



User Permissions and Device Access

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User Interfaces, User Types, and How To Transition Between Them

These topics describe the GUI and CLI interfaces used by Cisco EPN Manager , and how to transition between the Cisco EPN Manager and Linux CLI interfaces.

- [User Interfaces and User Types](#), on page 1
- [How to Transition Between the CLI User Interfaces in Cisco EPN Manager](#) , on page 3

User Interfaces and User Types

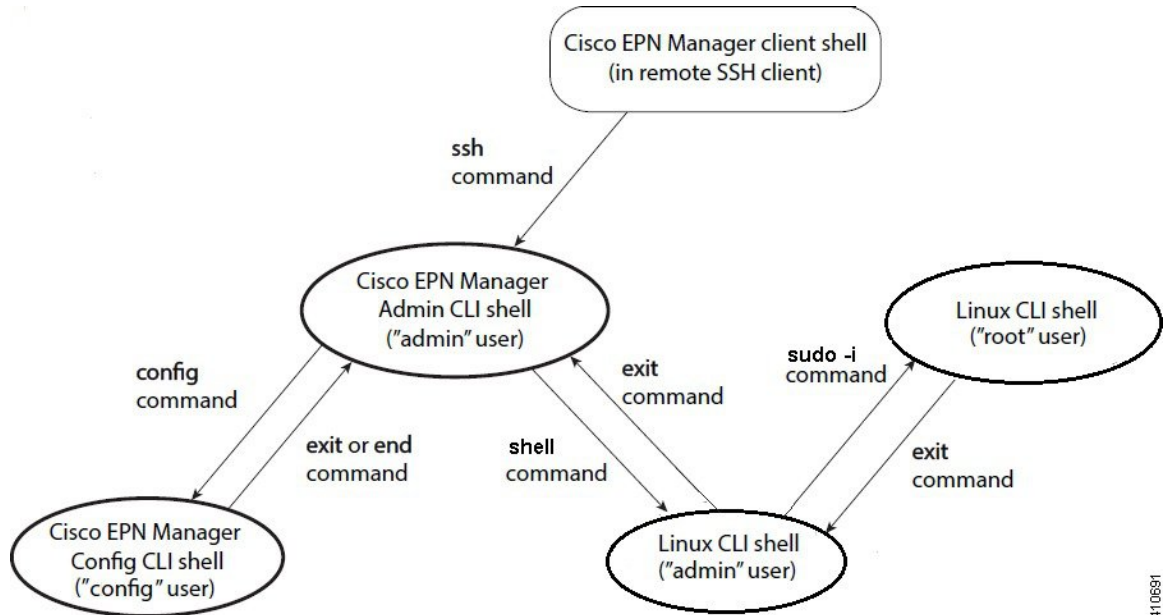
The following table describes the user interfaces employed by Cisco EPN Manager (CEPNM), and the types of users that can access each interface.

CEPNM User Interface	Interface Description	CEPNM User Types
CEPNM web GUI	<p>Web interface that facilitates day-to-day and administration operations using the web GUI. These users can have varying degrees of privileges and are classified into role-based access control (RBAC) classes and subclasses.</p> <p>This interface provides a subset of operations that are provided by the Cisco EPN Manager CLI admin and CLI config users.</p>	<p>Cisco EPN Manager web GUI everyday users—Created by web GUI root user . These users have varying degrees of privileges and are classified into role-based access control (RBAC) classes and subclasses called <i>user groups</i> (Admin, Super Users, Config Managers, and so forth). For information on the user groups, see Types of User Groups, on page 6.</p> <p>Cisco EPN Manager web GUI root user—Created at installation and intended for first-time login to the web GUI, and for creating other user accounts. This account should be disabled after creating at least one web GUI user that has Admin privileges—that is, a web GUI user that belongs to the Admin or Super Users user group. See Disable and Enable the Web GUI root User, on page 6.</p> <p>Note The Cisco EPN Manager web GUI root user is not the same as the Linux CLI root user, nor is it the same as the Cisco EPN Manager CLI admin user.</p>
CEPNM Admin CLI	<p>Cisco proprietary shell which provides secure and restricted access to the system (as compared with the Linux shell). This Admin shell and CLI provide commands for advanced Cisco EPN Manager administration tasks. These commands are explained throughout this guide. To use this CLI, you must have Cisco EPN Manager CLI admin user access. You can access this shell from a remote computer using SSH.</p>	<p>Cisco EPN Manager CLI Admin user—Created at installation time and used for administration operations such as stopping and restarting the application and creating remote backup repositories. (A subset of these administration operations are available from the web GUI).</p> <p>To display a list of operations this user can perform, enter ? at the prompt.</p> <p>Some tasks must be performed in config mode. To transition to config mode, use the procedure in Transition Between the Cisco EPN Manager admin CLI and Cisco EPN Manager config CLI, on page 3.</p>
CEPNM Config CLI	<p>Cisco proprietary shell which is restricted and more secure than the Linux shell. This Config shell and CLI provide commands for Cisco EPN Manager system configuration tasks. These commands are explained throughout this guide. To use this CLI, you must have admin-level user access (see the information in the User Types column of this table). You can access this shell from the Admin CLI shell.</p>	<p>The admin CLI user can create other CLI users for a variety of reasons, using the following command:</p> <pre>(config) username <i>username</i> password role {admin user} <i>password</i></pre> <p>These users may have admin-like privilege/roles or lower level privileges as defined during creation time. To create a Cisco EPN Manager CLI user with admin privileges, run the username command with the admin keyword; otherwise, use the user keyword.</p>

CEPNM User Interface	Interface Description	CEPNM User Types
Linux CLI	Linux shell which provides all Linux commands. The Linux shell should only be used by Cisco technical support representatives. Regular system administrators should not use the Linux shell. You cannot reach this shell from a remote computer using SSH; you can only reach it through the Cisco EPN Manager admin shell and CLI.	<p>Linux CLI admin user—Created at installation time and used for Linux-level administration purposes.</p> <p>This admin user can get root-level privileges by following the procedure in Log In and Out as the Linux CLI root User, on page 4. Tasks that require root-level permissions should only be performed by Cisco Support teams to debug product-related operational issues. For security purposes, the Linux CLI admin and root users should be disabled; see Disable and Enable the Linux CLI Users in Cisco EPN Manager 2.x, on page 5.</p>

How to Transition Between the CLI User Interfaces in Cisco EPN Manager

The following figure illustrates how to transition between the Cisco EPN Manager and Linux CLI user interfaces on deployments running Cisco EPN Manager .



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Transition Between the Cisco EPN Manager admin CLI and Cisco EPN Manager config CLI

To move from the Cisco EPN Manager admin CLI to the Cisco EPN Manager config CLI, enter **config** at the admin prompt.

```
(admin)# config
(config)#
```

To move from the config CLI back to the admin CLI, enter **exit** or **end** at the config prompt:

```
(config)# exit
(admin)#
```

Log In and Out as the Linux CLI root User

The Linux CLI has two shell users: One with administrative access (Linux CLI admin user), and another with root access (Linux CLI root user). The diagram in [How to Transition Between the CLI User Interfaces in Cisco EPN Manager](#), on page 3 illustrates the flow for logging in and out as the various CLI users.

To log in as the Linux CLI root user, you will have to transition from being the Cisco EPN Manager CLI admin user to the Linux CLI admin user to the Linux CLI root user. The following procedure gives you the exact steps you must follow.

Before You Begin

If the Linux CLI user is disabled, re-enable it. See [Disable and Enable the Linux CLI Users in Cisco EPN Manager 2.x](#), on page 5.

Step 1

To log in as the Linux CLI root user:

- a) Start an SSH session with the Cisco EPN Manager server and log in as the Cisco EPN Manager CLI admin user.
- b) As the Cisco EPN Manager CLI admin user, log in as the Linux CLI admin user:

```
shell
Enter shell access password: password
```

- c) Log in as the Linux CLI root user.

```
sudo -i
```

By default, the Linux CLI shell prompt is the same for the Linux CLI admin and root user. You can use the **whoami** command to check the current user.

Step 2

To exit:

- a) Log out as the Linux CLI root user.

```
exit
```

- b) Log out as the Linux CLI admin user.

```
exit
```

You are now logged in as the Cisco EPN Manager CLI admin user.

What to Do Next

For security purposes, disable the Linux CLI root user. See [Disable and Enable the Linux CLI Users in Cisco EPN Manager 2.x](#), on page 5.

Enable and Disable root Access for the Linux CLI and the Cisco EPN Manager Web GUI

As described in [How to Transition Between the CLI User Interfaces in Cisco EPN Manager](#), on page 3, after installation, you should disable the Cisco EPN Manager web GUI **root** user after creating at least one other web GUI user that has Admin or Super Users privileges. See [Disable and Enable the Web GUI root User](#), on page 6.

The Linux CLI root user is disabled after installation time. If you need to re-enable it, follow the procedure in [Disable and Enable the Linux CLI Users in Cisco EPN Manager 2.x](#), on page 5.

Disable and Enable the Linux CLI Users in Cisco EPN Manager 2.x

This procedure shows you how to disable and enable the Linux CLI admin shell in deployments running Cisco EPN Manager 2.x. When you disable the shell, you will no longer be able to log in as the Linux CLI admin or root users. When the shell is enabled, users can log in by following the procedure in [How to Transition Between the CLI User Interfaces in Cisco EPN Manager](#), on page 3.

Before You Begin

Make sure you have the password for the Linux CLI admin user.

-
- Step 1** Log in to Cisco EPN Manager as the Cisco EPN Manager CLI admin user. See [Establish an SSH Session With the Cisco EPN Manager Server](#).
- Step 2** Disable the Linux CLI admin shell (which disables the Linux CLI admin and root users):
- ```
shell disable
Enter shell access password: passwd
shell access is disabled
```
- Step 3** To re-enable the Linux CLI admin shell (you must run this command as the Cisco EPN Manager CLI admin user):
- ```
shell
Shell access password is not set
Configure password for shell access

Password: passwd
Password again: passwd

Shell access password is set
Run the command again to enter shell
```
-

Disable and Enable the Web GUI root User

-
- Step 1** Log into the Cisco EPN Manager web GUI as root, and create another web GUI user that has root privileges—that is, a web GUI user that belongs to the Admin or Super Users user group. See [Add Users and Manage User Accounts](#), on page 12. Once this is done, you can disable the web GUI **root** account.
- Step 2** Disable the Cisco EPN Manager web GUI root user account. (The web GUI admin account, which remains active, can perform all required CLI functions.)
- ```
ncs webroot disable
```
- Step 3** To re-enable the account:
- ```
ncs webroot enable
```
-

Control the Tasks Users Can Perform (User Groups)

Cisco EPN Manager user authorization is implemented through user groups. A user group contains a list of tasks that control which parts of Cisco EPN Manager a user can access and the tasks the user can perform in those parts.

While user groups control what the user can do, *virtual domains* control the devices on which a user can perform those tasks. Virtual domains are described in [Create Virtual Domains to Control User Access to Devices](#), on page 17.

Cisco EPN Manager provides several predefined user groups. If a user belongs to a user group, the user inherits all of the authorization settings for that group. A user is normally added to user groups when their account is created.

These topics explain how to manage user authorization:

- [Types of User Groups](#), on page 6
- [View and Change the Tasks a User Can Perform](#), on page 8
- [View and Change the Groups a User Belongs To](#), on page 9
- [View User Groups and Their Members](#), on page 10
- [Create a Customized User Group](#), on page 10
- [View and Change the Tasks a Group Can Perform](#), on page 10
- [Use Cisco EPN Manager User Groups with RADIUS and TACACS+](#), on page 11

Types of User Groups

Cisco EPN Manager provides the following predefined user groups:

- [User Groups—Web UI](#), on page 7

- [User Groups—NBI, on page 8](#)

For information about CLI users, see [User Interfaces and User Types, on page 1](#).

User Groups—Web UI

Cisco EPN Manager provides the default web GUI user groups listed in the following table. You can assign users to multiple groups, except for users that belong to the Monitor Lite user group (because Monitor Lite is meant for users who should have very limited permissions).

See [View and Change the Tasks a Group Can Perform, on page 10](#) for information on the tasks that pertain to each user group and the default settings.

User Group	Group Task Focus
Root	All operations. The group permissions are not editable. The root web UI user is available after installation and is described in User Interfaces and User Types, on page 1 . A best practice is to create other users with Admin or Super Users privileges, and then disable the root web UI user as described in Disable and Enable the Web GUI root User, on page 6 .
Super Users	All operations (similar to root). The group permissions are editable.
Admin	Administer the system and server. Can also perform monitoring and configuration operations. The group permissions are editable.
Config Managers	Configure and monitor the network (no administration tasks). The permissions assigned to this group are editable.
System Monitoring	Monitor the network (no configuration tasks). The group permissions are editable.
Help Desk Admin	Only has access to the help desk and user preferences related pages. Members of this user group cannot be members of any other user group. This is a special group which lacks access to the user interface.
Lobby Ambassador	User administration for Guest users only. Members of this user group cannot be members of any other user group.
User-Defined 1-4	N/A; these are blank groups and can be edited and customized as needed.
Monitor Lite	View network topology and use tags. The group permissions are not editable. Members of this user group cannot be members of any other user group.
NBI Credential	The Northbound Interface Credential API.
NBI Read	The Northbound Interface Read API.
NBI Write	The Northbound Interface Write API.
North Bound API	Access to the SOAP APIs.

User Group	Group Task Focus
User Assistant	Local Net user administration only. Members of this user group cannot be members of any other user group.
mDNS Policy Admin	mDNS policy administration functions.

User Groups—NBI

Cisco EPN Manager provides the default NBI user groups listed in the following table. The permissions in these groups are not editable.

See [View and Change the Tasks a Group Can Perform, on page 10](#) for information on the tasks that pertain to each user group and the default settings.

User Group	Provides access to:
NBI Credential	Credential management using MTOSI NBI. Can also belong to other NBI and web UI user groups.
NBI Read	MTOSI and RESTConf NBI read operations (HTTP GET). Can also belong to other NBI and web UI user groups.
NBI Write	MTOSI and RESTConf NBI write operations (HTTP PUT, POST, DELETE). Can also belong to other NBI and web UI user groups.

View and Change the Tasks a User Can Perform

The tasks a user can perform is controlled by the user groups the user belongs to. Follow these steps to find out which groups a user belongs to and which tasks a user is authorized to perform.



Note If you want to check the *devices* a user can access, see [Assign Virtual Domains to Users, on page 23](#).

-
- Step 1** Choose **Administrrration > Users > Users, Roles & AAA** and locate the user name.
- Step 2** Locate the user name and check the **Member of** column to find out which user groups the user belongs to.
- Step 3** Click a user group hyperlink. The **Group Detail** window lists the tasks that group members can and cannot perform.
- A checked check box means group members have permission to perform that task. If a checked box is greyed-out, it means you cannot disable the task. For example, Cisco EPN Manager does not allow you to remove the "View tags" task for the Monitor Lite user group because it is an integral task for that user group.
 - A blank check box means group members cannot perform that task. If a blank check box is greyed out, it means you cannot enable the task for the user group.

The web GUI root and Monitor Lite groups, and the NBI groups, are not editable.

Step 4

If you want to change permissions, you have these choices:

Note Be careful. Selecting and deselecting tasks in the Group Detail window will apply your changes to *all group members*.

- Change permissions for all user group members. See [View and Change the Tasks a Group Can Perform](#), on page 10.
- Add the user to a different user group. The predefined user groups are described in [User Groups—Web UI](#), on page 7 and [User Groups—NBI](#), on page 8. Those topics also describe any group restrictions; for example, if a user belongs to the predefined Monitor Lite user group, the user cannot belong to any other groups.
- Remove the user from this group. See [View and Change the Groups a User Belongs To](#), on page 9.
- Use a customized user group and add the user to that group. To find out which customized groups already exist, see [View and Change the Tasks a Group Can Perform](#), on page 10. To create a new customized group, see [Create a Customized User Group](#), on page 10.

View and Change the Groups a User Belongs To

The tasks users can perform is determined by the user groups they belong to. This is normally configured when a user account is created (see [Add and Delete Users](#), on page 13). User groups are described in [Types of User Groups](#), on page 6.

This procedure explains how to view the groups a user belongs to and, if necessary, change the user's group membership.

Step 1

Choose > **Administration** > **Users, Roles & AAA Users**, then choose **Users**.

Step 2

In the **User Name**, column, locate and click the user name hyperlink to open the **User Details** window. All user groups are listed under the General tab.

- A checked check box means the user belongs to that group. If a checked box is greyed-out, it means you cannot remove the user from that group. For example, Cisco EPN Manager will not allow you to remove the user named **root** from the root user group.
- A blank check box means the user does not belong to that group. If a blank check box is greyed-out, it means you cannot add the user to that group.

(To check the tasks that a group can perform, choose **User Groups** from the left sidebar menu and click a group name.)

Step 3

To change the groups the user belongs to, select and unselect the appropriate groups in the **User Details** window, then click **Save**.

View User Groups and Their Members

Users can belong to multiple groups, unless they belong to a very restricted group such as Monitoring Lite. This procedure explains how to view existing user groups and their members.

-
- Step 1** Choose **Administration > Users > Users, Roles & AAA**, then choose **User Groups**. The User Groups page lists all existing user groups and a short list of their members. For a description of these groups, see [Types of User Groups, on page 6](#).
- Step 2** To view all members of a group, click a group hyperlink to open the **Group Details** window, then click the **Members** tab.
- Step 3** If you want to make changes to these groups, see:
- [View and Change the Tasks a Group Can Perform, on page 10](#)
 - [View and Change the Groups a User Belongs To, on page 9](#)
-

Create a Customized User Group

Cisco EPN Manager provides a set of predefined user groups that help you control user authorization. These groups are described in [Types of User Groups, on page 6](#) and include four User Defined groups which you can customize to create a user group that is specific to your deployment. The following procedure explains how to create a customized group using one of the four predefined User Defined group templates.

-
- Step 1** Choose **Administration > Users > Users, Roles & AAA**, then choose **User Groups**.
- Step 2** Locate a User Defined group that has no members, then click its group name hyperlink.
- Step 3** Customize the group permissions by checking and unchecking tasks in the **Group Detail** window. If a task is greyed-out, it means you cannot adjust its setting. You cannot change the group name.
- Step 4** Click **Save** to save your group settings.
- Step 5** Add members to your group by editing the relevant user accounts and adding the user to your new group. See [Add and Delete Users, on page 13](#) for information on adjusting user accounts.
-

View and Change the Tasks a Group Can Perform

Follow these steps to get information about existing user groups and the tasks group members can perform. The predefined user groups are described in [View User Groups and Their Members, on page 10](#).



Note If you want to change *device* access, see [Assign Virtual Domains to Users](#), on page 23.

Step 1 Choose **Administration > Users > Users, Roles & AAA**, then choose **User Groups**. The User Groups page lists all existing user groups.

Step 2 Click a user group hyperlink. The **Group Detail** window lists the group permissions.

- A checked task means group members have permission to perform that task. If a checked box is greyed-out, it means you cannot disable the task.
- A blank check box means group members cannot perform that task. If a blank check box is greyed out, it means you cannot enable the task for the user group.

The web GUI root and Monitor Lite groups, and the NBI groups, are not editable.

Step 3 If you want to change the group permissions—which will affect *all group members*—check and uncheck tasks, then click **Save**.

Note Be careful. Selecting and deselecting tasks in the Group Detail window will apply your changes to *all group members*. An alternative is to create a new group using one of the User Defined group templates; see [Create a Customized User Group](#), on page 10.

Use Cisco EPN Manager User Groups with RADIUS and TACACS+

Your RADIUS or TACACS+ servers must be configured to recognize the user groups that exist in Cisco EPN Manager . You can do this using the procedure in [Export the Cisco EPN Manager User Group and Task List Attributes for RADIUS and TACACS+](#), on page 11.

Export the Cisco EPN Manager User Group and Task List Attributes for RADIUS and TACACS+

If you are using RADIUS or TACACS+, you must copy all Cisco EPN Manager user group and task information into your Cisco Access Control Server (ACS) or Cisco Identity Services Engine (ISE) server. You can do this using the Task List dialog box provided in the Cisco EPN Manager web GUI. If you do not export the data into your Cisco ACS or Cisco ISE server, Cisco EPN Manager will not allow users to perform their assigned tasks.

The following information must be exported, depending on the protocol you are using:

- TACACS+—Requires virtual domain, role, and task information.
- RADIUS—Requires virtual domain and role information (tasks are automatically added).

Information in the Task List dialog is preformatted for use with the Cisco ACS server.

**Note**

When you add tasks to the external server, be sure to add the **Home Menu Access** task. It is mandatory for all users.

Before You Begin

Make sure you have added the AAA server and configured the AAA mode as explained in [Configure External Authentication, on page 27](#).

Step 1

In Cisco EPN Manager :

- a) Choose **Administration > Users > User Groups**.
- b) From the User Groups table, copy the tasks for each user group by clicking the **Task List** hyperlink (at the end of a user group row).
 - If you are using RADIUS, right-click *all of the text* in the RADIUS Custom Attributes field and choose **Copy**.
 - If you are using TACACS+, right-click *all of text* in the TACACS+ Custom Attributes field and choose **Copy**.

Step 2

Paste the information into your Cisco ACS or Cisco ISE server. These steps show how to add the information to an existing user group in Cisco ACS. If you have not yet added this information to Cisco ACS or Cisco ISE, see:

- [Use Cisco ACS With RADIUS or TACACS+ for External Authentication, on page 34](#)
 - [Use Cisco ISE With RADIUS or TACACS+ for External Authentication, on page 29](#)
- a) Navigate to **User or Group Setup**.
 - b) For the applicable user or group, click **Edit Settings**.
 - c) Paste the attributes list into the appropriate text box.
 - d) Select the check boxes to enable these attributes, then click **Submit + Restart**.

Add Users and Manage User Accounts

- [Create Web GUI Users with Administrator Privileges, on page 12](#)
- [Add and Delete Users, on page 13](#)
- [Disable \(Lock\) a User Account, on page 14](#)
- [Change a User's Password, on page 14](#)

Create Web GUI Users with Administrator Privileges

After installation, Cisco EPN Manager has a web GUI root account named **root**. This account is used for first-time login to the server to create:

- Web GUI users with Administrator privileges who will manage the product and features

- All other user accounts

You should *not* use the web GUI root account for normal operations. For security purposes, create a new web GUI user with Administrator privileges (and access to all devices), and then disable the web GUI root account.

-
- Step 1** Choose **Administration > Users > Users, Roles & AAA**, then choose **Users**.
- Step 2** From the **Select a command** drop-down list, choose **Add User**, then click **Go**.
- Step 3** Complete the required fields.
- Step 4** In the **General** tab under **Groups Assigned to This User**, click **Admin**.
- Step 5** Click the **Virtual Domains** tab to specify which devices the user can access. You should have at least one Admin web GUI user that has access to all devices (ROOT-DOMAIN). For more information on virtual domains, see [Create Virtual Domains to Control User Access to Devices, on page 17](#).
- Step 6** Click **Save**.
-

What to Do Next

If you have not done so already, for security purposes, disable the web GUI root account as described in [Disable and Enable the Web GUI root User, on page 6](#).

Add and Delete Users

Before you create user accounts, create virtual domains to control device access so you can apply them during account creation. Otherwise you will have to edit the user account to add the domain access. See [Create Virtual Domains to Control User Access to Devices, on page 17](#).

If you want to temporarily disable an account (rather than delete it), see [Disable \(Lock\) a User Account, on page 14](#).

-
- Step 1** Choose **Administration > Users > Users, Roles & AAA**, then choose **Users**.
- Step 2** From the **Select a command** drop-down list, choose **Add User**, then click **Go**.
- Step 3** Configure the user account.
- Enter a username and password.
 - Control the actions the user can perform by selecting one or more user groups. For descriptions of user groups, see [View User Groups and Their Members, on page 10](#).
 - Control the devices a user can access by clicking the **Virtual Domains** tab and assigning domains to the user. (see [Create Virtual Domains to Control User Access to Devices, on page 17](#)).
- Step 4** Click **Save**.
- Step 5** To delete a user account, select a user, choose **Delete User** from the **Select a command** drop-down list, then click **Go**.
-

Disable (Lock) a User Account

Disable a user account when you temporarily want to disallow a user from logging in to the Cisco EPN Manager GUI. You might want to do this if a user is temporarily changing job functions. If the user tries to log in, Cisco EPN Manager displays a message saying the login failed because the account is locked. You can unlock the account later without having to re-create the user. If you want to delete a user account, see [Add and Delete Users](#), on page 13.

User accounts may be disabled automatically if the password is not changed before expiration. Only an administrator can reset the password in this case. See [Change a User's Password](#), on page 14 and [Configure Global Password Policies for Local Authentication](#), on page 16.

-
- Step 1** Choose **Administration > Users > Users, Roles & AAA**, then click **Users**.
 - Step 2** Select the user whose access you want to disable or enable.
 - Step 3** From the **Select a command** drop-down list, select **Lock User(s)** (or **Unlock User(s)**), then click **Go**.
-

Change a User's Password

You can force users to change their passwords on a regular basis using password rules (see [Configure Global Password Policies for Local Authentication](#), on page 16). Users can change their own passwords as described in [Change Your Password](#). If you need to make an immediate change to a user's password, use this procedure.

-
- Step 1** Choose **Administration > Users > Users, Roles & AAA**, then click **Users**.
 - Step 2** Click the username hyperlink.
 - Step 3** Enter the new password in the password fields, then click **Save**.
-

Find Out Which Users Are Currently Logged In

Use this procedure to find out who is currently logged into the Cisco EPN Manager server. You can also view a historical list of the actions performed by the user in the current web GUI session and past sessions.

-
- Step 1** Choose **Administration > Users > Users, Roles & AAA**, then choose **Active Sessions**. Cisco EPN Manager lists all users that are currently logged in to the Cisco EPN Manager server, including their client machine IP address. If the user performed any actions on managed devices (for example, the user added new devices to Cisco EPN Manager), the device IP addresses are listed in the Device IP Address column.
 - Step 2** To view a historical list of all actions performed by this user, click the Audit Trail icon that corresponds to the user name.
-

View the Tasks Performed By Users (Audit Trail)

Cisco EPN Manager maintains a history of all actions performed by users in active and past web GUI sessions. Follow these steps to view a historical list of tasks performed by a specific *user* or by all members of a specific *user group*. The audit information includes a description of the task, the IP address of the client from which the user performed the task, and the time at which the task was performed. If a task affects a managed device (for example, a user adds a new device), the affected device's IP address is listed in the Device IP Address column. If a change is made to multiple devices (for example, a user deploys a configuration template to 10 switches), Cisco EPN Manager displays an audit entry for each switch.

To find out which users are currently logged into the Cisco EPN Manager web GUI, see [Find Out Which Users Are Currently Logged In](#), on page 14.

To view audits that are not user-specific, see these topics:

- [Audit Actions Executed from the GUI \(System Audit\)](#)
- [Audit Configuration Archive and Software Management Changes \(Network Audit\)](#)
- [Audit Changes Made By Users \(Change Audit\)](#)

Step 1 Choose **Administration > Users > Users, Roles & AAA**.

Step 2 To view the tasks performed by a specific user:

- 1 Choose **Users**.
- 2 Locate the user name, then click the Audit Trail icon corresponding to that user.

Step 3 To view a historical list of the tasks performed by all members of a user group:

- 1 Choose **User Groups**.
 - 2 Locate the user group name, then click the Audit Trail icon corresponding to that group.
-

Configure Job Approvers and Approve Jobs

Use job approval when you want to control jobs that could significantly impact the network. If a job requires approval, Cisco EPN Manager sends an e-mail to all users with Admin privileges and does not run the job until one of them approves it. If a job is rejected by an approver, the job is removed from the database. By default, all jobs do not require approval.

If job approval is already enabled and you want to view jobs that need approval, approve a job, or reject a job, choose **Administration > Settings > System Settings**, then choose **General > Job Approval**.

To enable job approval and configure the jobs that require approval before running:

-
- Step 1** Choose **Administration > Settings > System Settings**, then choose **General > Job Approval**.
- Step 2** Check the **Enable Job Approval** check box.
- Step 3** Find the jobs you want to configure for approval, and move them from the left field to the right field. For example, if you want an Admin user to approve adding new devices, move the **Import job** type.
- Step 4** To specify a customized job type, enter a string using regular expressions in the Job Type field, then click **Add**. For example, to enable job approval for all job types that start with Config, enter **Config***.
- Step 5** Click **Save**.
-

Configure Global Password Policies for Local Authentication

If you are using local authentication (Cisco EPN Manager 's authentication mechanism), you control the global password policies from the web GUI. If you are authenticating Cisco EPN Manager users using external authentication, the policies are controlled by an external application (see [Set Up External Authentication Using the CLI](#)).

By default, users are not forced to change passwords after any period of time. To enforce password changes and configure other password rules, choose **Administration > Users > Users, Roles & AAA**, then choose **Local Password Policy**.

Configure the Global Timeout for Idle Users

Cisco EPN Manager provides two settings that control when and how idle users are automatically logged out:

- **User Idle Timeout**—You can disable or configure this setting, which ends your user session automatically when you exceed the timeout. It is enabled by default and is set to 15 minutes.
- **Global Idle Timeout**—The Global Idle Timeout setting overrides the User Idle Timeout setting. The Global Idle Timeout is enabled by default and is set to 15 minutes. Only users with administrative privileges can disable the Global Idle Timeout setting or change its time limit.

By default, client sessions are disabled and users are automatically logged out after 15 minutes of inactivity. This is a global setting that applies to all users. For security purposes, you should not disable this mechanism,

but you can adjust the timeout value using the following procedure. To disable/change the timeout for an idle user, see [Disable Idle User Timeout, on page 17](#)


-
- Step 1** Choose **Administration > Settings > System Settings**, then choose **General > Server**.
- Step 2** In the **Global Idle Timeout** area, make sure the **Logout all idle users** check box is selected (this means the mechanism is enabled).
- Step 3** Configure the timeout by choosing a value from the **Logout all idle users after** drop-down list.
- Step 4** Click **Save**. You will need to log out and log back in for this change to take effect.
-

Disable Idle User Timeout

By default, client sessions are disabled and users are automatically logged out after certain period of inactivity. This is a global setting that applies to all users. To avoid being logged out during the installation, it is recommended to disable automatic logout of idle users in the system settings using the following procedure.



Note The Global Idle Timeout setting overrides the User Idle Timeout setting. To configure Global Idle Timeout settings, see [Configure the Global Timeout for Idle Users, on page 16](#).

-
- Step 1** Choose **Administration > Settings > System Settings**, then choose **General > Server**.
- Step 2** In the **Global Idle Timeout** area, uncheck the **Logout all idle users** check box and click **Save**.
- Step 3** Click  at the top right of web GUI window and choose **My Preferences**.
- Step 4** In the **User Idle Timeout** area, uncheck the **Logout idle user** check box and click **Save**. If you need to change the idle timeout value, then select **Logout idle user** check box and from the **Logout idle user after** drop-down list, choose one of the idle timeout limits. (But this cannot exceed the value set in the Global Idle Timeout settings.)
- Step 5** Click **Save**. You will need to log out and log back in for this change to take effect.
-

Create Virtual Domains to Control User Access to Devices

- [What Are Virtual Domains?, on page 18](#)
- [How Virtual Domains Affect Cisco EPN Manager Features, on page 18](#)
- [Create New Virtual Domains, on page 20](#)
- [Import a List of Virtual Domains, on page 22](#)
- [Add Network Devices to Virtual Domains, on page 23](#)

- [Assign Virtual Domains to Users](#), on page 23
- [Export the Cisco EPN Manager Virtual Domain Attributes for RADIUS and TACACS+](#), on page 25
- [Edit a Virtual Domain](#), on page 24
- [Delete a Virtual Domain](#), on page 24

What Are Virtual Domains?

Virtual domains are logical groupings of devices, sites, and other NEs, and are used to control who has access to those NEs. You choose which elements are included in a virtual domain and which users have access to that virtual domain. Virtual domains can be based on physical sites, device types, user communities, or any other designation you choose. All devices belong to ROOT-DOMAIN, which is the parent domain for all new virtual domains.

Virtual domains work in conjunction with user groups. Virtual domains control the devices a user can access, while user groups determine the actions a user can perform on those devices. Users with access to a virtual domain (depending on their privileges) can configure devices, view alarms, and generate reports for the NEs in their virtual domain.

You can create virtual domains after you have added devices to Cisco EPN Manager. Each virtual domain must have a name and can have an optional description, email address, and time zone. Cisco EPN Manager uses the email address and time zone that you specify to schedule and email domain-specific reports.

Users work in one virtual domain at a time. Users can change the current virtual domain by choosing a different one from the Virtual Domain drop-down list (see [Work In a Different Virtual Domain](#)).

Before you set up virtual domains, determine which users are responsible for managing particular areas of the network. Then organize your virtual domains according to those needs—for example, by geography, by device type, or by the user community served by the network.

How Virtual Domains Affect Cisco EPN Manager Features

Virtual domains are organized hierarchically. The ROOT-DOMAIN domain includes all virtual domains.

Because network elements are managed hierarchically, user views of devices—as well as some associated features and components—are affected by the user's virtual domain. The following topics describe the effects of virtual domains on these features.

- [Reports and Virtual Domains](#), on page 19
- [Search and Virtual Domains](#), on page 19
- [Alarms and Virtual Domains](#), on page 19
- [Maps and Virtual Domains](#), on page 19
- [Configuration Templates and Virtual Domains](#), on page 19
- [Config Groups and Virtual Domains](#), on page 19
- [Email Notifications and Virtual Domains](#), on page 20

Reports and Virtual Domains

Reports only include components that belong to the active virtual domain. A parent virtual domain cannot view reports from its child domains. New components are only reflected in reports that are generated after the components were added.

Search and Virtual Domains

Search results only include components that belong to the active domain. You can only view saved search results if you are in the same domain from which the search was performed and saved. When working in a parent domain, you cannot view the results of searches performed in child domains.

Alarms and Virtual Domains

When a component is added to a virtual domain, no previous alarms for that component are visible to that virtual domain. Only new alarms are visible. For example, if a network element is added to Cisco EPN Manager, and that network element generated alarms before and after it was added, its alarm history would only include alarms generated after it was added.

**Note**

For alarm email notifications, only the ROOT-DOMAIN virtual domain can enable Location Notifications, Location Servers, and Cisco EPN Manager email notifications.

Maps and Virtual Domains

Maps only display network elements that are members of the active virtual domain.

Configuration Templates and Virtual Domains

When you create or discover a configuration template in a virtual domain, it can only be applied to network elements in that virtual domain. If you apply a template to a device and then add that device to a child domain, the template is also available to the same device in the child domain.

**Note**

If you create a child domain and then apply a configuration template to both network elements in the virtual domain, Cisco EPN Manager might incorrectly reflect the number of partitions to which the template was applied.

Config Groups and Virtual Domains

A parent domain can view the network elements in a child domain's configuration groups. The parent domain can also edit the child domain's configuration groups.

Email Notifications and Virtual Domains

Email notifications can be configured per virtual domain.

For *alarm* email notifications, only the ROOT-DOMAIN can enable Location Notifications, Location Servers, and email notifications.

Create New Virtual Domains

To create a new virtual domain, use one of the following procedures depending on the desired hierarchy of the virtual domain.

To create a new virtual domain (<i>new-domain</i>) here:	See this procedure:
ROOT-DOMAIN > <i>new-domain</i>	Create Virtual Domains Directly Under ROOT-DOMAIN , on page 20
ROOT-DOMAIN > <i>existing-domain</i> > <i>new-domain</i>	Create Child Virtual Domains (Subdomains) , on page 21
ROOT-DOMAIN > <i>existing-domain</i> > <i>existing-domain</i> > <i>new-domain</i>	
(etc.)	

Create Virtual Domains Directly Under ROOT-DOMAIN

The following procedure creates an empty virtual domain under ROOT-DOMAIN. You can also create multiple virtual domains at one time by using the procedure in [Import a List of Virtual Domains](#), on page 22.

If a virtual domain already exists under ROOT-DOMAIN, and you want to create a new domain under it (a child domain), see [Create Child Virtual Domains \(Subdomains\)](#), on page 21.

-
- Step 1** Choose **Administration** > **Users** > **Virtual Domains**.
 - Step 2** In the Virtual Domains sidebar menu, click the + icon (Add New Domain).
 - Step 3** Enter a name in the Name text box. This is required.
 - Step 4** (Optional) Enter the new domain's time zone, email address and description.
 - Step 5** Click **Submit** to view a summary of the newly-created virtual domain.
-

What to Do Next

Add devices to the virtual domain as described in [Add Network Devices to Virtual Domains](#), on page 23.

Create Child Virtual Domains (Subdomains)

The following procedure creates a child virtual domain (also called a subdomain). A child virtual domain is a domain that is *not* directly under ROOT-DOMAIN; it is under a domain that is under ROOT-DOMAIN.

Do not use this procedure if you want the new virtual domain to appear directly under ROOT-DOMAIN. In that case, see [Create Virtual Domains Directly Under ROOT-DOMAIN](#), on page 20.

Step 1 Choose **Administration > Users > Virtual Domains**.

Step 2 In the Virtual Domains sidebar menu:

- Locate the domain under which you want to create a new child domain. (This is called the parent domain.) In this example, the parent domain is **California**.
- Click the information (i) icon next to the domain name. This opens a data popup window.
- In the popup window, click **Create Sub Domain**. The navigation pane switches to the list view, with the parent domain **California** displayed above **Untitled**.

Step 3 Enter a name in the Name text box. This is required. In this example, the new child domain is named **Los Angeles**. (The name in the navigation pane will not change from **Untitled** to **Los Angeles** until you save the new child domain.)

The screenshot shows the 'Create Sub Domain' form in the Cisco Evolved Programmable Network Manager. The form is titled 'ROOT-DOMAIN Untitled' and includes the following fields:

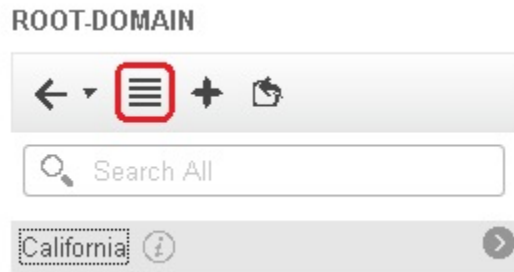
- Name:** Los Angeles
- Time Zone:** (GMT-8:0) America/Los_An...
- Email Address:** (empty)
- Description:** (empty)
- Parent Domain:** California

Below the form are tabs for Site Maps, Groups, Network Devices, Access Points, and Virtual Elements. The Network Devices tab is active, showing a table with columns for Device Name, IP Address/DNS, and Device.

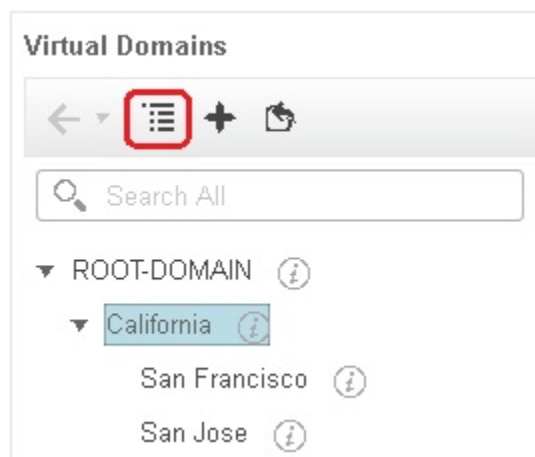
Device Name	IP Address/DNS	Device
<input type="text"/>	<input type="text"/>	<input type="text"/>

Step 4 (Optional) Enter the new domain's time zone, email address and description.

Step 5 Click **Submit** and confirm the creation of the new child domain. To revert back to the hierarchical view, click the view toggle button at the top of the navigation pane.



The view reverts to the hierarchical view.



What to Do Next

Add devices to the virtual domain as described in [Add Network Devices to Virtual Domains](#), on page 23.

Import a List of Virtual Domains

If you plan to create many virtual domains, or give them a complex hierarchy, you will find it easier to specify them in a properly formatted CSV file, and then import it. The CSV format allows you to specify a name,

description, time zone, and email address for each virtual domain you create, as well as each domain's parent domain. Adding network elements to the virtual domains must be performed separately.

-
- Step 1** Choose **Administration > Users > Virtual Domains**.
 - Step 2** Click the **Import Domain(s)** icon, download a sample CSV file from the link provided in the popup, and prepare the CSV file.
 - Step 3** Click **Choose File** and navigate to your CSV file.
 - Step 4** Click **Import** to import the CSV and create the virtual domains you specified.
-

What to Do Next

Add devices to the virtual domains as explained in [Add Network Devices to Virtual Domains](#), on page 23.

Add Network Devices to Virtual Domains

Use this procedure to add network devices to a virtual domain. When you add a new network device to an existing virtual domain, the device becomes immediately accessible to users with access to that domain (users do not have to restart the web GUI).

-
- Step 1** Choose **Administration > Users > Virtual Domains**.
 - Step 2** From the Virtual Domains sidebar menu, click the virtual domain to which you want to add network devices.
 - Step 3** Click the **Network Devices** tab, then click **Add**.
 - Step 4** Select the network devices you want to add to the domain. Note that the Select Network Devices dialog lists all managed devices, not only those that are in the parent domain. If you add a device that is not included in the parent domain, Cisco EPN Manager adds it to both the child and parent domain.
 - a) Select the devices you want to add to the domain. You can use the **Filter By** drop-down list to locate the devices you want to add.
 - b) Click **Select**.
 - Step 5** Click **Submit** to view the summary of the virtual domain contents.
 - Step 6** Click **Save** to confirm your changes.
-

What to Do Next

Give users access to the virtual domain as described in [Assign Virtual Domains to Users](#), on page 23.

Assign Virtual Domains to Users

Once a virtual domain is assigned to a user account, the user is restricted to viewing and performing operations on the devices in their assigned domain(s).

**Note**

When using external AAA, be sure to add the custom attributes for virtual domains to the appropriate user or group configuration on the external AAA server. See [Use Cisco EPN Manager Virtual Domains with RADIUS and TACACS+, on page 25](#).

-
- Step 1** Choose **Administration > Users > Users, Roles & AAA > Users**.
- Step 2** Select the user to whom you want to grant device access.
- Step 3** Click the **Virtual Domains** tab.
- Step 4** Use the **Add** and **Remove** buttons to make your assignment changes, then click **Save**.
-

Edit a Virtual Domain

To adjust a virtual domain, choose it from the Virtual Domain Hierarchy on the left sidebar menu to view or edit its assigned network devices. You cannot edit any of the settings for ROOT-DOMAIN.

-
- Step 1** Choose **Administration > Users > Virtual Domains**.
- Step 2** Click the virtual domain you want to edit in the Virtual Domains sidebar menu.
- Step 3** To adjust the name, email address, time zone, or description, enter your changes in the text boxes.
- Step 4** To adjust device members:
- To add devices, click **Add** and follow the instructions in [Add Network Devices to Virtual Domains, on page 23](#).
 - To delete devices, select the devices using their check boxes, then click **Delete**.
- Step 5** Click **Submit**, then check the summary of your changes.
- Step 6** Click **Save** to apply and save your edits.
-

Delete a Virtual Domain

Use this procedure to delete a virtual domain from Cisco EPN Manager . This procedure only deletes the virtual domain; it does not delete the network elements from Cisco EPN Manager (the network elements will continue to be managed by Cisco EPN Manager).

Before You Begin

You can only delete a virtual domain if:

- The virtual domain does not contain any network elements and does not have any child domains.
- It is not the only domain a user can access. In other words, if a Cisco EPN Manager user has access to *only* that domain, you cannot delete it.

- No users are logged into the domain.

-
- Step 1** Choose **Administration > Users > Virtual Domains**.
- Step 2** In the Virtual Domains sidebar menu, click the information (i) icon next to the virtual domain name. This opens a data popup window.
- Step 3** In the popup window, click **Delete**.
- Step 4** Click **OK** to confirm deleting the virtual domain.
-

Use Cisco EPN Manager Virtual Domains with RADIUS and TACACS+

Your RADIUS or TACACS+ servers must be configured to recognize the virtual domains that exist in Cisco EPN Manager . You can do this using the procedure in [Export the Cisco EPN Manager Virtual Domain Attributes for RADIUS and TACACS+](#), on page 25.

If your RADIUS or TACACS+ server does not have any virtual domain information for a user, the following occurs, depending on the number of virtual domains that are configured in Cisco EPN Manager :

- If Cisco EPN Manager has only one virtual domain (ROOT-DOMAIN), the user is assigned the ROOT-DOMAIN by default.
- If Cisco EPN Manager has multiple virtual domains, the user is prevented from logging in.

Export the Cisco EPN Manager Virtual Domain Attributes for RADIUS and TACACS+

If you are using RADIUS or TACACS+, you must copy all Cisco EPN Manager virtual domain information into your Cisco ACS or Cisco ISE server. You can do this using the Virtual Domains Custom Attributes dialog box provided in the Cisco EPN Manager web GUI. If you do not export the data into your Cisco ACS or Cisco ISE server, Cisco EPN Manager will not allow users to log in.

The following information must be exported, depending on the protocol you are using:

- TACACS+—Requires virtual domain, role, and task information.
- RADIUS—Requires virtual domain and role information (tasks are automatically added).

When you create a child domain for an existing virtual domain, the sequence numbers for the RADIUS/TACACS+ custom attributes are also updated in the parent virtual domain. These sequence numbers are for representation only and do not impact AAA integration.

Information in the Virtual Domains Custom Attributes dialog is preformatted for use with Cisco ACS server.

**Note**

When you add tasks to the external server, be sure to add the **Home Menu Access** task. It is mandatory for all users.

Before You Begin

Make sure you have added the AAA server and configured the AAA mode as explained in [Configure External Authentication](#), on page 27.

Step 1

In Cisco EPN Manager :

- a) Choose **Administration > Users > Virtual Domains**.
- b) Click **Export Custom Attributes** at the top right of the window. This opens the Virtual Domain Custom Attributes dialog.
- c) Copy the attributes list.
 - If you are using RADIUS, right-click *all of the text* in the RADIUS Custom Attributes field and choose **Copy**.
 - If you are using TACACS+, right-click *all of the text* in the TACACS+ Custom Attributes field and choose **Copy**.

Step 2

Paste the information into your Cisco ACS or Cisco ISE server. These steps show how to add the information to an existing user group in Cisco ACS. If you have not yet added this information to Cisco ACS or Cisco ISE, see:

- [Use Cisco ACS With RADIUS or TACACS+ for External Authentication](#), on page 34
 - [Use Cisco ISE With RADIUS or TACACS+ for External Authentication](#), on page 29
- a) Navigate to **User or Group Setup**.
If you want to specify virtual domains on a per-user basis, then you need to make sure you add all of the custom attributes (for example, tasks, roles, virtual domains) information to the User custom attribute page.
 - a) For the applicable user or group, click **Edit Settings**.
 - b) Paste the attributes list into the appropriate text box.
 - c) Select the check boxes to enable these attributes, then click **Submit + Restart**.

Configure Local Authentication

Cisco EPN Manager uses local authentication by default, which means that user passwords are stored and verified from the Cisco EPN Manager database. To check the authentication mode that is being used, choose **Administration > Users > Users, Roles & AAA**, then choose **AAA Mode Settings**. The selection is displayed on the AAA Mode Settings page. If you are using local authentication, be sure to configure strong password policies. See [Configure Global Password Policies for Local Authentication](#), on page 16.

If you want to use SSO with local authentication, see [Use SSO With Local Authentication](#), on page 26.

For information on external authentication, see [Configure External Authentication](#), on page 27.

Use SSO With Local Authentication

To use SSO with local authentication, you must add the SSO server and then configure Cisco EPN Manager to use SSO in local mode.

If you have deployed Cisco EPN Manager in a high availability environment where you have a primary and backup server, refer to the instructions in [Configure an SSO Server in a High Availability Environment](#).

Cisco EPN Manager does not support localization on the SSO sign-in page.

The following topics describe how to configure SSO for external authentication, but you can use the same procedures to configure SSO for local authentication. The only difference is that when you configure the SSO mode on the Cisco EPN Manager server, choose **Local** mode (not RADIUS or TACACS+).

- [Add the SSO Server, on page 40](#)
- [Configure SSO Mode on the Cisco EPN Manager Server, on page 41](#)

Configure External Authentication

Users with web GUI root user or SuperUser privileges can configure Cisco EPN Manager to communicate with external RADIUS, TACACS+, SSO, and LDAP servers for external authentication, authorization, and accounting (AAA). If you choose to configure external authentication, the user groups, users, authorization profiles, authentication policies, and policy rules must be created in the external server through which all access requests to Cisco EPN Manager will be routed.

You can use a maximum of three AAA servers. Users are authenticated on the second server only if the first server is not reachable or has network problems.

If you want to configure external authentication from the CLI, see [Set Up External Authentication Using the CLI](#).

See the following topics for more information.

- [Integrate Cisco EPN Manager with an LDAP Server, on page 27](#)
- [Use RADIUS or TACACS+ for External Authentication, on page 27](#)
- [Use Cisco ISE With RADIUS or TACACS+ for External Authentication, on page 29](#)
- [Use Cisco ACS With RADIUS or TACACS+ for External Authentication, on page 34](#)
- [Use SSO with External Authentication, on page 40](#)

Integrate Cisco EPN Manager with an LDAP Server

Cisco EPN Manager supports external authentication using an LDAP server. If you are interested in this configuration, contact your Cisco representative.

Use RADIUS or TACACS+ for External Authentication

These topics explain how to configure Cisco EPN Manager to use RADIUS or TACACS+ servers.

- [Add a RADIUS or TACACS+ Server to Cisco EPN Manager, on page 28](#)
- [Configure RADIUS or TACACS+ Mode on the Cisco EPN Manager Server, on page 29](#)

Add a RADIUS or TACACS+ Server to Cisco EPN Manager

To add a RADIUS or TACACS+ server to Cisco EPN Manager :

-
- Step 1** Choose **Administration > Users > Users, Roles & AAA**, then choose **RADIUS Servers**.
- Step 2** Select the type of server you want to add.
- For RADIUS, choose **RADIUS Servers**. From the **Select a command** drop-down list, choose **Add RADIUS Server**, then click **Go**.
 - For TACACS+, choose **TACACS+ Servers**. From the **Select a command** drop-down list, choose **Add TACACS+ Server**, then click **Go**.
- Step 3** Enter the required information—IP address, DNS Name, and so forth. For Cisco EPN Manager to communicate with the external authentication server, the shared secret you enter on this page must match the shared secret configured on the RADIUS or TACACS+ server. You can use alphabets, numbers, and special characters except ' (single quote) and " (double quote) while entering the shared secret key for a third-party TACACS+ or RADIUS server.
- Step 4** Select the authentication type.
- PAP—Password-based authentication is the protocol where two entities share a password in advance and use the password as the basis of authentication.
 - CHAP—Challenge-Handshake Authentication Protocol requires that both the client and server know the plain text of the secret, although it is never sent over the network. CHAP provides greater security than Password Authentication Protocol (PAP).
 - (RADIUS only) EAP_TLS—Extensible Authentication Protocol—Transport Layer Security is a secure protocol as it supports certificate-based mutual authentication. When EAP-TLS is selected as the authentication type, the generated key must be added to Cisco EPN Manager keystore using **ncs key importsigndcert** admin CLI, and the certificate chains must be present in RADIUS server. This does not require a restart of the Cisco EPN Manager services.
- Step 5** If you have enabled the High Availability feature and configured a virtual IP address for the **Local Interface IP**, choose either the virtual IP address or the physical IP address of the primary server. (See the information on setting up and installing high availability on a secondary server in the [Cisco Evolved Programmable Network Manager Installation Guide](#).)
- Note** The IP address configured in the external authentication server must match the **Local Interface IP**.
- Step 6** Click **Save**.
-

Configure RADIUS or TACACS+ Mode on the Cisco EPN Manager Server

-
- Step 1** Choose **Administration > Users > Users, Roles & AAA**, then choose **AAA Mode**.
- Step 2** Select **TACACS+** or **RADIUS**.
- Step 3** Check the **Enable Fallback to Local** check box to enable the use of the local database when the external AAA server is down.
- Step 4** If you want to revert to local authentication if the external RADIUS or TACACS+ server goes down, perform the following steps:
- a) Select **Enable Fallback to Local**.
 - b) Specify the fall back conditions—either **ONLY on no server response** or **on authentication failure or no server response**.
- Step 5** Click **Save**.
-

Use Cisco ISE With RADIUS or TACACS+ for External Authentication

Cisco Identity Services Engine (ISE) uses the RADIUS or TACACS+ protocols for authentication, authorization, and accounting (AAA). You can integrate Cisco EPN Manager with Cisco ISE to authenticate the Cisco EPN Manager users using the RADIUS or TACACS+ protocols. When you use external authentication, the details such as users, user groups, passwords, authorization profiles, authorization policies, and policy rules that are required for AAA must be stored and verified from the Cisco ISE database.

Complete the following tasks to use Cisco ISE with the RADIUS or TACACS+ protocol for external authentication:

Tasks to be completed to use Cisco ISE for external authentication	For information, see:
Make sure you are using a supported version of Cisco ISE	Supported Versions of Cisco ISE in Cisco EPN Manager , on page 30
Add Cisco EPN Manager as an AAA client in Cisco ISE	Add Cisco EPN Manager as a Client in Cisco ISE , on page 30
Create a user group in Cisco ISE	Create a User Group in Cisco ISE , on page 31
Create a user in Cisco ISE and add the user to the user group that is created in Cisco ISE	Create a User and Add the User to a User Group in Cisco ISE , on page 31

(If using RADIUS) Create an authorization profile for network access in Cisco ISE, and add the RADIUS custom attributes with user roles and virtual domains created in Cisco EPN Manager Note For RADIUS, you do not need to add the attributes for user tasks. They are automatically added based on the user roles.	Create an Authorization Profile for RADIUS in Cisco ISE, on page 31
(If using TACACS+) Create an authorization profile for network access in Cisco ISE, and add the TACACS+ custom attributes with user roles, tasks, and virtual domains created in Cisco EPN Manager Note For TACACS+, you must also add the attributes for user tasks.	Create an Authorization Profile for TACACS+ in Cisco ISE, on page 32
Create an authorization policy in Cisco ISE and associate the policy with the user groups and authorization profile created in Cisco ISE	Configure an Authorization Policy in Cisco ISE, on page 33
Create an authentication policy to define the protocols that Cisco ISE must use to communicate with Cisco EPN Manager , and the identity sources that it uses for authenticating users to Cisco EPN Manager	Create an Authentication Policy in Cisco ISE, on page 34
Add Cisco ISE as a RADIUS or TACACS+ server in Cisco EPN Manager	Add a RADIUS or TACACS+ Server to Cisco EPN Manager , on page 28
Configure the RADIUS or TACACS+ mode on the Cisco EPN Manager server	Configure RADIUS or TACACS+ Mode on the Cisco EPN Manager Server, on page 29

Supported Versions of Cisco ISE in Cisco EPN Manager

Cisco EPN Manager supports Cisco ISE 1.x and 2.x releases .

Add Cisco EPN Manager as a Client in Cisco ISE

-
- Step 1** Log in to Cisco ISE as the admin user.
- Step 2** Choose **Administration > Network Resources > Network Devices**.
- Step 3** In the **Network Devices** page, click **Add**.
- Step 4** Enter the device name and IP address of the Cisco EPN Manager server.
- Step 5** Check the **Authentication Settings** check box, and then enter the shared secret.
Note Ensure that this shared secret matches the shared secret you enter when adding the Cisco ISE server as the RADIUS server in Cisco EPN Manager .
- Step 6** Click **Submit**.
-

Create a User Group in Cisco ISE

-
- Step 1** Log in to Cisco ISE as the admin user.
- Step 2** Choose **Administration > Identity Management > Groups**.
- Step 3** In the **User Identity Groups** page, click **Add**.
- Step 4** In the **Identity Group** page, enter the name and description of the user group.
- Step 5** Click **Submit**.
-

Create a User and Add the User to a User Group in Cisco ISE

-
- Step 1** Log in to Cisco ISE as the admin user.
- Step 2** Choose **Administration > Identity Management > Identities**.
- Step 3** In the **Network Access Users** page, click **Add**.
- Step 4** From the **Select an item** drop-down list, choose a user group to assign the user to.
- Step 5** Click **Submit**.
-

Create an Authorization Profile for RADIUS in Cisco ISE

You create authorization profiles to define how different types of users are authorized to access the network. For example, you can define that a user attempting to access the network over a VPN connection is treated more strictly than a user attempting to access the network through a wired connection.

When you create an authorization profile for device administration, you must add the RADIUS custom attributes that are associated with user roles, tasks, and virtual domains created in Cisco EPN Manager .



Note For RADIUS, you can add the user role attributes without adding the task attributes. The tasks are automatically added with the user roles.

For more information about Cisco ISE authorization profiles, see the information on managing authorization policies and profiles in the [Cisco Identity Services Engine Administrator Guide](#).

To create an authorization profile for RADIUS in Cisco ISE:

Before You Begin

Make sure you have the complete list of the following Cisco EPN Manager custom attributes for RADIUS. You will need to add this information to Cisco ISE in this procedure.

- Cisco EPN Manager user roles and tasks—see [Export the Cisco EPN Manager User Group and Task List Attributes for RADIUS and TACACS+](#), on page 11

- Cisco EPN Manager virtual domains—see [Export the Cisco EPN Manager Virtual Domain Attributes for RADIUS and TACACS+](#), on page 25

-
- Step 1** Log in to Cisco ISE as the admin user.
- Step 2** Choose **Policy > Policy Elements > Results**.
- Step 3** From the left sidebar, choose **Authorization > Authorization Profiles**.
- Step 4** In the **Standard Authorization Profiles** page, click **Add**.
- Step 5** In the **Authorization Profile** page, enter the name and description of the authorization profile.
- Step 6** From the **Access Type** drop-down list, choose **ACCESS_ACCEPT**.
- Step 7** In the **Advanced Attributes Settings** area, paste in the complete list of RADIUS custom attributes for:
- User roles
 - Virtual domains
- Note** If you do add user tasks, be sure to add the Home Menu Access task. It is mandatory.
- Step 8** Click **Submit**.
-

Create an Authorization Profile for TACACS+ in Cisco ISE

You create authorization profiles to define how different types of users are authorized to access the network. For example, you can define that a user attempting to access the network over a VPN connection is treated more strictly than a user attempting to access the network through a wired connection.

When you create an authorization profile for device administration, you must add the TACACS+ custom attributes that are associated with user roles, tasks, and virtual domains created in Cisco EPN Manager .



Note For TACACS+, you must add the user role *and* task attributes. (Task attributes are not required for RADIUS.)

For more information about Cisco ISE authorization profiles, see the information on managing authorization policies and profiles in the [Cisco Identity Services Engine Administrator Guide](#).

To create an authorization profile for TACACS+ in Cisco ISE:

Before You Begin

Make sure you have the complete list of the following Cisco EPN Manager custom attributes for TACACS+. You will need to add this information to Cisco ISE in this procedure.

- Cisco EPN Manager user roles and tasks—see [Export the Cisco EPN Manager User Group and Task List Attributes for RADIUS and TACACS+](#), on page 11

- Cisco EPN Manager virtual domains—see [Export the Cisco EPN Manager Virtual Domain Attributes for RADIUS and TACACS+, on page 25](#)

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- Step 1** Log in to Cisco ISE as the admin user.
- Step 2** Choose **Policy > Policy Elements > Results**.
- Step 3** From the left sidebar, choose **Authorization > Authorization Profiles**.
- Step 4** In the **Standard Authorization Profiles** page, click **Add**.
- Step 5** In the **Authorization Profile** page, enter the name and description of the authorization profile.
- Step 6** From the **Access Type** drop-down list, choose **ACCESS_ACCEPT**.
- Step 7** In the **Advanced Attributes Settings** area, paste in the complete list of TACACS+ custom attributes for:
- User roles, including the tasks
 - Virtual domains

Note Be sure to add the Home Menu Access task. It is mandatory.

- Step 8** Click **Submit**.
-

Configure an Authorization Policy in Cisco ISE

An authorization policy consists of a rule or a set of rules that are user-defined and produce a specific set of permissions, which are defined in an authorization profile. Based on the authorization profile, access requests to Cisco EPN Manager are processed.

There are two types of authorization policies that you can configure:

- **Standard**—Standard policies are intended to be stable and are created to remain in effect for long periods of time, to apply to a larger group of users, devices, or groups that share a common set of privileges.
- **Exception**—Exception policies are created to meet an immediate or short-term need, such as authorizing a limited number of users, devices, or groups to access network resources. An exception policy lets you create a specific set of customized values for an identity group, condition, or permission that are tailored for one user or a subset of users.

For more information about authorization policies, see the “Manage Authorization Policies and Profiles” chapter in the [Cisco Identity Services Engine Administrator Guide](#).

To create an authorization policy in Cisco ISE:

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- Step 1** Log in to Cisco ISE as the admin user.
- Step 2** Choose **Policy > Authorization**.
- Step 3** In the **Standard** area, click the down arrow on the far right and select either **Insert New Rule Above** or **Insert New Rule Below**.
- Step 4** Enter the rule name and choose identity group, condition, attribute, and permission for the authorization policy.

For example, you can define a user group as Cisco EPN Manager -SystemMonitoring-Group and choose this group from the Identity Groups drop-down list. Similarly, define an authorization profile as Cisco EPN Manager -SystemMonitoring-authorization profile and choose this profile from the Permissions drop-down list. Now, you have defined a rule where all users belonging to the Cisco EPN Manager System Monitoring identity group receive an appropriate authorization policy with system monitoring custom attributes defined.

Step 5 Click **Done**, and then click **Save**.

Create an Authentication Policy in Cisco ISE

Authentication policies define the protocols that Cisco ISE uses to communicate with Cisco EPN Manager , and the identity sources that it uses for authenticating users to Cisco EPN Manager . An identity source is an internal or external database where the user information is stored.

You can create two types of authentication policies in Cisco ISE:

- Simple authentication policy - In this policy, you can choose the allowed protocols and identity sources to authenticate users.
- Rule-based authentication policy - In this policy, you can define conditions that allow Cisco ISE to dynamically choose the allowed protocols and identity sources.

For more information about authentication policies, see the "Manage Authentication Policies" chapter in the [Cisco Identity Services Engine Administrator Guide](#).

To create an authentication policy in Cisco ISE:

- Step 1** Log in to Cisco ISE as the Super Admin or System Admin user.
- Step 2** Choose **Policy > Authentication**.
- Step 3** Choose the Policy Type as **Simple** or **Rule-Based** to create the required authentication policy.
- Step 4** Enter the required details based on the policy type selected.
- Step 5** Click **Save**.
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Use Cisco ACS With RADIUS or TACACS+ for External Authentication

Cisco Secure Access Control System (ACS) uses RADIUS and TACACS+ protocol for authentication, authorization, and accounting (AAA). You can integrate Cisco EPN Manager with Cisco ACS to authenticate the Cisco EPN Manager users using the RADIUS or TACACS+ protocol. When you use an external authentication, the details such as users, user roles, passwords, authorization profiles, authorization policies, and policy rules that are required for AAA must be stored and verified from the Cisco ACS database.

Complete the following tasks to use Cisco ACS with the RADIUS or TACACS+ protocol for external authentication:

Tasks to be completed to use Cisco ACS for external authentication	For information, see:
Make sure you are using a supported version of Cisco ACS	Supported Versions of Cisco ACS in Cisco EPN Manager , on page 36
Add Cisco EPN Manager as an AAA client in Cisco ACS	Add Cisco EPN Manager as a Client in Cisco ACS , on page 36
Create a user group in Cisco ACS	Create a User Group in Cisco ACS , on page 36
Create a user in Cisco ACS and add the user to the Cisco ACS user group	Create a User and Add the User to a User Group in Cisco ACS , on page 36
(If using RADIUS) Create an authorization profile for network access in Cisco ACS, and add the RADIUS custom attributes for user roles and virtual domains created in Cisco EPN Manager . Note For RADIUS, you do not need to add the attributes for user tasks. They are automatically added based on the user roles.	Create an Authorization Profile for RADIUS in Cisco ACS , on page 37
(If using TACACS+) Create an authorization profile for device administration in Cisco ACS, and add the TACACS+ custom attributes with user roles, tasks, and virtual domains created in Cisco EPN Manager . Note For TACACS+, you must also add the attributes for user tasks.	Create an Authorization Profile for TACACS+ in Cisco ACS , on page 37
Create an access service in Cisco ACS and define a policy structure for the access service.	Create an Access Service for Cisco EPN Manager in Cisco ACS , on page 38
Create an authorization policy rule in Cisco ACS, and map the authorization or shell profile based on the access type (network access or device administration).	Create an Authorization Policy Rule in Cisco ACS , on page 39
Configure a service selection policy in Cisco ACS and assign an access service to an incoming request.	Configure a Service Selection Policy in Cisco ACS , on page 40
Add Cisco ACS as a RADIUS or TACACS+ server in Cisco EPN Manager .	Add a RADIUS or TACACS+ Server to Cisco EPN Manager , on page 28
Configure the RADIUS or TACACS+ mode on the Cisco EPN Manager server.	Configure RADIUS or TACACS+ Mode on the Cisco EPN Manager Server , on page 29

Supported Versions of Cisco ACS in Cisco EPN Manager

Cisco EPN Manager supports Cisco ACS 5.x releases.

Add Cisco EPN Manager as a Client in Cisco ACS

- Step 1** Log in to Cisco ACS as the admin user.
- Step 2** From the left sidebar, choose **Network Resources > Network Devices > Network Devices and AAA Clients**.
- Step 3** In the **Network Devices** page, click **Create**.
- Step 4** Enter the device name and IP address of the Cisco EPN Manager server.
- Step 5** Choose the authentication option as **RADIUS** or **TACACS+**, and enter the shared secret.
- Note** Ensure that this shared secret matches the shared secret you enter when adding the Cisco ACS server as the RADIUS or TACACS+ server in Cisco EPN Manager .
- Step 6** Click **Submit**.
-

Create a User Group in Cisco ACS

- Step 1** Log in to Cisco ACS as the admin user.
- Step 2** From the left sidebar, Choose **Users and Identity Stores > Identity Groups**.
- Step 3** In the **Identity Groups** page, click **Create**.
- Step 4** Enter the name and description of the user group.
- Step 5** Select a network device group parent for the user group.
- Step 6** Click **Submit**.
-

Create a User and Add the User to a User Group in Cisco ACS

- Step 1** Log in to Cisco ACS as the admin user.
- Step 2** From the left sidebar, Choose **Users and Identity Stores > Internal Identity Stores > Users**.
- Step 3** In the **Internal Users** page, click **Create**.
- Step 4** Enter the required details.
- Step 5** In the **Identity Group** field, click **Select** to choose a user group to assign the user to.
- Step 6** Click **Submit**.
-

Create an Authorization Profile for RADIUS in Cisco ACS

You create authorization profiles to define how different types of users are authorized to access the network. For example, you can define that a user attempting to access the network over a VPN connection is treated more strictly than a user attempting to access the network through a wired connection.

When you create an authorization profile for device administration, you must add the RADIUS custom attributes that are associated with user roles, tasks, and virtual domains created in Cisco EPN Manager .



Note For RADIUS, you can add the user role attributes without adding the task attributes. The tasks are automatically added with the user roles.

For more information about Cisco ACS authorization profiles and policies, see chapters on managing policy elements and access policies in the [User Guide for Cisco Secure Access Control System](#).

To create an authorization profile for RADIUS in Cisco ACS:

Before You Begin

Make sure you have the complete list of the following Cisco EPN Manager custom attributes for RADIUS. You will need to add this information to Cisco ACS in this procedure.

- Cisco EPN Manager user roles and tasks—see [Export the Cisco EPN Manager User Group and Task List Attributes for RADIUS and TACACS+](#), on page 11
- Cisco EPN Manager virtual domains—see [Export the Cisco EPN Manager Virtual Domain Attributes for RADIUS and TACACS+](#), on page 25

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- Step 1** Log in to Cisco ACS as the admin user.
- Step 2** From the left sidebar, choose **Policy Elements > Authorizations and Permissions > Network Access > Authorization Profiles**.
- Step 3** Click **Create**.
- Step 4** On the **General** tab, enter the name and description of the authorization profile.
- Step 5** Click the **RADIUS Attributes** tab, and paste in the complete list of RADIUS custom attributes for:
- User roles
 - Virtual domains
- Note** If you do add user tasks, be sure to add the Home Menu Access task. It is mandatory.
- Step 6** Click **Submit**.
-

Create an Authorization Profile for TACACS+ in Cisco ACS

When you create an authorization profile for device administration, you must add the TACACS+ custom attributes that are associated with user roles, tasks, and virtual domains created in Cisco EPN Manager .

**Note**

For TACACS+, you must add the user role *and* task attributes. (Task attributes are not required for RADIUS.)

For more information about Cisco ACS authorization profiles and policies, see chapters on managing policy elements and access policies in the [User Guide for Cisco Secure Access Control System](#).

To create an authorization profile for TACACS+ in Cisco ACS:

Before You Begin

Make sure you have the complete list of the following Cisco EPN Manager custom attributes. You will need to add this information to Cisco ACS in this procedure.

- Cisco EPN Manager user roles and tasks—see [Export the Cisco EPN Manager User Group and Task List Attributes for RADIUS and TACACS+](#), on page 11
- Cisco EPN Manager virtual domains—see [Export the Cisco EPN Manager Virtual Domain Attributes for RADIUS and TACACS+](#), on page 25.

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- Step 1** Log in to Cisco ACS as the admin user.
- Step 2** From the left sidebar, choose **Policy Elements > Authorizations and Permissions > Device Administration > Shell Profiles**.
- Step 3** Click **Create**.
- Step 4** On the **General** tab, enter the name and description of the authorization profile.
- Step 5** Click the **Custom Attributes** tab, and paste in the complete list of TACACS+ custom attributes for:
- User roles, including the tasks
 - Virtual domains
- Note** Be sure to add the Home Menu Access task. It is mandatory.
- Step 6** Click **Submit**.
-

Create an Access Service for Cisco EPN Manager in Cisco ACS

Access services contain the authentication and authorization policies for access requests. You can create separate access services for different use cases; for example, device administration (TACACS+), network access (RADIUS), and so on.

When you create an access service in Cisco ACS, you define the type of policies and policy structures that it contains; for example, policies for device administration, network access, and so on.



Note You must create access services before you define service selection rules, although you do not need to define the policies in the services.

To create an access service for Cisco EPN Manager requests:

-
- Step 1** Log in to Cisco ACS as the admin user.
- Step 2** From the left sidebar, choose **Access Policies > Access Services**.
- Step 3** Click **Create**.
- Step 4** Enter the name and description of the access service.
- Step 5** Choose one of the following options to define a policy structure for the access service:
- **Based on service template**—Creates an access service containing policies based on a predefined template.
 - **Based on existing service**—Creates an access service containing policies based on an existing access service. However, the new access service does not include the existing service's policy rules.
 - **User selected service type**—Provides you the option to select the access service type. The available options are Network Access (RADIUS), Device Administration (TACACS+), and External Proxy (External RADIUS or TACACS+ servers).
- Step 6** Click **Next**.
- Step 7** Choose the authentication protocols that are allowed for the access service.
- Step 8** Click **Finish**.
-

Create an Authorization Policy Rule in Cisco ACS

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- Step 1** Log in to Cisco ACS as the admin user.
- Step 2** From the left sidebar, choose **Access Policies > Access Services > service > Authorization**.
- Step 3** Click **Create**.
- Step 4** Enter the name of the rule and then choose the rule status.
- Step 5** Configure the required conditions for the rule.
For example, you can create a rule based on the location, device type, or user group that you have created.
- Step 6** If you are creating an authorization policy rule for network access (RADIUS), choose the required authorization profile(s) to map to the authorization policy rule.
Alternatively, if you are creating an authorization policy rule for device administration (TACACS+), choose the required shell profile(s) to map to the authorization policy rule.
- Note** If you are using multiple authorization profiles or shell profiles, make sure you order them in priority.
- Step 7** Click **OK**.
-

Configure a Service Selection Policy in Cisco ACS

A service selection policy determines which access service applies to an incoming request. For example, you can configure a service selection policy to apply the device administration access service to any access request that uses the TACACS+ protocol.

You can configure two types of service selection policy:

- Simple service selection policy—Applies the same access service to all requests.
- Rule-based service selection policy—Contains one or more conditions and a result, which is the access service that will be applied to an incoming request.

To configure a service selection policy:

-
- Step 1** Log in to Cisco ACS as the admin user.
- Step 2** From the left sidebar, choose **Access Policies > Access Services > Service Selection Rules**.
- Step 3** If you want to configure a simple service selection policy, click the **Single result selection** radio button, and then choose an access service to apply to all requests.
Alternatively, if you want to configure a rule-based service selection policy, click the **Rule based result selection** radio button, and then click **Create**.
- Step 4** Enter the name of the rule and then choose the rule status.
- Step 5** Choose either **RADIUS** or **TACACS+** as the protocol for the service selection policy.
- Step 6** Configure the required compound condition, and then choose an access service to apply to an incoming request.
- Step 7** Click **OK**, and then click **Save Changes**.
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Use SSO with External Authentication

To set up and use SSO (with or without a RADIUS or TACACS+ server), see these topics:

- [Add the SSO Server, on page 40](#)
- [Configure SSO Mode on the Cisco EPN Manager Server, on page 41](#)

Cisco EPN Manager does not support localization on the SSO sign-in page.

Add the SSO Server

If you have deployed Cisco EPN Manager in a high availability environment where you have a primary and backup server, refer to the instructions in [Configure an SSO Server in a High Availability Environment](#).

Cisco EPN Manager can be configured with a maximum of three AAA servers.

-
- Step 1** Choose **Administration > Users > Users, Roles & AAA**, then choose **SSO Servers**.
 - Step 2** From the **Select a command** drop-down list, choose **Add SSO Servers**, then click **Go**.
 - Step 3** Enter the SSO information. The maximum number of server retries for an SSO server authentication request is 3.
 - Step 4** Click **Save**.
-

Configure SSO Mode on the Cisco EPN Manager Server

The SSO functionality distributes CA and self-signed certificate when the SSO server is added to the SSO client.

Cisco EPN Manager supports CA and self-signed certificates as long as the Common Name (CN) field of the certificate contains the Fully Qualified Domain Name (FQDN) of the server on both the SSO client and the SSO server. The server must be capable of name resolution from the IP address to the FQDN. In addition, the hostname must match the left-most component of the FQDN. SSO requires accurate DNS configuration. You must define the DNS with fully qualified domain name (FQDN). For example, the nslookup command and expected data when configuring DNS with FQDN is:

```
hostname CUSTOMER_HOSTNAME
nslookup CUSTOMER_HOSTNAME
Server: ...
Address: ...
Name: CUSTOMER_HOSTNAME.example.com
Address: ...
```

For SSO operation, Cisco EPN Manager requires that the SSL/TLS certificate hold the FQDN in the CN field. To verify that the certificate used by your Cisco EPN Manager server has the FQDN in the CN field, use your browser to view the certificate. If the certificate does not contain the FQDN in the CN field, you must regenerate the certificate and redistribute it to all users that have the old certificate.



Note If you are using this procedure to configure SSO but are using local authentication, choose **Local** in Step 2.

-
- Step 1** Choose **Administration > Users > Users, Roles & AAA**, then choose **SSO Server Settings**.
 - Step 2** Choose which SSO Server AAA Mode you want to use. You can select only one at a time.
 - Step 3** Click **OK**.
-

