled Tasks](image)

   **FIGURE 110** Scheduled Tasks
3. Click **Create Task**.

The **Create Task** dialog appears.

![Create Task dialog](image1)

4. In the **Create Task** dialog:
   - For **Choose Appliance or Group**, select either *Appliance* or *Group*. An additional property appears, from which you select the required appliance or group.
   - For **Task Type**, select *Stage a software package*.
   - For **Target Version**, select the required software upgrade package.
   - For **Scheduled Time**, select the start time for the task.
   - (Optional) Add **Comments** as required. These appear on the **Scheduled Tasks** list.

5. Click **Save**.

The new task is added to the list of **Scheduled Tasks**. For example:

![Scheduled Staging Task Added](image2)

6. To add the second task, click **Create Task** again.
7. In the **Create Task** dialog:
   - For **Choose Appliance or Group**, select the same setting as for the first task, and select the same appliance or group.
   - For **Task Type**, select *Install a staged package*.
   - For **Target Version**, select the same package as for the first task.
   - For **Scheduled Time**, select the start time for the task. This must allow sufficient time for the first task to complete.
   - (Optional) Add **Comments** as required. These appear on the **Scheduled Task** list.

8. Click **Save**.

The new task is added to the list of **Scheduled Tasks**. For example:

**FIGURE 113** Scheduled Install Task Added

9. (Optional) You can edit the details for a scheduled task by clicking the **Edit** icon (📝) for the task.

10. (Optional) You can cancel a scheduled task by clicking the **Delete** icon for the task.

11. (Optional) You can monitor the progress of scheduled tasks using one of the following methods:
   - On the **Scheduled Tasks** tab. Here, the **Task Status** updates as a task starts and proceeds through to completion.
   - From the **Appliance Activities** panel. To access this, click the **Administration** tab, and then the **Appliance Activities** option.
   - From the **Appliances** tab, you can see status updates for individual appliances.
   - From the **Activities** panel for an appliance on the right side of the **Appliances** tab.
Scheduling a Full Upgrade from the Appliances Tab

To schedule an upgrade of an individual appliance using a pair of scheduled tasks from the **Appliances** tab:

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Appliances** tab.

   The **Appliances** tab lists all appliances on Pulse One. For example:

   ![List of Appliances](image1)

3. Click the **Actions** icon ( ) for the appliance you want to upgrade, and then click **Schedule Task**.

   The **Schedule Task** option is unavailable for:
   
   - Target appliances. That is, appliances that are in an appliance group, other than the master.
   - All non-**Leader** appliances in an Active/Active cluster.
   - The Active node in an Active/Passive cluster.

   The **Create Task** dialog appears.

   ![Create Task](image2)
4. In the **Create Task** dialog:
   - For **Task Type**, select *Stage a software package*.
   - For **Target Version**, select the required software upgrade package.
   - For **Scheduled Time**, select the start time for the task.
   - (Optional) Add **Comments** as required. These appear on the **Scheduled Tasks** list.

5. Click **Save**.

   The new task is added to the list of scheduled tasks in the **Scheduled Tasks** tab. For example:

   ![Scheduled Staging Task Added](image)

6. In the **Appliances** tab, click the **Actions** icon (🕒) for the appliance you want to upgrade, and then click **Schedule Task**.

   The **Create Task** dialog appears.

7. In the **Create Task** dialog:
   - For **Task Type**, select *Install a staged package*.
   - For **Target Version**, select the same package as for the first task.
   - For **Scheduled Time**, select the start time for the task. This must allow sufficient time for the first task to complete.
   - (Optional) Add **Comments** as required. These appear on the **Scheduled Tasks** list.

8. Click **Save**.

   The new task is added to the list of scheduled tasks in the **Scheduled Tasks** tab.

9. (Optional) You can edit the details for a scheduled task by clicking the **Edit** icon (📝) for the task.

10. (Optional) You can cancel a scheduled task by clicking the **Delete** icon for the task.
11. (Optional) You can monitor the progress of scheduled tasks using one of the following methods:

- On the **Scheduled Tasks** tab. Here, the **Task Status** updates as a task starts and proceeds through to completion.
- From the **Appliance Activities** panel. To access this, click the **Administration** tab, and then the **Appliance Activities** option.
- From the **Appliances** tab, you can see status updates for individual appliances.
- From the **Activities** panel for an appliance on the right side of the **Appliances** tab.

**Scheduling a Full Upgrade of an Appliance Group**

You can schedule an upgrade of an all target appliances in an appliance group as a single task from the **Config Groups** tab. When each task triggers, the same operation is initiated simultaneously on all group members.

**Note:** Before you upgrade a group, you can optionally publish any configuration changes from the master appliance to all group members. This can be performed as a separate scheduled task. You can also choose to publish a configuration to a group at any other time, see “” on page 66.

To schedule an upgrade of an appliance group using a pair of scheduled tasks from the **Config Groups** tab:

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Config Groups** tab.
   
   The **Config Groups** tab lists all appliance groups on Pulse One.

3. (Optional) If there are unpublished configuration changes for the group, you can choose to publish the configuration changes to all target appliances before performing other scheduled tasks. To do this:
   - Click the **Actions** icon ( ) for the appliance group you want to upgrade, and then click **Schedule Task**. The **Create Task** dialog appears.
   - In the **Create Task** dialog, for **Task Type**, select **Publish configuration**.
   - For **Scheduled Time**, select the start time for the task.
   - (Optional) Add **Comments** as required. These appear on the **Scheduled Tasks** list.
   - Click **Save**.
   
   The new task is added to the list of scheduled tasks in the **Scheduled Tasks** tab.

4. Click the **Actions** icon ( ) for the appliance group you want to upgrade, and then click **Schedule Task**.
   
   The **Create Task** dialog appears.
5. In the **Create Task** dialog:
   - For **Task Type**, select *Stage a software package*.
   - For **Target Version**, select the required software upgrade package.
   - For **Scheduled Time**, select the start time for the task.
     
     **Note:** If you scheduled a *Publish configuration* task for this group, you must leave sufficient time for that task to complete.

   - (Optional) Add **Comments** as required. These appear on the **Scheduled Tasks** list.

6. Click **Save**.

   The new task is added to the list of scheduled tasks in the **Scheduled Tasks** tab.

7. In the **Appliances** tab, click the **Actions** icon ( ) for the appliance you want to upgrade, and then click **Schedule Task**.

   The **Create Task** dialog appears.

8. In the **Create Task** dialog:
   - For **Task Type**, select *Install a staged package*.
   - For **Target Version**, select the same package as for the first task.
   - For **Scheduled Time**, select the start time for the task.
     
     **Note:** Ensure that you leave sufficient time for the *Stage a software package* task to complete.

   - (Optional) Add **Comments** as required. These appear on the **Scheduled Tasks** list.

9. Click **Save**.

   The new task is added to the list of scheduled tasks in the **Scheduled Tasks** tab.

10. (Optional) You can edit the details for a scheduled task by clicking the **Edit** icon ( ) for the task.

11. (Optional) You can cancel a scheduled task by clicking the **Delete** icon for the task.
12. (Optional) You can monitor the progress of scheduled tasks using one of the following methods:

- On the **Scheduled Tasks** tab. Here, the **Task Status** updates as a task starts and proceeds through to completion.
- From the **Appliance Activities** panel. To access this, click the **Administration** tab, and then the **Appliance Activities** option.
- From the **Config Group** tab, you can see status updates for the group as a whole.
- From the **Appliances** tab, you can see status updates for each appliance group member.
- From the **Activities** panel for an individual appliance on the right side of the **Appliances** tab.

**Viewing the Activities Log for an Appliance**

Viewing the log details of the activities between the Pulse One console and various appliances will help the Administrator to troubleshoot and resolve any issues. The **Appliances > Activities** panel in Pulse One provides details of appliance reboots, configuration uploads, and so on.

To view the activities log for an appliance:

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Appliances** tab.
   - The **Appliances** tab displays all current appliances.
3. Select an appliance whose **Pulse One Status** is status *Connected*. 
4. In the panel on the right, expand **Activities** to display details of all activities. For example:

**FIGURE 117** Activities Details

![Activities Details](image)

**Viewing the Configuration Change History for an Appliance**

The Configuration Changes panel in the Appliances tab provides the configuration change history for each appliance.

To view the configuration changes history:

1. Log into Pulse One as an administrator.

2. Click the **Appliances** menu and then the **Appliances** tab.

   The **Appliances** tab displays all current appliances.

3. Select an appliance whose **Pulse One Status** is status **Connected**.

4. In the panel on the right, select **Configuration History**. This displays the configuration changes history for the appliance, including timestamps for each change.
5. Expand the required timestamp to view the changes made at that time. For example:

**FIGURE 118** View Configuration Changes

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**Comparing Appliances**

The Compare Appliances feature allows you to compare two appliances based on their settings.

To compare two appliances:

1. Log into Pulse One as an administrator.
2. Click the **Appliances** menu and then the **Appliances** tab.
   The **Appliances** tab displays all current appliances.
3. Select the source appliance that you want to compare and click its **Actions** icon (udence).
4. On the drop-down menu, click **Compare Appliances**.

**FIGURE 119** Compare Appliances

5. In the **Appliance Configuration Comparison** window, select the source appliance and the target appliance to compare.

The **Differences** panel shows a list of settings that the two selected appliances have differences.

6. Select a setting. For example, **Pulse One (Modified)**.

In the **Results** pane, the **Base** text and **New** text highlight the differences in the two appliances for that setting. For example:

**FIGURE 120** Appliance Configuration Comparison
Rebooting an Appliance

Rebooting an appliance is necessary when the services on the appliance must be restarted, or when there are other issues with an appliance that must be resolved.

After the reboot, the appliance will connect back to the network and Pulse One will indicate the status of the appliance in the dashboard.

To reboot an appliance:

1. Log into Pulse One as an administrator.
2. Click the Appliances menu and then the Appliances tab.
   The Appliances tab displays all current appliances.
3. Select the appliance that you want to reboot and click the Actions icon ( ).
4. On the drop-down menu, click Reboot Appliance.

   FIGURE 121  Reboot Appliance

   The Reboot Appliance confirmation dialog appears.
5. Ensure that you have selected the correct appliance and click Yes.
   The selected appliance reboots.
Removing an Appliance from Pulse One

If you no longer want to use an appliance with Pulse One, or want to re-provision it, you can remove the appliance.

To remove an appliance:

1. Log into Pulse One as an administrator.
2. Click the Appliances menu and then the Appliances tab.
   
   The Appliances tab displays all current appliances.
3. Select the appliance that you want to remove and click its Actions icon ( ).
4. Click Remove Appliance to remove the appliance from Pulse One.

   **FIGURE 122** Remove Appliance

   ![Appliance Removal Screen](image)

   **Note:** For PCS appliance virtual machines on either vSphere or AWS, an additional command is available. Click Destroy Appliance to remove the appliance from Pulse One, and to also destroy the appliance on the vSphere/AWS platform.

   The Remove Appliance From Pulse One confirmation dialog appears.
5. Click Yes to remove the selected appliance.
Preparing a Target Appliance
This section details the steps to add an agent instance for the target appliance, and a checklist for preparing the target appliance for configuration distribution.

Preparing an RSA Agent Instance for the Target Appliance
The Pulse One administrator must ensure that the sdconf.rec file is uploaded to the master appliance that contains the agent instance for the target appliance.

To add a new target appliance:

1. In RSA Authentication Manager, add the agent instance for the target appliance.
2. Download the sdconf.rec file.
3. Upload the sdconf.rec file to the master appliance.

**Note:** Some configuration blocks that are distributed by Pulse One may refer to other blocks that are not distributed. In such cases, the configuration distribution fails at the target appliance while importing the configuration. The administrator must manually configure the target appliance before distributing the configuration through Pulse One.

A checklist for preparing the target appliance for configuration distribution is provided in “Appendix: Checklist for Preparing a Target Appliance” on page 133.

Removing an Appliance from an Appliance Group
You can remove any appliance other than the master appliance from the appliance group.

This section details the steps to remove an appliance from the group.

To remove an appliance from the group:

1. Select the Appliances menu.
2. Select the Config Groups tab.
   - A list of configuration groups is displayed.
3. Select the group from which the appliance needs to be removed.
4. Select the Target Appliances tab.
5. Click the Actions icon ( ) for the appliance you want to remove.
6. From the menu options, select **Remove from Group**. For example:

**FIGURE 123** Remove from Group

An alert message confirms the removal of the appliance from the group.

### Editing an Appliance Group

This section details the steps to modify an appliance group.

To edit an appliance group:

1. Select the **Appliances** menu.
2. Select the **Config Groups** tab.
   
   A list of configuration groups is displayed.
3. Select the group that you want to modify and click its **Actions** (ශ) icon.
4. From the menu options, select **Edit Group Configuration**.

**FIGURE 124** Edit Group Configuration

The **Edit Appliance Group** wizard appears. For example:

**FIGURE 125** Edit Appliance Group Wizard

5. Work through the wizard, making the required changes to the group name, master appliance, and configuration settings.

6. Click **Finish**.
Deleting an Appliance Group

This section details the steps to delete an appliance group.

**Note:** The appliances within the appliance group are not deleted when you delete the group, and can be viewed as normal in the **Appliances** tab.

1. Select the **Appliances** menu.

2. Select the **Config Groups** tab.
   
   A list of all configuration groups is displayed.

3. Click the group that you want to delete and click its **Actions** icon ( ).

4. From the menu options, select **Delete Group**.

5. In the **Delete Group** confirmation window, click **Yes** to delete the group.
Viewing Analytics and Reports

- Viewing the Login Attempts Report .................................................. 97
- Viewing the Appliance Health Report ............................................... 98
- Viewing the Profiled Devices Report .................................................. 99
- Viewing the Appliance Activities Report .............................................. 101
- Viewing the User Activities Report .................................................... 102
- Viewing Log Aggregation and Analysis ................................................. 103
- Viewing Appliance Activities ............................................................... 104

**Viewing the Login Attempts Report**

To view the **Login Attempts** report:

1. Select the **Analytics** menu.
2. Select **Login Attempts**.
3. From the **Login Attempts** drop-down, select one or more appliances for the report.
4. Select the graph type.

The report shows the login attempts, authentication mechanism and result, and device OS in the last 24 hours.

**FIGURE 127** Login Attempts Report
5. (Optional) Choose bar chart, line graph, pie chart or table data for each graph.

6. (Optional) Click Export to download displayed information as a .csv format file.

**Viewing the Appliance Health Report**

To view the Appliance Health report:

1. Select the Analytics menu.

2. Select Appliance Health.

3. From the Appliance Health drop-down, select one or more appliances for the report.

   The following reports for the selected appliance over the last 24 hours are displayed:
   - CPU Utilization
   - Memory Utilization
   - Disk Utilization
   - Network Throughput (kb/s)

   For example:

   **FIGURE 128** Appliance Health Report
Viewing the Profiled Devices Report

Pulse Secure Profiler dynamically identifies and classifies both managed and unmanaged endpoint devices, enabling control of access to networks and resources based on the type of the device.

The Profiled Devices report in Pulse One displays the list of devices that are discovered in the network.

To view profiled devices in Pulse One reports, a Pulse Policy Secure appliance must be registered in Pulse One and this Pulse Policy Secure appliance should have the Local Profiler Authentication server configured.

For details about configuring Local Profiler Authentication server in the Pulse Policy Secure appliance, refer to Pulse Secure Profiler Deployment Guide.

For details about registering the Pulse Policy Secure appliance, see “Registering an Existing PCS/PPS Appliance” on page 21.

To view Profiled Devices report:

1. Select Analytics > Profiled Devices.
   - The Profiled Devices page appears. This includes a table of devices and a Device Details area.

2. (Optional) Type a text entry (such as an IP address, a MAC address or a manufacturer name) into the Filter field and click Apply. The table updates to show entries that match that string.

3. (Optional) Select a Collector Type to filter the table based on the selected type and click Apply. The table updates to show entries that match that type: DHCP, SNMP, NMAP, SSH, WMI, MDM, TRAP, USER AGENT.

4. (Optional) Select the required number of Records per page. The default is 20.

5. Select a device in the table to update the Device Detail category tabs at the bottom of the page: DHCP Details, SNMP Details, NMAP Details, User Agent, History, WMI Details, MDM Details and SSH Details.

   Note: Some devices will not populate the Device Details tabs. These devices have been imported into a PPS appliance from another PPS appliance using the PPS GUI. See the Pulse Policy Secure documentation for details.
6. Click **Export** to download the details in a `.csv` format file.

**FIGURE 129** Profiled Devices

The above table is populated as endpoints join the network. It might take a few hours (to several days) for all the endpoints to be profiled.
Viewing the Appliance Activities Report

To view the **Appliance Activities** report:

1. Select the **Analytics** menu.
2. Select **Appliance Activities**.
3. From the **Appliance Activities** drop-down, select the required filter (**Critical**, **Alert**, **Notice**, and so on) for the report.

![Figure 130: Appliance Activities](image)

4. (Optional) Click **Export** to download displayed information as a .csv format file.
Viewing the User Activities Report

Pulse One administrators can aggregate user activities information as consolidated reports in Pulse One. This report provides the aggregated view of list of all users and their last login activities, compliance status, session length, appliance names, login success and failures.

- **Users Summary** table - information of all the users such as username, last login time, last login IP and their session lengths. This list can be filtered by date range, username and realm.

- **Selected User Sign-in Activities** table - information of selected user's authentication results, timestamps, authentication type, authentication mechanism, compliance information. The user details can be filtered by mac address, realm, compliance results, authentication mechanism and authentication results.

**Note:** PCS/PPS appliances with versions 9.0R1 or above must be registered with Pulse One to view user activity reports.

To view the **User Activities** report:

1. Select **Analytics > User Activities**.
2. Click a user to view the sessions details of that user in the Activities table.
3. Use the **View** drop-down to change the number of rows to be displayed.
4. Use the **Columns** drop-down to customize the columns to be displayed.
5. Use the filters to narrow down the search results.
6. Use the **Export** button to save the report in the .csv format.

If the device from which user performed sign-in was profiled by any registered PPS/Profiler in Pulse One, a hyperlink will be shown in MAC Address column. Upon clicking, it will take that device’s profiler report.
Viewing Log Aggregation and Analysis

The syslog forwarded from the configured PCS/PPS appliances can be viewed in Appliance Logs. Here, users have a consolidated view of logs generated by every PPS/PCS appliance that is configured to forward syslogs to the Pulse One server.

**FIGURE 131  Appliance Logs**

The system provides a set of Default Queries below the Appliance Logs menu in the navigation pane. Administrator can also customize the queries and save them for future use. These customized queries are listed below Saved Queries.

The Appliance Logs page allows searching by a string token by typing in the token in the search bar or double-clicking a string in the logs details. The view is then filtered to display all messages with the token that is being searched for. Users can enter multiple tokens separated by space.

This customized query can then be saved using the Save Query feature.

**FIGURE 132  Save Query**

To view logs from any of the system default queries, expand Default Queries and click on the query.

To view logs from the customized queries, expand Saved Queries and click on the query.

It is also possible to filter the logs by timestamp. This can be done by choosing a From date and To date in the date fields on the top-right corner of the panel.
Users can also choose to filter search results by **Match All** (which will display search results that have all specified tokens) or **Match Any** (which will display search results that include any of the specified tokens).

The number of search results to be displayed on the screen can be 50, 100, 250, 500 by making a choice on the bottom left corner of the screen. Finally, the search results can span over multiple pages and navigated using the buttons on the bottom right corner of the screen.

**Note:** Only the saved queries can be deleted using the **Delete Query** feature.

### Viewing Appliance Activities

The **Appliance Activities** page displays information about the events registered in the Management Server. You can view filtered activities for appliances.

To view appliance activities:

1. Select the **Administration** tab
2. Click **Appliance Activities**.
3. Click an **Event Type** button to filter for a specific event type.

**FIGURE 133** Filter Activities
4. Click the **Details** button associated with the activity you want to view the details.

The **Activity Details** dialog displays the additional details.

**FIGURE 134** Activity Details
User Management

• Adding an Admin User ................................................................. 107
• Editing User Details ................................................................. 108
• Removing an Admin User ......................................................... 109
• Resetting a User Password ....................................................... 109
• Suspending a User ................................................................. 110

Adding an Admin User
To add an admin user:

1. Select the Administration tab.

2. Select User Management.

   A list of existing admin users is displayed.

3. Click Add User to add an admin user.

   The Add Admin User window appears.

FIGURE 135 Add Admin User

   Note: If Role is set to Read Only Admin, then the user will not be given the permissions to create/ update/ delete functions.

4. In the Add Admin User window, enter the Username, Full Name and Email for the user.

5. Select a Role from the drop-down list:

   • Super Admin - This role has full access to the admin console. Super admin can create other admins.

   • Read Only Admin - This role has read-only access to the entire system. Read-only admin can view dashboard and report, perform search function, and run pre-defined queries.
6. Select a Sign in Method. Either:
   - Select **Enterprise SSO** if the same user ID exists on both Pulse One (Service Provider) and the Pulse Connect Secure (Identity Provider), OR
   - Select **Local Authentication**.

7. Click **Create**. The new user is displayed in the list of users.

**Editing User Details**

To modify a user's details:

1. Select the **Administration** tab.

2. Select **User Management**.
   
   A list of existing admin users is displayed.

3. Select the user from the list.

4. In the user details panel click the **Edit** icon and make the required changes.

5. Click **Update**.

**FIGURE 136  Edit User Details**

![Edit User Details](image)
Removing an Admin User

To remove an admin user:

1. Select the **Administration** tab.
2. Select **User Management**.
   
   A list of existing admin users is displayed.
3. Select the user from the list.
4. Click **Delete User**.
5. In the **Remove Admin User** confirmation message box, click **OK**.

The user is removed as an administrator.

Resetting a User Password

To reset a user’s password:

1. Select the user from the list.
2. Click the **Reset login** link in the user details pane.
   
   An email that contains the **Set new password** link will be sent to the registered email address.
3. Click the **Set new password** link in the email.
4. In the Pulse One page that appears, provide the new password and confirm the new password. The new password will be saved in the database.
5. Then log in to Pulse One with the new password.

**Note:** The **Set new password** link that you received in the email has an expiration time of 1 hour. Beyond this time, you should make a new request for setting the new password.

**FIGURE 137** Reset Login
Suspending a User

To suspend an admin user:

1. Select the user from the list.

2. Click **Suspend User**.

   The user will be locked and will not be able to log in.

   The **Forgot Password** option in the **Login** page will not send email to reset the password.

3. (Optional) To unlock the suspended user, select the user and click **Reset Login**. This will send a mail to the user with a set new password link.

![Suspend User](image-url)
Role Management

- Adding an Admin Defined Role ........................................ 111
- Editing an Admin Role ........................................... 112
- Removing an Admin Role ........................................... 112

Adding an Admin Defined Role

To add a new admin-defined role:

1. Select the Administration tab.
2. Select Role Management.
3. Click Add Role to add a new admin-defined role.
   
   **Note:** To create a role from an existing role, click Duplicate corresponding to the existing role.
4. In the Create New Role window, enter the role name.
5. In the Role Assignment section, select the permissions for Dashboard, Appliances, Settings, Users, and Roles from the drop-down list.
   - **None** - This permission disables the assigned feature. For example, if the Appliances permission is set to None, then Appliances page will not be visible in Pulse One console for this role.
   - **Read Only** - This permission will disable create/edit/delete options for the assigned feature.
   - **Edit** - This permission allows create/view/edit operations.
   - **Delete** - This permission allows all operations.

   **FIGURE 139  Create New Role**

6. Click Create.
Editing an Admin Role
You can modify only the admin defined roles.

To modify a role's permissions:

1. Select the **Administration** tab.
2. Select **Role Management**.
   A list of system defined roles is displayed.
3. Select the role from the list.
4. In the role details pane, click **Edit**.
5. Make the required changes and click **Save**.

![FIGURE 140  Modify Role](image)

Removing an Admin Role
You can remove only the admin defined roles.

To remove an admin defined role:

1. Select the **Administration** tab.
2. Select **Role Management**.
   A list of system defined roles is displayed.
3. Select the role from the list and click **Delete Role**.
   In the Confirmation message box, click **Yes** to remove the selected role.
Working With Pulse One Properties

- Viewing Pulse One Properties .......................................................... 113
- Editing Pulse One Properties ............................................................ 113
- Understanding Pulse One Properties ............................................... 114

Viewing Pulse One Properties
To open the Pulse One Properties page:

1. Click the Settings icon on top-right-corner of the page.
2. Select Pulse One Properties.

The Pulse One Properties page appears.

[FIGURE 141 Pulse One Properties]

Editing Pulse One Properties
To edit a Pulse One property:

1. View Pulse One properties, see Viewing Pulse One Properties.<ref>
2. Click the Edit (edit) button corresponding to the field you want to edit.
3. Change the value and then click Save. For example:

[FIGURE 142 Edit Properties]
Understanding Pulse One Properties

All Pulse One properties are described in the following sections:

- “Enterprise Connection Properties” on page 114
- “Password Properties” on page 114
- “Miscellaneous Properties” on page 115

Enterprise Connection Properties

The Enterprise Connections settings are described below:

- **Auto Configure SAML Settings** – Boolean. If True, Pulse One automates the SAML Metadata configuration flow for both Appliance and Pulse One SAML settings.

- **Create Users and Roles from SAML** – Boolean. If True, a Pulse One user is created automatically whenever a user from a linked SAML idP (PCS) authentication server logs into Pulse One for the first time using Enterprise SSO.

  Note: Further configuration is required to use this feature, see “Automatically Creating Pulse One Users for SAML SSO Logins” on page 130.

- **SAML Identity Provider** – The Pulse Connect Secure appliance that is configured for Pulse One server SAML auto-provisioning.

- **SAML Identity Provider Metadata** – Required metadata for the SAML identity provider.

- **SAML Service Provider Metadata** – Required metadata for the SAML service provider.

Password Properties

The Password settings are described below:

- **Console Minimum Password Length** – The minimum length of a console password.

- **Console Password Expiration Days** – The number of days after which an Administrator must change their console password.

- **Console Password Require Lowercase** – Boolean. If True, the console password must contain at least one lowercase letter.

- **Console Password Require Number** – Boolean. If True, the console password must contain at least one number.

- **Console Password Require Special** – Boolean. If True, the console password must contain at least one special character.

- **Console Password Require Uppercase** – Boolean. If True, the console password must contain at least one uppercase letter.
• **Console Password Reset Timeout Hours** – The number of hours a console password reset email link is valid.

• **Domain Allowed Password Attempts** – The number of login attempts until a console account is locked.

• **Welcome Timeout Hours** – The number of hours a registration token in a welcome email is valid.

### Miscellaneous Properties

The miscellaneous (Misc) settings are described below:

• **Created On** – The date on which the management console was created.

• **Locale** – The console language code.

• **Page Footer** – The footer information that will be displayed at the bottom of the admin console.

• **Server Version** – The current Management Server version that will be displayed at the bottom of the admin console.

*Note:* You cannot edit the **Created On** and **Server Version** properties.
Overview

By setting up Enterprise Single Sign On (SSO) with SAML, Enterprise users can sign into Pulse One by delegating authentication to their Pulse Connect Secure appliance.

FIGURE 143  Sign In with Enterprise SSO
If your authentication is performed by a PCS appliance at v8.3r1 or later, many of the configuration steps are automated. You must perform the following processes:

- “Configuring SAML idP in Pulse Connect Secure Server” on page 118.
- “Automatically Configuring a SAML idP on Pulse One” on page 122.
- (Optional) “Automatically Creating Pulse One Users for SAML SSO Logins” on page 130.
- “Testing Sign In with Enterprise SSO” on page 132.

If your authentication is performed by a PCS appliance that is earlier than v8.3r1, you must perform all stages of the following manual processes:

- “Configuring SAML idP in Pulse Connect Secure Server” on page 118.
- “Configuring a Metadata Provider in Pulse Connect Secure” on page 124.
- “Enabling Enterprise SSO in Pulse One Appliance” on page 125.
- “Configuring SAML Metadata in Pulse One” on page 125.
- “Adding SAML SP Metadata in Pulse Connect Secure Server” on page 126.
- (Optional) “Automatically Creating Pulse One Users for SAML SSO Logins” on page 130.
- “Testing Sign In with Enterprise SSO” on page 132.

### Configuring SAML idP in Pulse Connect Secure Server

**Note:** This section is required for all PCS appliance versions.

This section provides the steps to configure a SAML Identity Provider on Pulse Connect Secure server.

Before proceeding with the configuration, ensure that the Pulse Connect Secure appliance that you intend to use as the Identity Provider is registered with Pulse One, see “Registering an Existing PCS/PPS Appliance” on page 21.

**Note:** If the PCS server is already configured as a SAML identity provider, make sure that POST binding is enabled and the **Accept Unsigned AuthnRequest** option is selected.

To configure SAML IdP on the Pulse Connect Secure server:

1. Log in to the Pulse Connect Secure server that is identified as an Identity Provider.
2. Navigate to **System > Configuration > SAML > Settings**.
3. Configure the following Metadata Server Configuration:
   
   - **Timeout value for metadata fetch request** to 300.
   - **Host FQDN for SAML** to the Fully Qualified Domain Name, noting the host FQDN guidance below.

   **FIGURE 144** SAML Settings

   The host FQDN specified here is used in the SAML entity ID, used by browsers to connect to PCS, and used in the URLs for SAML services. Typically:

   - If the PCS is standalone, the FQDN should resolve to the IP address of the external interface / internal interface, whichever is chosen.
   - If the PCS is an Active-Passive cluster, the FQDN should resolve to the external VIP / Internal VIP, whichever is chosen.
   - If the PCS is an Active-Active cluster behind an in-line load balancer, the FQDN should resolve to the load balancer’s external VIP / Internal VIP, whichever is chosen.

4. Click **Save Changes**.
5. Navigate to **System > Configuration > Certificates > Device Certificate**, create a new CSR, and import certificate and keys. Skip this step if the PCS external interface / internal interface (whichever is chosen) already provides a certificate that matches the host's Fully Qualified Domain Name.

**FIGURE 145** Import Certificate and Keys

![Import Certificate and Keys](image)

6. Navigate to **Authentication > Signing In > Sign In SAML > Identity Provider**.
7. Locate the the **Basic Identity Provider (idP) Configuration** section. For example:

**FIGURE 146** Basic Identity Provider Configuration

8. In the **Basic Identity Provider (idP) Configuration** section, do the following:

- Select the **Post** check box for protocol binding to use for SAML response.
  
  **Note:** Only the **Post** protocol is supported in this release. **Artifact** is not supported.

- Select a **Signing Certificate** from the list.

- For **Decryption Certificate**, select **No Encryption**.

- Clear the **Reuse Existing NC (Pulse) Session** check box.

- Select the **Accept Unsigned AuthnRequest** check box.

For more details, refer to the "Configuring Sign-in SAML Identity Provider Settings" section in the *Pulse Connect Secure Administration Guide*.

9. Click **Save Changes** to save the Identity Provider configuration.
Automatically Configuring a SAML idP on Pulse One

**Note:** This section is only applicable if your PCS appliance is at v8.3r1 or later. If your PCS is at an earlier release, you must perform a number of manual processes, see “Overview” on page 117.

To automatically configure a SAML idP, you must have already completed the following tasks:

- Registered the Pulse Connect Secure appliance that you intend to use as the SAML idP with Pulse One, see “Registering an Existing PCS/PPS Appliance” on page 21.
- Configured the SAML idP on Pulse Connect Secure, see “Configuring SAML idP in Pulse Connect Secure Server” on page 118.

To auto-configure the SAML idP:

1. Log into Pulse One as an administrator.
2. Click the **Settings** icon on top-right-corner of the page.
3. Select **Pulse One Properties**.
   
   The **Pulse One Properties** page appears.
4. Expand the **Enterprise Connections** group to view its properties. For example:

   ![Pulse One Properties Enterprise Connections](image)

5. Set the **Auto Configure SAML Properties** property to **Yes**.

   **Note:** When you set **Auto Configure SAML Properties** to **Yes**, the **SAML Identity Provider Metadata** and the **SAML Service Provider Metadata** properties are removed. These are not required when auto-configuration is enabled.
6. Set the **SAML Identity Provider** property to match the appliance name, as registered on Pulse One. For example:

**FIGURE 148** Pulse One Properties Configure Auto SAML

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise Connections (3)</td>
<td></td>
</tr>
<tr>
<td>Auto Configure SAML settings</td>
<td>Yes</td>
</tr>
<tr>
<td>Create users and set roles from SAML</td>
<td>No</td>
</tr>
<tr>
<td>SAML Identity Provider</td>
<td>Ade.45.84.SAML</td>
</tr>
</tbody>
</table>

Once this process is complete, auto-configuration of the SAML idP will be performed.

7. (Optional) To confirm the auto-configuration of the SAML idP, log into Pulse Connect Secure and access the **System > Configuration > SAML** settings page. There will now be a **Metadata Name** called *AutoConfigured*.

**FIGURE 149** Pulse Connect Secure SAML Auto-configuration

The auto-configuration of the SAML idP is complete.

You can then either:

- Continue with an optional activity **“Automatically Creating Pulse One Users for SAML SSO Logins”** on page 130.
- Move directly to testing the SSO login, see **“Testing Sign In with Enterprise SSO”** on page 132.
Configuring a Metadata Provider in Pulse Connect Secure

**Note:** You do not have to perform the process in the section if your appliance is at v8.3r1 or later, and you have already performed auto-configuration of SAML, see “Automatically Configuring a SAML idP on Pulse One” on page 122.

This section provides the steps to configure Metadata Provider on Pulse Connect Secure.

**Note:** If the PCS server is already configured to operate as a SAML IdP, skip the steps 2 to 6.

To configure a Metadata Provider in the PCS server:

1. Log in to Pulse Connect Secure server.
2. Navigate to **Authentication > Signing-In > Sign In SAML > Metadata Provider**.
3. The SAML Metadata Provider **Entity Id** property is pre-populated. It is generated by the system, based on the value for the **Host FQDN for SAML** setting on the **System > Configuration > SAML > Settings** page.
4. Set **Metadata Validity** to 365 days.
5. Clear the **Do Not Publish IdP in Metadata** check box.
6. Click **Save Metadata Provider**.
7. Click **Download Metadata** and save the file to your computer.

![Metadata Provider](image_url)
Enabling Enterprise SSO in Pulse One Appliance

**Note:** You do not have to perform the process in the section if your appliance is at v8.3r1 or later, and you have already performed auto-configuration of SAML, see “Automatically Configuring a SAML idP on Pulse One” on page 122.

To enable Enterprise SSO:

1. Log into Pulse One as an administrator.
2. Select the Administration tab.
4. In the User Management page, add (or edit) all the admin users who need to use Enterprise SSO by setting their corresponding Sign In Method to Enterprise SSO. For example:

   ![Add Admin User](image)

   **FIGURE 151** Sign In Method

   **Note:** To use Enterprise SSO login, the same user identity (username) must exist on both Pulse One (Service Provider) and the Identity Provider (Pulse Connect Secure).

Configuring SAML Metadata in Pulse One

**Note:** You do not have to perform the process in the section if your appliance is at v8.3r1 or later, and you have already performed auto-configuration of SAML, see “Automatically Configuring a SAML idP on Pulse One” on page 122.

To configure metadata in Pulse One:

1. In the Pulse One admin console, click the settings icon on top-right-corner of the page and select Pulse One Properties.
2. Click the Edit icon corresponding to SAML Identity Provider and select the Pulse Connect Secure appliance that you are setting up as the Identity Provider.
3. Click the Edit icon corresponding to SAML Identity Provider Metadata.
4. Copy the contents of the metadata file that you downloaded from Pulse Connect Secure, paste it into the Edit Property window, and click Save. The SAML Service Provider Metadata will automatically be populated.

5. Click SAML Service Provider Metadata, copy the metadata content, paste it into a file such as saml-metadata-pws.xml and save the file to your computer. This file will be used when configuring Pulse Connect Secure later.

**FIGURE 152** Pulse One Properties

---

**Adding SAML SP Metadata in Pulse Connect Secure Server**

**Note:** You do not have to perform the process in the section if your appliance is at v8.3r1 or later, and you have already performed auto-configuration of SAML, see “Automatically Configuring a SAML idP on Pulse One” on page 122.

This section provides the steps to add SAML Service Provider metadata in PCS server.

1. Navigate to System > Configuration > SAML.
2. Click New Metadata Provider.
3. Enter a Name for the metadata provider.
4. Under **Metadata Provider Location Configuration**:
   - For **Location**, select *Local*.
   - For **Upload Metadata File**, click **Browse** and select the SP metadata file `saml-metadata-pws.xml` that you saved on your computer in the previous process.

5. Under **Metadata Provider Verification Configuration**:
   - Select the **Accept Unsigned Metadata** check box.

6. Under **Metadata Provider Filter Configuration**:
   - For **Roles**, select the **Service Provider** check box.

7. Click **Save Changes**.

8. Navigate to **Authentication > Signing In > Sign-In SAML > Identity Provider**.
9. In the **Configuration** section, click **Add SP**.

![FIGURE 155 SAML Identity Provider](image)

The **New Peer Service Provider** page appears.

10. In the **Service Provider Configuration** and **Certificate Status Checking Configuration** sections, make the necessary service provider specific settings. For more details, refer to the "Configuring Sign-in SAML Identity Provider Settings" section in the *Pulse Connect Secure Administration Guide*.

![FIGURE 156 New Peer Service Provider](image)

11. In the **Customize IdP Behavior** section, select the **Override Default Configuration** check box.

12. Clear the **Reuse Existing NC (Pulse) Session** check box.
13. Select the **Accept unsigned AuthnRequest** check box.

**FIGURE 157** Customize IdP Behavior

14. At the bottom of the page, click **Save Changes**.

SAML configuration is complete.

You can then either:

- Continue with an optional activity “**Automatically Creating Pulse One Users for SAML SSO Logins**” on page 130.
- Move directly to testing the SSO login, see “**Testing Sign In with Enterprise SSO**” on page 132.
Automatically Creating Pulse One Users for SAML SSO Logins

**Note:** This section is optional for all PCS appliance versions.

After you have linked a SAML idP (PCS) server to Pulse One, users can log into Pulse One using their Enterprise SSO. However, by default there is no Pulse One user created for these Enterprise SSO users. A Pulse One user is required for features such as appliance configuration management, and the addition of workspaces and devices.

You can configure roles on PCS and Pulse One so that a Pulse One user will be created automatically whenever an Enterprise SSO user logs into Pulse One for the first time.

1. Log into the PCS appliance.
2. Access user roles.
3. Create a user role with a name that starts with “Pulse One: “, followed by a defined Pulse One admin-defined role. For example:

![PCS User Roles](image)

In this example, there must be a role called *SAML Role1* on Pulse One.

4. Access the SAML idP configuration, see Configuring SAML idP in Pulse Connect Secure Server

5. In the Services-Provider-related idP Configuration section, ensure that there is an Attribute Statement Configuration entry that matches the following entry:

![Attribute Statement Configuration](image)

6. Log into Pulse One.
7. Click the **Settings** icon on top-right-corner of the page.

8. Select **Pulse One Properties**.

9. Under **Enterprise Connections**, ensure that the **Create users and roles from SAML** property is set to **Yes**.

![FIGURE 160 Pulse One Properties Enterprise Connections](image)

10. Select the **Administration** menu, and then click **Role Management**.

11. Ensure that there is an admin-defined role whose name was referenced in step 3. For example:

![FIGURE 161 Pulse One Admin Defined Roles](image)

The configuration is now complete.

Whenever a SAML user logs into Pulse One using their Enterprise SSO, an equivalent Pulse One user is created for them automatically.

**Note:** The user will continue to log in with their Enterprise SSO. However, their Pulse One user will enable them to use features such as appliance configuration management, and the addition of workspaces and devices.
Testing Sign In with Enterprise SSO

To test signing in using Enterprise SSO:

1. Navigate to the Pulse One admin login page and click **Sign In with Enterprise SSO**.

   ![Pulse One Properties](image)

   You are navigated to the Pulse Connect Secure login page.

2. Enter your Username and Password, and click **Sign In**.

   ![Pulse Connect Secure Login Page](image)

3. If this is the first time you’re logging in to Pulse One, you are prompted to access the **End User License Agreement (EULA)**. Read and scroll to the bottom of the EULA. Click **Agree** and you will be signed in to Pulse One using your SAML SSO credentials.

   **Note:** If you have configured the automatic creation of Pulse One users from SAML Enterprise SSO users, an equivalent Pulse One user is created for the SAML Enterprise SSO user. See [Automatically Creating Pulse One Users for SAML SSO Logins](#).

   **Note:** The user will continue to log in with their Enterprise SSO. However, their Pulse One user will enable them to use features such as appliance configuration management, and the addition of workspaces and devices.
## Appendix: Checklist for Preparing a Target Appliance

<table>
<thead>
<tr>
<th>Block Type (which is distributed) (Names as in Pulse One Console)</th>
<th>Requires Preparation of (which is not distributed) (Names as in Appliances Menu)</th>
<th>Sample Log Messages</th>
<th>How to Prepare the Target Appliance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Navigate to Authentication &gt; ESAP Versions. Upload the required ESAP package.</td>
</tr>
<tr>
<td>Auth &gt; Realms &gt; Admin, Auth &gt; Realms &gt; User</td>
<td>Auth. Servers (Local Auth Servers are not distributed)</td>
<td>Import of configuration from Pulse One returned an Error: [/users/resource-policies/network-connect-policies/network-connector-bandwidth-policy[name=vpm-tun-bandwidth-policy]] Bandwidth Management Not Enabled! The VPN Tunnels Maximum Bandwidth must be configured on the network overview page.</td>
<td>Configure the Local Auth Server</td>
</tr>
<tr>
<td>Policies &gt; Web &gt; Client Auth</td>
<td>Configuration &gt; Certificates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policies &gt; Web &gt; Client Auth</td>
<td>Resource Policies &gt; Email Client</td>
<td></td>
<td>An SANmnn (for example, SA6500), if it has been configured with Resource Policies &gt; Email Client, should not be a master appliance.</td>
</tr>
<tr>
<td>Policies &gt; Web &gt; Compression</td>
<td>Options</td>
<td></td>
<td>On the Options page select “Enable gzip compression”</td>
</tr>
<tr>
<td>Policies &gt; Web &gt; Java Code Signing</td>
<td>Configuration &gt; Certificates &gt; Code-signing Certificates</td>
<td></td>
<td>Save the policy with the default code-signing certificates.</td>
</tr>
<tr>
<td>Policies &gt; Web &gt; PTP</td>
<td>Network &gt; Overview</td>
<td>Import of configuration from Pulse One returned an Error: [/users/resource-policies/web-policies/ptp[application=ptp_policy_2,pARENT-type=none]] Please specify the IVE hostname on the Network Settings page under Network Identify.</td>
<td>Configure a valid hostname under System &gt; Network &gt; Overview.</td>
</tr>
<tr>
<td>Policies &gt; Secure Email</td>
<td>Network &gt; Overview</td>
<td>Import of configuration from Pulse One returned an Error: [/users/resource-profiles/mobile/secure-mail-profiles/secure-mail-profile[virtual-hostname=myhost.myco.com]] Please specify the IVE hostname on the Network Settings page under Network Identify.</td>
<td>Configure a valid hostname under System &gt; Network &gt; Overview.</td>
</tr>
<tr>
<td>Security</td>
<td>Network Settings &gt; Internal Port &gt; Virtual Port</td>
<td>Import of configuration from Pulse One returned an Error: [/system/configuration/security/ssl-options] Virtual port number virtual_internal is not a valid Virtual Port.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Network Settings &gt; External Port &gt; Virtual Port</td>
<td>Import of configuration from Pulse One returned an Error: [/system/configuration/security/ssl-options] Virtual port number virtual_external is not a valid Virtual Port.</td>
<td></td>
</tr>
<tr>
<td>SAML Auth-Server</td>
<td>System &gt; Configuration &gt; SAML &gt; Settings</td>
<td></td>
<td>Configure a valid “Host FQDN for SAML” on the System &gt; Configuration &gt; SAML &gt; Settings page.</td>
</tr>
<tr>
<td>Block Type (which is distributed) (Names as in Pulse One Console)</td>
<td>Requires Preparation of (which is not distributed) (Names as in Appliances Menu)</td>
<td>Sample Log Messages</td>
<td>How to Prepare the Target Appliance</td>
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</tr>
<tr>
<td>Signing in &gt; Sign-in</td>
<td>System &gt; Configuration &gt; SAML &gt; Settings</td>
<td>Import of configuration from Pulse One returned an Error: [authentication/signin/saml/identity-provider/sp-default-configuration/source-id] Modification of this attribute is not allowed.</td>
<td>Configure a valid “Host FQDN for SAML” on the System &gt; Configuration &gt; SAML &gt; Settings page.</td>
</tr>
<tr>
<td>(PPS) Policies &gt; Enforcer &gt; Access</td>
<td>Policies &gt; Enforcer &gt; Connection</td>
<td>Import of configuration from Pulse One returned an Error: Failed to resolve path references. Import of configuration from Pulse One returned an Error: [/uac/infranet-enforcer/resource-access-policies/resource-access-policy[name=enforcer_access_policy]/infranet-enforcer] Invalid reference: no ‘Infranet Enforcer’ object found with identifier ‘screenOS1’.</td>
<td></td>
</tr>
<tr>
<td>(PPS) Policies &gt; Enforcer &gt; Source Interface</td>
<td>Policies &gt; Enforcer &gt; Connection</td>
<td>No error message. Enforcer is a required field for Source Interface Policy.</td>
<td>Configure the appropriate ‘Trusted Server CA’ under System &gt; Configuration &gt; Certificates &gt; Trusted Server CAs, by importing the ‘Trusted Server CA’.</td>
</tr>
<tr>
<td>Pulse Secure Client &gt; Connections</td>
<td>System &gt; Configuration &gt; Certificates &gt; Trusted Server CAs</td>
<td>Import of configuration from Pulse One returned an Error: [users/junos-pulse/connection-sets/connection-set[name=PPS_PCS_Combo]/connections/connection[name=L2_Connection_WIRED]/trusted-servers/trusted-server[dn=ANY,ca=PMDRootCA]/ca] Invalid reference: no ‘Trusted Server CA’ object found with identifier ‘PMDRootCA’.</td>
<td></td>
</tr>
</tbody>
</table>