# Compliance


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# Posture Types

The following posture agents monitor and enforce Cisco ISE posture policies:

- **AnyConnect**: Deploys the AnyConnect agent to monitor and enforce Cisco ISE posture policies that require interaction with the client. The AnyConnect agent stays on the client. For more information about using AnyConnect in Cisco ISE, see Cisco AnyConnect Secure Mobility, on page 86.
- **AnyConnect Stealth**: Runs posture as a service, with no user interface. The agent stays on the client.

  When you choose the AnyConnect Stealth posture type in the posture requirement, some of the conditions, remediations, or attributes in a condition are disabled (grayed out). For example, when you enable AnyConnect Stealth requirement, the Manual Remediation Type is disabled (grayed out) because this action requires client-side interaction.

  When you map the posture profile to the AnyConnect configuration, and then map the AnyConnect configuration to the Client Provisioning window for AnyConnect Stealth mode deployment:

  - AnyConnect can read the posture profile and set it to the intended mode.
  - AnyConnect can send information related to the selected mode to Cisco ISE during the initial posture request.
  - Cisco ISE can match the right policy, based on the mode and other factors, such as identity group, OS, and compliance module.

**Note** AnyConnect Stealth mode requires AnyConnect version 4.4 and later.

  For more information about configuring AnyConnect Stealth in Cisco ISE, see Configure AnyConnect Stealth Mode Workflow, on page 58.

- **Temporal Agent**: When a client attempts to access the trusted network, Cisco ISE opens the Client Provisioning portal. The portal instructs the user to download and install the agent, and run the agent. The temporal agent checks the compliance status, and sends the status to Cisco ISE. Cisco ISE acts based on the results. The temporal agent removes itself from the client after compliance processing completes.

The temporal agent does not support custom remediation. The default remediation supports only message text.

The Temporal Agent does not support the following conditions:

- Service Condition MAC—System Daemon check
- Service Condition-MAC—Daemon or User Agent check
- PM—Up To Date check
- PM—Enabled check
- DE—Encryption check

- Configure posture policies using the **Posture Types Temporal Agent** and **Compliance Module 4.x or later**. Do not configure the compliance module as **3.x or earlier** or **Any Version**.
- For the Temporal Agent, you can only view Patch Management conditions containing the **Installation** check type in the **Requirements** window.
- Cisco ISE does not support VLAN-controlled posture with the Temporal Agent for macOS because macOS cannot detect VLAN changes. When you change the network access from an existing VLAN to a new VLAN, the user's IP address is released before the VLAN change. The client gets a new IP address by DHCP when the user connects to the new VLAN. Recognizing the new IP address requires root privileges, but the Temporal Agent runs as a user process.
- For the other operating systems, the Temporal Agent does not renew the IP address. The operating system should renew the IP address.
- Cisco ISE supports ACL-controlled posture environment, which does not require the refreshing of endpoint IP addresses.
- For more information about configuring the Temporal agent in Cisco ISE, see Configure Cisco Temporal Agent Workflow, on page 63.

- **AMP Enabler**—The AMP Enabler pushes the AMP for Endpoints software to a subset of endpoints from a server hosted locally within the enterprise, and installs AMP services to its existing user base.

You can select the posture type in the **Client Provisioning** window (**Policy > Policy Elements > Results > Client Provisioning > Resources**) and the **Posture Requirements** window (**Policy > Policy Elements > Results > Posture > Requirements**). The best practice is to provision the posture profile in the Client Provisioning window.

### Related Topics

Configure AnyConnect Stealth Mode Workflow, on page 58
Configure Cisco Temporal Agent Workflow, on page 63

# Posture Administration Settings

You can globally configure the Admin portal for posture services. You can download updates automatically to the Cisco ISE server through the web from Cisco. You can also update Cisco ISE manually offline later. In addition, having an agent like AnyConnect or the Web Agent installed on the clients provides posture assessment and remediation services to clients. The client agent periodically updates the compliance status

of clients to Cisco ISE. After login and successful requirement assessment for posture, the client agent displays a dialog with a link that requires end users to comply with terms and conditions of network usage. You can use this link to define network usage information for your enterprise network that end users accept before they can gain access to your network.

# Client Posture Requirements

To create a posture requirement:

1. Choose **Policy** > **Policy Elements** > **Results** > **Posture** > **Requirements**.
2. From the **Edit** drop-down list at the end of any requirement row, choose **Insert New Requirement**.
3. Enter the required details and click **Done**.

The following table describes the fields in the **Client Posture Requirements** window.

***Table 1: Posture Requirement***

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter a name for the requirement. |
| **Operating Systems** | Choose an operating system.<br>Click plus [+] to associate more than one operating system to the policy.<br>Click minus [-] to remove the operating system from the policy. |
| **Compliance Module** | From the **Compliance Module** drop-down list, choose the required compliance module:<br>• 4.x or Later: Supports antimalware, disk encryption, patch management, and USB conditions.<br>• 3.x or Earlier: Supports antivirus, antispyware, disk encryption, and patch management conditions.<br>• Any Version: Supports file, service, registry, application, and compound conditions.<br>For more information about compliance module, see Compliance Module, on page 18. |
| **Posture Type** | From the **Posture Type** drop-down list, choose the required posture type.<br>• AnyConnect: Deploys the AnyConnect agent to monitor and enforce Cisco ISE policies that require client interaction.<br>• AnyConnect Stealth: Deploys the AnyConnect agent to monitor and enforce Cisco ISE posture policies without any client interaction.<br>• Temporal Agent: A temporary executable file that is run on the client to check the compliance status. |

| Field Name | Usage Guidelines |
|---|---|
| **Conditions** | Choose a Condition from the list.<br>You can also create any user defined condition by clicking the Action Icon and associate it with the requirement. You cannot edit the associated parent operating system while creating user defined conditions.<br>The pr_WSUSRule is a dummy compound condition, which is used in a posture requirement with an associated Windows Server Update Services (WSUS) remediation. The associated WSUS remediation action must be configured to validate Windows updates by using the severity level option. When this requirement fails, the agent on the Windows client enforces the WSUS remediation action based on the severity level that you define in the WSUS remediation.<br>The pr_WSUSRule cannot be viewed in the Compound conditions list page. You can only select the pr_WSUSRule from the Conditions widget. |
| **Remediation Actions** | Choose a Remediation from the list.<br>You can also create a remediation action and associate it with the requirement.<br>You have a text box for all the remediation types that can be used to communicate to the agent users. In addition to remediation actions, you can communicate to agent users about the non-compliance of clients with messages.<br>The **Message Text Only** option informs agent users about the noncompliance. It also provides optional instructions to the user to contact the Help desk for more information, or to remediate the client manually. In this scenario, the agent does not trigger any remediation action. |

**Related Topics**

Configure Acceptable Use Policies for Posture Assessment, on page 14
Create Client Posture Requirements, on page 55

# Timer Settings for Clients

You can set up timers for users to remediate, to transition from one state to another, and to control the login success screen.

However, when there are no agent profiles configured to match the client provisioning policies, you can use the settings in the **General Settings** configuration window ( **Administration** > **System** > **Settings** > **Posture** > **General Settings**).

## Set Remediation Timer for Clients to Remediate Within Specified Time

You can configure the timer for client remediation within a specified time. When clients fail to satisfy configured posture policies during an initial assessment, the agent waits for the clients to remediate within the time configured in the remediation timer. If the client fails to remediate within this specified time, then the client agent sends a report to the posture run-time services after which the clients are moved to the noncompliance state.

**Step 1** Choose **Administration** > **System** > **Settings** > **Posture** > **General Settings**.

**Step 2** In the **Remediation Timer** field, enter a time value in minutes.

The default value is 4 minutes. The valid range is 1–300 minutes.

**Step 3** Click **Save**.

## Set Network Transition Delay Timer for Clients to Transition

You can configure the timer for clients to transition from one state to the other state within a specified time using the network transition delay timer, which is required for Change of Authorization (CoA) to complete. It may require a longer delay time when clients need time to get a new VLAN IP address during success and failure of posture. When successfully postured, Cisco ISE allows clients to transition from unknown to compliant mode within the time specified in the network transition delay timer. Upon failure of posture, Cisco ISE allows clients to transition from unknown to noncompliant mode within the time specified in the timer.

**Step 1** Choose **Administration** > **System** > **Settings** > **Posture** > **General Settings**.

**Step 2** Enter a time value in seconds, in the **Network Transition Delay** field.

The default value is 3 seconds. The valid range is 2 to 30 seconds.

**Step 3** Click **Save**.

## Set Login Success Window to Close Automatically

After successful posture assessment, the client agent displays a temporary network access screen. The user needs to click the **OK** button in the login window to close it. You can set up a timer to close this login screen automatically after specified time.

**Step 1** Choose **Administration** > **System** > **Settings** > **Posture** > **General Settings**.

**Step 2** Check the **Automatically Close Login Success Screen After** check box.

**Step 3** Enter a time value in seconds, in the field next to **Automatically Close Login Success Screen After** check box.

The valid range is 0 to 300 seconds. If the time is set to zero, then AnyConnect does not display the login success screen.

**Step 4** Click **Save**.

# Set Posture Status for Nonagent Devices

You can configure the posture status of endpoints that run on non-agent devices. When Android devices and Apple devices such as an iPod, iPhone, or iPad connect to a Cisco ISE enabled network, these devices assume the Default Posture Status settings.

These settings can also be applied to endpoints that run on Windows and MacOS operating systems when a matching client provisioning policy is not found during posture runtime while redirecting the endpoints to the client provisioning portal.

**Before you begin**

In order to enforce policy on an endpoint, you must configure a corresponding Client Provisioning policy (Agent installation package). Otherwise, the posture status of the endpoint automatically reflects the default setting.

**Step 1** Choose **Administration** > **System** > **Settings** > **Posture** > **General Settings**.

**Step 2** From the **Default Posture Status** drop-down list, choose the option as **Compliant** or **Noncompliant**.

**Step 3** Click **Save**.

# Posture Lease

You can configure Cisco ISE to perform posture assessment every time a user logs into your network or perform posture assessment in specified intervals. The valid range is from 1 to 365 days.

This configuration applies only for those who use AnyConnect agent for posture assessment.

When the posture lease is active, Cisco ISE will use the last known posture state and will not reach out to the endpoint to check for compliance. But when the posture lease expires, Cisco ISE does not automatically trigger a re-authentication or a posture reassessment for the endpoint. The endpoint will stay in the same compliance state since the same session is being used. When the endpoint re-authenticates, posture will be run and the posture lease time will be reset.

Example Use Case Scenario:

- The user logs on to the endpoint and gets it posture compliant with the posture lease set to one day.
- Four hours later the user logs off from the endpoint (the posture lease now has 20 hours left).
- One hour later the user logs on again. Now the posture lease has 19 hours left. The last know posture state was compliant. Hence the user is provided access without posture being run on the endpoint.
- Four hours later the user logs off (the posture lease now has 15 hours left).
- 14 hours later, the user logs on. The posture lease has one hour left. The last known posture state was compliant. The user is provided access without posture being run on the endpoint.
- One hour later, the posture lease expires. The user is still connected to the network as the same user session is being used.
- One hour later, user logs off (the session is tied to the user but not to the machine, so the machine can stay on the network).
- One hour later the user logs on. Since the posture lease has expired and a new user session is launched, the machine performs a posture assessment, the results are sent to the Cisco ISE and the posture lease timer is reset to one day in case of this use case.

# Periodic Reassessments

Periodic reassessment (PRA) can be done only for clients that are already successfully postured for compliance. PRA cannot occur if clients are not compliant on your network.

A PRA is valid and applicable only if the endpoints are in a compliant state. The policy service node checks the relevant policies, and compiles the requirements depending on the client role that is defined in the configuration to enforce a PRA. If a PRA configuration match is found, the policy service node responds to the client agent with the PRA attributes that are defined in the PRA configuration for the client before issuing a CoA request. The client agent periodically sends the PRA requests based on the interval specified in the configuration. The client remains in the compliant state if the PRA succeeds, or the action configured in the PRA configuration is to continue. If the client fails to meet PRA, then the client is moved from the compliant state to the noncompliant state.

The PostureStatus attribute shows the current posture status as compliant in a PRA request instead of unknown even though it is a posture reassessment request. The PostureStatus is updated in the Monitoring reports as well.

When the posture lease has not expired, an endpoint becomes compliant based on the Access Control List (ACL), and PRA is initiated. If PRA fails, the endpoint is deemed noncompliant and the posture lease is reset.

**Note** PRA is not supported during PSN failover. After PSN failover, you must either enable rescan on the client or enable posture lease.

## Configure Periodic Reassessments

You can configure periodic reassessments only for clients that are already successfully postured for compliance. You can configure each PRA to a user identity group that is defined in the system.

### Before you begin

- Ensure that each Periodic reassessment (PRA) configuration has a unique group or a unique combination of user identity groups assigned to the configuration.
- You can assign a role_test_1 and a role_test_2, which are the two unique roles to a PRA configuration. You can combine these two roles with a logical operator and assign the PRA configuration as a unique combination of two roles. For example, role_test_1 OR role_test_2.
- Ensure that two PRA configurations do not have a user identity group in common.
- If a PRA configuration already exists with a user identity group *Any*, you cannot create other PRA configurations unless you perform one of the following:
  - Update the existing PRA configuration with the Any user identity group to reflect a user identity group other than *Any*.
  - Delete the existing PRA configuration with a user identity group "*Any*".

**Step 1** Choose **Administration** > **System** > **Settings** > **Posture** > **Reassessments**.

**Step 2** Click **Add**.

**Step 3** Modify the values in the **New Reassessment Configuration** window to create a new PRA.

**Step 4** Click **Submit** to create a PRA configuration.

# Posture Troubleshooting Settings

The following table describes the fields on the Posture troubleshooting window, which you use to find and resolve posture problems on the network. The navigation path for this window is: **Operations** > **Troubleshoot** > **Diagnostic Tools** > **General Tools** > **Posture Troubleshooting**.

***Table 2: Posture Troubleshooting Settings***

| Field Name | Usage Guidelines |
|---|---|
| **Search and Select a Posture event for troubleshooting** | |
| **Username** | Enter the username to filter on. |
| **MAC Address** | Enter the MAC address to filter on, using format: xx-xx-xx-xx-xx-xx |
| **Posture Status** | Select the authentication status to filter on: |
| **Failure Reason** | Enter the failure reason or click **Select** to choose a failure reason from a list. Click **Clear** to clear the failure reason. |
| **Time Range** | Select a time range. The RADIUS authentication records that are created during this time range are used. |
| **Start Date-Time:** | (Available only when you choose Custom Time Range) Enter the start date and time, or click the calendar icon to select the start date and time. The date should be in the *mm/dd/yyyy* format and time in the *hh:mm* format. |
| **End Date-Time:** | (Available only when you choose Custom Time Range) Enter the end date and time, or click the calendar icon to select the start date and time. The date should be in the *mm/dd/yyyy* format and time in the *hh:mm* format. |
| **Fetch Number of Records** | Select the number of records to display: 10, 20, 50, 100, 200, 500 |
| **Search Result** | |
| **Time** | Time of the event |
| **Status** | Posture status |
| **Username** | User name associated with the event |
| **MAC Address** | MAC address of the system |
| **Failure Reason** | Failure reason for the event |

### Related Topics

Posture Troubleshooting Tool, on page 65

# Posture General Settings

These settings are the default settings for posture, which can be overridden by a posture profile.

### General Posture Settings

- **Remediation Timer**: Enter the time to wait before starting remediation. The default value is 4 minutes. The valid range is 1–300 minutes.
- **Network Transition Delay**: Enter a time value in seconds. The default value is 3 seconds. The valid range is from 2 to 30 seconds.
- **Default Posture Status**: Choose **Compliant** or **Noncompliant**. Non-agent devices assume this status while connecting to the network.
- **Automatically Close Login Success Screen After**: Check the check box to close the login success screen automatically after the specified time. You can configure the timer to close the login screen automatically. The valid range is from 0 to 300 seconds. If the time is set to zero, then the agents on the client do not display the login success screen.
- **Continuous Monitoring Interval**: Specify the time interval after which AnyConnect should start sending monitoring data. For application and hardware conditions, the default value is 5 minutes.
- **Acceptable Use Policy in Stealth Mode**: Choose **Block** in stealth mode to move a client to noncompliant posture status, if your company's network-usage terms and conditions are not met.

### Posture Lease

- **Perform posture assessment every time a user connects to the network**: Select this option to initiate posture assessment every time the user connects to network
- **Perform posture assessment every n days**: Select this option to initiate posture assessment after the specified number of days, even if the client is already postured Compliant.
- **Cache Last Known Posture Compliant Status**: Check this check box for Cisco ISE to cache the result of posture assessment. By default, this field is disabled.
- **Last Known Posture Compliant Status**: This setting only applies if you have checked **Cache Last Known Posture Compliant Status**. Cisco ISE caches the result of posture assessment for the amount of time specified in this field. Valid values are from 1 to 30 days, or from 1 to 720 hours, or from 1 to 43200 minutes.

### Related Topics

Posture Administration Settings, on page 3
Posture Lease, on page 7
Set Remediation Timer for Clients to Remediate Within Specified Time, on page 5
Set Network Transition Delay Timer for Clients to Transition, on page 6
Set Login Success Window to Close Automatically, on page 6
Set Posture Status for Nonagent Devices, on page 6

# Download Posture Updates to Cisco ISE

Posture updates include a set of predefined checks, rules, and support charts for antivirus and antispyware for both Windows and MacOS operating systems, and operating systems information that are supported by Cisco. You can also update Cisco ISE offline from a file on your local system, which contains the latest archives of updates.

When you deploy Cisco ISE on your network for the first time, you can download posture updates from the web. This process usually takes approximately 20 minutes. After the initial download, you can configure Cisco ISE to verify and download incremental updates to occur automatically.

Cisco ISE creates default posture policies, requirements, and remediations only once during an initial posture updates. If you delete them, Cisco ISE does not create them again during subsequent manual or scheduled updates.

### Before you begin

To ensure that you are able to access the appropriate remote location from which you can download posture resources to Cisco ISE, you may be required to verify that you have the correct proxy settings configured for your network as described in Specifying Proxy Settings in Cisco ISE.

You can use the Posture Update window to download updates dynamically from the web.

**Step 1** Choose **Administration** > **System** > **Settings** > **Posture** > **Updates**.

**Step 2** Choose the **Web** option to download updates dynamically.

**Step 3** Click **Set to Default** to set the Cisco default value for the **Update Feed URL** field.

If your network restricts URL-redirection functions (via a proxy server, for example) and you are experiencing difficulty accessing the above URL, try also pointing your Cisco ISE to the alternative URL in the related topics.

**Step 4** Modify the values in the **Posture Updates** window.

**Step 5** Click **Update Now** to download updates from Cisco.

After being updated, the Posture Updates window displays the current Cisco updates version information as a verification of an update under Update Information section in the Posture Updates window.

**Step 6** Click **Yes** to continue.

# Cisco ISE Offline Updates

This offline update option allows you to download client provisioning and posture updates, when direct internet access to Cisco.com from a device using Cisco ISE is not available or is not permitted by a security policy.

To download offline client provisioning resources:

**Step 1** Go to: https://software.cisco.com/download/home/283801620/type/283802505/release/2.7.0.

**Step 2** Provide your login credentials.

**Step 3** Navigate to the Cisco Identity Services Engine download window, and select the release.

The following Offline Installation Packages are available for download:

- **win_spw-**<*version*>**-isebundle.zip**—Offline SPW Installation Package for Windows
- **mac-spw-**<*version*>**.zip**—Offline SPW Installation Package for Mac OS X
- **compliancemodule-**<*version*>**-isebundle.zip**—Offline Compliance Module Installation Package
- **macagent-**<*version*>**-isebundle.zip**—Offline Mac Agent Installation Package

- **webagent-**<*version*>**-isebundle.zip**—Offline Web Agent Installation Package

**Step 4** Click either **Download** or **Add to Cart**.

For more information on adding the downloaded installation packages to Cisco ISE, see the "Add Client Provisioning Resources from a Local Machine" section in the Cisco Identity Services Engine Administrator Guide.

You can update the checks, operating system information, and antivirus and antispyware support charts for Windows and Mac operating systems offline from an archive in your local system, using posture updates.

For offline updates, ensure that the versions of the archive files match the versions in the configuration file. Use offline posture updates after you configure Cisco ISE and want to enable dynamic updates for the posture policy service.

To download offline posture updates:

**Step 1** Go to https://www.cisco.com/web/secure/spa/posture-offline.html.

**Step 2** Save the **posture-offline.zip** file to your local system. This file is used to update the operating system information, checks, rules, and antivirus and antispyware support charts for Windows and Mac operating systems.

**Step 3** Launch the Cisco ISE administrator user interface and choose **Administration > System > Settings > Posture**.

**Step 4** Click the arrow to view the settings for posture.

**Step 5** Click **Updates**.
The **Posture Updates** window is displayed.

**Step 6** Click the **Offline** option.

**Step 7** Click **Browse** to locate the archive file (posture-offline.zip) from the local folder in your system.

**Note** The **File to Update** field is a mandatory field. You can select only one archive file (.zip) containing the appropriate files. Archive files other than .zip, such as .tar, and .gz are not supported.

**Step 8** Click **Update Now**.

# Download Posture Updates Automatically

After an initial update, you can configure Cisco ISE to check for the updates and download them automatically.

### Before you begin

- You should have initially downloaded the posture updates to configure Cisco ISE to check for the updates and download them automatically.

**Step 1** Choose **Administration** > **System** > **Settings** > **Posture** > **Updates**.

**Step 2** In the **Posture Updates** window, check the **Automatically check for updates starting from initial delay** check box.

**Step 3** Enter the initial delay time in hh:mm:ss format.

Cisco ISE starts checking for updates after the initial delay time is over.

**Step 4** Enter the time interval in hours.

Cisco ISE downloads the updates to your deployment at specified intervals from the initial delay time.

**Step 5** Click **Save**.

# Posture Acceptable Use Policy Configuration Settings

*Table 3: Posture AUP Configurations Settings*

| Field Name | Usage Guidelines |
|---|---|
| **Configuration Name** | Enter the name of the AUP configuration that you want to create. |
| **Configuration Description** | Enter the description of the AUP configuration that you want to create. |
| **Show AUP to Agent users (for Windows only)** | When selected, the link to network usage terms and conditions for your network is displayed to users upon successful authentication and posture assessment. |
| **Use URL for AUP message** | When selected, you must enter the URL to the AUP message in the AUP URL field. |
| **Use file for AUP message** | When selected, you must browse to the location and upload a file in a zipped format. The file must contain the index.html at the top level.<br>The .zip file can include other files and subdirectories in addition to the index.html file. These files can reference each other using HTML tags. |
| **AUP URL** | Enter the URL to the AUP, which users must access upon successful authentication and posture assessment. |
| **AUP File** | Browse to the file and upload it to the Cisco ISE server. It should be a zipped file and should contain the index.html file at the top level. |
| **Select User Identity Groups** | Choose a unique user identity group or a unique combination of user identity groups for your AUP configuration.<br>Note the following while creating an AUP configuration:<br>• Posture AUP is not applicable for a guest flow<br>• No two configurations have any user identity group in common<br>• If you want to create a AUP configuration with a user identity group “Any”, then delete all other AUP configurations first<br>• If you create a AUP configuration with a user identity group “Any”, then you cannot create other AUP configurations with a unique user identity group or user identity groups. To create an AUP configuration with a user identity group other than Any, either delete an existing AUP configuration with a user identity group “Any” first, or update an existing AUP configuration with a user identity group “Any” with a unique user identity group or user identity groups. |

| Field Name | Usage Guidelines |
|---|---|
| **Acceptable use policy configurations—Configurations list** | Lists existing AUP configurations and end user identity groups associated with AUP configurations. |

**Related Topics**

Configure Acceptable Use Policies for Posture Assessment, on page 14

# Configure Acceptable Use Policies for Posture Assessment

After login and successful posture assessment of clients, the client agent displays a temporary network access screen. This screen contains a link to an acceptable use policy (AUP). When the user clicks the link, they are redirected to a page that displays the network-usage terms and conditions, which they must read and accept.

Each Acceptable Use Policy configuration must have a unique user identity group, or a unique combination of user identity groups. Cisco ISE finds the AUP for the first matched user identity group, and then it communicates to the client agent that displays the AUP.

**Step 1** Choose **Administration** > **System** > **Settings** > **Posture** > **Acceptable Use Policy**.

**Step 2** Click **Add**.

**Step 3** Modify the values in the **New Acceptable Use Policy Configuration** window.

**Step 4** Click **Submit**.

# Posture Conditions

A posture condition can be any one of the following simple conditions: a file, a registry, an application, a service, or a dictionary condition. One or more conditions from these simple conditions form a compound condition, which can be associated to a posture requirement.

When you deploy Cisco ISE on your network for the first time, you can download posture updates from the web. This process is called the initial posture update.

After an initial posture update, Cisco ISE also creates Cisco defined simple and compound conditions. Cisco defined simple conditions have pc_ as their prefixes and compound conditions have pr_ as their prefixes.

You can also configure Cisco ISE to download the Cisco-defined conditions periodically as a result of dynamic posture updates through the web. You cannot delete or edit Cisco defined posture conditions.

A user defined condition or a Cisco defined condition includes both simple conditions and compound conditions.

## Simple Posture Conditions

You can use the **Posture Navigation** pane to manage the following simple conditions:

- File Conditions: A condition that checks the existence of a file, the date of a file, and the versions of a file on the client.

- Registry Conditions: A condition that checks for the existence of a registry key or the value of the registry key on the client.
- Application Conditions: A condition that checks if an application or process is running or not running on the client.

**Note** If a process is installed and running, user is compliant. However, the Application condition works in reverse logic; If an application is not installed and not running, the end user is complaint. If an application is installed and running, the end user is non-complaint.

- Service Conditions: A condition that checks if a service is running or not running on the client.
- Dictionary Conditions: A condition that checks a dictionary attribute with a value.
- USB Conditions: A condition that checks for the presence of USB mass storage device.

# Create Simple Posture Conditions

You can create file, registry, application, service, and dictionary simple conditions that can be used in posture policies or in other compound conditions.

### Before you begin

To perform the following task, you must be a Super Admin or Policy Admin.

**Step 1** Choose **Policy** > **Policy Elements** > **Conditions** > **Posture**.
**Step 2** Choose any one of the following: **File**, **Registry**, **Application**, **Service**, or **Dictionary Simple Condition**.
**Step 3** Click **Add**.
**Step 4** Enter the appropriate values in the fields.
**Step 5** Click **Submit**.

# Compound Posture Conditions

Compound conditions are made up of one or more simple conditions, or compound conditions. You can make use of the following compound conditions while defining a Posture policy.

- Compound Conditions: Contains one or more simple conditions, or compound conditions of the type File, Registry, Application, or Service condition
- Antivirus Compound Conditions: Contains one or more AV conditions, or AV compound conditions
- Antispyware Compound Conditions: Contains one or more AS conditions, or AS compound conditions
- Dictionary Compound Conditions: Contains one or more dictionary simple conditions or dictionary compound conditions

- Antimalware Conditions: Contains one or more AM conditions.

## Create Compound Posture Conditions

You can create compound conditions that can be used in posture policies for posture assessment and validation.

### Before you begin

To perform the following task, you must be a Super Admin or Policy Admin.

**Step 1** Choose **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Compound Conditions** > **Add**.

**Step 2** Enter appropriate values for the fields.

**Step 3** Click **Validate Expression** to validate the condition.

**Step 4** Click **Submit**.

## Dictionary Compound Condition Settings

The following table describes the fields in the **Dictionary Compound Conditions** window. The navigation path for this window is **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Dictionary Compound Condition**.

*Table 4: Dictionary Compound Condition Settings*

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the dictionary compound condition that you want to create. |
| **Description** | Enter the description of the dictionary compound condition that you want to create. |
| **Select Existing Condition from Library** | Define an expression by selecting pre-defined conditions from the policy elements library or add ad-hoc attribute/value pairs to your expression in the subsequent steps. |
| **Condition Name** | Choose dictionary simple conditions that you have already created from the policy elements library. |
| **Expression** | The Expression is updated based on your selection from the Condition Name drop-down list. |

| Field Name | Usage Guidelines |
|---|---|
| **AND or OR operator** | Choose an AND, or an OR operator to logically combine dictionary simple conditions, which can be added from the library.<br>Click the **Action** icon to do the following:<br>• Add Attribute/Value<br>• Add Condition from Library<br>• Delete<br>Cisco ISE will process each OR condition in a compound condition sequentially. For example, if a compound condition checks for A OR B, Cisco ISE first checks A and then B. If either condition A or B is passed, the overall result is marked as passed.<br>If condition A fails and condition B succeeds, then the overall result is marked as passed. In this case, condition A is marked as failed and condition B as passed in the posture reports.<br>If condition A succeeds, Cisco ISE skips condition B and marks the overall result as passed. In the posture reports, condition A is marked as passed, condition B as skipped, and the overall result as passed. |
| **Create New Condition (Advance Option)** | Select attributes from various system or user-defined dictionaries.<br>You can also add predefined conditions from the policy elements library in the subsequent steps. |
| **Condition Name** | Choose a dictionary simple condition that you have already created. |
| **Expression** | From the Expression drop-down list, you can create a dictionary simple condition. |
| **Operator** | Choose an operator to associate a value to an attribute. |
| **Value** | Enter a value that you want to associate to the dictionary attribute, or choose a value from the drop-down list. |

### Related Topics

Compound Posture Conditions, on page 15
Create Compound Posture Conditions, on page 16

# Predefined Condition for Enabling Automatic Updates in Windows Clients

The pr_AutoUpdateCheck_Rule is a Cisco predefined condition, which is downloaded to the Compound Conditions window. This condition allows you to check whether the automatic updates feature is enabled on Windows clients. If a Windows client fails to meet this requirement, then the Network Access Control (NAC) Agents enforce the Windows client to enable (remediate) the automatic updates feature. After this remediation is done, the Windows client becomes posture compliant. The Windows update remediation that you associate in the posture policy overrides the Windows administrator setting, if the automatic updates feature is not enabled on the Windows client.

# Preconfigured Antivirus and Antispyware Conditions

Cisco ISE loads preconfigured antivirus and antispyware compound conditions in the AV and AS Compound Condition windows, which are defined in the antivirus and antispyware support charts for Windows and MacOS operating systems. These compound conditions can check if the specified antivirus and antispyware products exist on all the clients. You can also create new antivirus and antispyware compound conditions in Cisco ISE.

## Antivirus and Antispyware Support Chart

Cisco ISE uses an antivirus and antispyware support chart, which provides the latest version and date in the definition files for each vendor product. Users must frequently poll antivirus and antispyware support charts for updates. The antivirus and antispyware vendors frequently update antivirus and antispyware definition files, look for the latest version and date in the definition files for each vendor product.

Each time the antivirus and antispyware support chart is updated to reflect support for new antivirus and antispyware vendors, products, and their releases, the agents receive a new antivirus and antispyware library. It helps the Agents to support newer additions. Once the agents retrieve this support information, they check the latest definition information from the periodically updated se-checks.xml file (which is published along with the se-rules.xml file in the se-templates.tar.gz archive), and determine whether clients are compliant with the posture policies. Depending upon what is supported by the antivirus and antispyware library for a particular antivirus, or antispyware product, the appropriate requirements will be sent to the agents for validating their existence, and the status of particular antivirus and antispyware products on the clients during posture validation.

For more information on the antivirus and anti-malware products supported by the ISE posture agent, see the Cisco AnyConnect ISE Posture Support Charts: Cisco ISE Compatibility Guide.

You can verify the minimum compliance module version while creating an anti-malware posture condition. After the posture feed is updated, choose **Work Centers > Posture > Policy Elements > Anti-Malware Condition** and then choose the **Operating System** and **Vendor** to view the support chart.

**Note** Some of the Anti-Malware endpoint security solutions (such as FireEye, Cisco AMP, Sophos, and so on) require network access to their respective centralized service for functioning. For such products, AnyConnect ISE posture module (or OESIS library) expects the endpoints to have internet connectivity. It is recommended that internet access is allowed for such endpoints during pre-posture for these online agents (if offline detection is not enabled). Signature Definition condition might not be applicable in such cases.

# Compliance Module

The compliance module contains a list of fields, such as vendor name, product version, product name, and attributes provided by OPSWAT that supports Cisco ISE posture conditions.

Vendors frequently update the product version and date in the definition files, therefore, you must look for the latest version and date in the definition files for each vendor product by frequently polling the compliance module for updates. Each time the compliance module is updated to reflect the support for new vendors, products, and their releases, the AnyConnect agent receives a new library. It helps the AnyConnect agent to support newer additions. The AnyConnect agent retrieves this support information and checks the latest definition information from the periodically updated se-checks.xml file (which is published along with the se-rules.xml file in the se-templates.tar.gz archive), and determine whether clients are compliant with the

posture policies. Depending upon what is supported by the library for a particular antivirus, antispyware, antimalware, disk encryption, or patch management product, the appropriate requirements will be sent to the AnyConnect agent for validating their existence, and the status of the particular products on the clients during posture validation.

The compliance module is available on Cisco.com.

Table given below lists the OPSWAT API versions that support and do not support the ISE posture policy. There are different policy rules for agents that support versions 3 and 4.

***Table 5: OPSWAT API Versions***

| Posture Condition | Compliance Module Version |
|---|---|
| OPSWAT | |
| Antivirus | 3.x or earlier |
| Antispyware | 3.x or earlier |
| Antimalware | 4.x or later |
| Disk Encryption | 3.x or earlier and 4.x or later |
| Patch Management | 3.x or earlier and 4.x or later |
| USB | 4.x or later |
| Non-OPSWAT | |
| File | Any version |
| Application | Any version |
| Compound | Any version |
| Registry | Any version |
| Service | Any version |

**Note**

- Be sure to create separate posture policies for version 3.x or earlier and version 4.x or later, in anticipation of clients that may have installed any one of the above versions.
- OESIS version 4 support is provided for compliance module 4.x and Cisco AnyConnect 4.3 and higher. However, AnyConnect 4.3 supports both OESIS version 3 and version 4 policies.
- Version 4 compliance module is supported by ISE 2.1 and higher.

# Check Posture Compliance

**Step 1** Log in to Cisco ISE and access the dashboard.

**Step 2** In the **Posture Compliance** dashlet, hover your cursor over a stack bar or sparkline.

A tooltip provides detailed information.

**Step 3** Expand the data categories for more information.

**Step 4** Expand the **Posture Compliance** dashlet.

A detailed real-time report is displayed.

**Note** You can view the posture compliance report in the **Context Visibility** window. Navigate **Context Visibility > Endpoints > Compliance**. This window displays different charts based on **Compliance Status**, **Location**, **Endpoints**, and **Applications by Categories**.

You might see the posture status for endpoints that do not have any active sessions. For example, if the last known posture status for an endpoint is **Compliant**, the status remains **Compliant** in the **Context Visibility** window until the next update is received for the endpoint, even if the endpoint session is terminated. The posture status is retained in the **Context Visibility** window until that endpoint is deleted or purged.

# Create Patch Management Conditions

You can create a policy to check the status of a selected vendor's patch management product.

For example, you can create a condition to check if Microsoft System Center Configuration Manager (SCCM), Client Version 4.x software product is installed at an endpoint.

**Note** Supported versions of Cisco ISE and AnyConnect:

- Cisco ISE version 1.4 and later
- AnyConnect version 4.1 and later

### Before you begin

To perform the following task, you must be a Super Admin or Policy Admin.

**Step 1** Choose **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Patch Management Condition**.

**Step 2** Click **Add**.

**Step 3** Enter the condition name and description in the **Name** and **Description** fields.

**Step 4** Choose the appropriate operating system from the **Operating System** drop-down field.

**Step 5** Choose the **Compliance Module** from the drop-down list.

**Step 6** Choose the **Vendor Name** from the drop-down list.

**Step 7** Choose the **Check Type.**

**Step 8** Choose the appropriate patch from the **Check patches installed** drop-down list.

**Step 9** Click **Submit**.

**Related Topics**

Patch Management Condition Settings, on page 37
Add a Patch Management Remediation, on page 52

# Create Disk Encryption Conditions

You can create a policy to check if an end point is compliant with the specified data encryption software.

For example, you can create a condition to check if the C: drive is encrypted in an end point. If the C: drive is not encrypted then the end point receives a non-compliance notification and ISE logs a message.

**Before you begin**

To perform the following task, you must be a Super Admin or Policy Admin. You can associate a Disk Encryption condition with a posture requirement only when you use the AnyConnect ISE posture agent.

**Step 1** Choose **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Disk Encryption Condition**.

**Step 2** Click **Add**.

**Step 3** In the **Disk Encryption Condition** window, enter the appropriate values in the fields.

**Step 4** Click **Submit**.

# Posture Condition Settings

This section describes simple and compound conditions used for posture.

## File Condition Settings

The following table describes the fields in the **File Conditions** window. The navigation path for this window is **Policy** > **Policy Elements** > **Conditions** > **Posture** > **File Condition**.

***Table 6: File Condition Settings***

| Field Name | Usage Guidelines for Windows OS | Usage Guidelines for macOS |
|---|---|---|
| **Name** | Enter the name of the file condition. | Enter the name of the file condition. |

| Field Name | Usage Guidelines for Windows OS | Usage Guidelines for macOS |
|---|---|---|
| **Description** | Enter a description for the file condition. | Enter a description for the file condition. |
| **Operating System** | Select any Windows operating system to which the file condition should be applied. | Select any macOS to which the file condition should be applied. |
| **File Type** | Choose one of the predefined settings:<br>• **FileDate**: Checks whether a file with a particular file-created or file-modified date exists in the system.<br>• **FileExistence**: Checks whether a file exists in the system.<br>• **FileVersion**: Checks whether a particular version of a file exists in the system.<br>• **CRC32**: Checks the data integrity of a file using the checksum function.<br>• **SHA-256**: Checks the data integrity of a file using the hash function. | Choose one of the predefined settings:<br>• **FileDate**: Checks whether a file with a particular file-created or file-modified date exists in the system.<br>• **FileExistence**: Checks whether a file exists in the system.<br>• **CRC32**: Checks the data integrity of a file using the checksum function.<br>• **SHA-256**: Checks the data integrity of a file using the hash function.<br>• **PropertyList**: Checks the property value in a plist file, such as loginwindow.plist. |

| Field Name | Usage Guidelines for Windows OS | Usage Guidelines for macOS |
|---|---|---|
| **Data Type and Operator** | NA | (Available only if you select **PropertyList** as the File Type) Choose the data type or value of the key to be searched in the plist files. Each data type contains a set of operators.<br>• **Unspecified**: Checks the existence of the specified key. Enter an Operator (Exists, DoesNotExist).<br>• **Number**: Checks for the specified key of number data type. Enter an Operator (equals, does not equal, greater than, less than, greater than or equal to, less than or equal to) and a Value.<br>• **String**: Checks for the specified key of string data type. Enter an Operator (equals, does not equal, equals (ignore case), starts with, does not start with, contains, does not contain, ends with, does not end with) and a Value.<br>• **Version**: Checks for the value of the specified key as a version string. Enter an Operator (earlier than, later than, same as) and a Value. |
| **Property Name** | NA | (Available only if you select **PropertyList** as the File Type) Enter a name of the key, for example, BuildVersionStampAsNumber |

| Field Name | Usage Guidelines for Windows OS | Usage Guidelines for macOS |
|---|---|---|
| **File Path** | Choose one of the predefined settings:<br>• **ABSOLUTE_PATH**: Checks the file in the fully qualified path of the file. For example, C:\<directory>\file name. For other settings, enter only the file name.<br>• **SYSTEM_32**: Checks the file in the C:\WINDOWS\system32 directory. Enter the file name.<br>• **SYSTEM_DRIVE**: Checks the file in the C:\ drive. Enter the file name.<br>• **SYSTEM_PROGRAMS**: Checks the file in the C:\Program Files. Enter the file name.<br>• **SYSTEM_ROOT**: Checks the file in the root path for Windows system. Enter the file name.<br>• **USER_DESKTOP**: Checks if the specified file is present on the Windows user's desktop. Enter the file name.<br>• **USER_PROFILE**: Checks if the file is present in the Windows user's local profile directory. Enter the file path. | Choose one of the predefined settings:<br>• **Root**: Checks the file in the root (/) directory. Enter the file path.<br>• **Home**: Checks the file in the home (~) directory. Enter the file path. |
| **File Date Type** | (Available only if you select **FileDate** as the File Type) Choose **Creation Date** or **Modification Date**. | (Available only if you select **FileDate** as the File Type) Choose **Creation Date** or **Modification Date**. |

| Field Name | Usage Guidelines for Windows OS | Usage Guidelines for macOS |
|---|---|---|
| **File Operator** | The File Operator options change according to the settings you select in the File Type. Choose the settings appropriately:<br>FileDate<br>• EarlierThan<br>• LaterThan<br>• EqualTo<br>• Within: The last *n* number of days. Valid values are between 1 and 300 days.<br>FileExistence<br>• Exists<br>• DoesNotExist<br>FileVersion<br>• EarlierThan<br>• LaterThan<br>• EqualTo | The File Operator options change according to the settings you select in the File Type. Choose the settings appropriately:<br>FileDate<br>• EarlierThan<br>• LaterThan<br>• EqualTo<br>• Within: The last *n* number of days. Valid values are between 1 and 300 days.<br>FileExistence<br>• Exists<br>• DoesNotExist |
| **File CRC Data** | (Available only if you select **CRC32** as the File Type) You can enter a checksum value, for example, 0x3c37fec3 to check file integrity. The checksum value should start with 0x, a hexadecimal integer. | (Available only if you select **CRC32** as the File Type) You can enter a checksum value, for example, 0x3c37fec3 to check file integrity. The checksum value should start with 0x, a hexadecimal integer. |
| **File SHA-256 Data** | (Available only if you select **SHA-256** as the File Type) You can enter a 64-byte hexadecimal hash value to check file integrity. | (Available only if you select **SHA-256** as the File Type) You can enter a 64-byte hexadecimal hash value to check file integrity. |
| **Date and Time** | (Available only if you select **FileDate** as the File Type) Enter the date and time of the client system in mm/dd/yyyy and hh:mm:ss format. | (Available only if you select **FileDate** as the File Type) Enter the date and time of the client system in mm/dd/yyyy and hh:mm:ss format. |

**Related Topics**

Simple Posture Conditions, on page 14
Compound Posture Conditions, on page 15
Create a Posture Condition, on page 61

# Firewall Condition Settings

The Firewall condition checks if a specific Firewall product is running on an endpoint. The list of supported Firewall products is based on the OPSWAT support charts. You can enforce policies during initial posture and Periodic Reassessment (PRA).

Cisco ISE provides default Firewall conditions for Windows and macOS. These conditions are disabled by default.

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the Firewall condition. |
| **Description** | Enter a description for the Firewall condition. |
| **Compliance Module** | Choose the required compliance module.<br>• 4.x or later<br>• 3.x or later<br>• Any Version |
| **Operating System** | Checks If the required Firewall product is installed on an endpoint. You can select the Windows OS or macOS. |
| **Vendor** | Choose a vendor name from the drop-down list. The Firewall products of a vendor and their check type are retrieved and displayed in the **Products for Selected Vendor** table. The list in the table changes according to the selected operating system. |
| **Check Type** | Enabled: To check if a specific Firewall is running on an endpoint. Verify if the vendor's product supports the chosen check type by referring to the **Products for Selected Vendor** list. |

# Registry Condition Settings

The following table describes the fields in the Registry Conditions window. The navigation path for this window is **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Registry Condition**.

***Table 7: Registry Condition Settings***

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the registry condition. |
| **Description** | Enter a description for the registry condition. |
| **Registry Type** | Choose one of the predefined settings as the registry type. |

| Field Name | Usage Guidelines |
|---|---|
| **Registry Root Key** | Choose one of the predefined settings as the registry root key. |
| **Sub Key** | Enter the sub key without the backslash (“\”) to check the registry key in the path specified in the Registry Root Key.<br>For example, SOFTWARE\Symantec\Norton AntiVirus\version will check the key in the following path:<br>HKLM\SOFTWARE\Symantec\NortonAntiVirus\version |
| **Value Name** | (Available only if you select **RegistryValue** or **RegistryValueDefault** as the Registry Type) Enter the name of the registry key value to be checked for **RegistryValue**.<br>This is the default field for **RegistryValueDefault**. |
| **Value Data Type** | (Available only if you select **RegistryValue** or **RegistryValueDefault** as the Registry Type) Choose one of the following settings:<br>• **Unspecified**: Checks whether the registry key value exists or not. This option is available only for **RegistryValue**.<br>• **Number**: Checks the specified number in the registry key value<br>• **String**: Checks the string in the registry key value<br>• **Version**: Checks the version in the registry key value |
| **Value Operator** | Choose the settings appropriately. |
| **Value Data** | (Available only if you select **RegistryValue** or **RegistryValueDefault** as the Registry Type) Enter the value of the registry key according to the data type you have selected in **Value Data Type**. |
| **Operating System** | Select the operating system to which the registry condition should be applied. |

### Related Topics

Simple Posture Conditions, on page 14
Compound Posture Conditions, on page 15

# Continuous Endpoint Attribute Monitoring

You can use the AnyConnect agent to continuously monitor different endpoint attributes to improve the overall visibility of an endpoint. The AnyConnect agent monitors applications that are installed and running on an endpoint. You can turn on and off the feature and configure how often the data should be monitored. By default, data is collected every 5 minutes and is stored in the database. During initial posture, AnyConnect reports a complete list of running and installed applications. After initial posture, the AnyConnect agent scans the applications every X minutes and sends the differences from the last scan to the server. The server displays the complete list of running and installed applications.

# Application Condition Settings

The application condition queries for applications that are installed on an endpoint. This helps you to get an aggregate visibility of the software distributed on your endpoints.

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the application condition. |
| **Description** | Enter the description for the application condition. |
| **Operating System** | Select the Windows OS or MAC OSX to which the application condition should be |
| **Compliance Module** | Choose one of the following options:<br>• **4.x or later**<br>• **3.x or earlier**<br>• **Any Version** |
| **Check By** | Choose one of the following options:<br>• **Process**: Choose this option to check if a process is running on an endpoint.<br>• **Application**: Choose this option to check if an application is running on an end |
| **Process Name** | (Available only when you select **Process** as the **Check By** option) Enter the required name. |
| **Application Operator** | (Available only when you select **Process** as the **Check By** option) Choose one of the options:<br>• **Running**: Choose this option to check if an application is running on an endpo<br>• **Not Running**: Choose this option to check whether an application is not runnin endpoint. |
| **Application State** | (Available only when you select **Application** as the **Check By** option) Choose one o following options:<br>• **Installed**: Choose this option to check whether the clients have malicious appli installed. If a malicious application is found, the remediation action is triggered<br>• **Running**: Choose this option to check if an application is running on an endpo |

| Field Name | Usage Guidelines |
|---|---|
| **Provision By** | (Available only when you select **Application** as the **Check By** option) Choose o following options:<br>• **Everything**: You can select all listed categories such as Browser, Patch Mar so on.<br>• **Name**: You should select at least one category. For example, if you choose category, it displays the corresponding vendors in the **Vendor** drop-down li<br>• **Category**: You can check one or more categories such as Anti-Malware, Bac or Data Storage.<br>**Note** Categories are dynamically updated from the OPSWAT library. |

You can view the number of installed and running applications for each endpoint in the **Context Visibility** > **Endpoints** > **Compliance** window.

The **Home** > **Summary** > **Compliance** window displays the percentage of endpoints that are subject to posture assessment and are compliant.

# Service Condition Settings

The following table describes the fields in the **Service Conditions** window. The navigation path for this window is **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Service Condition**.

***Table 8: Service Conditions Settings***

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter a name for the service condition. |
| **Description** | Enter a description of the service condition. |
| **Operating Systems** | Select the operating system to which the service condition should be applied. You can select different versions of the Windows OS or macOS. |
| **Service Name** | Enter the name of the Daemon or User Agent service, for example, com.apple.geod, running as root. The AnyConnect agent uses the command **sudo launchctl list** to validate the service condition. |
| **Service Type** | Choose the type of service that AnyConnect should check for to ensure client compliance:<br>• **Daemon**: Checks if a specified service, such as scanning a client device for malware, is present in the specified list of Daemon services in the client.<br>• **User Agent**: Checks if a specified service, such as a service that runs when malware is detected, is present in the specified list of User services in the client.<br>• **Daemon or User Agent**: Checks if the specified services are present either in the Daemon or User Agent services list. |

| Field Name | Usage Guidelines |
|---|---|
| **Service Operator** | Choose the service status that you want to check in the client:<br>• **Windows OS**: To check if a service is **Running** or **Not Running**.<br>• **Mac OSX**: To check if a service is **Loaded**, **Not Loaded**, **Loaded and Running**, **Loaded with Exit Code**, and **Loaded and running or with Exit code**. |

**Related Topics**

Simple Posture Conditions, on page 14
Compound Posture Conditions, on page 15

# Posture Compound Condition Settings

The following table describes the fields in the **Compound Conditions** window. The navigation path for this window is **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Compound Condition**.

***Table 9: Posture Compound Condition Settings***

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the compound condition that you want to create. |
| **Description** | Enter the description of the compound condition that you want to create. |
| **Operating System** | Select one or more Windows operating systems. This allows you to associate Windows operating systems to which the condition is applied. |
| **Parentheses ( )** | Click the parentheses to combine two simple conditions from the following simple condition types: file, registry, application, and service conditions. |
| ( & ): AND operator (use "&" for an AND operator, without the quotes) | You can use the AND operator (ampersand [ & ]) in a compound condition. For example, enter **Condition1 & Condition2**. |
| ( \| ): OR operator (use "\|" for an OR operator, without the quotes) | You can use the OR operator (horizontal bar [ \| ]) in a compound condition. For example, enter **Condition1 & Condition2**. |
| ( ! ): NOT operator (use "!" for a NOT operator, without the quotes) | You can use the NOT operator (exclamation point [ ! ]) in a compound conditions. For example, enter **Condition1 & Condition2**. |
| **Simple Conditions** | Choose from a list of simple conditions of the following types: file, registry, application, and service conditions.<br>You can also create simple conditions of file, registry, application, and service conditions from the object selector.<br>Click the quick picker (down arrow) on the **Action** button to create simple conditions of file, registry, application, and service conditions. |

**Related Topics**

Posture Conditions, on page 14
Create Compound Posture Conditions, on page 16

# AntiVirus Condition Settings

The following table describes the fields in the **Anti-Virus Condition** window. The navigation path for this window is **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Anti-Virus Condition**.

*Table 10: AntiVirus Condition Settings*

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the antivirus condition that you want to create. |
| **Description** | Enter the description of the antivirus condition that you want to create. |
| **Operating System** | Select an operating system to check the installation of an antivirus programs on your client, or check the latest antivirus definition file updates to which the condition is applied. |
| **Vendor** | Choose a vendor from the drop-down list. The selection of Vendor retrieves their antivirus products and versions, which are displayed in the Products for Selected Vendor table. |
| **Check Type** | Choose whether to check an installation or check the latest definition file update on the client. |
| **Installation** | Choose to check only the installation of an antivirus program on the client. |
| **Definition** | Choose to check only the latest definition file update of an antivirus product on the client. |
| **Check against latest AV definition file version, if available** | (Available only when you choose Definition check type) Choose to check the antivirus definition file version on the client against the latest antivirus definition file version, if available as a result of posture updates in Cisco ISE. Otherwise, this option allows you to check the definition file date on the client against the latest definition file date in Cisco ISE. |
| **Allow virus definition file to be (Enabled)** | (Available only when you choose Definition check type) Choose to check the antivirus definition file version and the latest antivirus definition file date on the client. The latest definition file date cannot be older than that you define in the next field (days older than field) from the latest antivirus definition file date of the product or the current system date.<br>If unchecked, Cisco ISE allows you to check only the version of the antivirus definition file using the Check against latest AV definition file version, if available option. |
| **Days Older than** | Define the number of days that the latest antivirus definition file date on the client can be older from the latest antivirus definition file date of the product or the current system date. The default value is zero (0). |

| Field Name | Usage Guidelines |
|---|---|
| **Latest File Date** | Choose to check the antivirus definition file date on the client, which can be older by the number of days that you define in the days older than field.<br>If you set the number of days to the default value (0), then the antivirus definition file date on the client should not be older than the latest antivirus definition file date of the product. |
| **Current System Date** | Choose to check the antivirus definition file date on the client, which can be older by the number of days that you define in the days older than field.<br>If you set the number of days to the default value (0), then the antivirus definition file date on the client should not be older than the current system date. |
| **Products for Selected Vendor** | Choose an antivirus product from the table. Based on the vendor that you select in the New Anti-virus Condition page, the table retrieves information on their antivirus products and their version, remediation support that they provide, latest definition file date and its version.<br>The selection of a product from the table allows you to check for the installation of an antivirus program, or check for the latest antivirus definition file date, and its latest version. |

### Related Topics

Compound Posture Conditions, on page 15
Preconfigured Antivirus and Antispyware Conditions, on page 18
Antivirus and Antispyware Support Chart, on page 18

# Antispyware Compound Condition Settings

The following table describes the fields in the **AS Compound Conditions** window. The navigation path for this window is **Policy** > **Policy Elements** > **Conditions** > **AS Compound Condition**.

***Table 11: Antispyware Compound Condition Settings***

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the antispyware compound condition that you want to create. |
| **Description** | Enter the description of the antispyware compound condition that you want to create. |
| **Operating System** | Selecting an operating system allows you to check the installation of an antispyware program on your client, or check the latest antispyware definition file updates to which the condition is applied. |
| **Vendor** | Choose a vendor from the drop-down list. The selection of Vendor retrieves their antispyware products and versions, which are displayed in the Products for Selected Vendor table. |
| **Check Type** | Choose if you want to choose a type whether to check an installation, or check the latest definition file update on the client. |

| Field Name | Usage Guidelines |
|---|---|
| **Installation** | Choose if you want to check only the installation of an antispyware program on the client. |
| **Definition** | Choose if you want to check only the latest definition file update of an antispyware product on the client. |
| **Allow Virus Definition File to be (Enabled)** | Check this check box when you are creating antispyware definition check types, and disabled when creating antispyware installation check types.<br>If checked, the selection allows you to check antispyware definition file version and the latest antispyware definition file date on the client. The latest definition file date cannot be older than that you define in the days older than field from the current system date.<br>If unchecked, the selection allows you to check only the version of the antispyware definition file as the Allow virus definition file to be check box is not checked. |
| **Days Older than** | Define the number of days that the latest antispyware definition file date on the client can be older from the current system date. The default value is zero (0). |
| **Current System Date** | Choose to check the antispyware definition file date on the client, which can be older by the number of days that you define in the days older than field.<br>If you set the number of days to the default value (0), then the antispyware definition file date on the client should not be older than the current system date. |
| **Products for Selected Vendor** | Choose an antispyware product from the table. Based on the vendor that you select in the New Anti-spyware Compound Condition page, the table retrieves information on their antispyware products and their version, remediation support that they provide, latest definition file date and its version.<br>The selection of a product from the table allows you to check for the installation of an antispyware program, or check for the latest antispyware definition file date, and its latest version. |

### Related Topics

Compound Posture Conditions, on page 15
Preconfigured Antivirus and Antispyware Conditions, on page 18
Antivirus and Antispyware Support Chart, on page 18

# Antimalware Condition Settings

The antimalware condition is a combination of the antispyware and antivirus conditions and is supported by OESIS version 4.x or later compliance module.

The following table describes the fields in the **Antimalware Conditions** window. The navigation path is **Work Centers** > **Posture** > **Posture Elements** > **Conditions** > **Antimalware**. You can also access the option in the **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Antimalware Condition** window.

**Note** It is recommended that you manually update the installed Antimalware products to have the latest definitions at least once. Otherwise, the posture checks using AnyConnect for Antimalware definitions might fail.

*Table 12: Antimalware Condition Settings*

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the antimalware condition. |
| **Description** | Enter a description of the antimalware condition. |
| **Compliance Module** | Support for OESIS version 4.x or later. |
| **Operating System** | Select an operating system to check the installation of antimalware programs on your client, or check the latest antimalware definition file updates to which the condition is applied. It supports both macOS and Windows OS. |
| **Vendor** | Choose a vendor from the drop-down list. The selected vendor's antimalware products, versions, latest definition dates, latest definition versions, and the minimum compliance module versions, are displayed in the **Products for Selected Vendor** table. |
| **Check Type** | Choose whether to check an installation or check the latest definition file update on the client. |
| **Installation** | Choose this option to check if an antimalware program is installed on the client. |
| **Definition** | Choose this option to check the latest definition file update of an antimalware product on the client. |
| **Check Against Latest AV Definition File Version, if Available** | (Available only when you choose Definition check type) Choose to check the antimalware definition file version on the client against the latest antimalware definition file version, if available as a result of posture updates in Cisco ISE. Otherwise, this option allows you to check the definition file date on the client against the latest definition file date in Cisco ISE.<br>This check will only work if there is a value listed in Cisco ISE for the Latest Definition Date or Latest Definition Version field for the selected product. Otherwise, the Current System Date field must be used. |
| **Allow Virus Definition File to be (Enabled)** | (Available only when you choose Definition check type) Choose to check the antimalware definition file version and the latest antimalware definition file date on the client. The latest definition file date cannot be older than that you define in the next field (days older than field) from the latest antimalware definition file date of the product or the current system date.<br>If unchecked, Cisco ISE allows you to check only the version of the antimalware definition file using the Check against latest AV definition file version, if available option. |

| Field Name | Usage Guidelines |
|---|---|
| **Days Older Than** | Define the number of days that the latest antimalware definition file date on the client can be older from the latest antimalware definition file date of the product or the current system date. The default value is zero (0). |
| **Latest File Date** | Choose to check the antimalware definition file date on the client, which can be older by the number of days that you define in the days older than field.<br>If you set the number of days to the default value (0), then the antimalware definition file date on the client should not be older than the latest antimalware definition file date of the product.<br>This check works only if there is a value listed in Cisco ISE for the Latest Definition Date field for the selected product. Otherwise, the Current System Date field must be used. |
| **Current System Date** | Choose to check the antimalware definition file date on the client, which can be older by the number of days that you define in the days older than field.<br>If you set the number of days to the default value (0), then the antimalware definition file date on the client should not be older than the current system date. |
| **Products for Selected Vendor** | Choose an antimalware product from the table. Based on the vendor that you select in the New Antimalware Condition page, the table retrieves information on their antimalware products and their version, remediation support that they provide, latest definition file date and its version.<br>The selection of a product from the table allows you to check for the installation of an antimalware program, or check for the latest antimalware definition file date, and its latest version. |

For an antimalware condition for Carbon Black Cloud 3.x on Mac OS to be successful, the condition must meet the following requirements:

- The compliance module must be greater than 4.3.2741.
- The condition must be associated with the vendor VMware, Inc.

When you upgrade from one Cisco ISE release to another with a preconfigured Carbon Black Cloud 3.x condition, after a posture feed update, two Carbon Black Cloud 3.x conditions are listed in the **Advanced Conditions** area of the **Anti-Malware Condition** windows.

You must delete the Carbon Black Cloud 3.x condition associated with the vendor Carbon Black, Inc. You must reconfigure any existing antimalware conditions that use the Carbon Black Cloud 3.x from Carbon Black, Inc. to use the condition from the vendor VMware, Inc.

### Related Topics

Compound Posture Conditions, on page 15

# Dictionary Simple Condition Settings

The following table describes the fields in the **Dictionary Simple Conditions** window. The navigation path for this window is **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Dictionary Simple Condition**.

*Table 13: Dictionary Simple Condition Settings*

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the dictionary simple condition that you want to create. |
| **Description** | Enter the description of the dictionary simple condition that you want to create. |
| **Attribute** | Choose an attribute from the dictionary. |
| **Operator** | Choose an operator to associate a value to the attribute that you have selected. |
| **Value** | Enter a value that you want to associate to the dictionary attribute, or choose a predefined value from the drop-down list. |

### Related Topics

Simple Posture Conditions, on page 14
Create Simple Posture Conditions, on page 15

# Dictionary Compound Condition Settings

The following table describes the fields in the **Dictionary Compound Conditions** window. The navigation path for this window is **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Dictionary Compound Condition**.

*Table 14: Dictionary Compound Condition Settings*

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the dictionary compound condition that you want to create. |
| **Description** | Enter the description of the dictionary compound condition that you want to create. |
| **Select Existing Condition from Library** | Define an expression by selecting pre-defined conditions from the policy elements library or add ad-hoc attribute/value pairs to your expression in the subsequent steps. |
| **Condition Name** | Choose dictionary simple conditions that you have already created from the policy elements library. |
| **Expression** | The Expression is updated based on your selection from the Condition Name drop-down list. |

| Field Name | Usage Guidelines |
|---|---|
| **AND or OR operator** | Choose an AND, or an OR operator to logically combine dictionary simple conditions, which can be added from the library.<br>Click the **Action** icon to do the following:<br>• Add Attribute/Value<br>• Add Condition from Library<br>• Delete<br>Cisco ISE will process each OR condition in a compound condition sequentially. For example, if a compound condition checks for A OR B, Cisco ISE first checks A and then B. If either condition A or B is passed, the overall result is marked as passed.<br>If condition A fails and condition B succeeds, then the overall result is marked as passed. In this case, condition A is marked as failed and condition B as passed in the posture reports.<br>If condition A succeeds, Cisco ISE skips condition B and marks the overall result as passed. In the posture reports, condition A is marked as passed, condition B as skipped, and the overall result as passed. |
| **Create New Condition (Advance Option)** | Select attributes from various system or user-defined dictionaries.<br>You can also add predefined conditions from the policy elements library in the subsequent steps. |
| **Condition Name** | Choose a dictionary simple condition that you have already created. |
| **Expression** | From the Expression drop-down list, you can create a dictionary simple condition. |
| **Operator** | Choose an operator to associate a value to an attribute. |
| **Value** | Enter a value that you want to associate to the dictionary attribute, or choose a value from the drop-down list. |

### Related Topics

Compound Posture Conditions, on page 15
Create Compound Posture Conditions, on page 16

# Patch Management Condition Settings

The following table describes the fields in the **Patch Management Conditions** window. The navigation path isTo view this window, click the **Menu** icon (☰) and choose **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Patch Management Condition**.

***Table 15: Patch Management Condition***

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the patch management condition. |

| Field Name | Usage Guidelines |
|---|---|
| **Description** | Enter a description for the patch management condition. |
| **Operating System** | Choose an operating system to check the installation of a patch management software on the endpoint, or check the latest patch management definition file updates to which the condition is applied. You can select the Windows OS or macOS. You can also select more than one version of an operating system to create the patch management condition. |
| **Vendor Name** | Choose a vendor from the **Vendor Name** drop-down list. Based on your selection, the patch management products and their supported versions, check type, and minimum compliant module support details are displayed in the **Products for Selected Vendor** table. The list in the table changes according to the selected operating system. |
| **Check Type** | Choose one of the following options:<br>• **Installation**: To check if the selected product is installed on the endpoint. This check type is supported by all vendors.<br>**Note** For the Cisco Temporal Agent, you can only view the Patch Management conditions containing the **Installation** check type in the **Requirements** window.<br>• **Enabled**: To check if the selected product is enabled on the endpoint. Verify if the vendor's product supports the chosen check type by referring to the **Products for Selected Vendor** list.<br>• **Up to Date**: To check if the selected product does not have missing patches. Verify if the vendor's product supports the chosen check type by referring to the **Products for Selected Vendor** list.<br>Click the **Products for Selected Vendor** drop-down list to view the list of products that the vendor you have specified in the **Vendor Name** field supports. For example, if you have selected Vendor A that has two products, namely Product 1 and Product 2. Product 1 may support the **Enabled** option, whereas Product 2 might not. Or, if Product 1 does not support any of the check types, it is grayed out.<br>**Note** (Applicable for Cisco ISE 2.3 and above, and AnyConnect 4.5 and above) If you select the **Up to Date** Check Type in the Patch Management condition with SCCM, then Cisco ISE:<br>1. Uses the Microsoft API to check the current security patch for the specified severity level.<br>2. Triggers the Patch Management remediation for that missing security patch. |

| Field Name | Usage Guidelines |
|---|---|
| **Check Patches Installed** | (Available only when you select the **Up To Date** check type) You can configure severity levels for missing patches, which are then deployed based on the severity. Choose one of the following options:<br>• **Critical Only**: To check if critical software patches are installed on the endpoints in your deployment.<br>• **Important and Critical**: To check if important and critical software patches are installed on the endpoints in your deployment.<br>• **Moderate, Important, and Critical**: To check if moderate, important, and critical software patches are installed on the endpoints in your deployment.<br>• **Low To Critical**: To check if low, moderate, important, and critical software patches are installed on the endpoints in your deployment.<br>• **All**: To install the missing patches for all severity levels. |

### Related Topics

Create Patch Management Conditions, on page 20

# Disk Encryption Condition Settings

The following table describes the fields in the **Disk Encryption Condition** window. The navigation path is **Policy** > **Policy Elements** > **Conditions** > **Posture** > **Disk Encryption Condition**.

*Table 16: Disk Encryption Condition Settings*

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the disk encryption condition that you want to create. |
| **Description** | Enter a description for the disk encryption condition. |
| **Operating System** | Select an operating system of the end point, whose disk is to be checked for encryption. You can select the Windows OS or macOS. You can also select more than one version of an operating system to create the disk encryption condition. |
| **Vendor Name** | Choose a vendor name from the drop-down list. The data encryption products of a vendor, and their supported version, the encryption state check, and the minimum compliant module support are retrieved and displayed in the **Products for Selected Vendor** table. The list in the table changes according to the selected operating system. |

| Field Name | Usage Guidelines |
|---|---|
| **Location** | Enabled only when an option is checked in the **Products for Selected Vendor** section. Select any one of the following options:<br>• **Specific Location**: To check if the specified disk drive is encrypted in the end point, (for example, C: for Windows OS) or a specified volume label is encrypted, (for example, Mackintosh HD for macOS).<br>• **System Location**: To check if the default Windows OS system drive or macOS hard drive is encrypted in the end point.<br>• **All Internal Drives**: To check the internal drives. Includes all hard disks that are mounted and encrypted, and all internal partitions. Excludes read only drives, system recovery disk/partition, boot partition, network partitions, and the different physical disk drives that are external to the endpoint (including but not limited to disk drives connected via USB and Thunderbolt). Encryption software products that are validated include:<br>• Bit-locker-6.*x*/10.*x*<br>• Checkpoint 80.*x* on Windows 7 |
| **Encryption State** | The Encryption State checkbox is disabled when the selected product does not support encryption state check. The repeater is displayed only when the checkbox is checked. You can select the Fully Encrypted option to check if the client's disk drive is wholly encrypted.<br>If you create a condition, for example for TrendMicro, and select two vendors—one with the Encryption State "Yes" and another with the Encryption State "No", then the Encryption State will be disabled because one of the Vendor Encryption States is "No".<br>**Note** You can click the repeater to add more Locations and the relationship between each location is the logical AND operator. |

### Related Topics

Create Disk Encryption Conditions, on page 21

# USB Condition Settings

The following table describes the fields in the **USB Condition** window. The navigation path is **Work Centers** > **Posture** > **Policy Elements** > **USB**. You can also navigate to the **Policy** > **Policy Elements** > **Conditions** > **Posture** > **USB Condition** window.

The USB check is a predefined condition and supports only Windows OS.

***Table 17: USB Condition Settings***

| Field Name | Usage Guidelines |
|---|---|
| **Name** | USB_Check |
| **Description** | Cisco predefined check |

| Field Name | Usage Guidelines |
|---|---|
| **Operating System** | Windows |
| **Compliance Module** | A display-only field for ISE posture compliance module support for version 4.x (and later). |

**Related Topics**

Simple Posture Conditions, on page 14

# Hardware Attributes Condition Settings

Choose **Policy** > **Policy Elements** > **Hardware Attributes Condition** to access the **Hardware Attributes Condition** window. The following table describes the fields in the **Hardware Attributes Condition** window.

| Field Name | Usage Guidelines |
|---|---|
| **Name** | Hardware_Attributes_Check: The default name assigned to the condition. |
| **Description** | Cisco predefined check that collects hardware attributes from clients. |
| **Operating System** | Windows All or Mac OS |
| **Compliance Module** | 4.x or later |

# Posture External DataSource Condition

You can configure conditions to match an endpoints UDID with an external datasource. Currently, only Active Directory is supported. The scripts required on the posture agent to send UDID to Active Directory are not included with ISE.

# Configure Posture Policies

A posture policy is a collection of posture requirements that are associated with one or more identity groups and operating systems. The Dictionary Attributes are optional conditions that can be used along with the identity groups and the operating systems to define different policies for the devices.

Cisco ISE provides an option to configure the grace time for the devices that are noncompliant. If a device is found to be noncompliant, Cisco ISE looks for the previously known good state in the posture assessment result cache and provides grace time for the device accordingly. The device is granted access to the network during the grace period. You can configure the grace time period in minutes, hours, or days (up to a maximum of 30 days).

See the section "Posture Policy" in ISE Posture Prescriptive Deployment Guide for more information.

**Note** Profiler policy evaluation will not work if both 'Endpoint policies' and 'Logical Profiles' are configured under Other Conditions in **Policy** > **Posture**.

### Before you begin

- You must understand the Acceptable Use Policy (AUP).
- You must understand periodic reassessments (PRA).
- You must use AnyConnect agent 4.7 or higher to see compliance-related notifications. For more information about configuring the AnyConnect agent, see Create AnyConnect Configuration, on page 86.

**Step 1** Choose **Policy** > **Posture** or **Work Centers** > **Posture** > **Posture Policy**.

**Step 2** Use the drop-down arrow to add a new policy.

**Step 3** To edit the profile, either double-click a policy or click Edit at the end of the row.

**Step 4** From the **Rule Status** drop-down list, choose **Enabled** or **Disabled**.

**Step 5** Choose the drop-down under **Policy Options**, and specify the **Grace Period Settings** in minutes, hours, or days.

The valid values are:

- 1 to 30 days
- 1 to 720 hours
- 1 to 43,200 minutes

By default, this setting is disabled.

**Note** Even if the posture assessment result is noncompliant, if the device is found to be previously compliant and the cache is not yet expired, the device is granted access for the amount of time specified in the **Grace Period Settings**.

**Step 6** (Optional) Drag the slider named **Delayed Notification** to delay the grace period prompt from being displayed to the user until a specific percentage of grace period has elapsed. For example, if the notification delay period is set to 50% and the configured grace period is 10 minutes, Cisco ISE checks the posture status after 5 minutes and displays the grace period notification if the endpoint is found to be noncompliant. Grace period notification is not displayed if the endpoint status is compliant. If the notification delay period is set to 0%, the user is prompted immediately at the beginning of the grace period to remediate the problem. However, the endpoint is granted access until the grace period expires. The default value for this field is 0%. The valid range is from 0 to 95%.

**Step 7** In the **Rule Name** field, enter the name of the policy.

**Note** It is a best practice to configure a posture policy with each requirement as a separate rule in order to avoid unexpected results.

**Step 8** From the **Identity Groups** column, select the desired identity group.

You can create posture policies based on user or end-point identity groups.

**Step 9** From the **Operating Systems** column, select the operating system.

**Step 10** From the **Compliance Module** column, select the required compliance module:

- **4.x or Later**: Supports antimalware, disk encryption, patch management, and USB conditions.
- **3.x or Earlier**: Supports antivirus, antispyware, disk encryption, and patch management conditions
- **Any Version**—: upports file, service, registry, application, and compound conditions.

**Step 11** From the **Posture Type** column, select the Posture Type.

- **AnyConnect**—Deploys the AnyConnect agent to monitor and enforce Cisco ISE policies that require client interaction.
- **AnyConnect Stealth**—Deploys the AnyConnect agent to monitor and enforce Cisco ISE posture policies without any client interaction.
- **Temporal Agent**—A temporary executable file that is run on the client to check the compliance status.

**Step 12** In **Other Conditions**, you can add one or more dictionary attributes and save them as simple or compound conditions to a dictionary.

**Note** The dictionary simple conditions and compound conditions that you create in the **Posture Policy** window are not displayed while configuring an authorization policy.

**Step 13** Specify the requirements in the **Requirements** field.

**Step 14** Click **Save**.

# Configure AnyConnect Workflow

To configure the AnyConnect agent, perform the following steps in Cisco ISE:

### Before you begin

In the following Cisco ISE releases, the bug CSCvs39880 results in garbage collection processes that impacted memory space and file replication from a primary PSN to secondary PSNs. Because of this bug, in the following Cisco ISE releases, uploading an agent package in a large Cisco ISE deployment can take about 7 hours and about 40 minutes in a small deployment.

The following are the affected Cisco ISE releases:

2.7 Patch 7 and earlier

In the later Cisco ISE releases, this bug has been fixed resulting in an agent package upload time of about 5 minutes.

**Step 1** Create an AnyConnect agent profile.

**Step 2** Create an AnyConnect configuration for AnyConnect packages.

**Step 3** Create a client provisioning policy.

**Step 4** (Optional) Create custom posture condition.

**Step 5** (Optional) Create custom remediation action.

**Step 6** (Optional) Create custom posture requirements.

**Step 7** Create a posture policy.

**Step 8** Configure the client provisioning policy.

**Step 9** Create an authorization profile.

**Step 10** Configure the authorization policies.

**Step 11** Download and launch AnyConnect.

a) Connect to the SSID.
b) Launch a Browser and you will be redirected to the Client Provisioning Portal.
c) Click **Start**. This checks if the AnyConnect agent is installed and running.
d) Click **This Is My First Time Here**.
e) Choose **Click Here to Download and Launch AnyConnect**.
f) Save the Cisco Anyconnect .exe or .dmg file for Windows or macOS respectively. For Windows, run the .exe file and for macOS, double-click the .dmg file and run the app.

**Note** Cisco ISE does not support ARM64 version of AnyConnect for AnyConnect posture flow. Ensure that you do not use the ARM64 version of AnyConnect in the client provisioning policy, otherwise it might cause failure on the client side. Restart the client if AnyConnect is not working properly because of this issue.

# Prerequisite for Certificate-Based Conditions

Client Provisioning and Posture Policy rules may include conditions based on certificate attributes. A prerequisite for certificate-based conditions in either the Client Provisioning or Posture Policy is to ensure that there is s a matching Authorization Policy rule based on the same certificate attribute.

For example, you should use the same attribute as shown in the figures, the Issuer – Common Name attribute is used in both Client Provisioning or posture and authorization policies.

***Figure 1: Cisco Provisioning Policy***

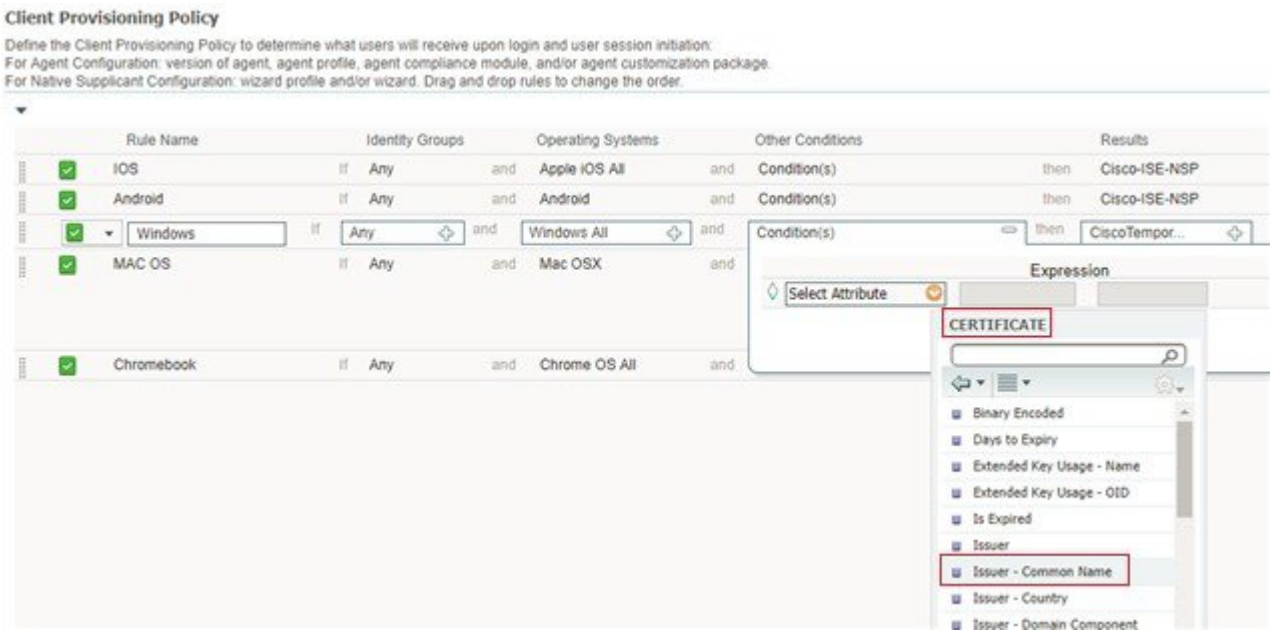
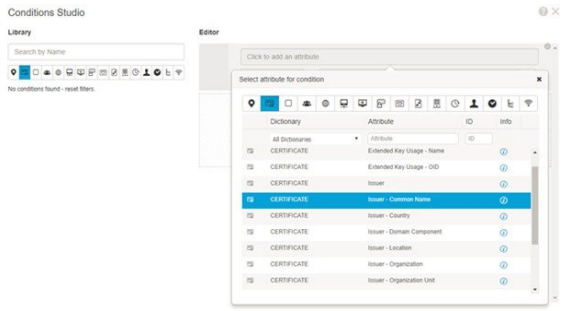


*Figure 2: Conditions Studio*




**Note** ISE server certificate must be trusted in the System Certificate store for AnyConnect 4.6 MR2 and above. Any posture check or remediation that requires elevated privileges will not work if the server is untrusted.

- Windows OS: The server certificate must be added to the System Certificate store.
- MAC OS: The server certificate must be added to the System Keychain. It is recommended that you use the command-line utility to trust the certificate. Adding the certificate to the System Keychain using the Keychain Access app might not work if it is already present in the Login Keychain.

# Default Posture Policies

| Rule Name | Description | Requirements |
|---|---|---|
| Default_Antimalware_Policy_Mac | Checks if endpoints have any of the supported vendor's antimalware software (that is recognized by AnyConnect) installed and running in their devices. | Any_AM_Installation |
| Default_Antimalware_Policy_Win | Checks if endpoints have any of the supported vendor's antimalware software (that is recognized by AnyConnect) installed and running in their devices. | Any_AM_Installation_Win |
| Default_AppVis_Policy_Mac | Gathers information and reports all the applications that are installed on a given endpoint. | Default_AppVis_Requirement_Mac |
| Default_AppVis_Policy_Win | Gathers information and reports all the applications that are installed on a given endpoint. | Default_AppVis_Requirement_Win |

| Rule Name | Description | Requirements |
|---|---|---|
| Default_Firewall_Policy_Mac | Checks if endpoints have any of the supported vendor's Firewall program (that is recognized by AnyConnect) installed. | Default_Firewall_Requirement_Mac |
| Default_Firewall_Policy_Win | Checks if endpoints have any of the supported vendor's Firewall program (that is recognized by AnyConnect) installed. | Default_Firewall_Requirement_Win |
| Default_USB_Block_Win | Ensures that the endpoint device does not have any USB storage devices connected. | USB_Block |

# Client Posture Assessment

To ensure that the imposed network security measures remain relevant and effective, Cisco ISE enables you to validate and maintain security capabilities on any client machine that accesses the protected network. By employing posture policies that are designed to ensure that up-to-date security settings or applications are available on client machines, the Cisco ISE administrator can ensure that any client machine that accesses the network meets, and continues to meet, the defined security standards for enterprise network access. Posture compliance reports provide Cisco ISE with a snapshot of the compliance level of the client machine at the time of user login, as well as any time a periodic reassessment occurs.

Posture assessment and compliance occurs using one of the following agent types available in Cisco ISE:

- AnyConnect ISE Agent: A persistent agent that can be installed on Windows or Mac OS X client to perform posture compliance functions.
- Cisco Temporal Agent: A temporary executable file that is run on the client to check the compliance status. The agent is removed from the client machine after the login session is terminated. By default, the agent resides in the Cisco ISE ISO image, and is uploaded to Cisco ISE during installation.

# Posture Assessment Options

The following table provides a list of posture assessment (posture conditions) options that are supported by the Cisco ISE Posture Agents for Windows and MacOS, and the Web Agent for Windows.

***Table 18: Posture Assessment Options***

| ISE Posture Agent for Windows | Cisco Temporal Agent for Windows | ISE Posture Agent for MacOS | Cisco Temporal Agent for MacOS |
|---|---|---|---|
| Operating System/Service Packs/Hotfixes | — | — | — |

| ISE Posture Agent for Windows | Cisco Temporal Agent for Windows | ISE Posture Agent for MacOS | Cisco Temporal Agent for MacOS |
|---|---|---|---|
| Service Check | Service Check (Temporal agent 4.5) | Service Check | Daemon checks are not supported |
| Registry Check | Registry Check (Temporal agent 4.5) | — | — |
| File Check | File Check (Temporal agent 4.5) | File Check | File Check (Temporal agent 4.5) |
| Application Check | Application Check (Temporal agent 4.5) | Application Check | Application Check (Temporal agent 4.5) |
| Antivirus Installation | Antimalware Installation | Antivirus Installation | Antimalware Installation |
| Antivirus Version/ Antivirus Definition Date | OPSWAT version 4 is used, hence no Antivirus/Antispyware support; only Antimalware is supported | Antivirus Version/ Antivirus Definition Date | OPSWAT version 4 is used, hence no Antivirus/Antispyware support; only Antimalware is supported |
| Antispyware Installation | OPSWAT version 4 is used, hence no Antivirus/Antispyware support; only Antimalware is supported | Antispyware Installation | OPSWAT version 4 is used, hence no Antivirus/Antispyware support; only Antimalware is supported |
| Antispyware Version/ Antispyware Definition Date | OPSWAT version 4 is used, hence no Antivirus/Antispyware support; only Antimalware is supported | Antispyware Version/ Antispyware Definition Date | OPSWAT version 4 is used, hence no Antivirus/Antispyware support; only Antimalware is supported |
| Patch Management Check | Only Patch Management installation check | Patch Management Check | — |
| Windows Update Running | — | — | — |
| Windows Update Configuration | — | — | — |
| WSUS Compliance Settings | — | — | — |

# Posture Remediation Options

The following table provides a list of posture remediation options that are supported by the Cisco ISE Posture Agents for Windows and MacOS, and the Web Agent for Windows.

*Table 19: Posture Remediation Options*

| ISE Posture Agent for Windows | ISE Posture Agent for MacOS |
|---|---|
| Message Text (Local Check) | Message Text (Local Check) |
| URL Link (Link Distribution) | URL Link (Link Distribution) |
| File Distribution | — |
| Launch Program | — |
| Antivirus Definition Update | Antivirus Live Update |
| Antispyware Definition Update | Antispyware Live Update |
| Patch Management Remediation | — |
| Windows Update | — |
| WSUS | — |

**ISE Community Resource**

Cisco ISE and SCCM Integration Workflow

# Custom Conditions for Posture

A posture condition can be any one of the following simple conditions: a file, a registry, an application, a service, or a dictionary condition. One or more conditions from these simple conditions form a compound condition, which can be associated with a posture requirement.

After an initial posture update, Cisco ISE also creates Cisco-defined simple and compound conditions. Cisco-defined simple conditions use the pc_ as and compound conditions use pr_ as.

A user-defined condition or a Cisco-defined condition includes both simple and compound conditions.

Posture service makes use of internal checks based on antivirus and antispyware (AV/AS) compound conditions. Hence, posture reports do not reflect the exact AV/AS compound-condition names that you have created. The reports display only the internal check names of AV/AS compound conditions.

For example, if you have created an AV compound condition named "MyCondition_AV_Check" to check any Vendor and any Product, the posture reports will display the internal check, that is “av_def_ANY”, as the condition name, instead of "MyCondition_AV_Check".

# Posture Endpoint Custom Attributes

You can use the posture endpoint custom attributes to create client provisioning and posture policies. You can create a maximum of 100 endpoint custom attributes. The following types of endpoint custom attributes are supported: Int, String, Long, Boolean, Float, IP, and Date.

Endpoint custom attributes can be used to allow or block devices based on certain attributes or to assign certain privileges based on the posture or client provisioning policies.

# Create Posture Policy Using Endpoint Custom Attributes

To create a posture policy using endpoint custom attributes:

**Step 1** Create the endpoint custom attributes.

a) Choose **Administration** > **Identity Management** > **Settings** > **Endpoint Custom Attributes**.

b) Enter the **Attribute Name** (for example, deviceType) and Data Type (for example, String) in the **Endpoint Custom Attributes** area.

c) Click **Save**.

**Step 2** Assign values to the custom attributes.

a) Choose **Context Visibility** > **Endpoints**.

b) Assign the custom attribute values.

- Check the required MAC address check box, and then click **Edit**.
- Or, click the required MAC address, and then click **Edit** in the **Endpoints** page.

c) Ensure that the custom attribute that you created is displayed in the **Custom Attributes** area in the **Edit Endpoint** dialog box.

d) Click **Edit** and enter the required attribute value (for example, deviceType = Apple-iPhone).

e) Click **Save**.

**Step 3** Create a posture policy using the custom attributes and values.

a) Choose **Work Centers** > **Posture** > **Posture Policy**.

b) Create the required policy. Choose the custom attributes by clicking **Other Conditions** and select the required dictionary (for example, choose Endpoints > deviceType, the custom attribute that you created in Step 1). For more information, see the Configure Cisco Temporal Agent Workflow, on page 63.

c) Click **Save**.

To create a client provisioning policy using endpoint custom attributes:

1. Choose **Work Centers** > **Posture** > **Client Provisioning** > **Client Provisioning Policy**.
2. Create the required policy.
   - Create the required rule (for example, Rule Name=WindowsAll, if Identity Groups=Any and Operating Systems=Windows All and Other Conditions=Conditions, then Results=AC_Win_44117).

- Choose the custom attributes by clicking **Other Conditions** and selecting the required dictionary.

# Custom Posture Remediation Actions

A custom posture remediation action is a file, a link, an antivirus or antispyware definition updates, launching programs, Windows updates, or Windows Server Update Services (WSUS) remediation types.

## Add an Antispyware Remediation

You can create an antispyware remediation, which updates clients with up-to-date file definitions for compliance after remediation.

The AS Remediations window displays all the antivirus remediations along with their name and description and their modes of remediation.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Posture**.
**Step 2** Click **Remediation Actions**.
**Step 3** Click **AS Remediation**.
**Step 4** Click **Add**.
**Step 5** Modify the values in the **New AS Remediations** window.
**Step 6** Click **Submit**.

## Add an Antivirus Remediation

You can create an antivirus remediation, which updates clients with up-to-date file definitions for compliance after remediation.

The AV Remediations window displays all the antivirus remediations along with their name and description and their modes of remediation.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Posture**.
**Step 2** Click **Remediation Actions**.
**Step 3** Click **AV Remediation**.
**Step 4** Click **Add**.
**Step 5** Modify the values in the **New AV Remediation** window.
**Step 6** Click **Submit**.

# Add a File Remediation

A file remediation allows clients to download the required file version for compliance. The client agent remediates an endpoint with a file that is required by the client for compliance.

You can filter, view, add, or delete file remediations in the File Remediations window, but you cannot edit file remediations. The File Remediations window displays all the file remediations along with their name and description and the files that are required for remediation.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Posture** .
**Step 2** Click **Remediation Actions**.
**Step 3** Click **File Remediation**.
**Step 4** Click **Add**.
**Step 5** Enter the name and description of the file remediation in the **Name** and **Description** fields.
**Step 6** Modify the values in the **New File Remediation** window.
**Step 7** Click **Submit**.

# Add a Launch Program Remediation

You can create a launch program remediation, where the client agent remediates clients by launching one or more applications for compliance.

The Launch Program Remediations page displays all the launch program remediations along with their name and description and their modes of remediation.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Posture**.
**Step 2** Click **Remediation Actions**.
**Step 3** Click **Launch Program Remediation**.
**Step 4** Click **Add**.
**Step 5** Modify the values in the **New Launch Program Remediation** page.
**Step 6** Click **Submit**.

## Troubleshoot Launch Program Remediation

### Problem

When an application is launched as a remediation using Launch Program Remediation, the application is successfully launched (observed in the Windows Task Manager), however, the application UI is not visible.

### Solution

The Launch program UI application runs with system privileges, and is visible in the Interactive Service Detection (ISD) window. To view the Launch program UI application, ISD should be enabled for the following OS:

- Windows Vista: ISD is in stop state by default. Enable ISD by starting ISD service in services.msc.
- Windows 7: ISD service is enabled by default.
- Windows 8/8.1: Enable ISD by changing "NoInteractiveServices" from 1 to 0 in the registry: \HKEY_LOCAL_MACHINE \ SYSTEM \ CurrentControlSet \ Control \ Windows.

# Add a Link Remediation

A link remediation allows clients to click a URL to access a remediation window or resource. The client agent opens a browser with the link and allow the clients to remediate themselves for compliance.

The Link Remediation window displays all the link remediations along with their name and description and their modes of remediation.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Posture**.
**Step 2** Click **Remediation Actions.**
**Step 3** Click **Link Remediation**.
**Step 4** Click **Add**.
**Step 5** Modify the values in the **New Link Remediation** window.
**Step 6** Click **Submit**.

# Add a Patch Management Remediation

You can create a patch management remediation, which updates clients with up-to-date file definitions for compliance after remediation.

The Patch Management Remediation window displays the remediation type, patch management vendor names, and various remediation options.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Posture**.
**Step 2** Click **Remediation Actions**.
**Step 3** Click **Patch Mangement Remediation**.
**Step 4** Click **Add**.
**Step 5** Modify the values in the **Patch Management Remediation** window.
**Step 6** Click **Submit** to add the remediation action to the **Patch Management Remediations** window.

# Add a Windows Server Update Services Remediation

You can configure Windows clients to receive the latest WSUS updates from a locally administered or a Microsoft-managed WSUS server for compliance. A Windows Server Update Services (WSUS) remediation installs latest Windows service packs, hotfixes, and patches from a locally managed WSUS server or a Microsoft-managed WSUS server.

You can create a WSUS remediation where the client agent integrates with the local WSUS Agent to check whether the endpoint is up-to-date for WSUS updates.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Posture**.
**Step 2** Click **Remediation Actions**.
**Step 3** Click **Windows Server Update Services Remediation**.
**Step 4** Click **Add**.
**Step 5** Modify the values in the **New Windows Server Update Services Remediation** window.
**Step 6** Click **Submit**.

## Add a Windows Update Remediation

The Windows Update Remediations page displays all the Windows update remediations along with their name and description and their modes of remediation.

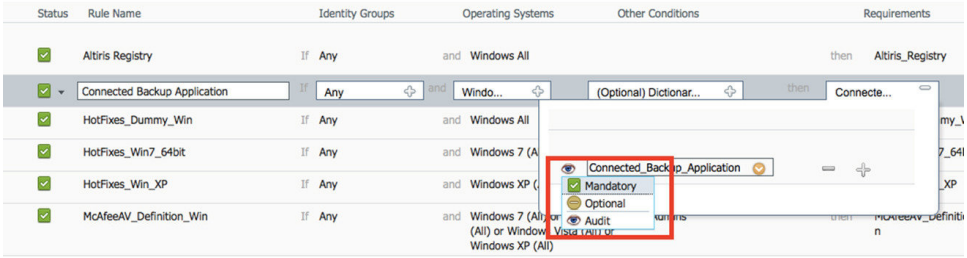
**Step 1** Choose **Policy** > **Policy Elements** > **Results** > > **Posture.**
**Step 2** Click **Remediation Actions.**
**Step 3** Click **Windows Update Remediation**.
**Step 4** Click **Add**.
**Step 5** Modify the values in the **New Windows Update Remediation** window.
**Step 6** Click **Submit**.

# Posture Assessment Requirements

A posture requirement is a set of compound conditions with an associated remediation action that can be linked with a role and an operating system. All the clients connecting to your network must meet mandatory requirements during posture evaluation to become compliant on the network.

Posture-policy requirements can be set to mandatory, optional, or audit types in posture policies. If requirements are optional and clients fail these requirements, then the clients have an option to continue during posture evaluation of endpoints.

***Figure 3: Posture Policy Requirement Types***



### Mandatory Requirements

During policy evaluation, the agent provides remediation options to clients who fail to meet the mandatory requirements defined in the posture policy. End users must remediate to meet the requirements within the time specified in the remediation timer settings.

For example, you have specified a mandatory requirement with a user-defined condition to check the existence of C:\temp\text.file in the absolute path. If the file does not exist, the mandatory requirement fails and the user will be moved to Non-Compliant state.

### Optional Requirements

During policy evaluation, the agent provides an option to clients to continue, when they fail to meet the optional requirements specified in the posture policy. End users are allowed to skip the specified optional requirements.

For example, you have specified an optional requirement with a user-defined condition to check for an application running on the client machine, such as Calc.exe. Although, the client fails to meet the condition, the agent prompts an option to continue further so that the optional requirement is skipped and the end user is moved to Compliant state.

### Audit Requirements

Audit requirements are specified for internal purposes and the agent does not prompt any message or input from end users, regardless of the pass or fail status during policy evaluation.

For example, you are in the process of creating a mandatory policy condition to check if end users have the latest version of the antivirus program. If you want to find out the non-compliant end users before actually enforcing it as a policy condition, you can specify it as an audit requirement.

### Visibility Requirements

During policy evaluation, the agent reports compliance data for visibility requirements, every five to ten minutes.

# Client System Stuck in Noncompliant State

If a client machine is unable to remediate a mandatory requirement, the posture status changes to “noncompliant” and the agent session is quarantined. To get the client machine past this “noncompliant” state, you need to restart the posture session so that the agent starts posture assessment on the client machine again. You can restart the posture session as follows:

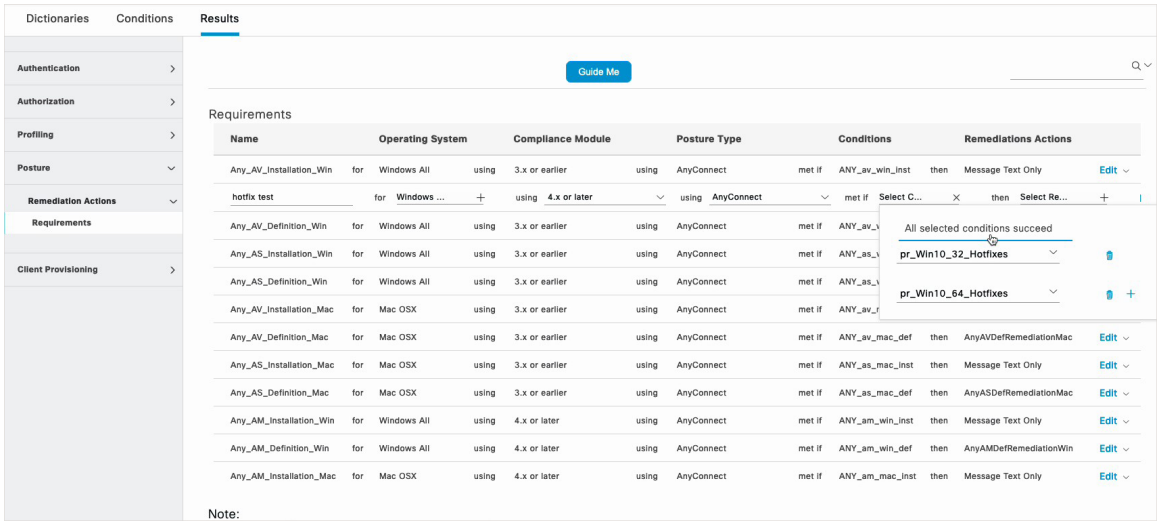
- In wired and wireless Change of Authorization (CoA) in an 802.1X environment:
  - You can configure the Reauthentication timer for a specific authorization policy when you create a new authorization profile in the New Authorization Profiles window.
  - Wired users can get out of the quarantine state once they disconnect and reconnect to the network. In a wireless environment, the user must disconnect from the wireless lan controller (WLC) and wait until the user idle timeout period has expired before attempting to reconnect to the network.
- In a VPN environment—Disconnect and reconnect the VPN tunnel.

# Create Client Posture Requirements

You can create a requirement in the Requirements window where you can associate user-defined conditions and Cisco defined conditions, and remediation actions. Once created and saved in the Requirements window, user-defined conditions and remediation actions can be viewed from their respective list windows.

**Note** To create a Posture Requirement to validate all Windows 10 hotfixes in the environment, you must configure the Conditions area of your Requirement to include both pr_Win10_32_Hotfixes and pr_Win10_64_Hotfixes. At the top of the conditions, ensure **All selected conditions succeed** is selected. If the configuration is successful, **pr_Win10_32_Hotfixes & pr_Win10_64_Hotfixes** will be displayed. To view the details of the validated conditions for an endpoint, from the main menu, choose **Operations** > **Reports** > **Reports** > **Endpoints and Users** > **Posture Assessment by Endpoints**. Click the endpoint to view the corresponding posture details.

***Figure 4: Validating Posture Requirements in Windows 10***




### Before you begin

- You must have an understanding of acceptable use policies (AUPs) for a posture.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Posture** > **Requirements**.

**Step 2** Enter the values in the **Requirements** window.

**Step 3** Click **Done** to save the posture requirement in read-only mode.

**Step 4** Click **Save**.

# Posture Reassessment Configuration Settings

*Table 20: Posture Reassessment Configuration Settings*

| Field Name | Usage Guidelines |
|---|---|
| **Configuration Name** | Enter the name of PRA configuration. |
| **Configuration Description** | Enter a description for PRA configuration. |
| **Use Reassessment Enforcement?** | Check the check box to apply the PRA configurations for the user identity groups. |
| **Enforcement Type** | Choose the action to be enforced:<br>• **Continue**: The user continues to have the privileged access without any user intervention to remediate the client irrespective of the posture requirement.<br>• **Logoff**: If the client is not compliant, the user is forced to logoff from the network. When the client logs in again, the compliance status is unknown.<br>• **Remediate**: If the client is not compliant, the agent waits for a specified time for the remediation to happen. Once the client has remediated, the agent sends the PRA report to the policy service node. If the remediation is ignored on the client, then the agent sends a logoff request to the policy service node to force the client to logoff from the network.<br>If the posture requirement is set to mandatory, then the RADIUS session will be cleared as a result of the PRA failure action and a new RADIUS session has to start for the client to be postured again.<br>If the posture requirement is set to optional, then the agent on the client allows the user to click the continue option from the agent. The user can continue to stay in the current network without any restriction. |
| **Interval** | Enter a time interval in minutes to initiate PRA on the clients after the first successful login.<br>The default value is 240 minutes. Minimum value is 60 minutes and maximum is 1440 minutes. |
| **Grace time** | Enter a time interval in minutes to allow the client to complete remediation. The grace time cannot be zero, and should be greater than the PRA interval. It can range between the default minimum interval (5 minutes) and the minimum PRA interval.<br>The minimum value is 5 minutes and the maximum value is 60 minutes.<br>**Note** The grace time is enabled only when the enforcement type is set to remediate action after the client fails the posture reassessment. |
| **Select User Identity Groups** | Choose a unique group or a unique combination of groups for your PRA configuration. |

| Field Name | Usage Guidelines |
|---|---|
| **PRA configurations** | Displays existing PRA configurations and user identity groups associated to PRA configurations. |

**Related Topics**

Posture Lease, on page 7
Periodic Reassessments, on page 7
Posture Assessment Options, on page 46
Posture Remediation Options, on page 47
Custom Conditions for Posture, on page 48
Custom Posture Remediation Actions, on page 50
Configure Periodic Reassessments, on page 8

# Custom Permissions for Posture

A custom permission is a standard authorization profile that you define in Cisco ISE. Standard authorization profiles set access privileges based on the matching compliance status of the endpoints. The posture service broadly classifies the posture into unknown, compliant, and noncompliant profiles. The posture policies and the posture requirements determine the compliance status of the endpoint.

You must create three different authorization profiles for an unknown, compliant, and noncompliant posture status of endpoints that can have different set of VLANs, DACLs, and other attribute value pairs. These profiles can be associated with three different authorization policies. To differentiate these authorization policies, you can use the Session:PostureStatus attribute along with other conditions.

### Unknown Profile

If no matching posture policy is defined for an endpoint, then the posture compliance status of the endpoint may be set to unknown. A posture compliance status of unknown can also apply to an endpoint where a matching posture policy is enabled but posture assessment has not yet occurred for that endpoint and, therefore no compliance report has been provided by the client agent.

**Note** We recommend you to use posture with redirection for all Cisco network access devices.

### Compliant Profile

If a matching posture policy is defined for an endpoint, then the posture compliance status of the endpoint is set to compliant. When the posture assessment occurs, the endpoint meets all the mandatory requirements that are defined in the matching posture policy. For an endpoint that is postured compliant, it can be granted privileged network access on your network.

### Noncompliant Profile

The posture compliance status of an endpoint is set to noncompliant when a matching posture policy is defined for that endpoint but it fails to meet all the mandatory requirements during posture assessment. An endpoint

that is postured noncompliant matches a posture requirement with a remediation action, and it should be granted limited network access to remediation resources in order to remediate itself.

# Configure Standard Authorization Policies

You can define two types of authorization policies on the Authorization Policy window, standard exceptions authorization policies. The standard authorization policies that are specific to posture are used to make policy decisions based on the compliance status of endpoints.

**Step 1** Choose **Policy** > **Policy Sets**.

**Step 2** In the **View** column, click the arrow icon adjacent the corresponding Default Policy.

**Step 3** In the **Actions** column, click the cog icon, and then from the dropdown list, choose a new authorization policy. A new row appears in the **Policy Sets** table.

**Step 4** Enter a rule name.

**Step 5** From the **Conditions** column, click the (+) symbol.

**Step 6** Create the required conditions on the **Conditions Studio Page**. In the **Editor** section, click the **Click To Add an Attribute** text box, and select the required Dictionary and Attribute.

You can drag and drop a Library condition to the **Click To Add An Attribute** text box.

**Step 7** Click **Use** to create a new standard authorization policy in read-only mode.

**Step 8** Click **Save**.

# Best Practices for Network Drive Mapping with Posture

During posture assessment of a Windows endpoint, the endpoint user may encounter a delay in accessing the desktop. This may be due to Windows trying to restore the file server drive letter mappings before providing the user access to the desktop. The best practices to avoid the delay during posture are:

- Endpoints should be able to reach the Active Directory server because the file server drive letter cannot be mapped without reaching the AD. When posture (with AnyConnect ISE posture agent) triggers, it blocks access to AD, causing delay in login. Use Posture Remediation ACLs to provide access to AD servers before posture is completed.
- You should set a delay for the login script until posture completes and then you have to set the Persistence attribute to NO. Windows tries to reconnect all the network drives during login and this cannot be done until AnyConnect ISE posture agent gains full network access.

# Configure AnyConnect Stealth Mode Workflow

The process of configuring AnyConnect in the stealth mode involves a series of steps. You should perform the following steps in Cisco ISE.

**Step 1** Create an AnyConnect agent profile, see Create an AnyConnect Agent Profile.

**Step 2** Create an AnyConnect configuration for AnyConnect packages, see Create an AnyConnect Configuration for AnyConnect Packages.

**Step 3** Upload a Open DNS Profile in Cisco ISE, see Upload an Open DNS Profile in Cisco ISE.

**Step 4** Create a Client Provisioning Policy, see Create a Client Provisioning Policy.

**Step 5** Create a Posture Condition, see Create a Posture Condition.

**Step 6** Create Posture Remediation, see Create Posture Remediation

**Step 7** Create Posture Requirement in Clientless Mode, see Create Posture Requirement in Stealth Mode.

**Step 8** Create Posture Policy, see Create Posture Policy.

**Step 9** Configure authorization profile.

a) Choose **Policy** > **Policy Elements** > **Results** > **Authorization** > **Authorization Profiles**.
b) Click **Add** and enter the **Name** of the profile.
c) In Common Tasks, enable **Web Redirection (CWA, MDM, NSP, CPP)** and choose **Client provisioning (Posture)** from the drop-down list, enter the redirect **ACL** name and choose the Client Provisioning Portal **Value**. You can edit or create a new Client Provisioning Portal in **Work Centers** > **Posture** > **Client Provisioning** > **Client Provisioning Portal**.

**Step 10** Configure authorization policies.

a) Choose **Policy** > **Policy Sets**.
b) Click **>** and choose **Authorization Policy** and click on **+** icon to create a new authorization rule that features **Session:Posture Status EQUALS Unknown** condition and the authorization profiled configured previously.
c) Above the previous rule, create a new authorization rule that features **Session:Posture Status EQUALS NonCompliant** condition and another one that features **Session:Posture Status EQUALS Compliant** condition.

# Create an AnyConnect Agent Profile

### Before you begin

You must upload the AnyConnect packages for MAC and Windows OS and the AnyConnect compliance modules.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources** page.

**Step 2** From the **Add** drop-down list, choose **AnyConnect Posture Profile**.

**Step 3** From the **Posture Agent Profile Settings** drop-down list, choose **AnyConnect**.

**Step 4** In the **Name** field, type the required name (for example, AC_Agent_Profile).

**Step 5** In the **Agent Behavior** section, select the **Stealth Mode** parameter as **Enabled**.

**Step 6** Click **Save**.

### What to do next

You should create the AnyConnect configuration for the AnyConnect packages.

# Create an AnyConnect Configuration for AnyConnect Packages

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources** page.
**Step 2** From the **Add** drop-down list, choose **AnyConnect Configuration**.
**Step 3** From the **Select AnyConnect Package** drop-down list, choose the required AnyConnect package.
**Step 4** In the **Configuration Name** text box, type the required Name.
**Step 5** In the **Compliance Module** drop-down list, choose the required compliance module.
**Step 6** In the **AnyConnect Module Selection** section, check the **ISE Posture** and **Network Access Manager** check boxes.
**Step 7** In the **Profile Selection** section, from the **ISE Posture** drop-down list, choose the AnyConnect agent profile.
**Step 8** From the **Network Access Manager** drop-down list, choose the required AnyConnect agent profile.

### What to do next

You should upload the Open DNS profile to be pushed to the client.

# Upload an Open DNS Profile in Cisco ISE

The Open DNS profile is pushed to the client.

**Step 1** Navigate to the **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources** page.
**Step 2** From the **Add** drop-down list, choose **Agent Resources From Local Disk**.
**Step 3** From the **Category** drop-down list, choose **Customer Created Packages**.
**Step 4** From the **Type** drop-down list, choose **AnyConnect Profile** .
**Step 5** In the **Name** text box, type the required name (for example, OpenDNS).
**Step 6** Click **Browse** and locate the JSON file from the local disk.
**Step 7** Click **Submit**.

### What to do next

You should create the client provisioning policy.

# Create a Client Provisioning Policy

**Step 1** Navigate to the **Policy** > **Client Provisioning** page.
**Step 2** Create the required rule (for example, Rule Name=WindowsAll, if Identity Groups=Any and Operating Systems=Windows All and Other Conditions=Conditions, then Results=AC_Win_44117).

### What to do next

You should create the posture condition.

# Create a Posture Condition

**Step 1** Navigate to the **Policy** > **Policy Elements** > **Conditions** > **Posture** > **File Condition**.
**Step 2** Enter the required name (for example, filechk).
**Step 3** From the **Operating Systems** drop-down list, choose Windows 7 (All).
**Step 4** From the **File Type** drop-down list, choose FileExistence.
**Step 5** From the **File Path** drop-down list, choose ABSOLUTE_PATH C:\test.txt.
**Step 6** From the **File Operator** drop-down list, choose DoesNotExist.

### What to do next

You should create the posture remediation.

# Create Posture Remediation

The file condition checks if test.txt file exists on the endpoint. If it does not exist, the remediation is to block the USB port and prevent the installation of the file using a USB device.

**Step 1** Navigate to the **Policy** > **Policy Elements** > **Results** > **Remediation Actions** > **USB Remediations** page.
**Step 2** Enter the required name (for example, clientless_mode_block).
**Step 3** Click **Submit**.

### What to do next

You should create the posture requirement.

# Create Posture Requirement in Stealth Mode

When you create a Remediation action from the Requirements page, only the remediations that are applicable to stealth mode are displayed: Anti-Malware, Launch Program, Patch Management, USB, Windows Server Update Services, and Windows Update.

**Step 1** Navigate to the **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources** page.
**Step 2** Create the required posture requirement (for example, Name=win7Req for Operating Systems=Windows7(All) using Compliance Module=4.x or later using Posture Type=AnyConnect Stealth met if Condition=filechk then Remediation Actions=clientless_mode_block).

### What to do next

You should create the posture policy.

# Create Posture Policy

### Before you begin

Ensure that the posture policy requirement and the policy are created in the clientless mode.

**Step 1** Choose **Policy** > **Posture**.

**Step 2** Create the required rule. For example, if Identity Groups=Any and Operating Systems=Windows 7(All) and Compliance Module=4.x or later and Posture Type=AnyConnect Stealth then Requirements=win7Req.

**Note** For Client Provisioning without URL redirection, configuring the conditions with attributes specific to Network Access or Radius will not work and matching of the client provisioning policy might fail due to the non-availability of session information for the specific user in the Cisco ISE server. However, Cisco ISE allows configuring conditions for the externally added identity groups.

# Enable AnyConnect Stealth Mode Notifications

Cisco ISE provides several new failure notifications for AnyConnect stealth mode deployments. Enabling failure notifications in stealth mode helps you to identify issues with wired, wireless, or VPN connections. To enable notifications in stealth mode:

**Note** AnyConnect version 4.5.0.3040 and higher supports stealth mode notifications.

### Before you begin

Configure AnyConnect in stealth mode.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources**.

**Step 2** Choose **Add** > **AnyConnect ISE Posture Profile**.

**Step 3** From the **Select a Category** drop-down list, choose **AnyConnect** .

**Step 4** From the **Agent Behavior** section, choose **Enabled** for the **Enable notifications in stealth mode** option.

# Configure Cisco Temporal Agent Workflow

The process of configuring the Cisco temporal agent involves a series of steps. You should perform the following steps in Cisco ISE.

**Step 1** Create Posture Condition

**Step 2** Create Posture Requirements

**Step 3** Create the Posture Policy

**Step 4** Configure the Client Provisioning Policy

**Step 5** Configure authorization profile.

a) Choose **Policy** > **Policy Elements** > **Results** > **Authorization** > **Authorization Profiles**.

b) Click **Add** and enter the **Name** of the profile.

c) In Common Tasks, enable **Web Redirection (CWA, MDM, NSP, CPP)** and choose **Client provisioning (Posture)** from the drop-down list, enter the redirect **ACL** name and choose the Client Provisioning Portal **Value**. You can edit or create a new Client Provisioning Portal in **Work Centers** > **Posture** > **Client Provisioning** > **Client Provisioning Portal**.

**Step 6** Configure authorization policies.

a) Choose **Policy** > **Policy Sets**.

b) Click > and choose **Authorization Policy** and click on + icon to create a new authorization rule that features **Session:Posture Status EQUALS Unknown** condition and the authorization profiled configured previously.

c) Above the previous rule, create a new authorization rule that features **Session:Posture Status EQUALS NonCompliant** condition and another one that features **Session:Posture Status EQUALS Compliant** condition.

**Step 7** Download and Launch Cisco Temporal Agent

## Create Posture Condition

**Step 1** Navigate to the **Policy** > **Policy Elements** > **Conditions** > **Posture** > **File Condition**.

**Step 2** Enter the required name (for example, filecondwin).

**Step 3** From the **Operating Systems** drop-down list, choose Windows 7 (All).

**Step 4** From the **File Type** drop-down list, choose FileExistence.

**Step 5** From the **File Path** drop-down list, choose ABSOLUTE_PATH C:\test.txt.

**Step 6** From the **File Operator** drop-down list, choose DoesNotExist.

## Create Posture Requirements

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Posture** > **Requirements**

**Step 2** From the **Edit** drop-down list, choose **Insert New Requirement**.

**Step 3** Enter the **Name**, **Operating Systems**, and **Compliance Module** (for example, Name filereqwin, Operating Systems Windows All, Compliance Module 4.x or later).

**Step 4** In the **Posture Type** drop-down, choose **Temporal Agent**.

**Step 5** Select the required condition (for example, filecondwin).

**Note** For the Cisco Termporal Agent, you can only view Patch Management conditions containing the **Installation** check type in the **Requirements** page.

**Step 6** Select the **Message Text Only** remediation action.

**Note** The temporal agent is supported by AnyConnect 4.x or later.

# Create the Posture Policy

**Step 1** Choose **Policy** > **Posture**.

**Step 2** Create the required rule (for example, Name=filepolicywin, Identity Groups=Any, Operating Systems=Windows All, Compliance Module=4.x or later, Posture Type=Temporal Agent, and Requirements=filereqwin).

# Configure the Client Provisioning Policy

**Step 1** Choose **Policy** > **Client Provisioning**.

**Step 2** Create the required rule (for example, Rule Name=Win, Identity Groups=Any, Operating Systems=Windows All, Other Conditions=Conditions, Results=CiscoTemporalAgentWindows4.5).

# Download and Launch Cisco Temporal Agent

**Step 1** Connect to the SSID.

**Step 2** Launch a Browser and you will be redirected to the Client Provisioning Portal.

**Step 3** Click **Start**. This checks if the Cisco Temporal agent is installed and running.

**Step 4** Click **This Is My First Time Here**.

**Step 5** Choose **Click Here to Download and Launch Cisco Temporal Agent**.

**Step 6** Save the Cisco Temporal Agent .exe or .dmg file for Windows or macOS respectively. For Windows, run the .exe file and for macOS, double-click the .dmg file and run the acisetempagent app.
The Cisco Temporal Agent scans the client and displays the results, such as Red cross marks for non-compliant checks.

# Posture Troubleshooting Tool

The Posture Troubleshooting tool helps you find the cause of a posture-check failure to identify the following:

- Which endpoints were successful in posture and which were not.
- If an endpoint failed in posture, what steps failed in the posture process.
- Which mandatory and optional checks passed and failed.

You determine this information by filtering requests based on parameters, such as username, MAC address, and posture status.

# Configure Client Provisioning in Cisco ISE

Enable client provisioning to allow users to download client provisioning resources and configure agent profiles. You can configure agent profiles for Windows clients, Mac OS X clients, and native supplicant profiles for personal devices. If you disable client provisioning, users attempting to access the network will receive a warning message indicating that they are not able to download client provisioning resources.

### Before you begin

If you are using a proxy and hosting client provisioning resources on a remote system, verify that the proxy allows clients to access that remote location.

**Step 1** Choose **Administration** > **System** > **Settings** > **Client Provisioning** or **Work Centers** > **Posture** > **Settings** > **Software Updates** > **Client Provisioning**.

**Step 2** From the **Enable Provisioning** drop-down list, choose **Enable** or **Disable**.

**Step 3** From the **Enable Automatic Download** drop-down list, choose **Enable**.

Feed downloads include all the available client provisioning resources. Some of these resources may not be pertinent to your deployment. Cisco recommends manually downloading resources whenever possible instead of setting this option.

**Step 4** Specify the URL where Cisco ISE searches for system updates in the **Update Feed URL** text box. For example, the default URL for downloading client-provisioning resources is https://www.cisco.com/web/secure/spa/provisioning-update.xml.

**Step 5** When there is no client provisioning resource for a device, choose one of the following options:

- **Allow Network Access**: Users are allowed to register their device on the network without having to install and launch the native supplicant wizard.
- **Apply Defined Authorization Policy**: Users must try to access the Cisco ISE network via standard authentication and authorization policy application (outside of the native supplicant provisioning process). If you enable this option, the user device goes through standard registration according to any client-provisioning policy applied to the user's ID. If the user's device requires a certificate to access the Cisco ISE network, you must also provide detailed instructions to the user describing how to obtain and apply a valid certificate using the customizable user-facing text fields.

**Step 6** Click **Save**.

**Note** If the ISE certificates are cached in the HTTP Strict Transport Security (HSTS) store of the endpoint, client provisioning portal redirection might fail and you might see the following error message:

```
You cannot visit hostname.domain.com right now because the website uses HSTS. Network errors
and attacks are temporary, so this page will probably work later.
```

To resolve this issue, delete the browser cache on the endpoint or navigate to chrome://net-internals/#hsts and delete the self-signed ISE certificates.

### What to do next

Configure client provisioning resource policies.

# Client Provisioning Resources

Client provisioning resources are downloaded to endpoints after the endpoint connects to the network. Client provisioning resources consist of compliance and posture agents for desktops, and native supplicant profiles for phones and tablets. Client provisioning policies assign these provisioning resources to endpoints to start a network session.

Client provisioning resources are listed on **Policy Elements** > **Results** > **Client Provisioning** > **Resources**. The following resource types can be added to the list by clicking the **Add** button:

- **Agent resources from Cisco Site**: Select the NAC, AnyConnect and supplicant provisioning wizards you want to make available for client provisioning policies. Cisco periodically updates this list of resources, adding new ones and updating existing ones. You can also set up ISE to download all the Cisco resources and resource updates automatically, see Configure Client Provisioning in Cisco ISE, on page 65 for more information.
- **Agent resources from local disk**: Select resources on your PC that you want to upload to ISE, see Add Cisco Provided Client Provisioning Resources from a Local Machine, on page 67.
- 
- **Native Supplicant Profile**: Configure a supplicant profile for phones and tablets that contain settings for your network. For more information, see Create Native Supplicant Profiles.
- **AnyConnect ISE Posture Profile**: Configure the AnyConnect ISE Posture here when you don't want to create and distribute agent XML profiles. For more information about the AnyConnect ISE Posture agent and ISE Posture Profile Editor, see the AnyConnect Administrators Guide for your version of AnyConnect https://www.cisco.com/c/en/us/support/security/anyconnect-secure-mobility-client/products-installation-and-configuration-guides-list.html.

After creating client provisioning resources, create client provisioning policies that apply the client provisioning resources to the endpoints. See Configure Client Provisioning Resource Policies, on page 90.

### Related Topics

Configure Client Provisioning in Cisco ISE, on page 65
Add Client Provisioning Resources from Cisco, on page 67
Add Cisco Provided Client Provisioning Resources from a Local Machine, on page 67
Add Customer Created Resources for AnyConnect from a Local Machine, on page 68

# Add Client Provisioning Resources from Cisco

You can add client provisioning resources from Cisco.com for AnyConnect Windows, MAC OSX clients, and Cisco Web agent. Depending on the resources that you select and available network bandwidth, Cisco ISE can take a few minutes to download client provisioning resources to Cisco ISE.

### Before you begin

- Ensure that you have configured the correct proxy settings in Cisco ISE.
- Enable client provisioning in Cisco ISE.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources**.

**Step 2** Choose **Add** > **Agent resources from Cisco site**.

**Step 3** Select one or more required client provisioning resources from the list available in the **Download Remote Resources** dialog box.

**Step 4** Click **Save**.

### What to do next

After you have successfully added client provisioning resources to Cisco ISE, you can begin to configure client provisioning resource policies.

# Add Cisco Provided Client Provisioning Resources from a Local Machine

You can add client provisioning resources from the local disk, which you previously downloaded from Cisco.

### Before you begin

Be sure to upload only current, supported resources to Cisco ISE. Older, unsupported resources are likely to cause serious issues for client access.

If you are downloading the resource files manually from the Cisco.com, see the Section “Cisco ISE Offline Updates” in the Cisco ISE Release Notes.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources**.

**Step 2** Choose **Add** > **Agent resources from local disk**.

**Step 3** Choose **Cisco Provided Packages** from the **Category** drop-down list.

**Step 4** Click **Browse** to the directory on your local machine where the resource file that you want to download to Cisco ISE resides.

You can add AnyConnect or Cisco Web Agent resources that you previously downloaded from Cisco to your local machine.

**Step 5** Click **Submit**.

### What to do next

After you have successfully added client provisioning resources to Cisco ISE, you can configure client provisioning resource policies.

# Add Customer Created Resources for AnyConnect from a Local Machine

Add customer created resources like AnyConnect customization and localization packages and AnyConnect profiles from the local machine to Cisco ISE.

### Before you begin

Ensure that customer created resources for AnyConnect are zipped files and available in your local disk.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Client provisioning** > **Resources**.

**Step 2** Choose **Add** > **Agent Resources from local disk**.

**Step 3** Choose **Customer Created Packages** from the **Category** drop-down list.

**Step 4** Enter the name and description for AnyConnect resources.

**Step 5** Click **Browse** to the directory on your local machine where the resource file that you want to download to Cisco ISE resides.

**Step 6** Choose the following AnyConnect resources to upload to Cisco ISE:

- AnyConnect customization bundle
- AnyConnect localization bundle
- AnyConnect profile
- Advanced Malware Protection (AMP) Enabler Profile

**Step 7** Click **Submit**.
The Uploaded AnyConnect Resources table displays AnyConnect resources that you add to Cisco ISE.

### What to do next

Create AnyConnect agent configuration.

# Create Native Supplicant Profiles

You can create native supplicant profiles to enable users to bring their own devices into the Cisco ISE network. When the user signs in, Cisco ISE uses the profile that you associated with that user's authorization requirements to choose the necessary supplicant provisioning wizard. The wizard runs and sets up the user's personal device to access the network.

**Note** The provisioning wizard only configures interfaces which are active. Because of this, users with Wired and Wireless connections will not be provisioned for both interfaces, unless they are both active.

### Before you begin

- Open up TCP port 8905 to enable the installation of Cisco AnyConnect Agent, Cisco Web Agent, and supplicant provisioning wizard. For more information about port usage, see the "Cisco ISE Appliance Ports Reference" appendix in the *Cisco Identity Services Engine Hardware Installation Guide*.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources**.

**Step 2** Choose **Add** > **Native Supplicant Profile**.

**Step 3** Create a profile, using the procedure described in Native Supplicant Profile Settings, on page 69.

### What to do next

Enable self-provisioning capabilities that allow employees to directly connect their personal devices to the network, as described in the Support for multiple Guest Portals section.

# Native Supplicant Profile Settings

When you choose **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources** > **Add** > **Native Supplicant Profile**. The following settings are displayed.

- **Name**: Enter the name of the native supplicant profile that you are creating.
- **Operating System**: Choose which operating system(s) this profile should apply to from the drop-down list.

Each profile defines the settings for a network connection that Cisco ISE will apply to the client's native supplicant.

### Wireless Profile

Configure a wireless profile, one for each SSID that you want to make available to the client:

- **SSID Name**: Enter the name of the SSID that the client will connect to.
- **Proxy Auto-Config File URL**: If the client will connect to a proxy to get the network configuration for its supplicant, enter the URL of that proxy server.
- **Proxy Host/IP**: If the client will connect to a proxy to get the network configuration for its supplicant, enter the Host/IP of that proxy server.
- **Proxy Port**: If the client will connect to a proxy to get the network configuration for its supplicant, enter the port of that proxy server.
- **Security**: Choose either **WPA** or **WPA2**.
- **Allowed Procotol**: Choose either **PEAP** or **EAP-TLS**.
- **Certificate Template**: For TLS, choose one of the certificate templates. The certificate templates are defined in **Administration** > **System Certificates** > **Certificate Authority** > **Certificate Templates**.

### Optional Settings

If you expand **Optional**, the following fields are displayed.

**Windows Setings**

- **Authentication Mode**: Choose **User**, **Machine** or **both** as credentials for authorization.
- **Do not prompt user to authorize new servers or trusted certification authorities**: If this option is enabled, the user is not prompted to authorize. User certificates are automatically accepted.
- **Use a different user name for the connection**: This is applicable only for wireless profiles. Use a different user name for the connection.
- **Connect even if the network is not broadcasting its name (SSID)**: This is applicable only for wireless profiles. Connect to a network even when its SSID is not being broadcasted.

**iOS Settings**

- **Enable if target network is hidden**: Check this check box if the target network is hidden.

### Wired Profile

- **Allowed Protocol**: Choose either **PEAP** or **EAP-TLS**.
- **Certificate Template**: For TLS, choose one of the certificate templates. The certificate templates are defined in **Administration** > **System Certificates** > **Certificate Authority** > **Certificate Templates**.

### Optional Settings

If you expand **Optional**, the following fields are also available for Windows clients.

- **Authentication Mode**: Choose **User**, **Machine** or **both** as credentials for authorization.
- **Automatically use logon name and password (and domain if any)**: If you selected **User** for **Authentication Mode**, use the logon and password to without prompting the user, if that information is available.
- **Enable Fast Reconnect**: Allow a PEAP session to resume without checking user credentials when the session resume feature is enabled in the PEAP protocol options, which is configured on **Administration** > **System** > **Settings** > **Protocols** > **PEAP**.
- **Enable Quarantine Checks**: Check if the client has been quarantined.
- **Disconnect if server does not present cryptobinding TLV**: Disconnect if cryptobinding TLV is not supported for the network connection.
- **Do not prompt user to authorize new servers or trusted certification authorities**: Automatically accept user certificates; do not prompt the user.

# Client Provisioning Without URL Redirection for Different Networks

Client provisioning without URL redirection is required when the third party NAC does not support CoA. You can perform client provisioning with and without URL redirection.

**Note** For client provisioning with URL redirection, if the client machine has proxy settings configured, ensure that you add Cisco ISE to the list of exceptions in the browser settings. This setting is applicable for all flows, BYOD, MDM, Guest, and Posture that use URL redirection. For example, on Windows machines, do the following:

1. From Control Panel, click **Internet Properties**.
2. Select the **Connections** tab.
3. Click **LAN settings**.
4. Click **Advanced** from the Proxy server area.
5. Enter the IP addresses of the Cisco ISE nodes in the **Exceptions** box.
6. Click **OK**.

Given below are the steps you perform to provision an endpoint without redirection for different networks.

Dot1X EAP-TLS

1. Connect the Cisco ISE network with provisioned certification.
2. Open a browser window and type in the provisioning URL: provisioning.cisco.com.
3. Log into the CP portal via internal user, AD, LDAP, or SAML.

   AnyConnect performs posture. The endpoint moves to the right network based on posture compliance.

Dot1X PEAP

1. Connect the Cisco ISE network with User Name and Password through NSP
2. Open a browser window and type in the provisioning URL: provisioning.cisco.com.
3. Log into the CP portal via internal user, AD, LDAP, or SAML

   AnyConnect performs posture. The endpoint moves to the right network based on posture compliance.

MAB (Wired Networks)

1. Connect the Cisco ISE network.
2. Open a browser window and type in the provisioning URL: provisioning.cisco.com.
3. Log into the CP portal via internal user, AD, LDAP, or SAML.

   AnyConnect performs posture. The endpoint moves to the right network based on posture compliance.

MAB (Wireless Networks)

1. Connect the Cisco ISE network
2. Open a browser window and type in the provisioning URL: provisioning.cisco.com.
3. Log into the CP portal via internal user, AD, LDAP, or SAML.

   AnyConnect performs posture. Posture starts for wireless 802.1X only.

# AMP Enabler Profile Settings

The following table describes the fields in the Advanced Malware Protection (AMP) Enabler Profile window. The navigation path is: **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources**.

Click the **Add** drop-down arrow and select the **AMP Enabler Profile**.

***Table 21: AMP Enabler Profile Page***

| Field Names | Usage Guidelines |
|---|---|
| **Name** | Enter the name of the AMP enabler profile that you want to create. |
| **Description** | Enter a description for the AMP enabler profile. |
| **Install AMP Enabler** | • **Windows Installer**: Specify the URL of the local server that hosts the AMP for Windows OS software. The AnyConnect module uses this URL to download the .exe file to the endpoint. The file size is approximately 25 MB.<br>• **Mac Installer**: Specify the URL of the local server that hosts the AMP for macOS software. The AnyConnect module uses this URL to download the .pkg file to the endpoint. The file size is approximately 6 MB.<br><br>The **Check** button communicates with the server to verify if the URL is valid. If the URL is valid, a "File found" message is displayed or else an error message is displayed. |
| **Uninstall AMP Enabler** | Uninstalls the AMP for endpoint software from the endpoint. |
| **Add to Start Menu** | Adds a shortcut for the AMP for endpoint software in the Start menu of the endpoint, after the AMP for endpoint software is installed on the endpoint. |
| **Add to Desktop** | Adds an icon for the AMP for endpoint software on the desktop of the endpoint, after the AMP for endpoint software is installed on the endpoint. |
| **Add to Context Menu** | Adds the Scan Now option in the right-click context menu of the endpoint, after the AMP for endpoint software is installed on the endpoint. |

# Create an AMP Enabler Profile Using the Embedded Profile Editor

You can create the AMP enabler profile using the Cisco ISE embedded profile editor or the standalone editor.

To create the AMP enable profile using the Cisco ISE embedded profile editor:

### Before you begin

- Download the AMP for Endpoint software from the SOURCEfire portal and host it on a local server.
- Import the certificate of the server that hosts the AMP for endpoint software to the ISE certificate store by navigating to **Administration** > **Certificates** > **Trusted Certificates**.
- Ensure that the **AMP Enabler** options are selected in the **AnyConnect Module Selection** and **Profile Selection** sections in the **AnyConnect Configuration** window ( **Policy** > **Policy Elements** > **Results** > **Client provisioning** > **Resources** > **Add** > **AnyConnect Configuration** > **Select AnyConnect Package**).
- You must log in to the SOURCEfire portal, create policies for endpoint groups, and download the AMP for endpoint software. The software comes preconfigured with the policies that you have chosen. You must download two images, namely, the redistributable version of the AMP for endpoint software for Windows OS and AMP for endpoint software for macOS. The downloaded software is hosted on a server that is accessible from the enterprise network.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources**.

**Step 2** Click the **Add** drop-down.

**Step 3** Choose **AMP Enabler Profile** to create a new AMP enabler profile.

**Step 4** Enter the appropriate values in the fields.

**Step 5** Click **Submit** to save the profile in the **Resources** window.

# Create an AMP Enabler Profile Using the Standalone Editor

To create an AMP enabler profile using the AnyConnect standalone editor.

### Before you begin

You can create an AMP enabler profile by uploading the XML format of the profile using the AnyConnect 4.1 standalone editor.

- Download the AnyConnect standalone profile editor for Windows and Mac OS from Cisco.com.
- Launch the standalone profile editor and enter the fields as specified in the AMP Enabler Profile Settings.
- Save the profile as an XML file in your local disk.
- Ensure that the **AMP Enabler** options are selected in the **AnyConnect Module Selection** and **Profile Selection** sections in the **AnyConnect Configuration** window ( **Policy** > **Policy Elements** > **Results** > **Client provisioning** > **Resources** > **Add** > **AnyConnect Configuration** > **Select AnyConnect Package**).

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Client provisioning** > **Resources**.

**Step 2** Click **Add**.

**Step 3** Choose **Agent resources from local disk**.

**Step 4** Choose **Customer Created Packages** from the **Category** drop-down.

**Step 5** Choose **AMP Enabler Profile** from the **Type** drop-down.

**Step 6** Enter a **Name** and **Description**.

**Step 7** Click **Browse** and select the saved profile (XML file) from the local disk. The following example shows a customized install file.

```
<?xml version="1.0" encoding="UTF-8"?>
<FAProfile xsi:noNamespaceSchemaLocation="FAProfile.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <FAConfiguration>
 <Install>
 <WindowsConnectorLocation>
https://fa_webserver/ACFA_Mac_FireAMPSetup.exe
</WindowsConnectorLocation>
 <MacConnectorLocation>
https://fa_webserver/ACFA_Mac_FireAMPSetup.exe
</MacConnectorLocation>
 <StartMenu>true</StartMenu>
 <DesktopIcon>false</DesktopIcon>
 <ContextIcon>true</ContextIcon>
 </Install>
 </FAConfiguration>
</FAProfile>
```

The following example shows a customized uninstall file.

```
<?xml version="1.0" encoding="UTF-8"?>
<FAProfile xsi:noNamespaceSchemaLocation="FAProfile.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
 <FAConfiguration>
 <Uninstall>
 </Uninstall>
 </FAConfiguration>
</FAProfile>
```

**Step 8** Click **Submit**.
The newly created AMP Enabler profile is displayed in the **Resources** page.

# Troubleshoot Common AMP Enabler Installation Errors

When you enter the SOURCEfire URL in the Windows or MAC Installer text box and click **Check**, you might encounter any of the following errors:

- Error Message: The certificate for the server containing the Mac/Windows installer file is not trusted by ISE. Add a trust certificate to **Administration** > **Certificates** > **Trusted Certificates**.

  This error message appears if you have not imported the SOURCEfire trusted certificate in to the Cisco ISE certificate store. Obtain a SOURCEfire trusted certificate and import it in to the Cisco ISE trusted certificate store (Administration > Certificates > Trusted Certificates).

- Error Message: The installer file is not found at this location, this may be due to a connection issue. Enter a valid path in the Installer text box or check your connection.

  This error message appears when the server hosting the AMP for Endpoint software is down or if there is a typographic error in the Windows Installer or MAC Installer text box.

- Error Message: The Windows/Mac installer text box does not contain a valid URL.

  This error message appears when you enter a syntactically incorrect URL format.

# Cisco ISE Support for Onboarding Chromebook Devices

Chromebook devices are managed devices (managed by the Google domain), unlike other devices (Apple, Windows, Android) and have limited onboarding support. Cisco ISE supports the onboarding of Chromebook devices on a network. Onboarding refers to the process of delivering the required settings and files to an endpoint such that it is able to connect securely to a network after authenticating with Cisco ISE. This process includes certificate provisioning and/or native supplicant provisioning. However, in Chromebook devices, you can only perform certificate provisioning. Native supplicant provisioning is done via the Google Admin Console.

Unmanaged Chromebook devices cannot be onboarded to a secure network.

The entities involved in the Chromebook onboarding process are the:

- Google Administrator
- ISE Administrator
- Chromebook User/Device
- Google Admin Console (Managed by the Google Administrator)

The Google administrator:

- Secures the following licenses:
  1. Google Apps Administrator license for the Google Admin Console configuration—URL: https://admin.google.com. The Google Admin Console enables an administrator to manage Google services for people in an organization.
  2. Chromebook device management license—URL: https://support.google.com/chrome/a/answer/2717664?hl=en. A Chromebook device management license is used to configure settings and enforce policies for a specific Chromebook device. It gives the Google Administrator access to device settings to control user access, customize features, configure network access, and more.
- Facilitates provisioning and enrolling of Chromebook devices with a Google device license.
- Manages Chromebook devices through the Google Admin Console.
- Sets up and manages the Wi-Fi network configuration for each Chromebook user.
- Manages the Chromebook devices by configuring applications and forced extensions to be installed on the Chromebook device. Onboarding the Chromebook device requires the Cisco Network Setup Assistant extensions to be installed in the Chromebook device. This allows the Chromebook device to connect to Cisco ISE and install the ISE certificate. The extension is forcibly installed because the action of certificate installation is allowed only for managed devices.
- Ensures that the Cisco ISE certificates are installed in the Google Admin Console to provide server validation and secure connection. The Google administrator decides whether a certificate should be generated for a device or a user. Cisco ISE provides options to:
  - Generate the certificate for a single user who does not share the Chromebook device.
  - Generate a certificate for a Chromebook device that is shared by multiple users. Refer to Step 5 in the Configure the Network and Force Extensions in the Google Admin Console section for the required additional configuration.

The Google Administrator installs the ISE server certificate so that ISE is trusted to perform the certificate provisioning on the Chromebook device and also to allow EAP-TLS certificate-based authentication. Google Chrome version 37 and higher supports certificate-based authentication for Chromebook devices. The google administrator needs to load the ISE provisioning application in the Google Admin Console and make it available to the Chromebook devices to get the certificate from ISE.

- Ensures that the recommended Google host names are allowed in the ACL definition list configured in the WLC for SSL secure connections. Refer to the recommended and allowed host names in the Google Support page.

The ISE Administrator:

- Defines the native supplicant profile for the Chromebook OS that includes the certificate template structure.
- Creates the necessary authorization rules and client provisioning policies in Cisco ISE for Chromebook users.

The Chromebook User:

- Wipes out the Chromebook device and enrolls it to the Google domain to secure the enforced policy that was defined by the Google administrator.
- Receives the Chromebook device polices and the Cisco Network Setup Assistant forced extension installed by the Google Admin Console.
- Connects to the provisioned SSID, as defined by the Google administrator, opens the browser, displays the BYOD pages, and starts the onboarding process.
- The Cisco Network Setup Assistant installs a client certificate in the Chromebook device, which allows the device to perform EAP-TLS certificate-based authentication.

The Google Admin Console:

The Google Admin Console supports Chromebook device management and allows configuring a secure network and pushing Cisco Network Setup Assistant certificate management extensions to the Chromebook. The extension sends an SCEP request to Cisco ISE and installs the client certificate to allow secure connection and access to the network.

# Best Practices for Using Chromebook Device in a Shared Environment

When a Chromebook device is used in a shared environment, such as schools and libraries, the Chromebook device is shared by different users. Some of the best practices that Cisco recommends include:

- When onboarding a Chromebook device with a specific user (student or professor) name, the user's name will be populated in the Common Name (CN) in the Subject field of the certificate. Also, the shared Chromebook is listed in the My Devices portal under that specific user. Therefore, it is recommended for shared devices to use a shared credential when onboarding, so that devices show up only under the specific user’s My Devices portal listing. The shared account can be administered by the administrator or professor as a separate account to control shared devices.
- The Cisco ISE administrator can create a custom certificate template for shared Chromebook devices and use it in the policy. For example, instead of using the standard certificate template that matches the Subject-Common Name (CN) value, you can specify a Name (for example, chrome-shared-grp1) in the

certificate and the same name can be assigned to the Chromebook device. A policy can be designed to match the name to allow or deny access to a Chromebook device.

- The Cisco ISE administrator can create an endpoint group with all the Chromebook devices' MAC addresses that needs to go through Chromebook onboarding (devices for which access need to be restricted). The authorization rule should call this out along with device type Chromebook—this would allow access to be redirected to the NSP.

# Chromebook Onboarding Process

The Chromebook onboarding process involves a series of steps:

**Step 1** Configure the Network and Force Extensions in the Google Admin Console .

**Step 2** Configure Cisco ISE for Chromebook Onboarding.

**Step 3** Wipe a Chromebook Device.

**Step 4** Enroll Chromebook to the Google Admin Console.

**Step 5** Connect Chromebook to the Cisco ISE Network for BYOD On Boarding.

# Configure the Network and Force Extensions in the Google Admin Console

The Google administrator performs the following steps.

**Step 1** Log in to the Google Admin Console.

a) Enter the following URL: https://admin.google.com in the browser.
b) Enter the required username and password.
c) In the **Welcome to Admin Console** window, click **Device Management**.
d) On the **Device Management** window, click **Network**.

**Step 2** Set up the Wi-Fi network for managed devices.

a) In the **Networks** window, click **Wi-Fi**.
b) Click **Add Wi-Fi** to add the required SSIDs. See Google Admin Console - Wi-Fi Network Settings for more information.

   For MAB flows, create two SSIDs, one for the open network, and the other for certificate authentication. When you connect to the open network, Cisco ISE ACLs redirect you to the credentialed guest portal for authentication. After successful authentication, ACLs redirect you to the BYOD portal.

   If the ISE certificate is issued by an intermediate CA, then you must map the intermediate certificate to the "Server certificate authority", instead of to the Root CA.

c) Click **Add**.

**Step 3** Create the forced extensions.

a) In the **Device Management** window, under the **Device Settings** , click **Chrome Management**.
b) Click **User Settings**.

c) Scroll down, and in the **Apps and Extensions** section, in the **Force-Installed Apps and Extensions** option, click **Manage Force-Installed Apps**.

**Step 4** Install the forced extensions.

a) In the **Force-Installed Apps and Extensions** window, click **Chrome Web Store**.

b) In the **Search** text box, type "Cisco Network Setup Assistant" to locate the extension.

The forced Cisco Network Setup Assistant extension of the Chromebook device requests the certificate from Cisco ISE, and installs the ISE certificate on the Chromebook device. The extension must be configured as force-installed because certificate installation is only allowed for managed devices. If the extension was not installed during the enrollment process, the Cisco ISE certificate cannot be installed.

c) Click **Add** to force install apps.

d) Click **Save**.

**Step 5** (Optional) Define the configuration file to install a certificate in a Chromebook device which is shared by multiple users.

a) Copy and paste the following code in a Notepad file and save it to your local disk.

```
{
  "certType": {
    "Value": "system"
  }
}
```

b) Choose **Device Management** > **Chromebook Management** > **App Management**.

c) Click the **Cisco Network Setup Assistant** extension.

d) Click **User Settings** and choose your domain.

e) Click **Upload Configuration File** and choose the .txt file that you saved in your local disk.

**Note** In order for the Cisco Network Setup Assistant to create a certificate for a device that is shared by multiple users, you must add the Notepad file in the Google Admin Console. Otherwise, the Cisco NSA creates a certificate for a single user.

f) Click **Save**.

**Step 6** (Optional) Install a certificate for a single user who does not share the Chromebook.

a) Choose **Device Management** > **Network** > **Certificates**.

b) In the **Certificates** window, click **Add Certificate** and upload the Cisco ISE certificate file.

### What to do next

Configure Cisco ISE for Chromebook on board.

# Configure Cisco ISE for Chromebook Onboarding

### Before you begin

The Cisco ISE administrator must create the required policy in the **Policy** > **Policy Sets** window.

Given below is an example of an authorization policy:

Rule Name: Full_Access_After_Onboarding, Conditions: If RegisteredDevices AND Wireless_802.1x AND Endpoints:BYODRegistration EQUALS Yes AND Certificate: Subject Alternative Name Equals

RadiusCalling-Station-ID AND Network Access: EAP-Authentication EQUALS EAP-TLS Then CompliantNetworkAccess.

The CompliantNetworkAccess is an authorization result configured in the **Policy** > **Policy Elements** > **Results** > **Authorization** > **Authorization Profiles** window.

**Step 1** Configure the Native Supplicant Profile (NSP) on Cisco ISE.

a) Choose **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources**.

The Chromebook device is displayed in the Client Provisioning page for a fresh Cisco ISE installation. However, for upgrade, you should download posture updates from the **Administration > System > Settings > Posture > Updates** window.

b) Click **Add** > **Native Supplicant Profile**.
c) Enter the **Name** and **Description**.
d) In the **Operating System** field, choose **Chrome OS All**.
e) In the **Certificate Template** field, select the required certificate template.
f) Click **Submit**. Observe that the SSID is provisioned via the Google Admin Console and not through the native supplicant provisioning flow.

**Step 2** Map the NSP in the Client Provisioning page.

a) Choose **Policy** > **Client Provisioning**.
b) Define the result.

- Choose the in-built Native Supplicant configuration (Cisco-ISE-Chrome-NSP) in the **Results** of the client provisioning policy.
- Or, create a new rule and ensure to choose the **Result** created for the Chromebook device.

# Wipe a Chromebook Device

The Chromebook device must be wiped after the Google Admin Console is configured by the Google Administrator. The Chromebook user must wipe the device, which is a one-time process, to force extensions and configure the network settings. You can refer to the following URL: https://support.google.com/chrome/a/answer/1360642 for further information.

The Chromebook user performs the following steps:

**Step 1** Press **Esc-Refresh-Power** key combination. The screen displays a yellow exclamation point (!).
**Step 2** Press **Ctrl -D** key combination to begin dev mode, then press **Enter** key. The screen displays a red exclamation point.
**Step 3** Press **Ctrl -D** key combination. The Chromebook deletes its local data, returning to its initial state. The deletion takes approximately 15 minutes.
**Step 4** When the transition completes, press the **Spacebar** key, then press the **Enter** key to return to verified mode.
**Step 5** Enroll the Chromebook before signing in.

### What to do next

Enroll Chromebook to the Google Admin Console.

# Enroll Chromebook to the Google Admin Console

In order to provision a Chromebook device, the Chromebook user must first enroll in the Google Admin Console page and receive device policies and forced extensions.

**Step 1** Turn on the Chromebook device and follow the onscreen instructions until you see the sign on screen. Do not sign in yet.

**Step 2** Before signing in to the Chromebook device, press **Ctrl-Alt-E** key combination. The **Enterprise Enrolment** screen appears.

**Step 3** Enter your email address and click **Next**.
You will receive the following message: Your device has successfully been enrolled for enterprise management.

**Step 4** Click **Done**.

**Step 5** Enter the username and password from your Google admin welcome letter, or the username and password for an existing Google Apps user on your account that has eligibility to enroll.

**Step 6** Click **Enroll Device**. You will receive a confirmation message that the device has been successfully enrolled.

Note that the Chromebook enrollment is a one-time process.

# Connect Chromebook to the Cisco ISE Network for BYOD On Boarding

The procedure is for Dual SSID—To connect to a 802.x network using the EAP-TLS protocol, the Chromebook user performs the following steps:

**Note** If you are using Dual SSID—When connecting from 802.x PEAP to an EAP-TLS network, connect to the network by entering your credentials in the network supplicant, not the web browser.

**Step 1** In the Chromebook, click **Settings**.

**Step 2** In the **Internet Connection** section, click **Provisioning Wi-Fi Network**, and then click your network.

**Step 3** The credentialed guest portal opens.

**a.** On the Sign On page, enter the **Username** and **Password**.

**b.** Click **Sign-on**.

**Step 4** In the BYOD Welcome page, click **Start**.

**Step 5** In the **Device Information** field, enter a name and a description for your device. For example, "Personal Devices: Jane's Chromebook Used for School or Shared Devices: Library Chromebook #1 or Classroom 1 Chromebook #1".

**Step 6** Click **Continue**.

**Step 7** Click **Yes** in the **Cisco Network Setup Assistant** dialog box to install the certificate to access the secure network.

If the Google Administrator configured secure Wi-Fi, the network connection should happen automatically. If it does not, choose the secure SSID from the list of available networks.

Chromebook users who have already enrolled in the domain, and have the Cisco Network Setup Assistant extension, can update the extension without waiting for the auto update. Manually update the extension by performing the following steps.

**a.** In your Chromebook, open the browser and enter the following **URL: chrome://Extensions**.

**b.** Check the **Developer Mode** check box.

**c.** Click **Update Extensions Now**.

**d.** Verify that the Cisco Network Setup Assistant extension version is 2.1.0.35 and higher.

# Google Admin Console - Wi-Fi Network Settings

The Wi-Fi network configuration is used to configure an SSID in a customer network or to match the certificate using certificate attributes (for EAP-TLS). When the certificate is installed in the Chromebook, it is synchronized with the Google admin settings. Connection is established only when one of the defined certificate attributes matches the SSID configuration.

Listed below are the mandatory fields, specific to EAP-TLS, PEAP, and Open network flows, which the Google administrator configures to set up the Wi-Fi network in the Google Admin Console page (**Device Management > Network > Wi-Fi > Add Wi-Fi**) for each Chromebook user.

| Field | EAP-TLS | PEAP | Open |
|---|---|---|---|
| Name | Enter the name of the network connection. | Enter the name of the network connection. | Enter the name of the network connection. |
| Service Set Identifier (SSID) | Enter the SSID (for example, tls_ssid). | Enter the SSID (for example, tls_ssid). | Enter the SSID (for example, tls_ssid). |
| This SSID Is Not Broadcast | Select the option. | Select the option. | Select the option. |
| Automatically Connect | Select the option. | Select the option. | Select the option. |
| Security Type | WPA/WPA2 Enterprise (802.1x) | WPA/WPA2 Enterprise (802.1x) | Open |
| Extensible Authentication Protocol | EAP-TLS | PEAP | — |

| Field | EAP-TLS | PEAP | Open |
|---|---|---|---|
| Inner Protocol | — | • Automatic<br>• MSCHAP v2 (Select the option)<br>• MD5<br>• PAP<br>• MSCHAP<br>• GTC | — |
| Outer Identity | — | — | — |
| Username | Optional, either set a fixed value or use variables from the user login: ${LOGIN_ ID} or ${LOGIN_EMAIL}. | Enter the PEAP credentials to authenticate against ISE (internal ISE user/AD/other ISE identities) and the Password field. | — |
| Server Certificate Authority | Select the ISE certificate (imported from Device Management > Network > Certificates). | Select the ISE certificate (imported from Device Management > Network > Certificates). | — |
| Restrict Access to this Wi-Fi Network by Platform | • Select Mobile Devices.<br>• Select Chromebooks. | • Select Mobile Devices.<br>• Select Chromebooks. | — |
| Client Enrollment URL | Enter a URL to which the Chromebook device browser is redirected for users who are not enrolled. Configure ACLs on the Wireless LAN Controller for redirecting unenrolled users. | — | — |

| Field | EAP-TLS | PEAP | Open |
|---|---|---|---|
| Issuer Pattern | An attribute in the certificate. Select at least one attribute from either the Issuer Pattern or Subject Pattern that should match installed certificate attributes. Specify certificate attributes that will be matched with the Chromebook device to accept the certificate.<br>• Common Name: Refers to the Subject field of the certificate or the wildcard domain in the Subject field of the certificate, which must match the FQDN of the node.<br>• Locality: Refers to the test locality (City) that is associated with the certificate subject.<br>• Organization: Refers to the organization name that is associated with the certificate subject.<br>• Organizational Unit: Refers to the organizational unit name that is associated with the certificate subject. | — | — |

| Field | EAP-TLS | PEAP | Open |
|---|---|---|---|
| Subject Pattern | An attribute in the certificate. Select at least one attribute from either the Issuer Pattern or Subject Pattern that should match installed certificate attributes. Specify certificate attributes that will be matched with the Chromebook device to accept the certificate.<br>• Common Name: Refers to the Subject field of the certificate or the wildcard domain in the Subject field of the certificate, which must match the FQDN of the node.<br>• Locality: Refers to the test locality (City) that is associated with the certificate subject.<br>• Organization: Refers to the organization name that is associated with the certificate subject.<br>• Organizational Unit: Refers to the organizational unit name that is associated with the certificate subject. | — | — |
| Proxy Settings | • Direct Internet Connection (Selected)<br>• Manual Proxy Configuration<br>• Automatic Proxy Configuration | • Direct Internet Connection (Selected)<br>• Manual Proxy Configuration<br>• Automatic Proxy Configuration | — |

| Field | EAP-TLS | PEAP | Open |
|---|---|---|---|
| Apply Network | By User | By User | — |

# Monitor Chromebook Device Activities in Cisco ISE

Cisco ISE provides various reports and logs to view information related to the authentication and authorization of Chromebook devices. You can run these reports either on demand or on regular basis. You can view the authentication method (for example, 802.1x) and authentication protocol (for example, EAP-TLS) in the **Operations** > **RADIUS** > **Live Logs** window. You can also identify the number of end points that are classified as Chromebook devices by navigating to the **Work Centers** > **Network Access** > **Identities** > **Endpoints** window.

# Troubleshoot Chromebook Device Onboarding

This section describes problems that you may encounter while onboarding your Chromebook device.

- Error: Unable to install the extension from the webstore—You cannot install the extension from the webstore. It will be automatically installed on your Chromebook device by the network administrator.
- Error: Completed the installation of the certificate, however, unable to connect to the secure network—Verify on the Admin Console that the installed certificate matches defined Issuer/Subject attribute pattern. You can get information about installed certificate from: chrome://settings/certificates
- Error: Displays an error message "Obtain Network Certificate", when trying to manually connect to the secure network on the Chromebook—Click Get New Certificate, the browser opens and redirects you to the ISE BYOD flow to install the certificate. However, if you are unable to connect to the secure network, verify on the Admin Console that the installed certificate matches the defined Issuer/Subject attribute pattern.
- Error: Clicked Get New Certificate but is forwarded to the www.cisco.com site—User needs to be connected to the provisioning SSID, in order to be redirected to ISE and commence the certificate installation process. Be sure that the correct access list is defined for this network.
- Error: Displays an error message "Only managed devices can use this extension. Contact helpdesk or network administrator"—Chromebook is a managed device and the extension must be configured as a forced install to gain access to the Chrome OS APIs to install the certificate on the device. Although, the extension can be installed manually by downloading it from the Google web store, an unenrolled Chromebook user cannot install the certificate.

  An unenrolled Chromebook device can secure a certificate if the user belongs to the Domain Users group. The extension tracks the domain user on any device. However, the domain user can produce user-based authentication keys for an unenrolled device.
- Error: Unclear of the order in which SSIDs are connected in the Google Admin Console—
  - If several SSIDs (PEAP and EAP-TLS) are configured on the Google Admin Console, after the certificate is installed and the attributes are matched, the Chrome OS automatically connects to the SSID with certificate-based authentication regardless of the order in which the SSIDs are configured.
  - If two EAP-TLS SSIDs match the same attribute, the connection depends on other factors such as signal strength and other network level signals, which cannot be controlled by the user or admin.

- If multiple EAP-TLS certificates are installed on the Chromebook device and all of them match the certificate pattern configured on the Admin Console, the newest certificate will be used for the connection.

# Cisco AnyConnect Secure Mobility

Cisco ISE uses an integrated module in Cisco AnyConnect for Cisco ISE posture requirements.

**Note** AnyConnect does not support CWA flow. You can't provision AnyConnect from the Guest portal using the **Require guest device compliance** field in the **Work CentersGuest Access** > **Portals & Components** > **Guest Portals** > **Create, Edit, or Duplicate** > **Portal Behavior and Flow Settings** > **Guest Device Compliance Settings** window. Instead, provision AnyConnect on the Client Provisioning portal. This method results in redirection as configured in authorization permissions.

When you integrate Cisco ISE with the Cisco AnyConnect agent, Cisco ISE:

- Serves as a staging server to deploy Cisco AnyConnect Version 4.0 and future releases
- Interacts with the AnyConnect posture component for Cisco ISE posture requirements
- Supports deployment of Cisco AnyConnect profiles, customization and language packages, and OPSWAT library updates for Windows and Mac OS X operating systems
- Supports Cisco AnyConnect and legacy agents at the same time

**Note** When switching network mediums, you must change the default gateway so the posture module can detect the changed network and reassess the client.

# Create AnyConnect Configuration

AnyConnect configuration includes AnyConnect software and its associated configuration files. This configuration can be used in the client provisioning policy that allows users to download and install AnyConnect resources on the clients. If you use both ISE and an ASA to deploy AnyConnect, then the configurations must match on both headends.

To push the ISE posture module when connected to a VPN, Cisco recommends that you install the AnyConnect agent through Cisco Adaptive Security Appliance (ASA), which uses the Cisco's Adaptive Security Device Manager (ASDM) GUI tool. ASA does the installation using the VPN downloader. With the download, the ISE posture profile is pushed via ASA, and the discovery host needed for later provisioning the profile is available before the ISE posture module contacts ISE. Whereas with ISE, the ISE posture module will get the profile only after ISE is discovered, which could result in errors. Therefore, ASA is recommended to push the ISE posture module when connected to a VPN.

**Note** When Cisco ISE is integrated with ASA, ensure that the Accounting mode is set to **Single** in ASA. Accounting data is sent to only one accounting server in Single mode.

### Before you begin

Before configuring an AnyConnect configuration object, you must:

1. Download the AnyConnect Headend Deployment package and compliance module from Cisco Software download page.
2. Upload these resources to Cisco ISE (see Add Cisco Provided Client Provisioning Resources from a Local Machine, on page 67).
3. (Optional) Add the customization and localization bundles (see Add Customer Created Resources for AnyConnect from a Local Machine, on page 68).
4. Configure an AnyConnect posture agent profile (see Create a Posture Agent Profile, on page 87).

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources**.

**Step 2** Click **Add** to create an AnyConnect configuration.

**Step 3** Choose **AnyConnect Configuration**.

**Step 4** Choose an AnyConnect Package, which you previously uploaded. For example, AnyConnect DesktopWindows xxx.x.xxxxx.x .

**Step 5** Enter the name for the current AnyConnect Configuration. For example, AC Config xxx.x.xxxxx.x.

**Step 6** Choose the compliance module, which you previously uploaded. For example, AnyConnect ComplianceModulewindows x.x.xxxx.x.

**Step 7** Check one or more AnyConnect module check boxes. For example, choose one or more modules from the following: ISE Posture, VPN, Network Access Manager, Web Security, AMP Enabler, ASA Posture, Start Before Log on (only for Windows OS), and Diagnostic and Reporting Tool.

**Note** Un-checking the VPN module under AnyConnect Module Selection does not disable the VPN tile in the provisioned client. You must configure VPNDisable_ServiceProfile.xml to disable the VPN tile on AnyConnect GUI. In a system where AnyConnect is installed at the default location, you can find this file under C:\Program Files\Cisco. If AnyConnect is installed at a different location, then the file will be available under <AnyConnect Installed path>\Cisco.

**Step 8** Choose AnyConnect profiles for selected AnyConnect modules. For example, ISE Posture, VPN, NAM, and Web Security.

**Step 9** Choose AnyConnect customization and localization bundles.

**Step 10** Click **Submit**.

# Create a Posture Agent Profile

Use this procedure to create an AnyConnect posture agent profile, where you can specify parameters that define the agent behavior for the posture protocol.

**Step 1** Choose **Policy** > **Policy Elements** > **Results** > **Client Provisioning** > **Resources**.

**Step 2** Click **Add**.

**Step 3** Choose **AnyConnect Posture Profile**.

**Step 4** Enter **Name** of the profile.

**Step 5** Configure parameters for the following:

- Cisco ISE posture agent behavior
- Client IP Address Changes
- Cisco ISE posture protocol

**Step 6** Click **Submit**.

# Client IP Address Refresh Configuration

The following table describes the fields in the NAC AnyConnect Posture Profile window, which allows you to configure parameters for the client to renew or refresh its IP address after VLAN change. Choose **Policy** > **Policy Elements** > **Resilts** > **Client Provisioning** > **Resources** > **Add** > **AnyConnect Posture Profile**.

| Field Name | Default Value | Usage Guidelines |
|---|---|---|
| **VLAN detection interval** | 0, 5 | This setting is the interval at which the agent check for the VLAN change.<br>For the Mac OS X agent, the default value is 5. By default, the access to authentication VLAN change feature is enabled with VlanDetectInteval as 5 seconds for Mac OS X. The valid range is 5 to 900 seconds.<br>0 —Access to Authentication VLAN change feature is disabled.<br>1 to 5—Agent sends an Internet Control Message Protocol (ICMP) or Address Resolution Protocol (ARP) query every 5 seconds.<br>6 to 900—An ICMP or ARP query is sent every x seconds. |
| **Enable VLAN detection without UI (Not applicable for a Mac OS X client)** | No | This setting enables or disables VLAN detection even when the user is not logged in.<br>No—VLAN detect feature is disabled.<br>Yes—VLAN detect feature is enabled. |

| Field Name | Default Value | Usage Guidelines |
|---|---|---|
| **Retry detection count** | 3 | If the Internet Control Message Protocol (ICMP) or Address Resolution Protocol (ARP) polling fails, this setting configures the agent to retry x times before refreshing the client IP address. |
| **Ping or ARP** | 0<br>The valid range is 0 to 2. | This setting specifies the method used for detecting the client IP address change.<br>0—Poll using ICMP<br>1—Poll using ARP<br>2—Poll using ICMP first, then (if ICMP fails) ARP |
| **Maximum timeout for ping** | 1<br>The valid range is 1 to 10 seconds. | Poll using ICMP, and if there is no response within the specified time, then declare an ICMP polling failure. |
| **Enable agent IP refresh** | Yes (Default) | This setting specifies whether or not the client machine to renew or refresh its IP address after the switch (or WLC) changes the VLAN for the login session of the client on the respective switch port. |
| **DHCP renew delay** | 0<br>The valid range is 0 to 60 seconds. | This setting specifies that the client machine waits before attempting to request for a new IP address from the network DHCP server. |
| **DHCP release delay** | 0<br>The valid range is 0 to 60 seconds. | The setting specifies that the client machine waits before releasing its current IP address. |

**Note** Merge parameter values with existing agent profile settings or overwrite them to appropriately configure clients on Windows and Mac OS X clients for refreshing IP addresses.

# Posture Protocol Settings

# Continuous Endpoint Attribute Monitoring

You can use the AnyConnect agent to continuously monitor different endpoint attributes to improve the overall visibility of an endpoint. The AnyConnect agent monitors applications that are installed and running on an endpoint. You can turn on and off the feature and configure how often the data should be monitored. By default, data is collected every 5 minutes and is stored in the database. During initial posture, AnyConnect

reports a complete list of running and installed applications. After initial posture, the AnyConnect agent scans the applications every X minutes and sends the differences from the last scan to the server. The server displays the complete list of running and installed applications.

# Cisco Web Agent

The Cisco Web Agent provides temporal posture assessment for client machines.

Users can launch the Cisco Web Agent executable, which installs the Web Agent files in a temporary directory on the client machine via ActiveX control or Java applet.

After users log in to the Cisco Web Agent, the Web Agent gets the requirements that are configured for the user role and the operating system from the Cisco ISE server, checks the host registry, processes, applications, and services for required packages and sends a report back to the Cisco ISE server. If requirements are met on the client machine, the user is allowed network access. If requirements are not met, the Web Agent presents a dialog to the user for each requirement that is not satisfied. The dialog provides the user with instructions and the action to take for the client machine to meet the requirement. Alternatively, if the specified requirements are not met, users can choose to accept the restricted network access while they try to remediate the client system so that it meets requirements for the user login role.

**Note** ActiveX is supported only on the 32-bit versions of Internet Explorer. You cannot install ActiveX on a Firefox web browser or on a 64-bit version of Internet Explorer.

# Configure Client Provisioning Resource Policies

For clients, the client provisioning resource policies determine which users receive which version of resources (agents, agent compliance modules, and agent customization packages or profiles) from Cisco ISE upon login and user session initiation.

For AnyConnect, resources can be selected from the **Client Provisioning Resources** window to create an AnyConnect configuration that you can use in the **Client Provisioning Policy** window. AnyConnect configuration specifies the AnyConnect software and its association with different configuration files that includes AnyConnect binary package for Windows and macOS clients, compliance module, module profiles, customization, and language packages.

### Before you begin

- Before you can create effective client-provisioning resource policies, ensure that you have added resources to Cisco ISE. When you download the agent compliance module, it always overwrites the existing one, if any, available in the system.
- Check the native supplicant profile that is used in the client provisioning policy and ensure that the wireless SSID is correct. For iOS devices, if the network that you are trying to connect is hidden, check the **Enable if target network is hidden** check box in the **iOS Settings** area.

**Step 1** Choose **Policy** > **Client Provisioning**.

**Step 2** From the **Behavior** drop-down list, choose one of the following options:

- **Enable**: Ensures Cisco ISE uses this policy to help fulfill client-provisioning functions when users log in to the network and conform to the client-provisioning policy guidelines.
- **Disable**: Cisco ISE does not use the specified resource policy to fulfill client-provisioning functions.
- **Monitor**: Disables the policy and "watches" the client-provisioning session requests to see how many times Cisco ISE tries to invoke based on the "Monitored" policy.

**Step 3** Enter a name for the new resource policy in the **Rule Name** text box.

**Step 4** Specify one or more Identity Groups to which a user who logs into Cisco ISE might belong.

You can choose to specify the **Any** identity group type, or choose one or more groups from a list of existing Identity Groups that you have configured.

**Step 5** Use the **Operating Systems** field to specify one or more operating systems that might be running on the client machine or device through which the user is logging into Cisco ISE.

You can choose to specify a single operating system like Android, Mac iOS, macOS or an umbrella operating system designation that addresses a number of client machine operating systems like Windows XP (All) or Windows 7 (All).

**Note** Though the option to select macOS 10.6, 10.7, and 10.8 is available in the **Client Provisioning** window in Cisco ISE GUI, these versions are not supported by AnyConnect.

**Step 6** In the **Other Conditions** field, specify a new expression that you want to create for this particular resource policy.

**Step 7** For client machines, use the **Agent Configuration** option to specify which agent type, compliance module, agent customization package, and profile to make available and provision on the client machine.

It is mandatory to include the client provisioning URL in authorization policy to enable the agent to popup in the client machines. This prevents request from any random clients and ensures that only clients with proper redirect URL can request for posture assessment.

**Step 8** Click **Save**.

### What to do next

After you have successfully configured one or more client provisioning resource policies, you can start to configure Cisco ISE to perform posture assessment on client machines during login.

# Configure Cisco ISE Posture Agent in the Client Provisioning Policy

For client machines, configure the agent type, compliance module, agent customization package, and/or profile to make available and provision for users to download and install on the client machine.

### Before you begin

You must add client provisioning resources for AnyConnect in Cisco ISE.

**Step 1** Choose an available agent from the **Agent** drop-down list and specify whether the agent upgrade (download) defined here is mandatory for the client machine by enabling or disabling the **Is Upgrade Mandatory** option, as appropriate.

The **Is Upgrade Mandatory** setting only applies to agent downloads. Agent profile, compliance module, and agent customization package updates are always mandatory.

**Step 2** Choose an existing agent profile from the **Profile** drop-down list.

**Step 3** Choose an available compliance module to download to the client machine using the **Compliance Module** drop-down list.

**Step 4** Choose an available agent customization package for the client machine from the **Agent Customization Package** drop-down list.

# Configure Native Supplicants for Personal Devices

Employees can connect their personal devices to the network directly using native supplicants, which are available for Windows, Mac OS, iOS, and Android devices. For personal devices, specify which Native Supplicant configuration to make available and provision on the registered personal device.

### Before you begin

Create native supplicant profiles so that when user log in, based on the profile that you associate with that users authorization requirements, Cisco ISE provides the necessary supplicant provisioning wizard to set up the users personal devices to access the network.

**Step 1** Choose **Policy** > **Client Provisioning**.

**Step 2** Choose **Enable**, **Disable**, or **Monitor** from the behavior drop-down list.

**Step 3** Enter a name for the new resource policy in the Rule Name text box.

**Step 4** Specify the following:

- Use the **Identity Groups** field to specify one or more Identity Groups to which a user who logs into Cisco ISE might belong.
- Use the **Operating System** field to specify one or more operating systems that might be running on the personal device through which the user is logging into Cisco ISE.
- Use the **Other Conditions** field to specify a new expression that you want to create for this particular resource policy.

**Step 5** For personal devices, use **Native Supplicant Configuration** to choose the specific **Configuration Wizard** to distribute to these personal devices.

**Step 6** Specify the applicable **Wizard Profile** for the given personal device type.

**Step 7** Click **Save**.

# Client Provisioning Reports

You can access the Cisco ISE monitoring and troubleshooting functions to check on overall trends for successful or unsuccessful user login sessions, gather statistics about the number and types of client machines logging into the network during a specified time period, or check on any recent configuration changes in client provisioning resources.

### Client Provisioning Requests

The **Operations** > **Reports** > **ISE Reports** > **Endpoints and Users** > **Client Provisioning** report displays statistics about successful and unsuccessful client provisioning requests. When you choose **Run** and specify one of the preset time periods, Cisco ISE combs the database and displays the resulting client provisioning data.

### Supplicant Provisioning Requests

The **Operations** > **Reports** > **ISE Reports** > **Endpoints and Users** > **Supplicant Provisioning** window displays information about recent successful and unsuccessful user device registration and supplicant provisioning requests. When you choose **Run** and specify one of the preset time periods, Cisco ISE combs the database and displays the resulting supplicant provisioning data.

The Supplicant Provisioning report provides information about a list of endpoints that are registered through the device registration portal for a specific period of time, including data like the Logged at Date and Time, Identity (user ID), IP Address, MAC Address (endpoint ID), Server, profile, Endpoint Operating System, SPW Version, Failure Reason (if any), and the Status of the registration.

# Client Provisioning Event Logs

You can search event log entries to help diagnose a possible problem with client login behavior. For example, you may need to determine the source of an issue where client machines on your network are not able to get client provisioning resource updates upon login. You can use logging entries for Posture and Client Provisioning Audit and Posture and Client Provisioning Diagnostics.

# Portal Settings for Client Provisioning Portals

### Portal Settings

- **HTTPS Port**: Enter a port value between 8000 to 8999; the default value is 8443 for all the default portals, except the **Blacklist** Portal, which is 8444. If you upgraded with port values outside this range, they are honored until you make any change to this page. If you make any change to this page, you must update the port setting to comply with this restriction.
- **Allowed Interfaces**: Select the PSN interfaces which can run a portal. Only a PSN with an available allowed interface on a PSN can create a portal. You can configure any combination of physical and bonded interfaces. This is a PSN-wide configuration; all portals can only run on these interfaces, this interface configuration is pushed to all the PSNs.
    - You must configure the Ethernet interfaces using IP addresses on different subnets.
    - The interfaces you enable here must be available on all your PSNs, including VM-based ones when Policy Services turned on. This is required because any of these PSNs can be used for a redirect at the start of the guest session.
    - The portal certificate Subject Name/Alternate Subject Name must resolve to the interface IP.
    - Configure ip host x.x.x.x yyy.domain.com in ISE CLI to map secondary interface IP to FQDN, which will be used to match Certificate Subject Name/Alternate Subject Name.

- If only the bonded NIC is selected, when the PSN attempts to configure the portal it first attempts to configure the Bond interface. If that is not successful, perhaps because there was no bond set upon that PSN, then the PSN logs an error and exits. It will NOT attempt to start the portal on the physical interface.
- **NIC Teaming** or bonding is an O/S configuration option that allows you to configure two individual NICs for high availability (fault tolerance). If one of the NICs fails, the other NIC that is part of the bonded connection continues the connection. A NIC is selected for a portal based on the portal settings configuration:
  - If both physical NICs and the corresponding bonded NIC are configured - When the PSN attempts to configure the portal, it first attempts to connect to the Bond interface. If that is not successful, perhaps because there was no bond setup on that PSN, then the PSN attempts to start the portal on the physical interface.

- **Certificate Group Tag**: Select the group tag of the certificate group to use for the portal's HTTPS traffic.
- **Authentication Method**: Choose which identity source sequence (ISS) or Identity Provider (IdP) to use for user authentication. The ISS is a list of Identity Stores that are searched in sequence to verify user credentials. Some examples include: Internal Guest Users, Internal Users, Active Directory, and LDAP.

  Cisco ISE includes a default client provisioning Identity Source Sequence for Client Provisioning Portals, Certificate_Request_Sequence.
- **Fully Qualified Domain Name (FQDN)**: Enter at least one unique FQDN and/or hostname for your Client Provisioning portal. For example, you can enter provisionportal.yourcompany.com, so that when the user enters either of those into a browser, they will reach the Client Provisioning Portal.
  - Update DNS to ensure that the FQDN of the new URL resolves to a valid Policy Services Node (PSN) IP address. Optionally, this address could point to a load balancer virtual IP address that serves a pool of PSNs.
  - To avoid certificate warning messages due to name mismatches, include the FQDN of the customized URL, or a wildcard, in the subject alternative name (SAN) attribute of the local server certificate of the Cisco ISE PSN.

**Note** For Client Provisioning without URL redirection, the portal name that is entered in the Fully Qualified Domain Name (FQDN) field must be configured in the DNS configuration. This URL must be communicated to the users to enable Client Provisioning without URL redirection.

- **Idle Timeout**: Enter the time in minutes that you want Cisco ISE to wait before it logs out the user if there is no activity in the portal. The valid range is from 1 to 30 minutes..

**Note** In the Client Provisioning Portal, you can define the port number and the certificate so that the host allows you to download the same certificate for Client Provisioning and Posture. If the portal certificate is signed by the officials certificate authority, you will not receive any security warning. If the certificate is self-signed, you will receive one security warning for both the portals and Cisco AnyConnect Posture component.

### Login Page Settings

- Enable Login: Select this check box to enable the login step in the Client Provisioning Portal
- Maximum failed login attempts before rate limiting: Specify the number of failed login attempts from a single browser session before Cisco ISE starts to artificially slow down the rate at which login attempts can be made, preventing additional login attempts. The time between attempts after this number of failed logins is reached is specified in **Time between login attempts when rate limiting**.
- Time between login attempts when rate limiting: Set the length of time in minutes that a user must wait before attempting to log in again, after failing to log in the number of times defined in **Maximum failed login attempts before rate limiting**.
- Include an AUP (on page/as link): Display your company's network-usage terms and conditions, either as text on the page currently being displayed for the user or as a link that opens a new tab or window with AUP text.
- Require acceptance: Require users to accept an AUP before they can access the portal. The **Login** button is not enabled unless the user accepts the AUP. If users do not accept the AUP, they will not be able to access the portal.
- Require scrolling to end of AUP: This option displays only if **Include an AUP on page** is enabled. Ensure that the user has read the AUP completely. The **Accept** button activates only after the user has scrolled to the end of the AUP.

### Acceptable Use Policy (AUP) Page Settings

- Include an AUP: Display your company's network-usage terms and conditions on a separate page to the user.
- Require scrolling to end of AUP: Ensure that the user has read the AUP completely. The Accept button activates only after the user has scrolled to the end of the AUP.
- On first login only: Display an AUP when the user logs into the network or portal for the first time only.
- On every login: Display an AUP each time the user logs into the network or portal.
- Every _____ days (starting at first login): Display an AUP periodically after the user first logs into the network or portal.

### Post-Login Banner Page Settings

Include a Post-Login Banner page: Display additional information after the users successfully log in and before they are granted network access.

### Change Password Settings

Allow internal users to change their own passwords: Allow employees to change their passwords after they log in to the Client Provisioning Portal. This only applies to employees whose accounts are stored in the Cisco ISE database and not to those stored in external databases, such as Active Directory or LDAP.

# HTML Support for Client Provisioning Portal Language Files

The navigation path to this portal's **Instructional Text** , **Content**,**Optional Content 1**, and **Optional Content 2** text boxes is **Administration** > **Device Portal Management** > **Client Provisioning Portals** > **Edit** > **Portal Page Customization** > **Pages**. You can use the **View HTML Source** icon in the mini-editor and add HTML code in your content.

These dictionary keys in the portal's language properties files support HTML in their text.

**Note** This is not a complete list of the dictionary keys in the files.

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- key.guest.ui_contact_instruction_message
- key.guest.ui_success_message
- key.guest.ui_client_provision_unable_to_detect_message
- key.guest.ui_client_provision_instruction_message
- key.guest.ui_client_provision_agent_installation_message
- key.guest.ui_client_provision_posture_agent_check_message
- key.guest.ui_vlan_instruction_message
- key.guest.ui_client_provision_agent_installation_instructions_with_no_java_message
- key.guest.ui_success_instruction_message
- key.guest.ui_vlan_optional_content_1
- key.guest.ui_vlan_optional_content_2
- key.guest.ui_contact_optional_content_2
- key.guest.ui_contact_optional_content_1
- key.guest.ui_contact_optional_content_1
- key.guest.ui_client_provision_posture_check_compliant_message
- key.guest.ui_client_provision_optional_content_2
- key.guest.ui_client_provision_optional_content_1
- key.guest.ui_error_optional_content_2
- key.guest.ui_error_optional_content_1
- key.guest.ui_client_provision_posture_check_non_compliant_message
- key.guest.ui_vlan_install_message
- key.guest.ui_success_optional_content_1

- key.guest.ui_success_optional_content_2
- key.guest.ui_client_provision_posture_agent_scan_message

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- key.guest.ui_client_provision_agent_installation_message
- key.guest.ui_client_provision_posture_agent_check_message
- key.guest.ui_vlan_instruction_message

- key.guest.ui_client_provision_agent_installation_instructions_with_no_java_message
- key.guest.ui_success_instruction_message
- key.guest.ui_vlan_optional_content_1
- key.guest.ui_vlan_optional_content_2
- key.guest.ui_contact_optional_content_2
- key.guest.ui_contact_optional_content_1
- key.guest.ui_contact_optional_content_1
- key.guest.ui_client_provision_posture_check_compliant_message
- key.guest.ui_client_provision_optional_content_2
- key.guest.ui_client_provision_optional_content_1
- key.guest.ui_error_optional_content_2
- key.guest.ui_error_optional_content_1
- key.guest.ui_client_provision_posture_check_non_compliant_message
- key.guest.ui_vlan_install_message
- key.guest.ui_success_optional_content_1
- key.guest.ui_success_optional_content_2
- key.guest.ui_client_provision_posture_agent_scan_message