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• Related Cisco UCS Documentation, on page xiii
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Audience

This guide is intended primarily for data center administrators with responsibilities and expertise in one or more of the following:

• Server administration
• Storage administration
• Network administration
• Network security

Conventions

<table>
<thead>
<tr>
<th>Text Type</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>GUI elements</td>
<td>GUI elements such as tab titles, area names, and field labels appear in this font. Main titles such as window, dialog box, and wizard titles appear in this font.</td>
</tr>
<tr>
<td>TUI elements</td>
<td>In a Text-based User Interface, text the system displays appears in this font.</td>
</tr>
<tr>
<td>System output</td>
<td>Terminal sessions and information that the system displays appear in this font.</td>
</tr>
<tr>
<td>CLI commands</td>
<td>CLI command keywords appear in this font. Variables in a CLI command appear in this font.</td>
</tr>
<tr>
<td>[ ]</td>
<td>Elements in square brackets are optional.</td>
</tr>
</tbody>
</table>
### Text Type

<table>
<thead>
<tr>
<th>Text Type</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>{x</td>
<td>y</td>
</tr>
<tr>
<td>[x</td>
<td>y</td>
</tr>
<tr>
<td>string</td>
<td>A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.</td>
</tr>
<tr>
<td>&lt;&gt;</td>
<td>Nonprinting characters such as passwords are in angle brackets.</td>
</tr>
<tr>
<td>[]</td>
<td>Default responses to system prompts are in square brackets.</td>
</tr>
<tr>
<td>!, #</td>
<td>An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.</td>
</tr>
</tbody>
</table>

### Note

Means reader take note. Notes contain helpful suggestions or references to material not covered in the document.

### Tip

Means the following information will help you solve a problem. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

### Timesaver

Means the described action saves time. You can save time by performing the action described in the paragraph.

### Caution

Means reader be careful. In this situation, you might perform an action that could result in equipment damage or loss of data.

### Warning

**IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS
Related Cisco UCS Documentation

Documentation Roadmaps

For a complete list of all B-Series documentation, see the Cisco UCS B-Series Servers Documentation Roadmap available at the following URL: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/overview/guide/UCS_roadmap.html

For a complete list of all C-Series documentation, see the Cisco UCS C-Series Servers Documentation Roadmap available at the following URL: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/overview/guide/ucs_rack_roadmap.html.

For information on supported firmware versions and supported UCS Manager versions for the rack servers that are integrated with the UCS Manager for management, refer to Release Bundle Contents for Cisco UCS Software.

Other Documentation Resources

Follow Cisco UCS Docs on Twitter to receive document update notifications.

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to ucs-docfeedback@external.cisco.com. We appreciate your feedback.
New and Changed Information for This Release

- New and Changed Information, on page 1

New and Changed Information

This section provides information on new features and changed behavior in Cisco UCS Manager, Release 3.2 (x).

Table 1: New Features and Changed Behavior in Cisco UCS Manager, Release 3.2(3)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Where Documented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Certificate for KVM Usage</td>
<td>This Cisco UCS Manager release enables the KVM certificate to be changed.</td>
<td>Changing the KVM Certificate, on page 74</td>
</tr>
</tbody>
</table>
CHAPTER 2

Administration Management Overview

This chapter includes the following sections:

• Administration Management Overview, on page 3

Administration Management Overview

You can configure the mandatory user access features from the Cisco UCS Manager to manage the Cisco UCS 6332 40 GB Fabric Interconnects, and the UCS 6200 Series 10 GB Fabric Interconnects that are in the same domain from one console. If your environment is using a UCS 6324 40 GB Mini, you can also manage the user access features using the same Cisco UCS Manager capabilities.

You can configure the following basic administration configurations to manage user access in your environment:

• **Passwords**—Choose a password during the initial setup for the default admin user account, and create a unique username and password for each user account to access the system.

• **RBAC**—Delegate and control user access privileges according to the role and restrict user access within an organization boundary defined for the tenant, such as multi-tenancy.

• **Authentication**—Create UCS Manager local user accounts, and remote user accounts using the LDAP, RADIUS, and TACACS+ protocols.

• **Communication Services**—Configure CIM XML, HTTP, HTTPS, SMASH CLP, SNMP, SSH, and Telnet to interface third-party applications with Cisco UCS.

• **Organizations**—Create organizations for policies, pools, and service profiles. You can create multiple sub-organizations under the default Root organization, and nest sub-organization under a different sub-organization.

• **CIMC**—Close the KVM, vMedia, and SOL sessions of any user. When UCS Manager receives an event from CIMC, it updates its session table and displays the information to all users.

• **Backup and Restore**—Take a snapshot of all or part of the system configuration and export the file to a location on your network. You can configure a full state, all configuration, system configuration, and logical configuration backup.

• **Call Home**—Configure e-mail alert notifications for UCS errors and faults. You can configure the e-mail notifications for Cisco TAC (predefined) or any other recipient.
• **Deferred Deployments**—Configure deployments for a service profile to deploy immediately or during a specified maintenance window. Use this to control when disruptive configuration changes to a service profile or a service profile template are implemented.

• **Scheduling**—Schedule a one time occurrence for a schedule, a recurring occurrence for a schedule, and delete schedules.

• **Fault Suppression**—Enable fault suppression to suppress SNMP trap and Call Home notifications during a planned maintenance time.
CHAPTER 3

Password Management

• Guidelines for Cisco UCS Passwords, on page 5
• Guidelines for Cisco UCS Usernames, on page 7
• Configuring the Maximum Number of Password Changes for a Change Interval, on page 8
• Configuring a No Change Interval for Passwords, on page 8
• Configuring the Password History Count, on page 9
• Password Profile for Locally Authenticated Users, on page 9
• Clearing the Password History for a Locally Authenticated User, on page 10
• Recovering a Lost Password, on page 11

Guidelines for Cisco UCS Passwords

Each locally authenticated user account requires a password. A user with admin or aaa privileges can configure Cisco UCS Manager to perform a password strength check on user passwords. Listed in Table 2: ASCII Table of Allowed Characters for UCS Passwords, on page 5 are the allowed ASCII characters for UCS passwords.

Table 2: ASCII Table of Allowed Characters for UCS Passwords

<table>
<thead>
<tr>
<th>ASCII Printable Characters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-Z</td>
<td>uppercase letters A to Z</td>
</tr>
<tr>
<td>a-z</td>
<td>lowercase letters a to z</td>
</tr>
<tr>
<td>0-9</td>
<td>digits 0 to 9</td>
</tr>
<tr>
<td>!</td>
<td>exclamation mark</td>
</tr>
<tr>
<td>&quot;</td>
<td>quotation mark</td>
</tr>
<tr>
<td>%</td>
<td>percent sign</td>
</tr>
<tr>
<td>&amp;</td>
<td>ampersand</td>
</tr>
<tr>
<td>'</td>
<td>apostrophe</td>
</tr>
<tr>
<td>(</td>
<td>left parenthesis</td>
</tr>
<tr>
<td>)</td>
<td>right parenthesis</td>
</tr>
<tr>
<td>ASCII Printable Characters</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>*</td>
<td>asterisk</td>
</tr>
<tr>
<td>+</td>
<td>plus sign</td>
</tr>
<tr>
<td>,</td>
<td>comma</td>
</tr>
<tr>
<td>-</td>
<td>hyphen</td>
</tr>
<tr>
<td>.</td>
<td>period</td>
</tr>
<tr>
<td>/</td>
<td>slash</td>
</tr>
<tr>
<td>:</td>
<td>colon</td>
</tr>
<tr>
<td>;</td>
<td>semicolon</td>
</tr>
<tr>
<td>&lt;</td>
<td>less-than</td>
</tr>
<tr>
<td>&gt;</td>
<td>greater-than</td>
</tr>
<tr>
<td>@</td>
<td>at sign</td>
</tr>
<tr>
<td>[</td>
<td>left square bracket</td>
</tr>
<tr>
<td>\</td>
<td>backslash</td>
</tr>
<tr>
<td>]</td>
<td>right square bracket</td>
</tr>
<tr>
<td>^</td>
<td>caret</td>
</tr>
<tr>
<td>_</td>
<td>underscore</td>
</tr>
<tr>
<td>`</td>
<td>grave accent</td>
</tr>
<tr>
<td>{</td>
<td>left curly brace</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>}</td>
<td>right curly brace</td>
</tr>
<tr>
<td>~</td>
<td>tilde</td>
</tr>
</tbody>
</table>

Cisco recommends using a strong password; otherwise, the password strength check for locally authenticated users, Cisco UCS Manager rejects any password that does not meet the following requirements:

- Must contain a minimum of eight characters and a maximum of 80 characters.
- If the password strength check is turned on, the minimum password length is variable and can be set from a minimum of 6 to a maximum of 80 characters.

**Note**

The default is 8 characters.
Guidelines for Cisco UCS Usernames

The username is also used as the login ID for Cisco UCS Manager. When you assign login IDs to Cisco UCS user accounts, consider the following guidelines and restrictions:

• The login ID can contain between 1 and 32 characters, including the following:
  • Any alphabetic character
  • Any digit
  • _ (underscore)
  • - (dash)
  • . (dot)

• The login ID must be unique within Cisco UCS Manager.

• The login ID must start with an alphabetic character. It cannot start with a number or a special character, such as an underscore.

• The login ID is case-sensitive.

• You cannot create an all-numeric login ID.

• After you create a user account, you cannot change the login ID. You must delete the user account and create a new one.
Configuring the Maximum Number of Password Changes for a Change Interval

You must have admin or aaa privileges to change the password profile properties. Except for password history, these properties do not apply to users with admin or aaa privileges.

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > User Services.
Step 3 Click the Locally Authenticated Users node.
Step 4 In the Password Profile area, do the following:
   a) In the Change During Interval field, click Enable.
   b) In the Change Count field, enter the maximum number of times a locally authenticated user can change his or her password during the Change Interval.
      This value can be anywhere from 0 to 10.
   c) In the Change Interval field, enter the maximum number of hours over which the number of password changes specified in the Change Count field are enforced.
      This value can be anywhere from 1 to 745 hours.
      For example, if this field is set to 48 and the Change Count field is set to 2, a locally authenticated user can make no more than 2 password changes within a 48 hour period.
Step 5 Click Save Changes.

Configuring a No Change Interval for Passwords

You must have admin or aaa privileges to change the password profile properties. Except for password history, these properties do not apply to users with admin or aaa privileges.

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > User Services.
Step 3 Click the Locally Authenticated Users node.
Step 4 In the Password Profile area, do the following:
   a) In the Change During Interval field, click Disable.
   b) In the No Change Interval field, enter the minimum number of hours that a locally authenticated user must wait before changing a newly created password.
This value can be anywhere from 1 to 745 hours.
This interval is ignored if the Change During Interval property is set to Disable.

Step 5 Click Save Changes.

### Configuring the Password History Count

You must have admin or aaa privileges to change the password profile properties.

**Procedure**

**Step 1** In the Navigation pane, click Admin.
**Step 2** Expand All > User Management > User Services.
**Step 3** Click the Locally Authenticated Users node.
**Step 4** In the Password Profile area, enter the number of unique passwords that a locally authenticated user must create before that user can reuse a previously used password in the History Count field.

This value can be anywhere from 0 to 15.
By default, the History Count field is set to 0, which disables the history count and allows users to reuse previously used passwords at any time.

**Step 5** Click Save Changes.

### Password Profile for Locally Authenticated Users

The password profile contains the password history and the password change interval properties for all locally authenticated users of Cisco UCS Manager. You cannot specify a different password profile for locally authenticated users.

**Note**
You must have admin or aaa privileges to change the password profile properties. Except for password history, these properties do not apply to users with admin or aaa privileges.

**Password History Count**
The password history count prevents locally authenticated users from reusing the same password. When you configure the password history count, Cisco UCS Manager stores up to a maximum of 15 previously used passwords. The password history count stores the passwords in reverse chronological order with the most recent password first. This ensures that the user can only reuse the oldest password when the history count reaches its threshold.
A user can create and use the number of passwords configured in the password history count before reusing a password. For example, if you set the password history count to 8, a user cannot reuse the first password until the ninth password expires.

By default, the password history is set to 0. This value disables the history count and allows users to reuse previously used passwords at any time.

You can clear the password history count for a locally authenticated user and enable reuse of previous passwords.

**Password Change Interval**

The password change interval restricts the number of password changes that a locally authenticated user can make within a specific number of hours. The following table describes the two interval configuration options for the password change interval.

<table>
<thead>
<tr>
<th>Interval Configuration</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
</table>
| No password change allowed | Does not allow changing passwords for locally authenticated user within a specified number of hours after a password change. You can specify a no change interval between 1 and 745 hours. By default, the no change interval is 24 hours. | To prevent the user from changing passwords within 48 hours after a password change:  
  • Set Change during interval to disable  
  • Set No change interval to 48 |
| Password changes allowed within change interval | Specifies the maximum number of times that a locally authenticated user password change can occur within a pre-defined interval. You can specify a change interval between 1 and 745 hours and a maximum number of password changes between 0 and 10. By default, a locally authenticated user is permitted a maximum of two password changes within a 48-hour interval. | To allow a password change for a maximum of one time within 24 hours after a password change:  
  • Set Change during interval to enable  
  • Set Change count to 1  
  • Set Change interval to 24 |

### Clearing the Password History for a Locally Authenticated User

**Procedure**

- **Step 1** In the **Navigation** pane, click **Admin**.
- **Step 2** Expand **All > User Management > User Services > Locally Authenticated Users**.
- **Step 3** Click the user for whom you want to clear the password history.
- **Step 4** In the **Actions** area, click **Clear Password History**.
Recovering a Lost Password

Password Recovery for the Admin Account

The admin account is the system administrator or superuser account. If an administrator loses the password to this account, you can have a serious security issue. The procedure to recover the password for the admin account requires you to power cycle all fabric interconnects and will lead to a temporary data transmission outage.

When you recover the password for the admin account, you actually change the password for that account. You cannot retrieve the original password for that account.

You can reset the password for all other local accounts through Cisco UCS Manager. However, you must log in to Cisco UCS Manager with an account that includes aaa or admin privileges.

Caution

For Cisco UCS Mini, this procedure requires you to pull all the fabric interconnects in a Cisco UCS domain out of their chassis slots. As a result, all data transmission in the Cisco UCS domain is stopped until you slide the fabric interconnects back into their chassis slots.

For other Cisco UCS configurations, this procedure requires you to power down all fabric interconnects. As a result, all data transmission in the Cisco UCS domain is stopped until you restart the fabric interconnects.

Determining the Leadership Role of a Fabric Interconnect

Important

To determine the role of the fabric interconnects in a cluster when the admin password is lost, open the Cisco UCS Manager GUI from the IP addresses of both fabric interconnects. The subordinate fabric interconnect fails with the following message:

UCSM GUI is not available on secondary node.

Procedure

Step 1 In the Navigation pane, click Equipment.
Step 2 In the Equipment tab, expand Equipment > Fabric Interconnects.
Step 3 Click the fabric interconnect for which you want to identify the role.
Step 4 In the Work pane, click the General tab.
Step 5 In the General tab, click the down arrows on the High Availability Details bar to expand that area.
Step 6 View the Leadership field to determine whether the fabric interconnect is the primary or subordinate.
Verifying the Firmware Versions on a Fabric Interconnect

You can use the following procedure to verify the firmware versions on all fabric interconnects in a Cisco UCS domain. You can verify the firmware for a single fabric interconnect through the Installed Firmware tab for that fabric interconnect.

Procedure

Step 1 In the Navigation pane, click Equipment.
Step 2 In the Equipment tab, click the Equipment node.
Step 3 In the Work pane, click the Firmware Management tab.
Step 4 In the Installed Firmware tab, verify that the following firmware versions for each fabric interconnect match the version to which you updated the firmware:
   • Kernel version
   • System version

Recovering the Admin Account Password in a Standalone Configuration in 6200 and 6300 FI Series

This procedure will help you to recover the password that you set for the admin account when you performed an initial system setup on the fabric interconnect. The admin account is the system administrator or superuser account.

Before you begin
1. Physically connect the console port on the fabric interconnect to a computer terminal or console server
2. Determine the running versions of the following firmware:
   • The firmware kernel version on the fabric interconnect
   • The firmware system version

Tip
To find this information, you can log in with any user account on the Cisco UCS domain.

Procedure

Step 1 Connect to the console port.
Step 2 Power cycle the fabric interconnect:
   a) For Cisco UCS Mini, pull the fabric interconnect out of its chassis slot. For all other configurations, turn off the power to the fabric interconnect.
b) For Cisco UCS Mini, slide the fabric interconnect back into its chassis slot. For all other configurations, turn on the power to the fabric interconnect.

**Step 3**

In the console, press one of the following key combinations as it boots to get the `loader` prompt:

- Ctrl+l
- Ctrl+Shift+r

You may need to press the selected key combination multiple times before your screen displays the `loader` prompt.

**Step 4**

Boot the kernel firmware version on the fabric interconnect.

```
loader > boot /installables/switch/
kernel_firmware_version
```

**Example:**

```
loader > boot /installables/switch/ucs-6100-k9-kickstart.4.1.3.N2.1.0.11.gbin
```

```
loader > boot /installables/switch/ucs-mini-k9-kickstart.5.0.3.N2.3.01a.bin
```

**Step 5**

Enter config terminal mode.

```
Fabric(boot)#
config terminal
```

**Step 6**

Reset the admin password.

```
Fabric(boot)(config)#
admin-password
password
```

Choose a strong password that includes at least one capital letter and one number. The password cannot be blank.

The new password displays in clear text mode.

**Step 7**

Exit config terminal mode and return to the boot prompt.

**Step 8**

Boot the system firmware version on the fabric interconnect.

```
Fabric(boot)#
load /installables/switch/
system_firmware_version
```

**Example:**

```
Fabric(boot)# load
/installables/switch/ucs-6100-k9-system.4.1.3.N2.1.0.211.bin
```

```
Fabric(boot)# load /installables/switch/ucs-mini-k9-system.5.0.3.N2.3.01a.bin
```
**Step 9**
After the system image loads, log in to Cisco UCS Manager.

**Step 10**
Sync the new password with Cisco UCS Manager.

```
UCS-B # scope security
UCS-B/security # set password
Enter new password: New_password
Confirm new password: New_password
UCS-B/security* # commit-buffer
```

### Recovering the Admin Account Password in a Cluster Configuration for 6200 and 6300 FI Series

This procedure will help you to recover the password that you set for the admin account when you performed an initial system setup on the fabric interconnects. The admin account is the system administrator or superuser account.

**Before you begin**

1. Physically connect a console port on one of the fabric interconnects to a computer terminal or console server

2. Obtain the following information:
   - The firmware kernel version on the fabric interconnect
   - The firmware system version
   - Which fabric interconnect has the primary leadership role and which is the subordinate

```
    Tip
To find this information, you can log in with any user account on the Cisco UCS domain.
```

### Procedure

**Step 1**
Connect to the console port of the subordinate fabric interconnect.

**Step 2**
For the subordinate fabric interconnect:

a) For Cisco UCS Mini, pull the fabric interconnect out of its chassis slot. For all other configurations, turn off the power to the fabric interconnect.

b) For Cisco UCS Mini, slide the fabric interconnect back into its chassis slot. For all other configurations, turn on the power to the fabric interconnect.

c) In the console, press one of the following key combinations as it boots to get the loader prompt:
   - Ctrl+1
   - Ctrl+Shift+r

You may need to press the selected key combination multiple times before your screen displays the loader prompt.
Step 3  Power cycle the primary fabric interconnect:
   a) For Cisco UCS Mini, pull the fabric interconnect out of its chassis slot. For all other configurations, turn off the power to the fabric interconnect.
   b) For Cisco UCS Mini, slide the fabric interconnect back into its chassis slot. For all other configurations, turn on the power to the fabric interconnect.

Step 4  In the console, press one of the following key combinations as it boots to get the loader prompt:
   • Ctrl+l
   • Ctrl+Shift+r

You may need to press the selected key combination multiple times before your screen displays the loader prompt.

Step 5  Boot the kernel firmware version on the primary fabric interconnect.

```
loader > boot /installables/switch/
kernel_firmware_version
```

Example:

```
loader > boot /installables/switch/ucs-6100-k9-kickstart.4.1.3.N2.1.0.11.gbin

loader > boot /installables/switch/ucs-mini-k9-kickstart.5.0.3.N2.3.01a.bin
```

Step 6  Enter config terminal mode.

```
Fabric(boot)# config terminal
```

Step 7  Reset the admin password.

```
Fabric(boot)(config)# admin-password password
```

Choose a strong password that includes at least one capital letter and one number. The password cannot be blank.

The new password displays in clear text mode.

Step 8  Exit config terminal mode and return to the boot prompt.

Step 9  Boot the system firmware version on the primary fabric interconnect.

```
Fabric(boot)# load /installables/switch/
system_firmware_version
```

Example:

```
Fabric(boot)# load
/installables/switch/ucs-6100-k9-system.4.1.3.N2.1.0.211.bin

Fabric(boot)# load /installables/switch/ucs-mini-k9-system.5.0.3.N2.3.01a.bin
```

Step 10 After the system image loads, log in to Cisco UCS Manager.

Step 11 In the console for the subordinate fabric interconnect, do the following to bring it up:
   a) Boot the kernel firmware version on the subordinate fabric interconnect.
loader > boot /installables/switch/
kernel_firmware_version

b) Boot the system firmware version on the subordinate fabric interconnect.

Fabric(boot)# load /installables/switch/
system_firmware_version

Step 12  Sync the new password with Cisco UCS Manager and other FI.

UCS-B # scope security
UCS-B/security # set password
Enter new password: New_password
Confirm new password: New_password
UCS-B/security* # commit-buffer
Role-Based Access Control Overview

Role-Based Access Control (RBAC) is a method of restricting or authorizing system access for users based on user roles and locales. A role defines the privileges of a user in the system and a locale defines the organizations (domains) that a user is allowed access. Because users are not directly assigned privileges, you can manage individual user privileges by assigning the appropriate roles and locales.

A user is granted write access to the required system resources only if the assigned role grants the access privileges and the assigned locale allows access. For example, a user with the Server Administrator role in the engineering organization can update server configurations in the Engineering organization. They cannot, however, update server configurations in the Finance organization, unless the locales assigned to the user include the Finance organization.

User Accounts for Cisco UCS

User accounts access the system. You can configure up to 48 local user accounts in each Cisco UCS Manager domain. Each user account requires a unique username and password.

You can set user accounts with an SSH public key. The public key can be set in either of the two formats: OpenSSH or SECSH.

Admin Account

An admin account comes with each Cisco UCS domain. The admin account is a default user account and cannot be modified or deleted. This account is the system administrator or superuser account's full privileges. There is no default password assigned to the admin account; you must choose the password during the initial system setup.

The admin account is always active and does not expire. You cannot configure the admin account as inactive.
Locally Authenticated User Accounts

A locally authenticated user account is authenticated directly through the fabric interconnect and can be enabled or disabled by anyone with admin or aaa privileges. After a local user account is disabled, the user cannot log in. The database does not delete the configuration details for disabled local user accounts. If you re-enable a disabled local user account, the account becomes active with the existing configuration, including the username and password.

Remotely Authenticated User Accounts

A remotely authenticated user account is any user account that is authenticated through LDAP, RADIUS, or TACACS+.

If a user maintains a local user account and a remote user account simultaneously, the roles defined in the local user account override those maintained in the remote user account.

Expiration of User Accounts

You can configure user accounts to expire at a predefined time. When the expiration time is reached, the user account is disabled.

By default, user accounts do not expire.

---

Note

After you configure a user account with an expiration date, you cannot reconfigure the account to not expire. However, you can configure the account to use the latest expiration date available.

Reserved Words: Locally Authenticated User Accounts

You cannot use the following words when creating a local user account in Cisco UCS.

- root
- bin
- daemon
- adm
- lp
- sync
- shutdown
- halt
- news
- uucp
- operator
- games
- gopher
Web Session Limits for User Accounts

Cisco UCS Manager uses web session limits to restrict the number of web sessions (both GUI and XML) that a given user account is permitted to access at any one time.

Each Cisco UCS Manager domain supports a maximum of 32 concurrent web sessions per user and 256 total user sessions. By default, the number of concurrent web sessions allowed by Cisco UCS Manager is set to 32 per user, but you can configure this value up to the system maximum of 256.

User Roles

User roles contain one or more privileges that define the operations that are allowed for a user. You can assign one or more roles to each user. Users with multiple roles have the combined privileges of all assigned roles. For example, if Role1 has storage-related privileges, and Role2 has server-related privileges, users with Role1 and Role2 have both storage-related and server-related privileges.

A Cisco UCS domain can contain up to 48 user roles, including the default user roles. Any user roles configured after the first 48 are accepted, but they are inactive with faults raised.

All roles include read access to all configuration settings in the Cisco UCS domain. Users with read-only roles cannot modify the system state.

You can create, modify or remove existing privileges, and delete roles. When you modify a role, the new privileges apply to all users with that role. Privilege assignment is not restricted to the privileges defined for the default roles. Meaning, you can use a custom set of privileges to create a unique role. For example, the default Server Administrator and Storage Administrator roles have a different set of privileges. However, you can create a Server and Storage Administrator role that combines the privileges of both roles.
If you delete a role after it was assigned to users, it is also deleted from those user accounts.

Modify the user profiles on AAA servers (RADIUS or TACACS+) to add the roles corresponding to the privileges granted to that user. The attribute stores the role information. The AAA servers return this attribute with the request and parse it to obtain the roles. LDAP servers return the roles in the user profile attributes.

If a local and a remote user account have the same username, Cisco UCS Manager overrides any roles assigned to the remote user with those assigned to the local user.

Default User Roles

The system contains the following default user roles:

**AAA Administrator**
- Read-and-write access to users, roles, and AAA configuration. Read access to the remaining system.

**Administrator**
- Complete read-and-write access to the entire system. Assigns this role to the default administrator account by default. You cannot change it.

**Facility Manager**
- Read-and-write access to power management operations through the power management privilege. Read access to the remaining system.

**Network Administrator**
- Read-and-write access to fabric interconnect infrastructure and network security operations. Read access to the remaining system.

**Operations**
- Read-and-write access to systems logs, including the syslog servers, and faults. Read access to the remaining system.

**Read-Only**
- Read-only access to system configuration with no privileges to modify the system state.

**Server Compute**
- Read and write access to most aspects of service profiles. However, the user cannot create, modify or delete vNICs or vHBAs.

**Server Equipment Administrator**
- Read-and-write access to physical server-related operations. Read access to the remaining system.

**Server Profile Administrator**
- Read-and-write access to logical server-related operations. Read access to the remaining system.
Server Security Administrator

Read-and-write access to server security-related operations. Read access to the remaining system.

Storage Administrator

Read-and-write access to storage operations. Read access to the remaining system.

Reserved Words: User Roles

You cannot use the following words when creating custom roles in Cisco UCS.

- network-admin
- network-operator
- vdc-admin
- vdc-operator
- server-admin

Privileges

Privileges give users, assigned to user roles, access to specific system resources and permission to perform specific tasks. The following table lists each privilege and the user role given that privilege by default.

**Tip**


<table>
<thead>
<tr>
<th>Privilege</th>
<th>Description</th>
<th>Default Role Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>aaa</td>
<td>System security and AAA</td>
<td>AAA Administrator</td>
</tr>
<tr>
<td>admin</td>
<td>System administration</td>
<td>Administrator</td>
</tr>
<tr>
<td>ext-lan-config</td>
<td>External LAN configuration</td>
<td>Network Administrator</td>
</tr>
<tr>
<td>ext-lan-policy</td>
<td>External LAN policy</td>
<td>Network Administrator</td>
</tr>
<tr>
<td>ext-lan-qos</td>
<td>External LAN QoS</td>
<td>Network Administrator</td>
</tr>
<tr>
<td>ext-lan-security</td>
<td>External LAN security</td>
<td>Network Administrator</td>
</tr>
<tr>
<td>ext-san-config</td>
<td>External SAN configuration</td>
<td>Storage Administrator</td>
</tr>
<tr>
<td>ext-san-policy</td>
<td>External SAN policy</td>
<td>Storage Administrator</td>
</tr>
<tr>
<td>ext-san-qos</td>
<td>External SAN QoS</td>
<td>Storage Administrator</td>
</tr>
<tr>
<td>Privilege</td>
<td>Description</td>
<td>Default Role Assignment</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>ext-san-security</td>
<td>External SAN security</td>
<td>Storage Administrator</td>
</tr>
<tr>
<td>fault</td>
<td>Alarms and alarm policies</td>
<td>Operations</td>
</tr>
<tr>
<td>operations</td>
<td>Logs and Smart Call Home</td>
<td>Operations</td>
</tr>
<tr>
<td>org-management</td>
<td>Organization management</td>
<td>Operations</td>
</tr>
<tr>
<td>pod-config</td>
<td>Pod configuration</td>
<td>Network Administrator</td>
</tr>
<tr>
<td>pod-policy</td>
<td>Pod policy</td>
<td>Network Administrator</td>
</tr>
<tr>
<td>pod-qos</td>
<td>Pod QoS</td>
<td>Network Administrator</td>
</tr>
<tr>
<td>pod-security</td>
<td>Pod security</td>
<td>Network Administrator</td>
</tr>
<tr>
<td>power-mgmt</td>
<td>Read-and-write access to power management operations</td>
<td>Facility Manager</td>
</tr>
<tr>
<td>read-only</td>
<td>Read-only access</td>
<td>Read-Only</td>
</tr>
<tr>
<td></td>
<td>Read-only cannot be selected as a privilege; it is assigned to every user role.</td>
<td></td>
</tr>
<tr>
<td>server-equipment</td>
<td>Server hardware management</td>
<td>Server Equipment Administrator</td>
</tr>
<tr>
<td>server-maintenance</td>
<td>Server maintenance</td>
<td>Server Equipment Administrator</td>
</tr>
<tr>
<td>server-policy</td>
<td>Server policy</td>
<td>Server Equipment Administrator</td>
</tr>
<tr>
<td>server-security</td>
<td>Server security</td>
<td>Server Security Administrator</td>
</tr>
<tr>
<td>service-profile-compute</td>
<td>Service profile compute</td>
<td>Server Compute Administrator</td>
</tr>
<tr>
<td>service-profile-config</td>
<td>Service profile configuration</td>
<td>Server Profile Administrator</td>
</tr>
<tr>
<td>service-profile-config-policy</td>
<td>Service profile configuration policy</td>
<td>Server Profile Administrator</td>
</tr>
<tr>
<td>service-profile-ext-access</td>
<td>Service profile endpoint access</td>
<td>Server Profile Administrator</td>
</tr>
<tr>
<td>service-profile-network</td>
<td>Service profile network</td>
<td>Network Administrator</td>
</tr>
<tr>
<td>service-profile-network-policy</td>
<td>Service profile network policy</td>
<td>Network Administrator</td>
</tr>
<tr>
<td>service-profile-qos</td>
<td>Service profile QoS</td>
<td>Network Administrator</td>
</tr>
<tr>
<td>service-profile-qos-policy</td>
<td>Service profile QoS policy</td>
<td>Network Administrator</td>
</tr>
<tr>
<td>service-profile-security</td>
<td>Service profile security</td>
<td>Server Security Administrator</td>
</tr>
<tr>
<td>service-profile-security-policy</td>
<td>Service profile security policy</td>
<td>Server Security Administrator</td>
</tr>
<tr>
<td>service-profile-server</td>
<td>Service profile server management</td>
<td>Server Profile Administrator</td>
</tr>
</tbody>
</table>
Creating a User Role

Procedure

**Step 1** In the **Navigation** pane, click **Admin**.

**Step 2** Expand **All > User Management > User Services**.

**Step 3** Right-click **User Services** and choose **Create Role**.

You can also right-click **Roles** to access that option.

**Step 4** In the **Create Role** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name field</td>
<td>A user-defined name for this user role. This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.</td>
</tr>
<tr>
<td>Privileges list box</td>
<td>A list of the privileges defined in the system. Click a privilege to view a description of that privilege. Check the check box to assign that privilege to the selected user.</td>
</tr>
<tr>
<td>Help Section</td>
<td></td>
</tr>
<tr>
<td>Description field</td>
<td>A description of the most recent privilege you clicked in the Privileges list box.</td>
</tr>
</tbody>
</table>

**Step 5** Click **OK**.
Adding Privileges to a User Role

Procedure

Step 1  In the Navigation pane, click Admin.
Step 2  Expand All > User Management > User Services.
Step 3  Expand the Roles node.
Step 4  Choose the role to which you want to add privileges.
Step 5  In the General tab, check the boxes for the privileges you want to add to the role.
Step 6  Click Save Changes.

Removing Privileges from a User Role

Procedure

Step 1  In the Navigation pane, click Admin.
Step 2  Expand All > User Management > User Services.
Step 3  Expand the Roles node.
Step 4  Choose the role from which you want to remove privileges.
Step 5  In the General tab, uncheck the boxes for the privileges you want to remove from the role.
Step 6  Click Save Changes.

Deleting a User Role

When you delete a user role, Cisco UCS Manager removes that role from all user accounts to which the role was assigned.

Procedure

Step 1  In the Navigation pane, click Admin.
Step 2  Expand All > User Management > User Services.
Step 3  Expand the Roles node.
Step 4  Right-click the role you want to delete and choose Delete.
Step 5  In the Delete dialog box, click Yes.
Locales

User Locales

You can assign a user to one or more locales. Each locale defines one or more organizations (domains) to which a user can access. Access is usually limited to the organizations specified in the locale. An exception is a locale without any organizations. It provides unrestricted access to system resources in all organizations.

A Cisco UCS domain can contain up to 48 user locales. Any user locales configured after the first 48 are accepted, but are inactive with faults raised.

Users with admin or aaa privileges can assign organizations to the locale of other users. The assignment of organizations is restricted to only those in the locale of the user assigning the organizations. For example, if a locale contains only the Engineering organization, a user assigned to that locale can only assign the Engineering organization to other users.

[Note]
You cannot assign a locale to users with one or more of the following privileges:

- aaa
- admin
- fault
- operations

You can hierarchically manage organizations. A user who is assigned to a top-level organization has automatic access to all organizations below it. For example, an Engineering organization can contain a Software Engineering organization and a Hardware Engineering organization. A locale containing only the Software Engineering organization has access to system resources only within that organization. However, a locale that contains the Engineering organization has access to the resources for both the Software Engineering and Hardware Engineering organizations.

Assigning an Organization to a Locale

Procedure

Step 1  In the Navigation pane, click Admin.
Step 2  Expand All > User Management > User Services.
Step 3  Expand the Locales node and click the locale to which you want to add an organization.
Step 4  In the Work pane, click the General tab.
Step 5  In the Organizations area, click + on the table icon bar.
Step 6  In the Assign Organizations dialog box, do the following:
    a) Expand the Organizations area to view the organizations in the Cisco UCS domain.
    b) Expand the root node to see the sub-organizations.
c) Click an organization that you want to assign to the locale.
d) Drag the organization from the Organizations area and drop it into the design area on the right.
e) Repeat Steps b and c until you have assigned all desired organizations to the locale.

Step 7 Click OK.

Creating a Locale

**Before you begin**

One or more organizations must exist before you create a locale.

**Procedure**

**Step 1** In the Navigation pane, click Admin.

**Step 2** Expand All > User Management > User Services.

**Step 3** Right-click Locales and choose Create a Locale.

**Step 4** In the Create Locale page, do the following:

a) In the Name field, enter a unique name for the locale.

   This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special
   characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change
   this name after the object is saved.

b) Click Next.

**Step 5** In the Assign Organizations dialog box, do the following:

a) Expand the Organizations area to view the organizations in the Cisco UCS domain.

b) Expand the root node to see the sub-organizations.

c) Click an organization that you want to assign to the locale.

d) Drag the organization from the Organizations area and drop it into the design area on the right.

e) Repeat Steps b and c until you have assigned all desired organizations to the locale.

**Step 6** Click Finish.

**What to do next**

Add the locale to one or more user accounts. For more information, see Changing the Locales Assigned to a
Locally Authenticated User Account, on page 31.

Deleting an Organization from a Locale

**Procedure**

**Step 1** In the Navigation pane, click Admin.
Deleting a Locale

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > User Services.
Step 3 Expand the Locales node.
Step 4 Right-click the locale you want to delete and choose Delete.
Step 5 If a confirmation dialog box displays, click Yes.

Locally Authenticated User Accounts

Creating a User Account

At a minimum, Cisco recommends that you create the following users:

• Server administrator account
• Network administrator account
• Storage administrator

Note

After you create the user account, if you make any changes to any of the user account fields from the Cisco UCS Manager GUI, make sure to enter the password again.

Before you begin

Perform the following tasks, if the system includes any of the following:

• Remote authentication services—Ensures that the users exist in the remote authentication server with the appropriate roles and privileges.
• Multitenancy with organizations—Creates one or more locales. If you do not have any locales, all users are created in root and are assigned roles and privileges in all organizations.
• SSH authentication—Obtains the SSH key.

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > User Services.
Step 3 Right-click User Services and choose Create User to open the User Properties dialog box.
You can also right-click Locally Authenticated Users to access that option.
Step 4 Complete the following fields with the required information about the user:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Login ID field** | The account name that is used when logging into this account. This account must be unique and meet the following guidelines and restrictions for Cisco UCS Manager user accounts:  
  • The login ID can contain between 1 and 32 characters, including the following:  
    • Any alphabetic character  
    • Any digit  
    • _ (underscore)  
    • - (dash)  
    • . (dot)  
  • The login ID must be unique within Cisco UCS Manager.  
  • The login ID must start with an alphabetic character. It cannot start with a number or a special character, such as an underscore.  
  • The login ID is case-sensitive.  
  • You cannot create an all-numeric login ID.  
  • After you create a user account, you cannot change the login ID. You must delete the user account and create a new one.  
After you save the user, the login ID cannot be changed. You must delete the user account and create a new one. |
| **First Name field** | The first name of the user. This field can contain up to 32 characters. |
| **Last Name field** | The last name of the user. This field can contain up to 32 characters. |
| **Email field** | The email address for the user. |
| **Phone field** | The telephone number for the user. |
The password associated with this account. If password strength check is enabled, a user’s password must be strong and Cisco UCS Manager rejects any password that does not meet the following requirements:

- Must contain a minimum of eight characters and a maximum of 80 characters.

- If the password strength check is turned on, the minimum password length is variable and can be set from a minimum of 6 to a maximum of 80 characters.

  **Note** The default is 8 characters.

- Must contain at least three of the following:
  - Lower case letters
  - Upper case letters
  - Digits
  - Special characters

- Must not contain a character that is repeated more than three times consecutively, such as aaabbb.

- Must not be identical to the username or the reverse of the username.

- Must pass a password dictionary check. For example, the password must not be based on a standard dictionary word.

- Must not contain the following symbols: $ (dollar sign), ? (question mark), and = (equals sign).

- Should not be blank for local user and admin accounts.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Password</strong> field</td>
<td>The password a second time for confirmation purposes.</td>
</tr>
<tr>
<td><strong>Confirm Password</strong> field</td>
<td>The password a second time for confirmation purposes.</td>
</tr>
<tr>
<td><strong>Account Status</strong> field</td>
<td>If the status is set to <strong>Active</strong>, a user can log into Cisco UCS Manager with this login ID and password.</td>
</tr>
<tr>
<td><strong>Account Expires</strong> check box</td>
<td>If checked, this account expires and cannot be used after the date specified in the <strong>Expiration Date</strong> field.</td>
</tr>
</tbody>
</table>

**Note** After you configure a user account with an expiration date, you cannot reconfigure the account to not expire. However, you can configure the account to use the latest expiration date available.
### Enabling the Password Strength Check for Locally Authenticated Users

You must have admin or aaa privileges to enable the password strength check. If enabled, Cisco UCS Manager does not permit a user to choose a password that does not meet the guidelines for a strong password.

**Procedure**

**Step 1**  
In the Navigation pane, click Admin.

**Step 2**  
Expand All > User Management > User Services.

**Step 3**  
Click the Locally Authenticated Users node.

**Step 4**  
In the Work pane, check the Password Strength Check check box in the Properties area.

**Step 5**  
Click Save Changes.
Setting the Web Session Limits

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>In the Navigation pane, click Admin.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Expand All &gt; Communication Management &gt; Communication Services.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Click the Communication Services tab.</td>
</tr>
<tr>
<td>Step 4</td>
<td>In the Web Session Limits area, complete the following fields:</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong> The HTML-5 Interface supports one user session per browser.</td>
</tr>
<tr>
<td></td>
<td><strong>Name</strong></td>
</tr>
<tr>
<td></td>
<td>Maximum Sessions Per User</td>
</tr>
<tr>
<td></td>
<td>Maximum Sessions</td>
</tr>
<tr>
<td></td>
<td>Maximum Event Interval (in seconds)</td>
</tr>
<tr>
<td>Step 5</td>
<td>Click Save Changes.</td>
</tr>
</tbody>
</table>

Changing the Locales Assigned to a Locally Authenticated User Account

**Note** Do not assign locales to users with an admin or aaa role.

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>In the Navigation pane, click Admin.</td>
</tr>
<tr>
<td>Step 2</td>
<td>On the Admin tab, expand All &gt; User Management &gt; User Services &gt; Locally Authenticated Users.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Click the user account that you want to modify.</td>
</tr>
<tr>
<td>Step 4</td>
<td>In the Work pane, click the General tab.</td>
</tr>
<tr>
<td>Step 5</td>
<td>In the Locales area, do the following:</td>
</tr>
<tr>
<td></td>
<td>• To assign a new locale to the user account, check the appropriate check boxes.</td>
</tr>
</tbody>
</table>
Changing the Roles Assigned to a Locally Authenticated User Account

Changes in user roles and privileges do not take effect until the next time the user logs in. If a user is logged in when you assign a new role to or remove an existing role from a user account, the active session continues with the previous roles and privileges.

Procedure

1. In the Navigation pane, click Admin.
2. On the Admin tab, expand All > User Management > User Services > Locally Authenticated Users.
3. Click the user account that you want to modify.
4. In the Work pane, click the General tab.
5. In the Roles area, do the following:
   - To assign a new role to the user account, check the appropriate check boxes.
   - To remove a role from the user account, uncheck the appropriate check boxes.
6. Click Save Changes.

Enabling a User Account

You must have admin or aaa privileges to enable or disable a local user account.

Before you begin

Create a local user account.

Procedure

1. In the Navigation pane, click Admin.
2. Expand All > User Management > User Services > Locally Authenticated Users.
3. Click the user that you want to enable.
4. In the Work pane, click the General tab.
5. In the Account Status field, click the active radio button.
6. Click Save Changes.
Disabling a User Account

You must have admin or aaa privileges to enable or disable a local user account.

Note

If you change the password on a disabled account through the Cisco UCS Manager GUI, the user cannot use this changed password after you enable the account and make it active. The user must enter the required password again after the account is enabled and made active.

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > User Services > Locally Authenticated Users.
Step 3 Click the user that you want to disable.
Step 4 In the Work pane, click the General tab.
Step 5 In the Account Status field, click the inactive radio button.
Step 6 Click Save Changes.

Clearing the Password History for a Locally Authenticated User

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > User Services > Locally Authenticated Users.
Step 3 Click the user for whom you want to clear the password history.
Step 4 In the Actions area, click Clear Password History.
Step 5 If a confirmation dialog box displays, click Yes.

Deleting a Locally Authenticated User Account

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > User Services.
Step 3 Expand the Locally Authenticated Users node.
Step 4 Right-click the user account you want to delete and choose Delete.
Step 5 In the **Delete** dialog box, click **Yes**.

---

**Monitoring User Sessions**

**Procedure**

**Step 1** In the **Navigation** pane, click **Admin**.

**Step 2** In the **Admin** tab, expand **All > User Management**.

**Step 3** Click the **User Services** node.

**Step 4** In the **Work** pane, click the **Sessions** tab.

The tab displays the following details of user sessions:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name column</td>
<td>The name for the session.</td>
</tr>
<tr>
<td>User column</td>
<td>The username that is involved in the session.</td>
</tr>
<tr>
<td>Fabric ID column</td>
<td>The fabric interconnect that the user logged in to for the session.</td>
</tr>
<tr>
<td>Login Time column</td>
<td>The date and time the session started.</td>
</tr>
<tr>
<td>Refresh Period column</td>
<td>When a web client connects to Cisco UCS Manager, the client must send refresh requests to Cisco UCS Manager to keep the web session active. This option specifies the maximum amount of time allowed between refresh requests for a user in this domain. If this time limit is exceeded, Cisco UCS Manager considers the web session inactive, but it does not terminate the session.</td>
</tr>
<tr>
<td>Session Timeout column</td>
<td>The maximum amount of time that can elapse after the last refresh request before Cisco UCS Manager considers a web session as inactive. If this time limit is exceeded, Cisco UCS Manager automatically terminates the web session.</td>
</tr>
<tr>
<td>Terminal Type column</td>
<td>The kind of terminal the user is logged in through.</td>
</tr>
<tr>
<td>Host column</td>
<td>The IP address from which the user is logged in.</td>
</tr>
<tr>
<td>Current Session column</td>
<td>If this column displays Y, the associated user session is currently active.</td>
</tr>
</tbody>
</table>
CHAPTER 5

Remote Authentication

- Authentication Services, on page 35
- Guidelines and Recommendations for Remote Authentication Providers, on page 35
- User Attributes in Remote Authentication Providers, on page 36
- Two-Factor Authentication, on page 38
- LDAP Providers and Groups, on page 38
- RADIUS Providers, on page 46
- TACACS+ Providers, on page 47
- Primary Authentication Service, on page 49
- Multiple Authentication Services Configuration, on page 53

Authentication Services

Cisco UCS supports the following two methods to authenticate user logins:

- Local user authentication - uses user accounts that exist locally in the Cisco UCS Manager
- Remote user authentication - uses one of the following protocols:
  - LDAP
  - RADIUS
  - TACACS+

Guidelines and Recommendations for Remote Authentication Providers

If a system is configured for one of the supported remote authentication services, you must create a provider for that service to ensure that Cisco UCS Manager can communicate with the system. The following guidelines impact user authorization:

User Accounts in Remote Authentication Services

User accounts can exist locally in Cisco UCS Manager or in the remote authentication server.
You can view the temporary sessions for users who log in through remote authentication services from the Cisco UCS Manager GUI and from the Cisco UCS Manager CLI.

**User Roles in Remote Authentication Services**

If you create user accounts in the remote authentication server, you must ensure that the accounts include the roles those users require for working in Cisco UCS Manager and that the names of those roles match the names used in Cisco UCS Manager. Based on the role policy, a user might not be allowed to log in, or is granted only read-only privileges.

**User Attributes in Remote Authentication Providers**

For RADIUS and TACACS+ configurations, you must configure a user attribute for Cisco UCS in each remote authentication provider through which users log in to Cisco UCS Manager. This user attribute holds the roles and locales assigned to each user.

---

**Note**

This step is not required for LDAP configurations that use the LDAP Group Mapping to assign roles and locales.

When a user logs in, Cisco UCS Manager does the following:

1. Queries the remote authentication service.
2. Validates the user.
3. If the user is validated, checks for the roles and locales assigned to that user.

The following table contains a comparison of the user attribute requirements for the remote authentication providers supported by Cisco UCS.

### Table 4: Comparison of User Attributes by Remote Authentication Provider

<table>
<thead>
<tr>
<th>Authentication Provider</th>
<th>Custom Attribute</th>
<th>Schema Extension</th>
<th>Attribute ID Requirements</th>
</tr>
</thead>
</table>
| LDAP                    | Not required if group mapping is used | Optional. You can choose to do one of the following:  
* Do not extend the LDAP schema and configure an existing, unused attribute that meets the requirements.  
* Extend the LDAP schema and create a custom attribute with a unique name, such as CiscoAVPair. | The Cisco LDAP implementation requires a unicode type attribute.  
If you choose to create the CiscoAVPair custom attribute, use the following attribute ID: 1.3.6.1.4.1.9.287247.1  
A sample OID is provided in the following section. |
<table>
<thead>
<tr>
<th>Authentication Provider</th>
<th>Custom Attribute</th>
<th>Schema Extension</th>
<th>Attribute ID Requirements</th>
</tr>
</thead>
</table>
| RADIUS                 | Optional         | Optional. You can choose to do one of the following:  
  • Do not extend the RADIUS schema and use an existing unused attribute that meets the requirements.  
  • Extend the RADIUS schema and create a custom attribute with a unique name, such as cisco-avpair. | The vendor ID for the Cisco RADIUS implementation is 009 and the vendor ID for the attribute is 001. The following syntax example shows how to specify multiples user roles and locales if you choose to create the cisco-avpair attribute:  
  `shell:roles="admin,aaa"
  shell:locales="L1,abc"`. Use a comma `,` as the delimiter to separate multiple values. |
| TACACS+                | Required         | Required. You must extend the schema and create a custom attribute with the name cisco-av-pair. | The cisco-av-pair name is the string that provides the attribute ID for the TACACS+ provider. The following syntax example shows how to specify multiples user roles and locales when you create the cisco-av-pair attribute:  
  `cisco-av-pair=shell:roles="admin aaa" shell:locales="L1 abc"`. Using an asterisk (*) in the cisco-av-pair attribute syntax flags the locale as optional, preventing authentication failures for other Cisco devices that use the same authorization profile. Use a space as the delimiter to separate multiple values. |

**Sample OID for LDAP User Attribute**

The following is a sample OID for a custom CiscoAVPair attribute:

```
CN=CiscoAVPair,CN=Schema,
CN=Configuration,CN=X
objectClass: top
objectClass: attributeSchema
cn: CiscoAVPair
distinguishedName: CN=CiscoAVPair,CN=Schema,CN=Configuration,CN=X
instanceType: 0x4
uSNCreated: 26318654
attributeID: 1.3.6.1.4.1.9.287247.1
attributeSyntax: 2.5.5.12
isSingleValued: TRUE
showInAdvancedViewOnly: TRUE
adminDisplayName: CiscoAVPair
adminDescription: UCS User Authorization Field
oMSyntax: 64
```
Two-Factor Authentication

Cisco UCS Manager uses two-factor authentication for remote user logins, which adds a level of security to account logins. Two-factor authentication login requires a username, a token, and a password combination in the password field. You can provide a PIN, a certificate, or a token.

Two-factor authentication uses authentication applications that maintain token servers to generate one-time tokens for users during the login process and store passwords in the AAA server. Requests are sent to the token server to retrieve a vendor-specific attribute. Cisco UCS Manager expects the token server to integrate with the AAA server, therefore it forwards the request to the AAA server. The password and token are validated at the same time by the AAA server. Users must enter the token and password sequence in the same order as it is configured in the AAA server.

Two-factor authentication is supported by associating RADIUS or TACACS+ provider groups with designated authentication domains and enabling two-factor authentication for those domains. Two-factor authentication does not support IPM and is not supported when the authentication realm is set to LDAP, local, or none.

Web Session Refresh and Web Session Timeout Period

The Web Session Refresh Period is the maximum amount of time allowed between refresh requests for a Cisco UCS Manager GUI web session. The Web Session Timeout is the maximum amount of time that can elapse after the last refresh request before a Cisco UCS Manager GUI web session becomes inactive.

You can increase the Web Session Refresh Period to a value greater than 60 seconds up 172800 seconds to avoid frequent session timeouts that requires regeneration and re-entering a token and password multiple times. The default value is 7200 seconds when two-factor authentication is enabled, and is 600 seconds when two-factor authentication is not enabled.

You can specify a value between 300 and 172800 for the Web Session Timeout Period. The default is 8000 seconds when two-factor authentication is enabled, and 7200 seconds when two-factor authentication is not enabled.

LDAP Providers and Groups

Nested LDAP Groups

You can add an LDAP group as a member of another group and nest groups to consolidate member accounts and to reduce the replication of traffic. Cisco UCS Manager release 2.1(2) and higher enables you to search LDAP groups that are nested within another group defined in an LDAP group map.

Note

Nested LDAP search support is supported only for Microsoft Active Directory servers. The supported versions are Microsoft Windows 2003 SP3, Microsoft Windows 2008 R2, and Microsoft Windows 2012.
By default, user rights are inherited when you nest an LDAP group within another group. For example, if you make Group_1 a member of Group_2, the users in Group_1 have the same permissions as the members of Group_2. You can then search users that are members of Group_1 by choosing only Group_2 in the LDAP group map, instead of having to search Group_1 and Group_2 separately.

You do not always need to create subgroups in a group map in Cisco UCS Manager.

**LDAP Group Rule**

The LDAP group rule determines whether Cisco UCS should use LDAP groups when assigning user roles and locales to a remote user.

**Configuring Properties for LDAP Providers**

The properties that you configure in this task are the default settings for all provider connections of this type defined in Cisco UCS Manager. If an individual provider includes a setting for any of these properties, Cisco UCS uses that setting and ignores the default setting.

**Before you begin**

If you are using Active Directory as your LDAP server, create a user account in the Active Directory server to bind with Cisco UCS. Give this account a non-expiring password.

**Procedure**

| Step 1 | In the Navigation pane, click Admin. |
| Step 2 | Expand All > User Management > LDAP. |
| Step 3 | In the Properties area, complete all fields. |

**Note**

User login fails if the userDn for an LDAP user exceeds 255 characters.

| Step 4 | Click Save Changes. |

**What to do next**

Create an LDAP provider.

**Creating an LDAP Provider**

Cisco UCS Manager supports a maximum of 16 LDAP providers.

**Before you begin**

If you are using Active Directory as your LDAP server, create a user account in the Active Directory server to bind with Cisco UCS. Give this account a non-expiring password.

- In the LDAP server, perform one of the following configurations:
  - Configure LDAP groups. LDAP groups contain user role and locale information.
• Configure users with the attribute that holds the user role and locale information for Cisco UCS Manager. You can choose whether to extend the LDAP schema for this attribute. If you do not want to extend the schema, use an existing LDAP attribute to hold the Cisco UCS user roles and locales. If you prefer to extend the schema, create a custom attribute, such as the CiscoAVPair attribute.

The Cisco LDAP implementation requires a unicode type attribute.

If you choose to create the CiscoAVPair custom attribute, use the following attribute ID:
1.3.6.1.4.1.9.287247.1

• For a cluster configuration, add the management port IPv4 or IPv6 addresses for both fabric interconnects. This configuration ensures that remote users can continue to log in if the first fabric interconnect fails and the system fails over to the second fabric interconnect. All login requests are sourced from these IP addresses, not the virtual IPv4 or IPv6 address used by Cisco UCS Manager.

• If you want to use secure communications, create a trusted point containing the certificate of the root certificate authority (CA) of the LDAP server in Cisco UCS Manager.

• If you need to change the LDAP providers or add or delete them, change the authentication realm for the domain to local, make the changes to the providers, then change the domain authentication realm back to LDAP.

Attention
LDAP remote usernames that include special characters cannot log in to systems that are running versions 2.2(3a) and later. The user cannot log in because of the Nexus OS limitations where special characters, !,%,^, are not supported in the username.

Procedure

Step 1  In the Navigation pane, click Admin.
Step 2  Expand All > User Management > LDAP.
Step 3  In the Work pane, click the General tab.
Step 4  In the Actions area, click Create LDAP Provider.
Step 5  On the Create LDAP Provider page of the wizard, complete all fields with appropriate LDAP service information.
a) Complete the following fields with information about the LDAP service you want to use:
### Creating an LDAP Provider

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hostname/FDQN (or IP Address) field</strong></td>
<td>The hostname, or IPv4 or IPv6 address on which the LDAP provider resides. If SSL is enabled, this field must exactly match a Common Name (CN) in the security certificate of the LDAP database. Note: If you use a hostname rather than an IPv4 or IPv6 address, you must configure a DNS server. If the Cisco UCS domain is not registered with Cisco UCS Central or DNS management is set to <code>local</code>, configure a DNS server in Cisco UCS Manager. If the Cisco UCS domain is registered with Cisco UCS Central and DNS management is set to <code>global</code>, configure a DNS server in Cisco UCS Central.</td>
</tr>
<tr>
<td><strong>Order field</strong></td>
<td>The order that the Cisco UCS uses this provider to authenticate users. Enter an integer between 1 and 16, or enter <code>lowest-available</code> or 0 (zero) if you want Cisco UCS to assign the next available order based on the other providers defined in this Cisco UCS domain.</td>
</tr>
<tr>
<td><strong>Bind DN field</strong></td>
<td>The distinguished name (DN) for an LDAP database account that has read and search permissions for all objects under the base DN. The maximum supported string length is 255 ASCII characters.</td>
</tr>
<tr>
<td><strong>Base DN field</strong></td>
<td>The specific distinguished name in the LDAP hierarchy where the server begins a search when a remote user logs in and the system attempts to obtain the user's DN based on their username. You can set the length of the base DN to a maximum of 255 characters minus the length of CN=username, where username identifies the remote user attempting to access Cisco UCS Manager using LDAP authentication. This value is required unless a default base DN has been set on the LDAP General tab.</td>
</tr>
<tr>
<td><strong>Port field</strong></td>
<td>The port through which Cisco UCS communicates with the LDAP database. The standard port number is 389.</td>
</tr>
<tr>
<td><strong>Enable SSL check box</strong></td>
<td>If checked, encryption is required for communications with the LDAP database. If unchecked, authentication information will be sent as clear text. If checked, do not change the port to 636, leave it as 389. Cisco UCS negotiates a TLS session on port 636 for SSL, but initial connection starts unencrypted on 389.</td>
</tr>
<tr>
<td><strong>Filter field</strong></td>
<td>The LDAP search is restricted to those user names that match the defined filter. This value is required unless a default filter has been set on the LDAP General tab.</td>
</tr>
</tbody>
</table>
An LDAP attribute that stores the values for the user roles and locales. This property is always a name-value pair. The system queries the user record for the value that matches this attribute name.

If you do not want to extend your LDAP schema, you can configure an existing, unused LDAP attribute with the Cisco UCS roles and locales. Alternatively, you can create an attribute named CiscoAVPair in the remote authentication service with the following attribute ID: `1.3.6.1.4.1.9.287247.1`

This value is required unless a default attribute has been set on the LDAP General tab.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute</td>
<td>An LDAP attribute that stores the values for the user roles and locales. This property is always a name-value pair. The system queries the user record for the value that matches this attribute name. If you do not want to extend your LDAP schema, you can configure an existing, unused LDAP attribute with the Cisco UCS roles and locales. Alternatively, you can create an attribute named CiscoAVPair in the remote authentication service with the following attribute ID: <code>1.3.6.1.4.1.9.287247.1</code> This value is required unless a default attribute has been set on the LDAP General tab.</td>
</tr>
<tr>
<td>Password</td>
<td>The password for the LDAP database account specified in the Bind DN field. You can enter any standard ASCII characters except for space, § (section sign), ? (question mark), or = (equal sign).</td>
</tr>
<tr>
<td>Confirm Password</td>
<td>The LDAP database password repeated for confirmation purposes.</td>
</tr>
<tr>
<td>Timeout</td>
<td>The length of time in seconds the system spends trying to contact the LDAP database before it times out. Enter an integer from 1 to 60 seconds, or enter 0 (zero) to use the global timeout value specified on the LDAP General tab. The default is 30 seconds.</td>
</tr>
<tr>
<td>Vendor</td>
<td>The LDAP vendor that you want to use. This can be one of the following: • Open Ldap—The open source implementation of the LDAP protocol. • MS AD—Microsoft Active Directory.</td>
</tr>
</tbody>
</table>

b) Click Next.

**Step 6**

On the LDAP Group Rule page of the wizard, complete all fields with appropriate LDAP group rule information.

**Note** Role and locale assignment is cumulative. If a user is included in multiple groups, or has a role or locale specified in the LDAP attribute, Cisco UCS assigns that user all the roles and locales mapped to any of those groups or attributes.

**What to do next**

For implementations involving a single LDAP database, select LDAP as the authentication service.

For implementations involving multiple LDAP databases, configure an LDAP provider group.
Changing the LDAP Group Rule for an LDAP Provider

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>In the Navigation pane, click Admin.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Expand All &gt; User Management &gt; LDAP.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Expand LDAP Providers and choose the LDAP provider for which you want to change the group rule.</td>
</tr>
<tr>
<td>Step 4</td>
<td>In the Work pane, click the General tab.</td>
</tr>
<tr>
<td>Step 5</td>
<td>In the LDAP Group Rules area, complete the following fields:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Authorization field</td>
<td>Whether Cisco UCS also searches LDAP groups when authenticating and assigning user roles and locales to remote users. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• Disable—Cisco UCS does not access any LDAP groups.</td>
</tr>
<tr>
<td></td>
<td>• Enable—Cisco UCS searches all LDAP groups mapped in this Cisco UCS domain. If the remote user is found, Cisco UCS assigns the user roles and locales defined for that LDAP group in the associated LDAP group map.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong> Role and locale assignment is cumulative. If a user is included in multiple groups, or has a role or locale specified in the LDAP attribute, Cisco UCS assigns that user all the roles and locales mapped to any of those groups or attributes.</td>
</tr>
<tr>
<td>Group Recursion field</td>
<td>Whether Cisco UCS searches both the mapped groups and their parent groups. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• Non Recursive—Cisco UCS searches only the groups mapped in this Cisco UCS domain. If none of the groups containing the user explicitly set the user's authorization properties, Cisco UCS uses the default settings.</td>
</tr>
<tr>
<td></td>
<td>• Recursive—Cisco UCS searches each mapped group and all its parent groups for the user's authorization properties. These properties are cumulative, so for each group Cisco UCS finds with explicit authorization property settings, it applies those settings to the current user. Otherwise it uses the default settings.</td>
</tr>
<tr>
<td>Target Attribute field</td>
<td>The attribute Cisco UCS uses to determine group membership in the LDAP database.</td>
</tr>
<tr>
<td></td>
<td>The supported string length is 63 characters. The default string is memberOf.</td>
</tr>
</tbody>
</table>
Deleting an LDAP Provider

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > LDAP.
Step 3 Expand LDAP Providers.
Step 4 Right-click the LDAP provider that you want to delete and choose Delete.
Step 5 If a confirmation dialog box displays, click Yes.

LDAP Group Mapping

LDAP group mapping eliminates having to define role or locale information in the LDAP user object. UCSM can use group membership information to assign a role or locale to an LDAP user during login for organizations using LDAP groups to restrict access to LDAP databases.

When a user logs in to Cisco UCS Manager, the LDAP group map pulls information about the user's role and locale. If the role and locale criteria match the information in the policy, access is granted. Cisco UCS Manager supports a maximum of 28, 128, or 160 LDAP group maps depending on the release version.

Note

Cisco UCS Manager Release 3.1(1) supports a maximum of 128 LDAP group maps, and Release 3.1(2) and later releases support a maximum of 160 LDAP group maps.

The role and locale definitions that you configure locally in the Cisco UCS Manager do not update automatically based on changes to an LDAP directory. When deleting or renaming LDAP groups in an LDAP directory, you must also update the Cisco UCS Manager with the change.

You can configure an LDAP group map to include any of the following combinations of roles and locales:

- Roles only
- Locales only
- Both roles and locales
For example, consider an LDAP group representing a group of server administrators at a specific location. The LDAP group map might include user roles such as server profile and server equipment. To restrict access to server administrators at a specific location, you can set the locale to a particular site name.

Note
Cisco UCS Manager includes out-of-the-box user roles, but does not include any locales. Mapping an LDAP provider group to a locale requires that you create a custom locale.

Creating an LDAP Group Map

Before you begin
- Create an LDAP group in the LDAP server.
- Configure the distinguished name for the LDAP group in the LDAP server.
- Create locales in Cisco UCS Manager (optional).
- Create custom roles in Cisco UCS Manager (optional).

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > LDAP.
Step 3 Right-click LDAP Group Maps and choose Create LDAP Group Map.
Step 4 In the Create LDAP Group Map dialog box, specify all LDAP group map information, as appropriate.

Important The name that you specify in the LDAP Group DN field must match the name in the LDAP database.

Note If you use a special character in the LDAP Group DN field, you must prefix the special character with an escape character \ (single back slash).

What to do next
Set the LDAP group rule.

Deleting an LDAP Group Map

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > LDAP.
Step 3 Expand LDAP Group Maps.
Step 4
Right-click the LDAP group map that you want to delete and choose Delete.

Step 5
If a confirmation dialog box displays, click Yes.

---

RADIUS Providers

Configuring Properties for RADIUS Providers

The properties that you configure in this task are the default settings for all provider connections of this type defined in Cisco UCS Manager. If an individual provider includes a setting for any of these properties, Cisco UCS uses that setting and ignores the default setting.

Note
RADIUS authentication uses Password Authentication Protocol (PAP).

Procedure

Step 1
In the Navigation pane, click Admin.

Step 2
Choose User Management > RADIUS.

Step 3
In the Properties area, complete all fields.

Step 4
Click Save Changes.

What to do next
Create a RADIUS provider.

Creating a RADIUS Provider

Cisco UCS Manager supports a maximum of 16 RADIUS providers.

Before you begin
Perform the following configuration in the RADIUS server:

• Configure users with the attribute that holds the user role and locale information for Cisco UCS Manager. You can choose whether to extend the RADIUS schema for this attribute. If you do not want to extend the schema, use an existing RADIUS attribute to hold the Cisco UCS user roles and locales. If you prefer to extend the schema, create a custom attribute, such as the cisco-avpair attribute.

The vendor ID for the Cisco RADIUS implementation is 009 and the vendor ID for the attribute is 001.

The following syntax example shows how to specify multiples user roles and locales if you choose to create the cisco-avpair attribute: `shell:roles="admin,aaa" shell:locales="L1,abc"`. Use a comma `,"` as the delimiter to separate multiple values.
For a cluster configuration, add the management port IPv4 or IPv6 addresses for both fabric interconnects. This configuration ensures that remote users can continue to log in if the first fabric interconnect fails and the system fails over to the second fabric interconnect. All login requests are sourced from these IP addresses, not the virtual IP address used by Cisco UCS Manager.

Procedure

Step 1  In the Navigation pane, click Admin.
Step 2  Expand All > User Management > RADIUS.
Step 3  In the Create RADIUS Provider dialog box, specify all appropriate RADIUS service information.

Note  If you use a hostname rather than an IPv4 or IPv6 address, you must ensure that a DNS server is configured for the hostname.

Step 4  Click Save Changes.

What to do next

For implementations involving a single RADIUS database, select RADIUS as the primary authentication service.

For implementations involving multiple RADIUS databases, configure a RADIUS provider group.

Deleting a RADIUS Provider

Procedure

Step 1  In the Navigation pane, click Admin.
Step 2  Choose User Management > RADIUS.
Step 3  Right-click the RADIUS provider that you want to delete and choose Delete.
Step 4  If a confirmation dialog box displays, click Yes.

TACACS+ Providers

Configuring Properties for TACACS+ Providers

Note  The properties that you configure in this task are the default settings for all provider connections of this type defined in Cisco UCS Manager. If an individual provider includes a setting for any of these properties, Cisco UCS uses that setting and ignores the default setting.
Creating a TACACS+ Provider

Cisco UCS Manager supports a maximum of 16 TACACS+ providers.

Before you begin
Perform the following configuration in the TACACS+ server:

- Create the cisco-av-pair attribute. You cannot use an existing TACACS+ attribute.

  The cisco-av-pair name is the string that provides the attribute ID for the TACACS+ provider.

  The following syntax example shows how to specify multiples user roles and locales when you create the cisco-av-pair attribute: `cisco-av-pair=shell:roles="admin aaa" shell:locales="L1 abc"`.

  Using an asterisk (*) in the cisco-av-pair attribute syntax flags the locale as optional, preventing authentication failures for other Cisco devices that use the same authorization profile. Use a space as the delimiter to separate multiple values.

- For a cluster configuration, add the management port IPv4 or IPv6 addresses for both fabric interconnects. This configuration ensures that remote users can continue to log in if the first fabric interconnect fails and the system fails over to the second fabric interconnect. All login requests are sourced from these IP addresses, not the virtual IP address used by Cisco UCS Manager.

Procedure

<table>
<thead>
<tr>
<th>Step 1</th>
<th>In the Navigation pane, click Admin.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Choose User Management &gt; TACACS+.</td>
</tr>
<tr>
<td>Step 3</td>
<td>In the Properties area, complete the Timeout field.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Click Save Changes.</td>
</tr>
</tbody>
</table>

What to do next
Create a TACACS+ provider.
Step 5  Click **Save Changes**.

---

**What to do next**

For implementations involving a single TACACS+ database, select TACACS+ as the primary authentication service.

For implementations involving multiple TACACS+ databases, configure a TACACS+ provider group.

---

**Deleting a TACACS+ Provider**

**Procedure**

**Step 1**  In the **Navigation** pane, click **Admin**.

**Step 2**  Choose **User Management** > **TACACS+**.

**Step 3**  Right-click the TACACS+ provider that you want to delete and choose **Delete**.

**Step 4**  If a confirmation dialog box displays, click **Yes**.

---

**Primary Authentication Service**

**Selecting the Console Authentication Service**

**Before you begin**

If the system uses a remote authentication service, create a provider for that authentication service. If the system uses only local authentication through Cisco UCS, you do not need to create a provider first.

**Procedure**

**Step 1**  In the **Navigation** pane, click **Admin**.

**Step 2**  Expand **All** > **User Management** > **Authentication**.

**Step 3**  Click **Native Authentication**.

**Step 4**  In the **Work** pane, click the **General** tab.

**Step 5**  In the **Console Authentication** area, complete the following fields:
<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realm field</td>
<td>The method by which a user logging into the console is authenticated. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• <strong>Local</strong>—The user account must be defined locally in this Cisco UCS domain.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Radius</strong>—The user must be defined on the RADIUS server specified for this Cisco UCS domain.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Tacacs</strong>—The user must be defined on the TACACS+ server specified for this Cisco UCS domain.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Ldap</strong>—The user must be defined on the LDAP server specified for this Cisco UCS domain.</td>
</tr>
<tr>
<td></td>
<td>• <strong>None</strong>—If the user account is local to this Cisco UCS domain, no password is required when the user logs into the console.</td>
</tr>
<tr>
<td>Provider Group</td>
<td>The provider group to be used to authenticate a user logging into the console.</td>
</tr>
<tr>
<td>drop-down list</td>
<td><strong>Note</strong> The Provider Group drop-down list is displayed when you select Ldap, Radius, or Tacacs as the method by which a user is authenticated.</td>
</tr>
<tr>
<td>Two Factor Authentication</td>
<td>Two-factor authentication is available only when the Realm is set to Radius or Tacacs. When this checkbox is selected, the Console requires users whose accounts are authenticated by Radius or Tacacs servers to enter a token plus a password to log in.</td>
</tr>
</tbody>
</table>

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

---

**Selecting the Default Authentication Service**

**Before you begin**

If the system uses a remote authentication service, create a provider for that authentication service. If the system uses only local authentication through Cisco UCS, you do not need to create a provider first.

**Procedure**

**Step 1** In the Navigation pane, click **Admin**.
### Step 2
Expand All > User Management > Authentication.

### Step 3
Click Native Authentication.

### Step 4
In the Work pane, click the General tab.

### Step 5
In the Default Authentication area, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Realm drop-down list</strong></td>
<td>The default method by which a user is authenticated during remote login. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• Local—The user account must be defined locally in this Cisco UCS domain.</td>
</tr>
<tr>
<td></td>
<td>• Radius—The user account must be defined on the RADIUS server specified for this Cisco UCS domain.</td>
</tr>
<tr>
<td></td>
<td>• Tacacs—The user account must be defined on the TACACS+ server specified for this Cisco UCS domain.</td>
</tr>
<tr>
<td></td>
<td>• Ldap—The user account must be defined on the LDAP server specified for this Cisco UCS domain.</td>
</tr>
<tr>
<td></td>
<td>• None—If the user account is local to this Cisco UCS domain, no password is required when the user logs in remotely.</td>
</tr>
<tr>
<td><strong>Provider Group drop-down list</strong></td>
<td>The default provider group to be used to authenticate the user during remote login.</td>
</tr>
<tr>
<td><strong>Web Session Refresh Period (sec)</strong></td>
<td>When a web client connects to Cisco UCS Manager, the client must send refresh requests to Cisco UCS Manager to keep the web session active. This option specifies the maximum amount of time allowed between refresh requests for a user in this domain.</td>
</tr>
<tr>
<td></td>
<td>If this time limit is exceeded, Cisco UCS Manager considers the web session inactive, but it does not terminate the session.</td>
</tr>
<tr>
<td></td>
<td>Specify an integer between 60 and 172800. The default is 600 seconds when Two-Factor Authentication is not enabled and 7200 seconds when it is enabled.</td>
</tr>
<tr>
<td><strong>Web Session Timeout (sec)</strong></td>
<td>The maximum amount of time that can elapse after the last refresh request before Cisco UCS Manager considers a web session as inactive. If this time limit is exceeded, Cisco UCS Manager automatically terminates the web session.</td>
</tr>
<tr>
<td></td>
<td>Specify an integer between 300 and 172800. The default is 7200 seconds when Two-Factor Authentication is not enabled and 8000 seconds when it is enabled.</td>
</tr>
</tbody>
</table>
### Role Policy for Remote Users

By default, if user roles are not configured in Cisco UCS Manager read-only access is granted to all users logging in to Cisco UCS Manager from a remote server using the LDAP, RADIUS, or TACACS protocols. For security reasons, it might be desirable to restrict access to those users matching an established user role in Cisco UCS Manager.

You can configure the role policy for remote users in the following ways:

- **assign-default-role**
  - Does not restrict user access to Cisco UCS Manager based on user roles. Read-only access is granted to all users unless other user roles have been defined in Cisco UCS Manager.
  - This is the default behavior.

- **no-login**
  - Restricts user access to Cisco UCS Manager based on user roles. If user roles have not been assigned for the remote authentication system, access is denied.

### Configuring the Role Policy for Remote Users

**Procedure**

1. **Step 1** In the Navigation pane, click Admin.
2. **Step 2** Expand All > User Management > Authentication.
3. **Step 3** Click Native Authentication.
4. **Step 4** In the Work pane, click the General tab.
Multiple Authentication Services Configuration

Multiple Authentication Services

You can configure Cisco UCS to use multiple authentication services by configuring the following features:

- Provider groups
- Authentication domains

Provider Groups

A provider group is a set of providers that the Cisco UCS accesses during the authentication process. All of the providers within a provider group are accessed in the order that the Cisco UCS provider uses to authenticate users. If all of the configured servers are unavailable or unreachable, Cisco UCS Manager automatically falls back to the local authentication method using the local username and password.

Cisco UCS Manager allows you to create a maximum of 16 provider groups, with a maximum of eight providers allowed per group.

Creating an LDAP Provider Group

Creating an LDAP provider group allows you to authenticate using multiple LDAP databases.

Before you begin

Create one or more LDAP providers.

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > LDAP.
Step 3 Right-click LDAP Provider Groups and choose Create LDAP Provider Group.

Note If you use a hostname rather than an IPv4 or IPv6 address, you must ensure a DNS server is configured for the hostname.
Deleting an LDAP Provider Group

Before you begin
Remove the provider group from an authentication configuration.

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > LDAP.
Step 3 Expand LDAP Provider Groups.
Step 4 Right-click the LDAP provider group that you want to delete and choose Delete.
Step 5 If a confirmation dialog box displays, click Yes.

Creating a RADIUS Provider Group

Creating a RADIUS provider group allows you to authenticate using multiple RADIUS databases.

Before you begin
Create one or more RADIUS providers.

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > RADIUS.
Step 3 Right-click RADIUS Provider Groups and choose Create RADIUS Provider Group.
Step 4 In the Create RADIUS Provider Group dialog box, do the following:
   a) In the Name field, enter a unique name for the group.
      This name can be between 1 and 127 ASCII characters.
   b) In the RADIUS Providers table, choose one or more providers to include in the group.
   c) Click the >> button to add the providers to the Included Providers table.
      You can use the << button to remove providers from the group.
d) (Optional) Use the Move Up or Move Down arrows in the Included Providers list to change the order in which the RADIUS providers authenticate providers.
e) After you add all of the required providers to the provider group, click OK.

What to do next
Configure an authentication domain or select a default authentication service.

Deleting a RADIUS Provider Group
You cannot delete a provider group if another authentication configuration is using that provider group.

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > RADIUS.
Step 3 Expand RADIUS Provider Groups.
Step 4 Right-click the RADIUS provider group you want to delete and choose Delete.
Step 5 If a confirmation dialog box displays, click Yes.

Creating a TACACS+ Provider Group
Creating a TACACS+ provider group allows you to authenticate using multiple TACACS+ databases.

Before you begin
Create one or more TACACS+ providers.

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > User Management > TACACS+.
Step 3 Right-click TACACS+ Provider Groups and choose Create TACACS+ Provider Group.
Step 4 In the Create TACACS+ Provider Group dialog box, specify all TACACS+ provider group information, as appropriate.

Deleting a TACACS+ Provider Group
You cannot delete a provider group if another authentication configuration is using that provider group.
Procedure

**Step 1** In the **Navigation** pane, click **Admin**.

**Step 2** Expand All > **User Management** > **TACACS+**.

**Step 3** Expand **TACACS+ Provider Groups**.

**Step 4** Right-click the TACACS+ provider group that you want to delete and choose **Delete**.

**Step 5** If a confirmation dialog box displays, click **Yes**.

### Authentication Domains

The Cisco UCS Manager uses Authentication Domains to leverage multiple authentication systems. You can specify and configure each authentication domain during login; otherwise, Cisco UCS Manager uses the default authentication service configuration.

You can create up to eight authentication domains. Each authentication domain is associated with a provider group and a realm in the Cisco UCS Manager. The Cisco UCS Manager uses all servers within the realm if you do not specify a provider group.

### Creating an Authentication Domain

**Procedure**

**Step 1** In the **Navigation** pane, click **Admin**.

**Step 2** Expand All > **User Management** > **Authentication**.

**Step 3** Right-click **Authentication Domains** and choose **Create a Domain**.

**Step 4** In the **Create a Domain** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td>The name of the domain. This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), and . (period), and you cannot change this name after the object is saved.</td>
</tr>
</tbody>
</table>

**Note** For systems using the remote authentication protocol, the authentication domain name is considered part of the username and counts toward the 32-character limit for locally created usernames. Because Cisco UCS inserts 5 characters for formatting, authentication fails if the domain name and username combined characters total exceeds 27.
When a web client connects to Cisco UCS Manager, the client must send refresh requests to Cisco UCS Manager to keep the web session active. This option specifies the maximum amount of time allowed between refresh requests for a user in this domain.

If this time limit is exceeded, Cisco UCS Manager considers the web session inactive, but it does not terminate the session.

Specify an integer between 60 and 172800. The default is 600 seconds when Two-Factor Authentication is not enabled and 7200 seconds when it is enabled.

**Note** The number of seconds set for the **Web Session Refresh Period** must be less than the number of seconds set for the **Web Session Timeout**. Do not set the **Web Session Refresh Period** to the same value as the **Web Session Timeout**.

## Web Session Timeout (sec)

The maximum amount of time that can elapse after the last refresh request before Cisco UCS Manager considers a web session as inactive. If this time limit is exceeded, Cisco UCS Manager automatically terminates the web session.

Specify an integer between 300 and 172800. The default is 7200 seconds when Two-Factor Authentication is not enabled and 8000 seconds when it is enabled.

## Realm

The authentication protocol to apply to users in this domain. This can be one of the following:

- **Local**—The user account must be defined locally in this Cisco UCS domain.
- **Radius**—The user must be defined on the RADIUS server specified for this Cisco UCS domain.
- **Tacacs**—The user must be defined on the TACACS+ server specified for this Cisco UCS domain.
- **Ldap**—The user must be defined on the LDAP server specified for this Cisco UCS domain.

## Provider Group

The default provider group to use to authenticate users during remote login.

**Note** The **Provider Group** drop-down list displays when you select Ldap Radius, or Tacacs as the method to authenticate users.
Two-Factor Authentication is available only when the Realm is set to Radius or Tacacs. When you select this check box, Cisco UCS Manager and the KVM launch manager require users whose accounts are authenticated by Radius or Tacacs servers to enter a token plus a password to log in. When 60 seconds remain for the Web Session Refresh Period to expire, users must generate a new token and enter the token plus their password to continue the session.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Factor Authentication</td>
<td>Two-Factor Authentication is available only when the Realm is set to Radius or Tacacs. When you select this check box, Cisco UCS Manager and the KVM launch manager require users whose accounts are authenticated by Radius or Tacacs servers to enter a token plus a password to log in. When 60 seconds remain for the Web Session Refresh Period to expire, users must generate a new token and enter the token plus their password to continue the session.</td>
</tr>
</tbody>
</table>

**Step 5**  
Click OK.
How to Enable and Disable the Call Home Feature

- Call Home in UCS Overview, on page 59
- Enabling Call Home, on page 60
- Disabling Call Home, on page 62
- Creating a Call Home Profile, on page 62
- Deleting a Call Home Profile, on page 64
- Configuring a Call Home Policy, on page 64
- Deleting a Call Home Policy, on page 65

Call Home in UCS Overview

Call Home provides an email-based notification for critical system policies. A range of message formats are available for compatibility with pager services or XML-based automated parsing applications. You can use this feature to page a network support engineer, email a Network Operations Center, or use Cisco Smart Call Home services to generate a case with the Technical Assistance Center.

The Call Home feature can deliver alert messages containing information about diagnostics and environmental faults and events.

The Call Home feature can deliver alerts to multiple recipients, referred to as Call Home destination profiles. Each profile includes configurable message formats and content categories. A predefined destination profile is provided for sending alerts to the Cisco TAC, but you also can define your own destination profiles.

When you configure Call Home to send messages, Cisco UCS Manager executes the appropriate CLI `show` command and attaches the command output to the message.

Cisco UCS delivers Call Home messages in the following formats:

- Short text format which provides a one or two line description of the fault that is suitable for pagers or printed reports.
- Full text format which provides fully formatted message with detailed information that is suitable for human reading.
- XML machine-readable format that uses Extensible Markup Language (XML) and Adaptive Messaging Language (AML) XML Schema Definition (XSD). The AML XSD is published on the Cisco.com website. The XML format enables communication with the Cisco Systems Technical Assistance Center.

For information about the faults that can trigger Call Home email alerts, see the Cisco UCS Faults and Error Messages Reference.
The following figure shows the flow of events after a Cisco UCS fault is triggered in a system with Call Home configured:

*Figure 1: Flow of Events after a Fault is Triggered*

---

**Enabling Call Home**

**Procedure**

**Step 1** In the Navigation pane, click Admin.

**Step 2** Expand All > Communication Management > Call Home.

**Step 3** In the Work pane, click the General tab.

**Step 4** In the Admin area, complete the following fields to enable Call Home:
### Name | Description
--- | ---
State field | This can be one of the following:
• Off—Call Home is not used for this Cisco UCS domain.
• On—Cisco UCS generates Call Home alerts based on the Call Home policies and profiles defined in the system.

**Note** If this field is set to **On**, Cisco UCS Manager GUI displays the rest of the fields on this tab.

Switch Priority drop-down list | This can be one of the following:
• Alerts
• Critical
• Debugging
• Emergencies
• Errors
• Information
• Notifications
• Warnings

Throttling field | Indicates whether the system limits the number of duplicate messages received for the same event. This can be one of the following:
• On—If the number of duplicate messages sent exceeds 30 messages within a 2-hour timeframe, then the system discards further messages for that alert type.
• Off—The system sends all duplicate messages, regardless of how many are encountered.

### Step 5
Click **Save Changes**.

### What to do next
Ensure that Call Home is fully configured.

For more information on the Call Home feature, see the *Cisco UCS System Monitoring Guide*. 
Disabling Call Home

Procedure

Step 1  In the Navigation pane, click Admin.
Step 2  Expand All > Communication Management > Call Home.
Step 3  In the Work pane, click the General tab.
Step 4  In the Admin area, click off in the State field.

Note  If this field is set to off, Cisco UCS Manager hides the rest of the fields on this tab.

Step 5  Click Save Changes.

What to do next

For more information on the Call Home feature, see the Cisco UCS System Monitoring Guide.

Creating a Call Home Profile

By default, you must configure the Cisco TAC-1 profile. However, you can also create additional profiles to send email alerts to one or more specified groups when events occur at the level that you specify.

Procedure

Step 1  In the Navigation pane, click Admin.
Step 2  Expand All > Communication Management > Call Home.
Step 3  In the Work pane, click the Profiles tab.
Step 4  On the icon bar to the right of the table, click +.

If the + icon is disabled, click an entry in the table to enable it.

Step 5  In the Create Call Home Profile dialog box, complete the following information fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name field</td>
<td>A user-defined name for this profile. This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.</td>
</tr>
</tbody>
</table>
How to Enable and Disable the Call Home Feature

Creating a Call Home Profile

Step 6

In the **Email Configuration** area, complete the following fields to configure the email alerts:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Format</strong></td>
<td>This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• <strong>Xml</strong>—A machine readable format that uses Extensible Markup Language (XML) and Adaptive Messaging Language (AML) XML schema definition (XSD). This format enables communication with the Cisco Systems Technical Assistance Center.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Full Txt</strong>—A fully formatted message with detailed information that is suitable for human reading.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Short Txt</strong>—A one or two line description of the fault that is suitable for pagers or printed reports.</td>
</tr>
</tbody>
</table>
### Deleting a Call Home Profile

**Procedure**

1. In the *Navigation* pane, click *Admin*.
2. Expand *All > Communication Management > Call Home*.
3. In the *Work* pane, click the *Profiles* tab.
4. Right-click the profile you want to delete and choose *Delete*.
5. Click *Save Changes*.

### Configuring a Call Home Policy

**Tip**

By default, all Call Home policies are enabled to ensure that email alerts are sent for all critical system events.
### How to Enable and Disable the Call Home Feature

#### Procedure

**Step 1** In the **Navigation** pane, click **Admin**.

**Step 2** Expand **All > Communication Management > Call Home**.

**Step 3** In the **Work** pane, click the **Policies** tab.

**Step 4** On the icon bar to the right of the table, click `+`. If the `+` icon is disabled, click an entry in the table to enable it.

**Step 5** In the **Create Call Home Policy** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>State field</td>
<td>If this field is <strong>Enabled</strong>, the system uses this policy when an error matching the associated cause is encountered. Otherwise, the system ignores this policy even if a matching error occurs. By default, all policies are enabled.</td>
</tr>
<tr>
<td>Cause field</td>
<td>The event that triggers the alert. Each policy defines whether an alert is sent for one type of event.</td>
</tr>
</tbody>
</table>

**Step 6** Click **OK**.

**Step 7** Repeat Steps 4 and 5 if you want to configure a Call Home policy for a different type of fault or event.

### Deleting a Call Home Policy

#### Procedure

**Step 1** In the **Navigation** pane, click **Admin**.

**Step 2** Expand **All > Communication Management > Call Home**.

**Step 3** In the **Work** pane, click the **Policies** tab.

**Step 4** Right-click the policy that you want to disable and choose **Delete**.

**Step 5** Click **Save Changes**.
You can use the communication services defined below to interface third-party applications with Cisco UCS. Cisco UCS Manager supports IPv4 and IPv6 address access for the following services:

- CIM XML
- HTTP
- HTTPS
- SNMP
- SSH
- Telnet

Cisco UCS Manager supports out-of-band IPv4 address access to the **Cisco UCS KVM Direct** launch page from a web browser. To provide this access, you must enable the following service:

- CIMC Web Service

<table>
<thead>
<tr>
<th>Communication Service</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIM XML</td>
<td>The Common Information Model (CIM) XML) service is disabled by default and is only available in read-only mode. The default port is 5988. The CIM XML is a standards-based protocol for exchanging CIM information that the Distributed Management Task Force defines.</td>
</tr>
<tr>
<td>Communication Service</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>CIMC Web Service</td>
<td>This service is disabled by default. When this service is enabled, users can directly access a server CIMC using one of the out-of-band management IP addresses assigned directly to the server, or associated with the server through a service profile. <strong>Note</strong> CIMC Web Service can only be enabled or disabled globally. You cannot configure KVM direct access for individual CIMC IP addresses.</td>
</tr>
<tr>
<td>HTTP</td>
<td>By default, HTTP is enabled on port 80. You can run the Cisco UCS Manager GUI in an HTTP or HTTPS browser. If you select HTTP, all data is exchanged in clear text mode. For a secure browser session, we recommend that you enable HTTPS and disable HTTP. By default, Cisco UCS implements a browser redirects to an HTTPS equivalent and recommends that you do not change this behavior. <strong>Note</strong> If you are upgrading to Cisco UCS, version 1.4(1), the browser redirect to a secure browser does not occur by default. To redirect the HTTP browser to an HTTPS equivalent, enable the Redirect HTTP to HTTPS in Cisco UCS Manager.</td>
</tr>
<tr>
<td>HTTPS</td>
<td>By default, HTTPS is enabled on port. With HTTPS, all data is exchanged in encrypted mode through a secure server. For a secure browser session, We recommend that you only use HTTPS and either disable or redirect HTTP communications.</td>
</tr>
<tr>
<td>SMASH CLP</td>
<td>This service is enabled for read-only access and supports a limited subset of the protocols, such as the show command. You cannot disable it. This shell service is one of the standards that the Distributed Management Task Force defines.</td>
</tr>
<tr>
<td>SNMP</td>
<td>By default, this service is disabled. If enabled, the default port is 161. You must configure the community and at least one SNMP trap. Enable this service only if your system includes integration with an SNMP server.</td>
</tr>
<tr>
<td>SSH</td>
<td>This service is enabled on port 22. You cannot disable it, and you cannot change the default port. This service provides access to the Cisco UCS Manager CLI.</td>
</tr>
<tr>
<td>Telnet</td>
<td>By default, this service is disabled. This service provides access to the Cisco UCS Manager CLI.</td>
</tr>
</tbody>
</table>
Non-Secure Communication Services

Web Session Limits for User Accounts

Cisco UCS Manager uses web session limits to restrict the number of web sessions (both GUI and XML) that a given user account is permitted to access at any one time.

Each Cisco UCS Manager domain supports a maximum of 32 concurrent web sessions per user and 256 total user sessions. By default, the number of concurrent web sessions allowed by Cisco UCS Manager is set to 32 per user, but this value can be configured up to the system maximum of 256.

Setting Web Session Limits

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Navigate to Admin &gt; Communication Management &gt; Communication Services</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Under Web Session Limits, complete the following fields:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum Sessions Per User</strong></td>
<td>The maximum number of concurrent HTTP and HTTPS sessions allowed for each user. Enter an integer between 1 and 256.</td>
</tr>
<tr>
<td><strong>Maximum Sessions</strong></td>
<td>The maximum number of concurrent HTTP and HTTPS sessions allowed for all users within the system. Enter an integer between 1 and 256.</td>
</tr>
<tr>
<td><strong>Maximum Event Interval (in seconds)</strong></td>
<td>The maximum time interval between two events. This tracks various types of event change notifications, such as responses to any user requests from the UI. If the interval expires, the UI session is terminated. Enter and integer between 120-3600</td>
</tr>
</tbody>
</table>

**Step 3** | Click Save Changes. |

Setting Shell Session Limits

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Navigate to Admin &gt; Communication Management &gt; Communication Services</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Under Shell Session Limits, complete the following fields:</td>
</tr>
</tbody>
</table>
### Configuring CIM-XML

**Procedure**

| Step 1 | In the Navigation pane, click Admin. |
| Step 2 | Expand All > Communication Management > Communication Services. |
| Step 3 | In the CIM-XML area, click the Enabled radio button. |

The CIM-XML area expands to display the default Port number, 5988. You cannot change this port number.

| Step 4 | Click Save Changes. |

### Configuring HTTP

**Procedure**

| Step 1 | In the Navigation pane, click Admin. |
| Step 2 | Expand All > Communication Management > Communication Services. |
| Step 3 | In the HTTP area, click the Enabled radio button. |

The HTTP area expands to display the available configuration options.

| Step 4 | (Optional) In the Port field, change the default port that Cisco UCS Manager GUI uses for HTTP. The default port is 80. |
| Step 5 | (Optional) In the Redirect HTTP to HTTPS field, click the Enabled radio button. |

You must also configure and enable HTTPS to enable redirection of HTTP logins to the HTTPS login. Once enabled, you cannot disable the redirection until you have disabled HTTPS.

**Note**

If you redirect HTTP to HTTPS, you cannot use HTTP to access Cisco UCS Manager GUI. Redirection disables HTTP as it automatically redirects to HTTPS.
Step 6  Click Save Changes.

Secure Communication Services

Certificates, Key Rings, and Trusted Points

HTTPS uses components of the Public Key Infrastructure (PKI) to establish secure communications between two devices, such as a client's browser and Cisco UCS Manager.

Encryption Keys and Key Rings

Each PKI device holds a pair of asymmetric Rivest-Shamir-Adleman (RSA) encryption keys, one kept private and one made public, stored in an internal key ring. A message encrypted with either key can be decrypted with the other key. To send an encrypted message, the sender encrypts the message with the receiver's public key, and the receiver decrypts the message using its own private key. A sender can also prove its ownership of a public key by encrypting (also called 'signing') a known message with its own private key. If a receiver can successfully decrypt the message using the public key in question, the sender's possession of the corresponding private key is proven. Encryption keys can vary in length, with typical lengths from 512 bits to 2048 bits. In general, a longer key is more secure than a shorter key. Cisco UCS Manager provides a default key ring with an initial 1024-bit key pair, and allows you to create additional key rings.

The default key ring certificate must be manually regenerated if the cluster name changes or the certificate expires.

This operation is only available in the UCS Manager CLI.

Certificates

To prepare for secure communications, two devices first exchange their digital certificates. A certificate is a file containing a device's public key along with signed information about the device's identity. To merely support encrypted communications, a device can generate its own key pair and its own self-signed certificate. When a remote user connects to a device that presents a self-signed certificate, the user has no easy method to verify the identity of the device, and the user's browser will initially display an authentication warning. By default, Cisco UCS Manager contains a built-in self-signed certificate containing the public key from the default key ring.

You can change the self-signed KVM certificate on CIMC for UCS M5 servers to a user-generated public certificate. However, a password protected X.509 certificate private key is not supported. Changing the KVM Certificate, on page 74 provides detailed information about this process.

The certificate must be in Base64 encoded X.509 (CER) format.

Trusted Points

To provide stronger authentication for Cisco UCS Manager, you can obtain and install a third-party certificate from a trusted source, or trusted point, that affirms the identity of your device. The third-party certificate is signed by the issuing trusted point, which can be a root certificate authority (CA) or an intermediate CA or
trust anchor that is part of a trust chain that leads to a root CA. To obtain a new certificate, you must generate a certificate request through Cisco UCS Manager and submit the request to a trusted point.

Creating a Key Ring

Cisco UCS Manager supports a maximum of 8 key rings, including the default key ring.

Procedure

1. In the Navigation pane, click Admin.
2. Expand All &gt; Key Management.
3. Right-click Key Management and choose Create Key Ring.
4. In the Create Key Ring dialog box, do the following:
   a) In the Name field, enter a unique name for the key ring.
   b) In the Modulus field, select one of the following radio buttons to specify the SSL key length in bits:
      - Mod2048
      - Mod2560
      - Mod3072
      - Mod3584
      - Mod4096
   c) Click OK.

What to do next

Create a certificate request for this key ring.

Creating a Certificate Request for a Key Ring

Procedure

1. In the Navigation pane, click Admin.
2. Expand All &gt; Key Management.
3. Click the key ring for which you want to create a certificate request.
4. In the Work pane, click the General tab.
5. In the General tab, click Create Certificate Request.
6. In the Create Certificate Request dialog box, complete the following fields:
### Name | Description
--- | ---
DNS field | The domain name assigned to the network that is common to all host names.

**Locality field** | The city or town in which the company requesting the certificate is headquartered.

Enter up to 64 characters. You can use any letters, numbers, or spaces, as well as the following special characters: , (comma), . (period), @ (at sign), ^ (carat), ( (open parenthesis), ) (close parenthesis), - (dash), _ (underscore), + (plus sign), : (colon), / (forward slash).

**State field** | The state or province in which the company requesting the certificate is headquartered.

Enter up to 64 characters. You can use any letters, numbers, or spaces, as well as the following special characters: , (comma), . (period), @ (at sign), ^ (carat), ( (open parenthesis), ) (close parenthesis), - (dash), _ (underscore), + (plus sign), : (colon), / (forward slash).

**Country field** | The country code corresponding to the country in which the company resides.

Enter up to 64 characters.

**Organization Name field** | The organization requesting the certificate.

Enter up to 64 characters. You can use any letters, numbers, or spaces, as well as the following special characters: , (comma), . (period), @ (at sign), ^ (carat), ( (open parenthesis), ) (close parenthesis), - (dash), _ (underscore), + (plus sign), : (colon), / (forward slash).

**Organization Unit Name field** | The organizational unit.

Enter up to 64 characters. You can use any letters, numbers, or spaces, as well as the following special characters: , (comma), . (period), @ (at sign), ^ (carat), ( (open parenthesis), ) (close parenthesis), - (dash), _ (underscore), + (plus sign), : (colon), / (forward slash).

**Email field** | The email address associated with the request.

**Password field** | An optional password for this request.

**Confirm Password field** | If you specified a password, enter it again for confirmation.

**Subject field** | The fully qualified domain name of the fabric interconnect.

---

**Step 7**

To assign IP addresses, click the IPv4 or IPv6 tab. The choice you make depends upon how the fabric interconnects were configured when you set up Cisco UCS Manager.

- Click the IPv4 tab, and complete the following fields:

### Name | Description
--- | ---
IP Address field | The IPv4 address of the Cisco UCS domain.
Changing the KVM Certificate

You can use this procedure to change the KVM certificate to a user-generated public certificate.

**Procedure**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>In the Navigation pane, click Equipment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Expand Equipment &gt; Chassis &gt; Chassis Number &gt; Servers.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Click the server for which you want to change the KVM certificate.</td>
</tr>
<tr>
<td>Step 4</td>
<td>In the Work pane, click the Inventory tab.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Click the CIMC subtab.</td>
</tr>
<tr>
<td>Step 6</td>
<td>In the Actions area, click Change KVM Certificate:</td>
</tr>
<tr>
<td>Step 7</td>
<td>In the Change KVM Certificate dialog box, complete the following fields:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate field</td>
<td>A user-generated public certificate.</td>
</tr>
<tr>
<td>Key field</td>
<td>The corresponding user-generated private key.</td>
</tr>
</tbody>
</table>

**Note** Password protected X.509 certificate private key is not supported.

| Step 8 | Click OK. |

---

Cisco UCS Manager Administration Management Guide 3.2
Step 9
If a confirmation dialog box appears, click Yes.
This operation will result in a reboot of the CIMC.

Clearing the KVM Certificate

Procedure

Step 1
In the Navigation pane, click Equipment.

Step 2
Expand Equipment > Chassis > Chassis Number > Servers.

Step 3
Click the server for which you want to clear the KVM certificate.

Step 4
In the Work pane, click the Inventory tab.

Step 5
Click the CIMC subtab.

Step 6
In the Actions area, click Clear KVM Certificate.

Step 7
In the Clear KVM Certificate dialog box, click Yes.
This operation will result in a reboot of the CIMC.

Creating a Trusted Point

Procedure

Step 1
In the Navigation pane, click Admin.

Step 2
Expand All > Key Management.

Step 3
Right-click Key Management and choose Create Trusted Point.

Step 4
In the Create Trusted Point dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name field</td>
<td>The name of the trusted point.</td>
</tr>
<tr>
<td></td>
<td>This name can be between 1 and 16 alphanumeric characters. You cannot use</td>
</tr>
<tr>
<td></td>
<td>spaces or any special characters other than - (hyphen), _ (underscore),</td>
</tr>
<tr>
<td></td>
<td>: (colon), and . (period), and you cannot change this name after the object</td>
</tr>
<tr>
<td></td>
<td>is saved.</td>
</tr>
</tbody>
</table>
### Importing a Certificate into a Key Ring

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>In the Navigation pane, click Admin.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Expand All &gt; Key Management.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>Click the key ring into which you want to import the certificate.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>In the Work pane, click the General tab.</td>
</tr>
</tbody>
</table>
| **Step 5** | In the Certificate area, complete the following fields:  
  a) From the Trusted Point drop-down list, select the trusted point for the trust anchor that granted this certificate.  
  b) In the Certificate field, paste the text from the certificate you received from the trust anchor or certificate authority.  
     **Important** The certificate must be in Base64 encoded X.509 (CER) format. |
| **Step 6** | Click Save Changes. |

**What to do next**

Configure your HTTPS service with the key ring.

---

**Certificate Chain** field  
The certificate information for this trusted point.  
**Important** The certificate must be in Base64 encoded X.509 (CER) format.  
For Windows 2012 server, using RSASSA-PSS returns the following error occurs: Trustpoint's cert-chain is invalid, reason: unknown. UCS Manager does not support this algorithm.
Configuring HTTPS

Caution

After you complete the HTTPS configuration, including changing the port and key ring for the HTTPS to use, all current HTTP and HTTPS sessions are closed without warning as soon as you save or commit the transaction.

Procedure

Step 1
In the Navigation pane, click Admin.

Step 2
Expand All > Communication Management > Communication Services.

Step 3
In the HTTPS area, click the Enabled radio button.

The HTTPS area expands to display the available configuration options.

Step 4
Complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin State field</td>
<td>This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• Enabled</td>
</tr>
<tr>
<td></td>
<td>• Disabled</td>
</tr>
<tr>
<td></td>
<td>If Admin State is enabled, Cisco UCS Manager GUI displays the remaining</td>
</tr>
<tr>
<td></td>
<td>fields in this section.</td>
</tr>
<tr>
<td>Port field</td>
<td>The port to use for HTTPS connections.</td>
</tr>
<tr>
<td></td>
<td>Specify an integer between 1 and 65535. By default, HTTPS is enabled on</td>
</tr>
<tr>
<td></td>
<td>port.</td>
</tr>
<tr>
<td>Operational Port field</td>
<td>The port Cisco UCS Manager requires for system-level HTTPS communication.</td>
</tr>
<tr>
<td></td>
<td>You cannot change this port.</td>
</tr>
<tr>
<td>Key Ring drop-down list</td>
<td>The key ring for HTTPS connections.</td>
</tr>
<tr>
<td>Cipher Suite Mode field</td>
<td>The level of Cipher Suite security used by the Cisco UCS domain. This</td>
</tr>
<tr>
<td></td>
<td>can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• High Strength</td>
</tr>
<tr>
<td></td>
<td>• Medium Strength</td>
</tr>
<tr>
<td></td>
<td>• Low Strength</td>
</tr>
<tr>
<td></td>
<td>• Custom—Allows you to specify a user-defined Cipher Suite specification</td>
</tr>
<tr>
<td></td>
<td>string.</td>
</tr>
</tbody>
</table>
If you select Custom in the Cipher Suite Mode field, specify the user-defined Cipher Suite specification string in this field.

The Cipher Suite specification string can contain up to 256 characters and must conform to the OpenSSL Cipher Suite specifications. You cannot use any spaces or special characters except ! (exclamation point), + (plus sign), - (hyphen), and : (colon). For details, see http://httpd.apache.org/docs/2.0/mod/mod_ssl.html#sslciphersuite.

For example, the medium strength specification string Cisco UCS Manager uses as the default is:

```
ALL:!ADH:!EXPORT56:!LOW:RC4+RSA:+HIGH:+MEDIUM:+EXP:+eNULL
```

### Allowed SSL Protocols

Enables you to choose which SSL protocols can be used. Values are Default (Allow all except SSLv2 and SSLv3) and Only TLSv1.2. If you choose Only TLSv1.2, all web client connections trying to use less secure versions of TLS are blocked.

---

### Deleting a Key Ring

**Procedure**

1. In the Navigation pane, click Admin.
2. Expand All > Key Management.
3. Right-click the key ring you want to delete and choose Delete.
4. If a confirmation dialog box displays, click Yes.

---

### Deleting a Trusted Point

**Before you begin**

Ensure that the trusted point is not used by a key ring.

**Procedure**

1. In the Navigation pane, click Admin.
2. Expand All > Key Management.
3. Right-click the trusted point you want to delete and choose Delete.
4. If a confirmation dialog box displays, click Yes.

---
Network-Related Communication Services

Enabling SNMP and Configuring SNMP Properties

SNMP messages from a Cisco UCS domain display the fabric interconnect name rather than the system name.

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>In the Navigation pane, click Admin.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Expand All &gt; Communication Management &gt; Communication Services.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>Select the Communication Services tab.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>In the SNMP area, complete the following fields:</td>
</tr>
<tr>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>Admin State field</td>
<td>This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• Enabled</td>
</tr>
<tr>
<td></td>
<td>• Disabled</td>
</tr>
<tr>
<td></td>
<td>Enable this service only if your system includes integration with an SNMP server.</td>
</tr>
<tr>
<td></td>
<td>If Admin State is enabled, Cisco UCS Manager GUI displays the remaining fields in this section.</td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td>Click Save Changes.</td>
</tr>
</tbody>
</table>

**What to do next**

Create SNMP traps and users.

Enabling the CIMC Web Service

The CIMC web service is enabled by default. Follow the steps below to enable the service if it is disabled.

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>In the Navigation pane, click Admin.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Expand All &gt; Communication Management &gt; Communication Services.</td>
</tr>
</tbody>
</table>
Step 3  Select the **Communication Services** tab.
Step 4  In the **CIMC Web Service** area, click the **Enabled** radio button.
Step 5  Click **Save Changes**.

---

### Disabling Communication Services

**Note**  We recommend that you disable all communication services that are not required to interface with other network applications.

**Procedure**

Step 1  In the **Navigation** pane, click **Admin**.
Step 2  Expand **All > Communication Management > Communication Services**.
Step 3  On the **Communication Services** tab, click the **disable** radio button for each service that you want to disable.
Step 4  Click **Save Changes**.

---

### Enabling Telnet

**Procedure**

Step 1  In the **Navigation** pane, click **Admin**.
Step 2  Expand **All > Communication Management > Communication Services**.
Step 3  Click the **Communication Services** tab.
Step 4  In the **Telnet** area, click the **Enabled** radio button.
Step 5  Click **Save Changes**.
CIMC Sessions Management

You can view and close any KVM, vMedia, and SOL sessions in Cisco UCS Manager. If you have administrator privileges, you can discontinue the KVM, vMedia, and SOL sessions of any user. Cisco Integrated Management Controller (CIMC) provides session information to Cisco UCS Manager. When Cisco UCS Manager gets an event from CIMC, it updates its session table and displays the information to all users.

The session information consists of the following information:

- **Name**—The name of the user who launched the session.
- **Session ID**—The ID associated with the session. The format of the session ID for blades is [unique identifier]_[chassis id]_[Blade id]. The format of the session ID for racks is [unique identifier]_0_[Rack id].
- **Type of session**—KVM, vMedia, or SOL.
- **Privilege level of the user**—Read-Write, Read Only, or Granted.
- **Administrative state**—Active or Inactive. The value is active if the session is active. The value is inactive if the session terminate command has been issued but the session has not been terminated. This situation occurs when FSM of the server is in progress with another operation or when the connectivity to CIMC is lost.
- **Source Address**—The IP address of the computer from which the session was opened.
- **Service Profile**—The service profile associated with the session. The service profile attribute value for a CIMC session is displayed only if the session is opened on an IP address that is provided from the service profile.
- **Server**—The name of the server associated with the session.
- **Login time**—The date and time the session started.
- **Last Update Time**—The last time the session information was updated by CIMC.

A new session is generally added when a user connects to KVM, vMedia, or SOL. A Pnuos vMedia session will be displayed in the session table during the server discovery with the user name __vmediausr__.
The CIMC session data is available under the **CIMC Sessions** tab in Cisco UCS Manager GUI. Any CIMC session terminated by the user is audit logged with proper details.

---

**Note**  
To perform the GUI and CLI tasks that are described in this guide, a CIMC image version of 2.1(2a) or above is required for the session management support for the blade servers. The latest CIMC image version of 1.5(1l) and above is required for the rack-servers.

---

### Viewing All Open CIMC Sessions

This task describes one way to view all CIMC sessions opened globally on Cisco UCS Manager. You can view CIMC sessions of all servers opened by local, remote, or IPMI users in a single page.

**Procedure**

1. In the **Navigation** pane, click **Admin > User Management > User Services**.
2. In the **Work** pane, click the **CIMC Sessions** tab.

---

### Viewing the CIMC Sessions of a Server

This task describes how to view the CIMC sessions of a specific server. You can view the CIMC sessions opened on the server and the service profile.

**Procedure**

1. In the **Navigation** pane, click **Equipment**.
2. Expand **Chassis > Chassis Number > Servers > Server Number**.
3. In the **Work** pane, click the **CIMC Sessions** tab.

---

### Viewing the CIMC Sessions of a Service Profile

This task describes how to view the CIMC sessions of a specific service profile.

**Note**  
A CIMC session will only be displayed under a service profile if the session was opened on an IP address provided from that service profile.
### Viewing the CIMC Sessions Opened by a Local User

This task describes how to view CIMC sessions opened by a local user.

**Procedure**

**Step 1**  
In the Navigation pane, click **Servers**.

**Step 2**  
Expand **Servers > Service Profiles > Root > Service Profile Name**.

**Step 3**  
In the Work pane, click the **CIMC Sessions** tab.

### Viewing the CIMC Sessions Opened by a Remote User

This task describes how to view CIMC sessions opened by a remote user.

**Procedure**

**Step 1**  
In the Navigation pane, click **Admin > User Management > User Services > Locally Authenticated Users > User Name**.

**Step 2**  
In the Work pane, click the **CIMC Sessions** tab.

### Clearing All Open CIMC Sessions

This task describes how to clear all open CIMC sessions. You can clear the CIMC sessions of all servers and service-profiles opened by the local, remote, or IPMI users.

**Procedure**

**Step 1**  
In the Navigation pane, click the **Admin** tab.

**Step 2**  
On the Admin tab, click **User Management**.

**Step 3**  
In the Work pane, click the **CIMC Sessions** tab.

**Step 4**  
Select the CIMC sessions you want to clear, right-click, and select **Clear CIMC Session**.
Clearing the CIMC Sessions of a Server

This task describes how to clear the CIMC session of a server. You can clear one or more CIMC sessions that are opened on a server.

Procedure

Step 1 In the Navigation pane, click the Equipment tab.
Step 2 On the Equipment tab, expand Servers > Server Name.
Step 3 In the Work pane, click the CIMC Sessions tab.
Step 4 Select the CIMC sessions that you want to clear, right-click, and select Clear CIMC Session.
Step 5 If the Cisco UCS Manager GUI displays a confirmation dialog box, click Yes.

Clearing the CIMC Sessions of a Service Profile

This task describes how to clear the CIMC sessions of a service profile. You can clear one or more CIMC sessions opened with an IP address provided on the service-profile.

Procedure

Step 1 In the Navigation pane, click the Servers tab.
Step 2 On the Servers tab, expand Servers > Service Profiles > root > Service Profile Name.
Step 3 In the Work pane, click the CIMC Sessions tab.
Step 4 Select the CIMC sessions that you want to clear, right-click, and select Clear CIMC Session.
Step 5 If the Cisco UCS Manager GUI displays a confirmation dialog box, click Yes.

Clearing the CIMC Sessions of a Local User

This task describes how to clear the CIMC sessions of a local user. You can clear one or more CIMC sessions opened by a local user.

Procedure

Step 1 In the Navigation pane, click the Admin tab.
Step 2 On the Admin tab, expand User Services > Locally Authenticated Users > User Name.
Step 3 In the Work pane, click the General tab.
Clearing the CIMC Sessions of a Remote User

This task describes how to clear the CIMC sessions of a remote user. You can clear one or more CIMC sessions opened by a remote user.

Procedure

**Step 1** In the Navigation pane, click Admin.
**Step 2** Expand User Management > User Services > Remotely Authenticated Users > User Name.
**Step 3** In the Work pane, click the General tab.
**Step 4** Under the General tab, expand the CIMC Sessions section.
**Step 5** Select the CIMC sessions that you want to clear, right-click, and select Clear CIMC Session.
**Step 6** If the Cisco UCS Manager GUI displays a confirmation dialog box, click Yes.
Setting the Management IP Address

- Management IP Address, on page 87
- Configuring the Management IP Address on a Server, on page 88
- Setting the Management IP Address on a Service Profile Template, on page 92
- Setting the Management IP Address on a Service Profile Template, on page 92
- Management IP Pools, on page 93
- Creating an IPv6 Address Block in the Management IP Pool, on page 93
- Deleting an IP Address Block from the Management IP Pool, on page 94
- Creating an IPv4 Address Block in the Management IP Pool, on page 94

Management IP Address

Each server in a Cisco UCS domain must have a one or more management IP addresses assigned to its Cisco Integrated Management Controller (CIMC) or to the service profile associated with the server. Cisco UCS Manager uses these IP addresses for external access that terminates in the CIMC. This external access can be through one of the following services:

- KVM console
- Serial over LAN
- An IPMI tool

The management IP addresses used to access the CIMC on a server can be out-of-band (OOB) addresses, through which traffic traverses the fabric interconnect via the management port, or inband addresses, through which traffic traverses the fabric interconnect via the fabric uplink port. Up to six IP addresses can be configured to access the CIMC on a server, two out-of-band (OOB) and four inband.

You can configure the following management IP addresses:

- A static OOB IPv4 address assigned directly to the server
- An OOB IPv4 address assigned to the server from a global ext-mgmt pool
- An inband IPv4 address derived from a service profile associated with the server
- An inband IPv4 address drawn from a management IP pool and assigned to a service profile or service profile template
- An static inband IPv6 address assigned directly to the server
• An inband IPv6 address derived from a service profile associated with the server

You can assign multiple management IP addresses to each CIMC on the server and to the service profile associated with the server. If you do so, you must use different IP addresses for each of them.

A management IP address that is assigned to a service profile moves with that service profile. If KVM or SoL sessions are active when you migrate the service profile to another server, Cisco UCS Manager terminates the sessions and does not restart them after the migration is completed. You configure the IP address when you create or modify a service profile.

---

**Note**

You cannot assign a static IP address to a server or service profile if that IP address has already been assigned to a server or service profile in the Cisco UCS domain. If you attempt to do so, Cisco UCS Manager warns you that the IP address is already in use and rejects the configuration.

An ARP request will be sent to the gateway IP address every second from each server that is configured with an Inband IP address. This is to check if connectivity for the Inband traffic through the current Fabric Interconnect is up, and to initiate a failover to the other Fabric Interconnect if it is down. The path selected for Inband and the failover operations are completely independent of the server data traffic.

---

**Configuring the Management IP Address on a Server**

**Configuring a Server to Use a Static IP Address**

If this action is greyed out, the server has already been assigned a static IP address.

You can configure a total of three static management addresses per server:

- Outband IPv4
- Inband IPv4
- Inband IPv6

---

**Note**

You are not required to configure all three.

---

**Procedure**

**Step 1** In the Navigation pane, click Equipment.

**Step 2** Expand Equipment > Chassis > Chassis Number > Cartridges > Cartridge Number > Servers

**Step 3** Click the server for which you want to configure IP addresses.

**Step 4** In the Work pane, click the Inventory tab.

**Step 5** Click the CIMC subtab.

In the Actions area, two choices are available for management IP addresses:

- Modify Outband Static Management IP
- Change Inband Management IP
Step 6  
To modify the outband static management IP address, in the **Actions** area, click **Modify Outband Static Management IP**:

Step 7  
In the **Modify Outband Static Management IP** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Address</td>
<td>The static IPv4 address to be assigned to the server.</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>The subnet mask for the IP address.</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>The default gateway that the IP address should use.</td>
</tr>
</tbody>
</table>

Step 8  
Click **OK**.

Step 9  
To modify the inband management IP address, click **Change Inband Management IP**.  
In the **Change Management IP Address** dialog box, there are two tabs:

- **Inband IPv4**
- **Inband IPv6**

  a) To change the static inband IPv4 management address, click the **Inband IPv4** subtab.
  b) In the **Change Management IP Address** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management IP Address Policy drop-down</td>
<td>Click <strong>Static</strong>.</td>
</tr>
<tr>
<td>IP Address</td>
<td>The static IPv4 address to be assigned to the server.</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>The subnet mask for the IP address.</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>The default gateway that the IP address should use.</td>
</tr>
</tbody>
</table>

c) Click **OK**.

d) To change the static inband management IPv6 address, click the **Inband IPv6** subtab.

e) In the **Change Management IP Address** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management IP Address Policy drop-down</td>
<td>Click <strong>Static</strong>.</td>
</tr>
<tr>
<td>IP Address</td>
<td>The static IPv6 address to be assigned to the server.</td>
</tr>
<tr>
<td>Prefix</td>
<td>The network prefix for the IP address.</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>The default gateway that the IP address should use.</td>
</tr>
</tbody>
</table>

c) Click **OK**.

e) To change the static inband management IPv6 address, click the **Inband IPv6** subtab.

e) In the **Change Management IP Address** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management IP Address Policy drop-down</td>
<td>Click <strong>Static</strong>.</td>
</tr>
<tr>
<td>IP Address</td>
<td>The static IPv6 address to be assigned to the server.</td>
</tr>
<tr>
<td>Prefix</td>
<td>The network prefix for the IP address.</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>The default gateway that the IP address should use.</td>
</tr>
</tbody>
</table>

c) Click **OK**.

e) To change the static inband management IPv6 address, click the **Inband IPv6** subtab.

e) In the **Change Management IP Address** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management IP Address Policy drop-down</td>
<td>Click <strong>Static</strong>.</td>
</tr>
<tr>
<td>IP Address</td>
<td>The static IPv6 address to be assigned to the server.</td>
</tr>
<tr>
<td>Prefix</td>
<td>The network prefix for the IP address.</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>The default gateway that the IP address should use.</td>
</tr>
</tbody>
</table>

c) Click **OK**.

e) To change the static inband management IPv6 address, click the **Inband IPv6** subtab.

e) In the **Change Management IP Address** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management IP Address Policy drop-down</td>
<td>Click <strong>Static</strong>.</td>
</tr>
<tr>
<td>IP Address</td>
<td>The static IPv6 address to be assigned to the server.</td>
</tr>
<tr>
<td>Prefix</td>
<td>The network prefix for the IP address.</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>The default gateway that the IP address should use.</td>
</tr>
</tbody>
</table>

c) Click **OK**.

e) To change the static inband management IPv6 address, click the **Inband IPv6** subtab.

e) In the **Change Management IP Address** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management IP Address Policy drop-down</td>
<td>Click <strong>Static</strong>.</td>
</tr>
<tr>
<td>IP Address</td>
<td>The static IPv6 address to be assigned to the server.</td>
</tr>
<tr>
<td>Prefix</td>
<td>The network prefix for the IP address.</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>The default gateway that the IP address should use.</td>
</tr>
</tbody>
</table>

c) Click **OK**.

e) To change the static inband management IPv6 address, click the **Inband IPv6** subtab.

e) In the **Change Management IP Address** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management IP Address Policy drop-down</td>
<td>Click <strong>Static</strong>.</td>
</tr>
<tr>
<td>IP Address</td>
<td>The static IPv6 address to be assigned to the server.</td>
</tr>
<tr>
<td>Prefix</td>
<td>The network prefix for the IP address.</td>
</tr>
<tr>
<td>Default Gateway</td>
<td>The default gateway that the IP address should use.</td>
</tr>
</tbody>
</table>
Configuring a Server to Use a Management IP Pool

If any action is specified in this procedure is greyed out, it means that the configuration has already been completed. You can configure a total of three management IP pools per server:

- Outband IPv4
- Inband IPv4
- Inband IPv6

**Note**
You are not required to configure all three.

**Before you begin**
Configure management IP pools before configuring servers to use management IP pools.

**Procedure**

**Step 1**  
In the **Navigation** pane, click **Equipment**.

**Step 2**  
Expand **Equipment > Chassis > Chassis Number > Cartridges > Cartridge Number > Servers**

**Step 3**  
Click the server that you want to configure to use the management IP pool.

**Step 4**  
In the **Work** pane, click the **Inventory** tab.

**Step 5**  
Click the **CIMC** subtab.

- To configure an outband IP pooled management IP address policy, proceed with **Step 6**.
- To configure inband IPv4 and/or IPv6 management IP address policies, proceed to **Step 8**.

**Step 6**  
In the **Actions** area, click **Use Outband Pooled Management IP**.

**Step 7**  
Click **Yes** in the **Use Outband Pooled Management IP** confirmation dialog box, then click **OK**.  
The management IP address policy is now switched to using an OOB IP address from the outband management IP pool.

**Step 8**  
In the **Actions** area, click **Change Inband Management IP**.

**Step 9**  
In the **Change Management IP Dialog** box, there are two tabs:

- **Inband IPv4**
- **Inband IPv6**

  a) To change the inband IPv4 management IP pool, click the **Inband IPv4** tab, and complete the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network drop-down list</td>
<td>A VLAN selected from the associated VLAN group.</td>
</tr>
</tbody>
</table>
The management IP pool you want to assign to the server. There are two types of pools available:

- Domain Pools
- Global Pools

Select one of the pools available from either the Domain Pools entries or the Global Pools entries.

b) To change the inband IPv6 management IP pool, click the Inband IPv6 tab, and complete the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
</table>
| Management IP Address Policy   | The management IP pool you want to assign to the server. There are two types of pools available:
|                                | - Domain Pools
|                                | - Global Pools
|                                | Select one of the pools available from either the Domain Pools entries or the Global Pools entries. |

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network</td>
<td>A VLAN selected from the associated VLAN group.</td>
</tr>
</tbody>
</table>

Step 10 Click OK.

Step 11 If a confirmation dialog box displays, click Yes.

---

**Deleting the Inband Configuration from a Server**

This procedure removes the inband management IP address configuration from a server. If this action is greyed out, no inband configuration was completed.

**Procedure**

1. In the Navigation pane, click Equipment.
2. Expand Equipment > Chassis > Chassis Number > Cartridges > Cartridge Number > Servers
3. Choose the server for which you want to delete the inband management IP configuration.
4. In the Work area, click the Inventory tab.
5. Click the CIMC subtab.
6. In the Actions area, click Delete Inband Configuration.
7. Click Yes in the Delete confirmation dialog box.

The inband configuration for the server is deleted.
If an inband service profile is configured in Cisco UCS Manager with a default VLAN and pool name, the server CIMC will automatically get an inband configuration from the inband profile approximately one minute after deleting the inband configuration here.

Setting the Management IP Address on a Service Profile Template

Procedure

Step 1 In the Navigation pane, click Servers.
Step 2 Expand Servers > Service Profile Templates.
Step 3 Expand the node for the organization that contains the service profile template for which you want to set the management IP address.
   If the system does not include multitenancy, expand the root node.
Step 4 Click the service profile template for which you want to set the management IP address.
Step 5 In the Work pane, click the General tab.
Step 6 Expand the Management IP Address area.
Step 7 In the Actions area, click Change Management IP Address.
Step 8 Complete the fields in the Change Management IP Address dialog box.
Step 9 Click Save Changes.
Step 6  Expand the Management IP Address area.
Step 7  In the Actions area, click Change Management IP Address.
Step 8  Complete the fields in the Change Management IP Address dialog box.
Step 9  Click Save Changes.

Management IP Pools

The default management IP pool, IP Pool ext-mgmt is a collection of external IPv4 and IPv6 addresses. Cisco UCS Manager reserves each block of IP addresses in the management IP pool for external access that terminates in the CIMC on a server.

By default, the IP Pool ext-mgmt is used to configure the CIMC outbound management IP address. You cannot change this IP pool if already a static IP address is assigned to the server from this pool. If you want to configure the outbound management IP address for CIMC from a static IP address, then you can delete the IP addresses from the default management IP pool.

You can configure separate out-of-band IPv4 address pools, and in-band IPv4 or IPv6 address pools. You can configure in-band pools that contain both IPv4 and IPv6 address blocks.

Tip
To avoid assigning an IP pool that contains only IPv4 addresses as the in-band IPv6 policy, or assigning an IP pool that contains only IPv6 addresses as the in-band IPv4 policy to a server CIMC, it is suggested that you configure separate in-band address pools, each with only IPv4 or IPv6 addresses.

You can configure service profiles and service profile templates to use IP addresses from the management IP pools. You cannot configure servers to use the management IP pool.

All IP addresses in the management IP pool must be in the same IPv4 subnet, or have the same IPv6 network prefix as the IP address of the fabric interconnect.

Note
The management IP pool must not contain any IP addresses that were assigned as static IP addresses for a server or service profile.

Creating an IPv6 Address Block in the Management IP Pool

The management IP pool must not contain any IP addresses that were assigned as static IP addresses for a server or service profile.

Procedure

Step 1  In the Navigation pane, click LAN.
Step 2  In the LAN tab, expand LAN > Pools > Organization_Name.
Step 3  Expand the IP Pools node.
Deleting an IP Address Block from the Management IP Pool

**Step 4** Right-click **IP Pool ext-mgmt** and select **Create Block of IP Addresses**.

**Step 5** In the **Create a Block of IPv6 Addresses** dialog box, specify the required information.

**Step 6** Click **OK**.

**What to do next**

Configure one or more service profiles or service profile templates to obtain the CIMC IP address from the management IP pool.

Creating an IPv4 Address Block in the Management IP Pool

The management IP pool must not contain any IP addresses that were assigned as static IP addresses for a server or service profile.

**Procedure**

**Step 1** In the **Navigation** pane, click **LAN**.

**Step 2** In the **LAN** tab, expand **LAN > Pools > Organization_Name**.

**Step 3** Expand the **IP Pools** node.

**Step 4** Select **IP Pool ext-mgmt**.

**Step 5** Right-click the IP address block that you want to delete and select **Delete**.

**Step 6** If a confirmation dialog box displays, click **Yes**.

**Table**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name column</td>
<td>The range of IPv4 addresses assigned to the block.</td>
</tr>
<tr>
<td>From column</td>
<td>The first IPv4 address in the block.</td>
</tr>
<tr>
<td>To column</td>
<td>The last IPv4 address in the block.</td>
</tr>
<tr>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Subnet column</td>
<td>The subnet mask associated with the IPv4 addresses in the block.</td>
</tr>
<tr>
<td>Default Gateway column</td>
<td>The default gateway associated with the IPv4 addresses in the block.</td>
</tr>
<tr>
<td>Primary DNS column</td>
<td>The primary DNS server that this block of IPv4 addresses should access.</td>
</tr>
<tr>
<td>Secondary DNS column</td>
<td>The secondary DNS server that this block of IPv4 addresses should access.</td>
</tr>
</tbody>
</table>

**Step 6**

Click **OK**.

**What to do next**

Configure one or more service profiles or service profile templates to obtain the CIMC IP address from the management IP pool.
Organizations in a Multitenancy Environment

Multi-tenancy allows you to divide the large physical infrastructure of an Cisco UCS domain into logical entities known as organizations. As a result, you can achieve a logical isolation between organizations without providing a dedicated physical infrastructure for each organization.

You can assign unique resources to each tenant through the related organization in the multi-tenant environment. These resources can include different policies, pools, and quality of service definitions. You can also implement locales to assign or restrict user privileges and roles by organization, if you do not want all users to have access to all organizations.

If you set up a multi-tenant environment, all organizations are hierarchical. The top-level organization is always root. The policies and pools that you create in root are system-wide and are available to all organizations in the system. However, any policies and pools created in other organizations are only available to organizations that are above it in the same hierarchy. For example, if a system has organizations named Finance and HR that are not in the same hierarchy, Finance cannot use any policies in the HR organization, and HR cannot access any policies in the Finance organization. However, both Finance and HR can use policies and pools in the root organization.

If you create organizations in a multi-tenant environment, you can also set up one or more of the following for each organization or for a sub-organization in the same hierarchy:

- Resource pools
- Policies
- Service profiles
- Service profile templates

The root organization is always the top level organization.
Hierarchical Name Resolution in a Multi-Tenancy Environment

In a multi-tenant environment, Cisco UCS uses the hierarchy of an organization to resolve the names of policies and resource pools. When Cisco UCS Manager searches for details of a policy or a resource assigned to a pool, the following occurs:

1. Cisco UCS Manager checks for policies and pools with the specified name within the organization assigned to the service profile or policy.

2. If a policy is found or an available resource is inside a pool, Cisco UCS Manager uses that policy or resource. If the pool does not have any available resources at the local level, Cisco UCS Manager moves up in the hierarchy to the parent organization and searches for a pool with the same name. Cisco UCS Manager repeats this step until the search reaches the root organization.

3. If the search reaches the root organization and has not found an available resource or policy, Cisco UCS Manager returns to the local organization and begins to search for a default policy or available resource in the default pool.

4. If an applicable default policy or available resource in a default pool is found, Cisco UCS Manager uses that policy or resource. If the pool does not have any available resources, Cisco UCS Manager moves up in the hierarchy to the parent organization and searches for a default pool. Cisco UCS Manager repeats this step until the search reaches the root organization.

5. If Cisco UCS Manager cannot find an applicable policy or available resource in the hierarchy, it returns an allocation error.

Example: Server Pool Name Resolution in a Single-Level Hierarchy

In this example, all organizations are at the same level below the root organization. For example, a service provider creates separate organizations for each customer. In this configuration, organizations only have access to the policies and resource pools assigned to that organization and to the root organization.

In this example, a service profile in the XYZcustomer organization is configured to use servers from the XYZcustomer server pool. When resource pools and policies are assigned to the service profile, the following occurs:

1. Cisco UCS Manager checks for an available server in the XYZcustomer server pool.

2. If the XYZcustomer server pool has an available server, Cisco UCS Manager associates that server with the service profile and discontinues the search. If the pool does not have an available server, Cisco UCS Manager checks the root organization for a server pool with the same name.

3. If the root organization includes an XYZcustomer server pool and that pool has an available server, Cisco UCS Manager associates that server with the service profile and discontinues the search. If the pool does not have an available server, Cisco UCS Manager returns to the XYZcustomer organization to check the default server pool.

4. If the default pool in the XYZcustomer organization has an available server, Cisco UCS Manager associates that server with the service profile and discontinues the search. If the default pool does not have an available server, Cisco UCS Manager checks the default server pool in the root organization.
5. If the default server pool in the root organization has an available server, Cisco UCS Manager associates that server with the service profile and discontinues the search. If the default pool does not have an available server, Cisco UCS Manager returns an allocation error.

Example: Server Pool Name Resolution in a Multi-Level Hierarchy

In this example, each organization includes at least one suborganization. For example, a company could create organizations for each major division in the company and for subdivisions of those divisions. In this configuration, each organization has access to its local policies and resource pools and to the resource pools in the parent hierarchy.

In this example, the Finance organization includes two sub-organizations, AccountsPayable and AccountsReceivable. A service profile in the AccountsPayable organization is configured to use servers from the AP server pool. When resource pools and policies are assigned to the service profile, the following occurs:

1. Cisco UCS Manager checks for an available server in the AP server pool defined in the service profile.

2. If the AP server pool has an available server, Cisco UCS Manager associates that server with the service profile and discontinues the search. If the pool does not have an available server, Cisco UCS Manager moves one level up the hierarchy and checks the Finance organization for a pool with the same name.

3. If the Finance organization includes a pool with the same name and that pool has an available server, Cisco UCS Manager associates that server with the service profile and discontinues the search. If the pool does not have an available server, Cisco UCS Manager moves one level up in the hierarchy and checks the root organization for a pool with the same name.

4. If the root organization includes a pool with the same name and that pool has an available server, Cisco UCS Manager associates that server with the service profile and discontinues the search. If the pool does not have an available server, Cisco UCS Manager returns to the AccountsPayable organization to check the default server pool.

5. If the default pool in the AccountsPayable organization has an available server, Cisco UCS Manager associates that server with the service profile and discontinues the search. If the default pool does not have an available server, Cisco UCS Manager moves one level up in the hierarchy and checks the default server pool in the Finance organization.

6. If the default pool in the Finance organization has an available server, Cisco UCS Manager associates that server with the service profile and discontinues the search. If the default pool does not have an available server, Cisco UCS Manager moves one level up in the hierarchy and checks the default server pool in the root organization.

7. If the default server pool in the root organization has an available server, Cisco UCS Manager associates that server with the service profile and discontinues the search. If the default pool does not have an available server, Cisco UCS Manager returns an allocation error.
Creating an Organization under the Root Organization

Procedure

Step 1  On the toolbar, choose New > Create Organization.
Step 2  In the Name field of the Create Organization dialog box, enter a unique name for the organization. This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.
Step 3  In the Description field, enter a description for the organization.
Step 4  Click OK.

Creating an Organization under a Sub-Organization

Procedure

Step 1  In the Navigation pane, click Servers.
Step 2  Expand Service Profiles > root.
You can also access the Sub-Organizations node under the Policies or Pools nodes.
Step 3  Expand the Sub-Organizations node and do one of the following:
   • To create an organization directly under root, right-click Sub-Organizations and choose Create Organization.
   • To create an organization under a lower-level sub-organization, expand the sub-organization nodes in the hierarchy and then right-click the sub-organization under which you want to create the new organization and choose Create Organization.
Step 4  In the Name field of the Create Organization dialog box, enter a unique name for the organization. This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.
Step 5  In the Description field, enter a description for the organization.
Step 6  Click OK.
**Deleting an Organization**

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>In the <strong>Navigation</strong> pane, click <strong>Servers</strong>.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Navigate to the organization that you want to delete.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Right-click the organization and choose <strong>Delete</strong>.</td>
</tr>
<tr>
<td>Step 4</td>
<td>If a confirmation dialog box displays, click <strong>Yes</strong>.</td>
</tr>
</tbody>
</table>
Deleting an Organization
Backup and Restore

- Backup Operations in UCS, on page 103
- Considerations and Recommendations for Backup Operations, on page 103
- Required User Role for Backup and Import Operations, on page 104
- Creating a Backup Operation, on page 104
- Running a Backup Operation, on page 108
- Modifying a Backup Operation, on page 109
- Deleting One or More Backup Operations, on page 109
- Backup Types, on page 110
- System Restore, on page 119

Backup Operations in UCS

When you perform a backup through Cisco UCS Manager, you take a snapshot of all or part of the system configuration and export the file to a location on your network. You cannot use Cisco UCS Manager to backup data on the servers.

You can perform a backup while the system is up and running. The backup operation only saves information from the management plane. It does not have any impact on the server or network traffic.

Considerations and Recommendations for Backup Operations

Before you create a backup operation, consider the following:

Backup Locations

The backup location is the destination or folder on the network where you want Cisco UCS Manager to export the backup file. You can maintain only one backup operation for each location where you plan to save a backup file.

Potential to Overwrite Backup Files

If you rerun a backup operation without changing the filename, Cisco UCS Manager overwrites the existing file on the server. To avoid overwriting existing backup files, change the filename in the backup operation or copy the existing file to another location.
Multiple Types of Backups

You can run and export more than one type of backup to the same location. Change the backup type before you rerun the backup operation. We recommend that you change the filename for easier identification and to avoid overwriting the existing backup file.

Scheduled Backups

You can create a backup operation in advance and leave the admin state disabled, until you are ready to run the backup. Cisco UCS Manager does not run the backup operation, save, or export the configuration file until you set the admin state of the backup operation to enabled.

Incremental Backups

You cannot perform incremental backups.

Encryption of Full State Backups

Full state backups are encrypted so that passwords and other sensitive information are not exported as clear text.

FSM Tasks for Backup Policy and Configuration Export Policy

When configuring both Backup Policy and Config Export Policy on the Policy Backup & Export tab and using the same hostname for both policies, Cisco UCS Manager will create only one Backup Operation in the Backup Configuration page to run both tasks. Each policy run will not have a separate FSM task.

To see a separate FSM task for each policy, you can create a hostname alias in your DNS server to point to the same FTP/TFTP/SCP/SFTP server. Then you can use one hostname for the Backup Policy and another hostname for the Config Export Policy.

Required User Role for Backup and Import Operations

You must have a user account that includes the admin role to create and run backup and import operations.

Creating a Backup Operation

Before you begin

Obtain the backup server IPv4 or IPv6 address and authentication credentials.

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>In the Navigation pane, click Admin.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Click the All node.</td>
</tr>
<tr>
<td>Step 3</td>
<td>In the Work pane, click the General tab.</td>
</tr>
<tr>
<td>Step 4</td>
<td>In the Actions area, click Backup Configuration.</td>
</tr>
<tr>
<td>Step 5</td>
<td>In the Backup Configuration dialog box, click Create Backup Operation.</td>
</tr>
<tr>
<td>Step 6</td>
<td>In the Create Backup Operation dialog box, complete the following fields:</td>
</tr>
<tr>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Admin State field</td>
<td>This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• <strong>Enabled</strong>—Cisco UCS Manager runs the backup operation as soon as you click <strong>OK</strong>.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Disabled</strong>—Cisco UCS Manager does not run the backup operation when you click <strong>OK</strong>. If you select this option, all fields in the dialog box remain visible. However, you must manually run the backup from the <strong>Backup Configuration</strong> dialog box.</td>
</tr>
<tr>
<td>Type field</td>
<td>The information saved in the backup configuration file. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• <strong>Full state</strong>—A binary file that includes a snapshot of the entire system. You can use the file generated from this backup to restore the system during disaster recovery. This file can restore or rebuild the configuration on the original fabric interconnect, or recreate the configuration on a different fabric interconnect. You cannot use this file for an import.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong> You can only use a full state backup file to restore a system that is running the same version as the system from which the backup file was exported.</td>
</tr>
<tr>
<td></td>
<td>• <strong>All configuration</strong>—An XML file that includes all system and logical configuration settings. You can use the file generated from this backup to import these configuration settings to the original fabric interconnect or to a different fabric interconnect. You cannot use this file for a system restore. This file does not include passwords for locally authenticated users.</td>
</tr>
<tr>
<td></td>
<td>• <strong>System configuration</strong>—An XML file that includes all system configuration settings such as usernames, roles, and locales. You can use the file generated from this backup to import these configuration settings to the original fabric interconnect or to a different fabric interconnect. You cannot use this file for a system restore.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Logical configuration</strong>—An XML file that includes all logical configuration settings such as service profiles, VLANs, VSANs, pools, and policies. You can use the file generated from this backup to import these configuration settings to the original fabric interconnect or to a different fabric interconnect. You cannot use this file for a system restore.</td>
</tr>
</tbody>
</table>
### Name: Preserve Identities check box

This checkbox remains selected for **All Configuration** and **System Configuration** type of backup operation, and provides the following functionality:

- **All Configuration**—The backup file preserves all identities derived from pools, including vHBAs, WWPNs, WWNN, vNICs, MACs and UUIDs. Also, the identities for Chassis, FEX, Rack Servers, and user labels for Chassis, FEX, Rack Servers, IOMs and Blade Servers are preserved.

  **Note** If this check box is not selected the identities will be reassigned and user labels will be lost after a restore.

- **System Configuration**—The backup file preserves identities for Chassis, FEX, Rack Servers, and user labels for Chassis, FEX, Rack Servers, IOMs and Blade Servers.

  **Note** If this check box is not selected the identities will be reassigned and user labels will be lost after a restore.

If this checkbox is selected for **Logical Configuration** type of backup operation, the backup file preserves all identities derived from pools, including vHBAs, WWPNs, WWNN, vNICs, MACs and UUIDs.

  **Note** If this check box is not selected the identities will be reassigned and user labels will be lost after a restore.

### Name: Location of the Backup File field

Where the backup file should be saved. This can be one of the following:

- **Remote File System**—The backup XML file is saved to a remote server. Cisco UCS Manager GUI displays the fields described below that allow you to specify the protocol, host, filename, username, and password for the remote system.

- **Local File System**—The backup XML file is saved locally.

  HTML-based Cisco UCS Manager GUI displays the **Filename** field. Enter a name for the backup file in `<filename>.xml` format. The file is downloaded and saved to a location depending on your browser settings.
<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol field</td>
<td>The protocol to use when communicating with the remote server. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• FTP</td>
</tr>
<tr>
<td></td>
<td>• TFTP</td>
</tr>
<tr>
<td></td>
<td>• SCP</td>
</tr>
<tr>
<td></td>
<td>• SFTP</td>
</tr>
<tr>
<td></td>
<td>• USB A—The USB drive inserted into fabric interconnect A. This option is only available for certain system configurations.</td>
</tr>
<tr>
<td></td>
<td>• USB B—The USB drive inserted into fabric interconnect B. This option is only available for certain system configurations.</td>
</tr>
<tr>
<td>Hostname field</td>
<td>The hostname, IPv4 or IPv6 address of the location where the backup file is stored. This can be a server, storage array, local drive, or any read/write media that the fabric interconnect can access through the network.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong> If you use a hostname rather than an IPv4 or IPv6 address, you must configure a DNS server. If the Cisco UCS domain is not registered with Cisco UCS Central or DNS management is set to <strong>local</strong>, configure a DNS server in Cisco UCS Manager.</td>
</tr>
<tr>
<td></td>
<td>If the Cisco UCS domain is registered with Cisco UCS Central and DNS management is set to <strong>global</strong>, configure a DNS server in Cisco UCS Central.</td>
</tr>
<tr>
<td>Remote File field</td>
<td>The full path to the backup configuration file. This field can contain the filename as well as the path. If you omit the filename, the backup procedure assigns a name to the file.</td>
</tr>
<tr>
<td>User field</td>
<td>The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP or USB.</td>
</tr>
<tr>
<td>Password field</td>
<td>The password for the remote server username. This field does not apply if the protocol is TFTP or USB.</td>
</tr>
<tr>
<td></td>
<td>Cisco UCS Manager does not store this password. Therefore, you do not need to enter this password unless you intend to enable and run the backup operation immediately.</td>
</tr>
</tbody>
</table>

**Step 7** Click **OK**.

**Step 8** If Cisco UCS Manager displays a confirmation dialog box, click **OK**.

If you set the **Admin State** field to enabled, Cisco UCS Manager takes a snapshot of the configuration type that you selected and exports the file to the network location. The backup operation displays in the **Backup Operations** table in the **Backup Configuration** dialog box.

**Step 9** (Optional) To view the progress of the backup operation, do the following:
a) If the operation does not display in the Properties area, click the operation in the Backup Operations table.
b) In the Properties area, click the down arrows on the FSM Details bar.

The FSM Details area expands and displays the operation status.

Step 10 Click OK to close the Backup Configuration dialog box.

The backup operation continues to run until it is completed. To view the progress, re-open the Backup Configuration dialog box.

---

**Running a Backup Operation**

**Procedure**

**Step 1** In the Navigation pane, click Admin.

**Step 2** Click the All node.

**Step 3** In the Work pane, click the General tab.

**Step 4** In the Actions area, click Backup Configuration.

**Step 5** In the Backup Operations table of the Backup Configuration dialog box, click the backup operation that you want to run.

The details of the selected backup operation display in the Properties area.

**Step 6** In the Properties area, complete the following fields:

a) In the Admin State field, click the Enabled radio button.
b) For all protocols except TFTP, enter the password for the username in the Password field.
c) (Optional) Change the content of the other available fields.

**Note** If you change other fields -- such as resetting a scheduled backup from weekly to daily -- you must re-enter your user name and password. Otherwise, an FI backup will fail.

**Step 7** Click Apply.

Cisco UCS Manager takes a snapshot of the configuration type that you selected and exports the file to the network location. The backup operation displays in the Backup Operations table in the Backup Configuration dialog box.

**Step 8** (Optional) To view the progress of the backup operation, click the down arrows on the FSM Details bar.

The FSM Details area expands and displays the operation status.

**Step 9** Click OK to close the Backup Configuration dialog box.

The backup operation continues to run until it is completed. To view the progress, re-open the Backup Configuration dialog box.
Modifying a Backup Operation

You can modify a backup operation to save a file of another backup type to that location or to change the filename and avoid overwriting previous backup files.

**Note**

You can only use a full state backup file to restore a system that is running the same version as the system from which the backup file was exported.

**Procedure**

1. In the **Navigation** pane, click **Admin**.
2. Click the **All** node.
3. In the **Work** pane, click the **General** tab.
4. In the **Actions** area, click **Backup Configuration**.
5. In the **Backup Operations** area of the **Backup Configuration** dialog box, click the backup operation that you want to modify.

   The details of the selected backup operation display in the **Properties** area. If the backup operation is in a disabled state, the fields are dimmed.

6. In the **Admin State** field, click the **enabled** radio button.
7. Modify the appropriate fields.

   You do not have to enter the password unless you want to run the backup operation immediately.

8. (Optional) If you do not want to run the backup operation immediately, click the **disabled** radio button in the **Admin State** field.
9. Click **OK**.

Deleting One or More Backup Operations

**Procedure**

1. In the **Navigation** pane, click **Admin**.
2. Click the **All** node.
3. In the **Work** pane, click the **General** tab.
4. In the **Actions** area, click **Backup Configuration**.
5. In the **Backup Operations** table of the **Backup Configuration** dialog box, click the backup operations that you want to delete.

   **Tip** You cannot click a backup operation in the table if the admin state of the operation is set to **Enabled**.
Step 6  Click the **Delete** icon in the icon bar of the **Backup Operations** table.

Step 7  If a confirmation dialog box displays, click **Yes**.

Step 8  In the **Backup Configuration** dialog box, click one of the following:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply</td>
<td>Deletes the selected backup operations without closing the dialog box.</td>
</tr>
<tr>
<td>OK</td>
<td>Deletes the selected backup operations and closes the dialog box.</td>
</tr>
</tbody>
</table>

## Backup Types

You can perform one or more of the following types of backups in Cisco UCS Manager and Cisco UCS Central:

- **Full state**—A binary file that includes a snapshot of the entire system. You can use the file generated from this backup to restore the system during disaster recovery. This file can restore or rebuild the configuration on the original fabric interconnect, or recreate the configuration on a different fabric interconnect. You cannot use this file for an import.

  > **Note** You can only use a full state backup file to restore a system that is running the same version as the system from which the backup file was exported.

- **All configuration**—An XML file that includes all system and logical configuration settings. You can use the file generated from this backup to import these configuration settings to the original fabric interconnect or to a different fabric interconnect. You cannot use this file for a system restore. This file does not include passwords for locally authenticated users.

- **System configuration**—An XML file that includes all system configuration settings such as usernames, roles, and locales. You can use the file generated from this backup to import these configuration settings to the original fabric interconnect or to a different fabric interconnect. You cannot use this file for a system restore.

- **Logical configuration**—An XML file that includes all logical configuration settings such as service profiles, VLANs, VSANs, pools, and policies. You can use the file generated from this backup to import these configuration settings to the original fabric interconnect or to a different fabric interconnect. You cannot use this file for a system restore.

## Configuring the Full State Backup Policy

**Before you begin**

Obtain the backup server IPv4 or IPv6 address and authentication credentials.
### Procedure

**Step 1** In the Navigation pane, click **Admin**.

**Step 2** Click the **All** node.

**Step 3** In the Work pane, click the **Backup and Export Policy** tab.

**Step 4** In the **Full State Backup Policy** area, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Hostname field**  | The hostname, IPv4 or IPv6 address of the location where the policy backup file is stored. This can be a server, storage array, local drive, or any read/write media that the fabric interconnect can access through the network.  
  **Note** If you use a hostname rather than an IPv4 or IPv6 address, you must configure a DNS server. If the Cisco UCS domain is not registered with Cisco UCS Central or DNS management is set to **local**, configure a DNS server in Cisco UCS Manager. If the Cisco UCS domain is registered with Cisco UCS Central and DNS management is set to **global**, configure a DNS server in Cisco UCS Central. |
| **Protocol field**   | The protocol to use when communicating with the remote server. This can be one of the following:  
  • FTP  
  • TFTP  
  • SCP  
  • SFTP  
  • **USB A**—The USB drive inserted into fabric interconnect A.  
    This option is only available for certain system configurations.  
  • **USB B**—The USB drive inserted into fabric interconnect B.  
    This option is only available for certain system configurations. |
| **User field**       | The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP or USB. |
| **Password field**   | The password for the remote server username. This field does not apply if the protocol is TFTP or USB. |
| **Remote File field**| The full path to the policy backup file. This field can contain the filename as well as the path. If you omit the filename, the backup procedure assigns a name to the file. |
### Configuring the All Configuration Export Policy

**Before you begin**

Obtain the backup server IPv4 or IPv6 address and authentication credentials.

---

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Admin State</strong></td>
<td>This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• <strong>Enabled</strong>—Cisco UCS Manager backs up all policy information using the schedule specified in the <strong>Schedule</strong> field.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Disabled</strong>—Cisco UCS Manager does not back up policy information.</td>
</tr>
<tr>
<td><strong>Schedule</strong></td>
<td>The frequency with which Cisco UCS Manager backs up policy information.</td>
</tr>
<tr>
<td><strong>Max Files</strong></td>
<td>The maximum number of backup files that Cisco UCS Manager maintains.</td>
</tr>
<tr>
<td></td>
<td>This value cannot be changed.</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>The description of the backup policy. The default description is <strong>Database Backup Policy</strong>.</td>
</tr>
<tr>
<td></td>
<td>Enter up to 256 characters. You can use any characters or spaces except ' (accent mark), \ (backslash), ^ (carat), &quot; (double quote), = (equal sign), &gt; (greater than), &lt; (less than), or ' (single quote).</td>
</tr>
</tbody>
</table>

**Step 5**  
(Optional) In the **Backup/Export Config Reminder** area, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Admin State</strong></td>
<td>This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• <strong>Enable</strong>—Cisco UCS Manager raises a fault if a backup is not taken during the specified time period.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Disable</strong>—Cisco UCS Manager does not raise a fault if a backup is not taken during the specified time period.</td>
</tr>
<tr>
<td><strong>Remind Me After (days)</strong></td>
<td>The number of days before you are reminded to take a backup. Enter an integer between 1 and 365.</td>
</tr>
<tr>
<td></td>
<td>The default value is 30 days.</td>
</tr>
</tbody>
</table>

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

---

**Cisco UCS Manager Administration Management Guide 3.2**
## Procedure

**Step 1**  
In the Navigation pane, click Admin.

**Step 2**  
Click the All node.

**Step 3**  
In the Work pane, click the Policy Backup & Export tab.

**Step 4**  
In the Config Export Policy area, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Hostname field** | The hostname, IPv4 or IPv6 address of the location where the configuration backup file is stored. This can be a server, storage array, local drive, or any read/write media that the fabric interconnect can access through the network.  
  **Note**  
  If you use a hostname rather than an IPv4 or IPv6 address, you must configure a DNS server. If the Cisco UCS domain is not registered with Cisco UCS Central or DNS management is set to local, configure a DNS server in Cisco UCS Manager.  
  If the Cisco UCS domain is registered with Cisco UCS Central and DNS management is set to global, configure a DNS server in Cisco UCS Central. |
| **Protocol field** | The protocol to use when communicating with the remote server. This can be one of the following:  
  - FTP  
  - TFTP  
  - SCP  
  - SFTP  
  - **USB A**—The USB drive inserted into fabric interconnect A.  
    This option is only available for certain system configurations.  
  - **USB B**—The USB drive inserted into fabric interconnect B.  
    This option is only available for certain system configurations. |
| **User field**     | The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP or USB. |
| **Password field** | The password for the remote server username. This field does not apply if the protocol is TFTP or USB. |
| **Remote File field** | The full path to the backup configuration file. This field can contain the filename as well as the path. If you omit the filename, the backup procedure assigns a name to the file. |
**Import Methods**

You can use one of the following methods to import and update a system configuration through Cisco UCS:

- **Merge**—The information in the imported configuration file is compared with the existing configuration information. If there are conflicts, the import operation overwrites the information on the Cisco UCS domain with the information in the import configuration file.
• **Replace**—The current configuration information is replaced with the information in the imported configuration file one object at a time.

### Import Configuration

You can import any configuration file that was exported from Cisco UCS. The file does not need to have been exported from the same Cisco UCS.

---

**Note**

You cannot import configuration from a higher release to a lower release.

The import function is available for all configuration, system configuration, and logical configuration files. You can perform an import while the system is up and running. An import operation modifies information on the management plane only. Some modifications caused by an import operation, such as a change to a vNIC assigned to a server, can cause a server reboot or other operations that disrupt traffic.

You cannot schedule an import operation. You can, however, create an import operation in advance and leave the admin state disabled until you are ready to run the import. Cisco UCS will not run the import operation on the configuration file until you set the admin state to enabled.

You can maintain only one import operation for each location where you saved a configuration backup file.

### Creating an Import Operation

You cannot import a Full State backup file. You can import any of the following configuration files:

- All configuration
- System configuration
- Logical configuration

**Before you begin**

Collect the following information to import a configuration file:

- Backup server IP address and authentication credentials
- Fully-qualified name of a backup file

**Procedure**

1. In the **Navigation** pane, click **Admin**.
2. Click the **All** node.
3. In the **Work** pane, click the **General** tab.
4. In the **Actions** area, click **Import Configuration**.
5. In the **Import Configuration** dialog box, click **Create Import Operation**.
6. In the **Create Import Operation** dialog box, complete the following fields:
**Name** | **Description**  
--- | ---  
**Admin State field** | This can be one of the following:  
- **Enabled**—Cisco UCS Manager runs the import operation as soon as you click OK.  
- **Disabled**—Cisco UCS Manager does not run the import operation when you click OK. If you select this option, all fields in the dialog box remain visible. However, you must manually run the import from the **Import Configuration** dialog box.  
**Action field** | This can be one of the following:  
- **Merge**—The configuration information is merged with the existing information. If there are conflicts, the system replaces the information on the current system with the information in the import configuration file.  
- **Replace**—The system takes each object in the import configuration file and overwrites the corresponding object in the current configuration.  
**Location of the Import File field** | Where the backup file that you want to import is located. This can be one of the following:  
- **Remote File System**—The backup XML file is stored on a remote server. Cisco UCS Manager GUI displays the fields described below that allow you to specify the protocol, host, filename, username, and password for the remote system.  
- **Local File System**—The backup XML file is stored locally. Cisco UCS Manager GUI displays the **Filename** field with an associated **Browse** button that let you specify the name and location for the backup file to be imported.  
**Protocol field** | The protocol to use when communicating with the remote server. This can be one of the following:  
- **FTP**  
- **TFTP**  
- **SCP**  
- **SFTP**  
- **USB A**—The USB drive inserted into fabric interconnect A. This option is only available for certain system configurations.  
- **USB B**—The USB drive inserted into fabric interconnect B. This option is only available for certain system configurations.
### Running an Import Operation

You cannot import a Full State backup file. You can import any of the following configuration files:

- All configuration
- System configuration

### Step 7
Click **OK**.

### Step 8
In the confirmation dialog box, click **OK**.

If you set the **Admin State** to enabled, Cisco UCS Manager imports the configuration file from the network location. Depending on the action that you select, the information in the file merges with the existing configuration or replaces the existing configuration. The import operation displays in the **Import Operations** table of the **Import Configuration** dialog box.

### Step 9
(Optional) To view the progress of the import operation, do the following:

a) If the operation does not automatically display in the **Properties** area, click the operation in the **Import Operations** table.

b) In the **Properties** area, click the down arrows on the **FSM Details** bar.

The **FSM Details** area expands and displays the operation status.

### Step 10
Click **OK** to close the **Import Configuration** dialog box.

The import operation continues to run until it is completed. To view the progress, re-open the **Import Configuration** dialog box.

---

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Hostname field** | The hostname, IPv4 or IPv6 address from which the configuration file should be imported.  
  **Note**: If you use a hostname rather than an IPv4 or IPv6 address, you must configure a DNS server. If the Cisco UCS domain is not registered with Cisco UCS Central or DNS management is set to **local**, configure a DNS server in Cisco UCS Manager. If the Cisco UCS domain is registered with Cisco UCS Central and DNS management is set to **global**, configure a DNS server in Cisco UCS Central. |
| **Remote File field** | The name of the XML configuration file.                                                                                                                                                                          |
| **User field** | The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP or USB.                                                                                     |
| **Password field** | The password for the remote server username. This field does not apply if the protocol is TFTP or USB. Cisco UCS Manager does not store this password. Therefore, you do not need to enter this password unless you intend to enable and run the import operation immediately. |
Logical configuration

Procedure

Step 1  In the **Navigation** pane, click **Admin**.
Step 2  Click the **All** node.
Step 3  In the **Work** pane, click the **General** tab.
Step 4  In the **Actions** area, click **Import Configuration**.
Step 5  In the **Import Operations** table of the **Import Configuration** dialog box, click the operation that you want to run.

The details of the selected import operation display in the **Properties** area.

Step 6  In the **Properties** area, complete the following fields:
   a)  In the **Admin State** field, click the **Enabled** radio button.
   b)  For all protocols except TFTP, enter the password for the username in the **Password** field.
   c)  (Optional) Change the content of the other available fields.

Step 7  Click **Apply**.

Cisco UCS Manager imports the configuration file from the network location. Depending upon which action you selected, the information in the file is either merged with the existing configuration or replaces the existing configuration. The import operation displays in the **Import Operations** table of the **Import Configuration** dialog box.

Step 8  (Optional) To view the progress of the import operation, click the down arrows on the **FSM Details** bar.

The **FSM Details** area expands and displays the operation status.

Step 9  Click **OK** to close the **Import Configuration** dialog box.

The import operation continues to run until it is completed. To view the progress, re-open the **Import Configuration** dialog box.

Modifying an Import Operation

Procedure

Step 1  In the **Navigation** pane, click **Admin**.
Step 2  Click the **All** node.
Step 3  In the **Work** pane, click the **General** tab.
Step 4  In the **Actions** area, click **Import Configuration**.
Step 5  In the **Import Operations** area of the **Import Configuration** dialog box, click the import operation that you want to modify.

The details of the selected import operation display in the **Properties** area. If the import operation is in a disabled state, the fields are dimmed.
Deleting One or More Import Operations

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Click the All node.
Step 3 In the Work pane, click the General tab.
Step 4 In the Actions area, click Import Configuration.
Step 5 In the Import Operations table of the Backup Configuration dialog box, click the import operations that you want to delete.

Tip You cannot click an import operation in the table if the admin state of the operation is set to Enabled.

Step 6 Click the Delete icon in the icon bar of the Import Operations table.
Step 7 If a confirmation dialog box displays, click Yes.
Step 8 In the Import Configuration dialog box, click one of the following:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply</td>
<td>Deletes the selected import operations without closing the dialog box.</td>
</tr>
<tr>
<td>OK</td>
<td>Deletes the selected import operations and closes the dialog box.</td>
</tr>
</tbody>
</table>

System Restore

You can use the restore function for disaster recovery.

You can restore a system configuration from any full state backup file that was exported from Cisco UCS. The file does not need to have been exported from Cisco UCS on the system that you are restoring. When restoring using a backup file that was exported from a different system, we recommend that you use a system with the same or similar system configuration and hardware, including fabric interconnects, servers, adapters, and I/O module or FEX connectivity. Mismatched hardware and system configuration can lead to the restored system not fully functioning. If there is a mismatch between the I/O module links or servers on the two systems, acknowledge the chassis and servers after the restore operation.
The restore function is only available for a full state backup file. You cannot import a full state backup file. You perform a restore through the initial system setup. For more information, see the appropriate Cisco UCS Central Installation and Upgrade Guide.

---

**Note**

You can only use a full state backup file to restore a system that is running the same version as the system from which the backup file was exported.

---

## Restoring the Configuration for a Fabric Interconnect

It is recommended that you use a full state backup file to restore a system that is running the same version as the system from which the backup file was exported. You can also use a full state backup to restore a system if they have the same release train. For example, you can use a full state backup taken from a system running Release 2.1(3a) to restore a system running Release 2.1(3f).

To avoid issues with VSAN or VLAN configuration, a backup should be restored on the fabric interconnect that was the primary fabric interconnect at the time of backup.

### Before you begin

Collect the following information to restore the system configuration:

- Fabric interconnect management port IPv4 address and subnet mask, or IPv6 address and prefix
- Default gateway IPv4 or IPv6 address
- Backup server IPv4 or IPv6 address and authentication credentials
- Fully-qualified name of a Full State backup file

---

**Note**

You must have access to a Full State configuration file to perform a system restore. You cannot perform a system restore with any other type of configuration or backup file.

---

### Procedure

**Step 1**

Connect to the console port.

**Step 2**

If the fabric interconnect is off, power on the fabric interconnect.

You will see the power on self-test message as the fabric interconnect boots.

**Step 3**

At the installation method prompt, enter `gui`.

**Step 4**

If the system cannot access a DHCP server, you may be prompted to enter the following information:

- IPv4 or IPv6 address for the management port on the fabric interconnect
- Subnet mask or prefix for the management port on the fabric interconnect
- IPv4 or IPv6 address for the default gateway assigned to the fabric interconnect
Step 5 Copy the web link from the prompt into a web browser and go to the Cisco UCS Manager GUI launch page.

Step 6 On the launch page, select **Express Setup**.

Step 7 On the **Express Setup** page, select **Restore From Backup** and click **Submit**.

Step 8 In the **Protocol** area of the Cisco UCS Manager Initial Setup page, select the protocol you want to use to upload the full state backup file:

- SCP
- TFTP
- FTP
- SFTP

Step 9 In the **Server Information** area, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server IP</td>
<td>The IPv4 or IPv6 address of the computer where the full state backup file is located. This can be a server, storage array, local drive, or any read/write media that the fabric interconnect can access through the network.</td>
</tr>
<tr>
<td>Backup File Path</td>
<td>The file path where the full state backup file is located, including the folder names and filename.</td>
</tr>
<tr>
<td>Note</td>
<td>You can only use a full state backup file to restore a system that is running the same version as the system from which the backup file was exported.</td>
</tr>
<tr>
<td>User ID</td>
<td>The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP or USB.</td>
</tr>
<tr>
<td>Password</td>
<td>The password for the remote server username. This field does not apply if the protocol is TFTP or USB.</td>
</tr>
</tbody>
</table>

Step 10 Click **Submit**.

You can return to the console to watch the progress of the system restore.

The fabric interconnect logs in to the backup server, retrieves a copy of the specified full-state backup file, and restores the system configuration.

For a cluster configuration, you do not need to restore the secondary fabric interconnect. As soon as the secondary fabric interconnect reboots, Cisco UCS Manager synchronizes the configuration with the primary fabric interconnect.
CHAPTER 12

Scheduling Options

• Creating a Schedule, on page 123
• Creating a One Time Occurrence for a Schedule, on page 128
• Creating a Recurring Occurrence for a Schedule, on page 130
• Deleting a One Time Occurrence from a Schedule, on page 133
• Deleting a Recurring Occurrence from a Schedule, on page 133
• Deleting a Schedule, on page 134

Creating a Schedule

Procedure

Step 1 In the Navigation pane, click Servers.
Step 2 On the Servers tab, right-click Schedules and choose Create Schedule.
Step 3 In the Identify Schedule page of the Create Schedule wizard, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name field</td>
<td>The name of the schedule. This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than -(hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.</td>
</tr>
<tr>
<td>Description</td>
<td>A description of the schedule. We recommend including information about where and when the schedule should be used. Enter up to 256 characters. You can use any characters or spaces except ` (accent mark), \ (backslash), ^ (caret), &quot; (double quote), = (equal sign), &gt; (greater than), &lt; (less than), or ‘ (single quote).</td>
</tr>
</tbody>
</table>
**Owner field**
The owner of the schedule. This can be one of the following:

- **Local**—Cisco UCS Manager owns the schedule, which is configured in this Cisco UCS domain.
- **Pending Global**—Cisco UCS Manager is in the process of transferring this schedule to Cisco UCS Central.
- **Global**—Cisco UCS Central owns the schedule, which is configured on a remote server.

---

**Step 4**
Click Next.

**Step 5**
On the **One Time Occurrences** page, click one of the following:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Next</td>
<td>Moves to the next page. Choose this option if you do not want to create a one time occurrence for this schedule. If you choose this option, continue with Step 8.</td>
</tr>
<tr>
<td>Add</td>
<td>Opens the <strong>Create a One Time Occurrence</strong> dialog box, where you can specify a single time when this schedule should be run. If you choose this option, continue with Step 6.</td>
</tr>
</tbody>
</table>

---

**Step 6**
(Optional) In the **Create a One Time Occurrence** dialog box, do the following:

a) Complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name field</td>
<td>The name of the one time occurrence of this schedule. This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.</td>
</tr>
<tr>
<td>Start Time field</td>
<td>The date and time that the occurrence will run. Click the down arrow at the end of the field to select the date from a calendar.</td>
</tr>
</tbody>
</table>

b) Click the down arrows to expand the **Options** area.

c) In the **Options** area, complete the following fields:
Max Duration field

The maximum length of time that the scheduled occurrence can run. This can be one of the following:

- **None**—The occurrence runs until all tasks are completed.
- **other**—Cisco UCS Manager GUI displays the `dd:hh:mm:ss` field allowing you to specify the maximum amount of time that the occurrence can run. Cisco UCS completes as many scheduled tasks as possible within the specified time.

By default, the maximum duration is set to **none**. If you do not change this setting and you do not set a maximum number of tasks, the maintenance window continues until all pending activities are completed.

Max Number of Tasks field

The maximum number of scheduled tasks that can be run during this occurrence. This can be one of the following:

- **Unlimited**—Cisco UCS runs all scheduled tasks unless those tasks exceed the maximum time specified in the **Max Duration** field. If **Max Duration** is set to **none** and you select this option, the maintenance window continues until all pending activities are completed.
- **other**—Cisco UCS Manager GUI displays a text field allowing you to specify the maximum number of tasks that can be run during this occurrence. Enter an integer between 1 and 65535.

Note: This option does not apply if this schedule is associated with a fault suppression task.

Max Number of Concurrent Tasks field

The maximum number of tasks that can run concurrently during this occurrence. This can be one of the following:

- **Unlimited**—Cisco UCS runs as many concurrent tasks as the system can handle.
- **other**—Cisco UCS Manager GUI displays a text field allowing you to specify the maximum number of concurrent tasks that can be run during this occurrence. Enter an integer between 1 and 65535.

Note: This option does not apply if this schedule is associated with a fault suppression task.
**Name** Minimum Interval Between Tasks field

**Description** The minimum length of time that the system should wait before starting a new task. This setting is meaningful only if the maximum number of concurrent tasks is set to a value other than None. This can be one of the following:

- **None**—Cisco UCS runs the next task as soon as possible.
- **other**—Cisco UCS Manager GUI displays the `dd:hh:mm:ss` field allowing you to specify the minimum amount of time that Cisco UCS will wait between tasks.

**Note** This option does not apply if this schedule is associated with a fault suppression task.

d) Click **OK**.

**Step 7** To add another one time occurrence, click **Add** and repeat step 6. Otherwise, click **Next**.

**Step 8** *(Optional)* If you want to define a recurring occurrence for this schedule, on the **Recurring Occurrences** page, click **Add**.

a) In the **Create a Recurring Occurrence** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th><strong>Name</strong> field</th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong> field</td>
<td>The name of the recurring occurrence of this schedule. This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Day field</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Day field</strong></td>
<td>The day on which Cisco UCS runs an occurrence of this schedule. This can be one of the following:</td>
</tr>
</tbody>
</table>

- **every day**
- **Monday**
- **Tuesday**
- **Wednesday**
- **Thursday**
- **Friday**
- **Saturday**
- **Sunday**
- **odd days**
- **even days**
b) Click the down arrows to expand the **Options** area.

c) In the **Options** area, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hour field</td>
<td>The hour of the specified day at which this occurrence of the schedule starts. This can be an integer between 0 and 24, where 0 and 24 are both equivalent to midnight. <strong>Note</strong> Cisco UCS ends all recurring occurrences on the same day in which they start, even if the maximum duration has not been reached. For example, if you specify a start time of 11 p.m. and a maximum duration of 3 hours, Cisco UCS starts the occurrence at 11 p.m. but ends it at 11:59 p.m. after only 59 minutes. Ensure that the start time you specify is early enough so that the recurring occurrence finishes before 11:59 p.m.</td>
</tr>
<tr>
<td>Minute field</td>
<td>The minute of the hour at which the schedule occurrence starts. This can be an integer between 0 and 60.</td>
</tr>
</tbody>
</table>
| Max Duration field    | The maximum length of time that each occurrence of this schedule can run. This can be one of the following:

  - **None**—The occurrence runs until all tasks are completed.
  - **other**—Cisco UCS Manager GUI displays the `dd:hh:mm:ss` field allowing you to specify the maximum amount of time that the occurrence can run. Cisco UCS completes as many scheduled tasks as possible within the specified time. |
| Max Number of Tasks field | The maximum number of scheduled tasks that can be run during each occurrence. This can be one of the following:

  - **Unlimited**—Cisco UCS runs all scheduled tasks unless those tasks exceed the maximum time specified in the **Max Duration** field. If **Max Duration** is set to **none** and you select this option, the maintenance window continues until all pending activities are completed.
  - **other**—Cisco UCS Manager GUI displays a text field allowing you to specify the maximum number of tasks that can be run during this occurrence. Enter an integer between 1 and 65535. **Note** This option does not apply if this schedule is associated with a fault suppression task. |
Creating a One Time Occurrence for a Schedule

By default, the maximum duration and the maximum number of tasks are set to none. If you do not change either of these defaults, Cisco UCS Manager does not impose any limit to the length of time that the maintenance window lasts. All pending activities are applied as soon as the scheduled maintenance window begins, and Cisco UCS Manager continues to reboot the servers impacted by the pending activities until all of those tasks are complete.

Procedure

Step 1 In the Navigation pane, click Servers.
Step 2  Expand Schedules.

Step 3  Right-click the schedule to which you want to add an occurrence and choose Create a One Time Occurrence.

Step 4  In the Create a One Time Occurrence dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name field</td>
<td>The name of the one time occurrence of this schedule. This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.</td>
</tr>
<tr>
<td>Start Time field</td>
<td>The date and time that the occurrence will run. Click the down arrow at the end of the field to select the date from a calendar.</td>
</tr>
</tbody>
</table>

Step 5  Click the down arrows to expand the Options area.

Step 6  In the Options area, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Duration field</td>
<td>The maximum length of time that the scheduled occurrence can run. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• None—The occurrence runs until all tasks are completed.</td>
</tr>
<tr>
<td></td>
<td>• other—Cisco UCS Manager GUI displays the dd:hh:mm:ss field allowing you to specify the maximum amount of time that the occurrence can run. Cisco UCS completes as many scheduled tasks as possible within the specified time.</td>
</tr>
<tr>
<td></td>
<td>By default, the maximum duration is set to none. If you do not change this setting and you do not set a maximum number of tasks, the maintenance window continues until all pending activities are completed.</td>
</tr>
<tr>
<td>Max Number of Tasks field</td>
<td>The maximum number of scheduled tasks that can be run during this occurrence. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• Unlimited—Cisco UCS runs all scheduled tasks unless those tasks exceed the maximum time specified in the Max Duration field. If Max Duration is set to none and you select this option, the maintenance window continues until all pending activities are completed.</td>
</tr>
<tr>
<td></td>
<td>• other—Cisco UCS Manager GUI displays a text field allowing you to specify the maximum number of tasks that can be run during this occurrence. Enter an integer between 1 and 65535.</td>
</tr>
</tbody>
</table>

Note  This option does not apply if this schedule is associated with a fault suppression task.
### Creating a Recurring Occurrence for a Schedule

#### Procedure

1. In the Navigation pane, click Servers.
2. Expand Schedules.
3. Right-click the schedule to which you want to add an occurrence and choose **Create a Recurring Occurrence**.
4. In the **Create a Recurring Occurrence** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Max Number of Concurrent Tasks</strong> field</td>
<td>The maximum number of tasks that can run concurrently during this occurrence. This can be one of the following:</td>
<td>This option does not apply if this schedule is associated with a fault suppression task.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Unlimited</strong>—Cisco UCS runs as many concurrent tasks as the system can handle.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- <strong>other</strong>—Cisco UCS Manager GUI displays a text field allowing you to specify the maximum number of concurrent tasks that can be run during this occurrence. Enter an integer between 1 and 65535.</td>
<td></td>
</tr>
<tr>
<td><strong>Minimum Interval Between Tasks</strong> field</td>
<td>The minimum length of time that the system should wait before starting a new task. This setting is meaningful only if the maximum number of concurrent tasks is set to a value other than None. This can be one of the following:</td>
<td>This option does not apply if this schedule is associated with a fault suppression task.</td>
</tr>
<tr>
<td></td>
<td>- <strong>None</strong>—Cisco UCS runs the next task as soon as possible.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- <strong>other</strong>—Cisco UCS Manager GUI displays the <em>dd:hh:mm:ss</em> field allowing you to specify the minimum amount of time that Cisco UCS will wait between tasks.</td>
<td></td>
</tr>
</tbody>
</table>

**Step 7** Click OK.
<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name field</td>
<td>The name of the recurring occurrence of this schedule. This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.</td>
</tr>
<tr>
<td>Day field</td>
<td>The day on which Cisco UCS runs an occurrence of this schedule. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• every day</td>
</tr>
<tr>
<td></td>
<td>• Monday</td>
</tr>
<tr>
<td></td>
<td>• Tuesday</td>
</tr>
<tr>
<td></td>
<td>• Wednesday</td>
</tr>
<tr>
<td></td>
<td>• Thursday</td>
</tr>
<tr>
<td></td>
<td>• Friday</td>
</tr>
<tr>
<td></td>
<td>• Saturday</td>
</tr>
<tr>
<td></td>
<td>• Sunday</td>
</tr>
<tr>
<td></td>
<td>• odd days</td>
</tr>
<tr>
<td></td>
<td>• even days</td>
</tr>
<tr>
<td>Hour field</td>
<td>The hour of the specified day at which this occurrence of the schedule starts. This can be an integer between 0 and 24, where 0 and 24 are both equivalent to midnight.</td>
</tr>
<tr>
<td>Note</td>
<td>Cisco UCS ends all recurring occurrences on the same day in which they start, even if the maximum duration has not been reached. For example, if you specify a start time of 11 p.m. and a maximum duration of 3 hours, Cisco UCS starts the occurrence at 11 p.m. but ends it at 11:59 p.m. after only 59 minutes. Ensure that the start time you specify is early enough so that the recurring occurrence finishes before 11:59 p.m.</td>
</tr>
<tr>
<td>Minute field</td>
<td>The minute of the hour at which the schedule occurrence starts. This can be an integer between 0 and 60.</td>
</tr>
</tbody>
</table>

**Step 5**  
Click the down arrows to expand the **Options** area.

**Step 6**  
In the **Options** area, complete the following fields:
<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Max Duration</strong> field</td>
<td>The maximum length of time that each occurrence of this schedule can run. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>- <strong>None</strong>—The occurrence runs until all tasks are completed.</td>
</tr>
<tr>
<td></td>
<td>- <strong>other</strong>—Cisco UCS Manager GUI displays the <code>dd:hh:mm:ss</code> field allowing you to specify the maximum amount of time that the occurrence can run. Cisco UCS completes as many scheduled tasks as possible within the specified time.</td>
</tr>
<tr>
<td><strong>Max Number of Tasks</strong> field</td>
<td>The maximum number of scheduled tasks that can be run during each occurrence. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>- <strong>Unlimited</strong>—Cisco UCS runs all scheduled tasks unless those tasks exceed the maximum time specified in the <strong>Max Duration</strong> field. If <strong>Max Duration</strong> is set to <strong>none</strong> and you select this option, the maintenance window continues until all pending activities are completed.</td>
</tr>
<tr>
<td></td>
<td>- <strong>other</strong>—Cisco UCS Manager GUI displays a text field allowing you to specify the maximum number of tasks that can be run during this occurrence. Enter an integer between 1 and 65535.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>This option does not apply if this schedule is associated with a fault suppression task.</td>
</tr>
<tr>
<td><strong>Max Number of Concurrent Tasks</strong> field</td>
<td>The maximum number of tasks that can run concurrently during each occurrence. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>- <strong>Unlimited</strong>—Cisco UCS runs as many concurrent tasks as the system can handle.</td>
</tr>
<tr>
<td></td>
<td>- <strong>other</strong>—Cisco UCS Manager GUI displays a text field allowing you to specify the maximum number of concurrent tasks that can be run during this occurrence. Enter an integer between 1 and 65535.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>This option does not apply if this schedule is associated with a fault suppression task.</td>
</tr>
<tr>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Minimum Interval Between Tasks field      | The minimum length of time that the system should wait before starting a new task. This setting is meaningful only if the maximum number of concurrent tasks is set to a value other than None. This can be one of the following:  
  - None—Cisco UCS runs the next task as soon as possible.  
  - other—Cisco UCS Manager GUI displays the dd:hh:mm:ss field allowing you to specify the minimum amount of time that Cisco UCS will wait between tasks.  |
| Note                                      | This option does not apply if this schedule is associated with a fault suppression task. |

Step 7 Click OK.

Deleting a One Time Occurrence from a Schedule

If this is the only occurrence in a schedule, that schedule is reconfigured with no occurrences. If the schedule is included in a maintenance policy and that policy is assigned to a service profile, any pending activities related to the server associated with the service profile cannot be deployed. You must add a one time occurrence or a recurring occurrence to the schedule to deploy the pending activity.

Procedure

Step 1 In the Navigation pane, click Servers.
Step 2 Expand Schedules > Schedule_Name.
Step 3 Expand One Time Occurrences.
Step 4 Right-click the occurrence you want to delete and choose Delete.
Step 5 If a confirmation dialog box displays, click Yes.

Deleting a Recurring Occurrence from a Schedule

If this is the only occurrence in a schedule, that schedule is reconfigured with no occurrences. If the schedule is included in a maintenance policy and that policy is assigned to a service profile, any pending activities related to the server associated with the service profile cannot be deployed. You must add a one time occurrence or a recurring occurrence to the schedule to deploy the pending activity.
Deleting a Schedule

If this schedule is included in a maintenance policy, the policy is reconfigured with no schedule. If that policy is assigned to a service profile, any pending activities related to the server associated with the service profile cannot be deployed. You must add a schedule to the maintenance policy to deploy the pending activity.

Procedure

Step 1  In the Navigation pane, click Servers.
Step 2  Expand Schedules > Schedule_Name.
Step 3  Expand Recurring Occurrences.
Step 4  Right-click the occurrence you want to delete and choose Delete.
Step 5  If a confirmation dialog box displays, click Yes.
Deferred Deployments of Service Profile Updates

- Service Profile Deferred Deployments, on page 135
- Maintenance Policy, on page 137
- Pending Activities for Deferred Deployments, on page 141

Service Profile Deferred Deployments

Some modifications to a service profile or to an updating service profile template can be disruptive and require a reboot of the server. You can, however, configure deferred deployment to control when those disruptive configuration changes are implemented. For example, you can choose to deploy the service profile changes immediately or have them deployed during a specified maintenance window. You can also choose whether or not a service profile deployment requires explicit user acknowledgment.

Deferred deployment is available for all configuration changes that occur through the association of a service profile with a server. These configuration changes can be prompted by a change to a service profile, to a policy that is included in a service profile, or to an updating service profile template. For example, you can defer the upgrade and activation of firmware through host firmware packages and management firmware packages, such as server BIOS, RAID controller, host HBA, and network adapters. However, you cannot defer the direct deployment of firmware images for components that do not use either of the firmware packages, such as Cisco UCS Manager, fabric interconnects, and I/O modules.

Deferred deployment is not available for the following actions which require the reboot of a server:

- Initial association of a service profile with a server
- Final disassociation of a service profile from a server, without associating the service profile with a different server
- Decommissioning a server
- Re-acknowledging a server
- Resetting a server

If you want to defer the deployment of service profile changes, you must configure one or more maintenance policies and configure each service profile with a maintenance policy. If you want to define the time period when the deployment should occur, you also need to create at least one schedule with one or more recurring occurrences or one time occurrences, and include that schedule in a maintenance policy.
Schedules for Deferred Deployments

A schedule contains a set of occurrences. These occurrences can be one time only or can recur at a specified time and day each week. The options defined in the occurrence, such as the duration of the occurrence or the maximum number of tasks to be run, determine whether a service profile change is deployed. For example, if a change cannot be deployed during a given maintenance window because the maximum duration or number of tasks was reached, that deployment is carried over to the next maintenance window.

Each schedule checks periodically to see whether the Cisco UCS domain entered one or more maintenance windows. If so, the schedule executes the deployments that are eligible according to the constraints specified in the maintenance policy.

A schedule contains one or more occurrences, which determine the maintenance windows associated with that schedule. An occurrence can be one of the following:

**One Time Occurrence**

One time occurrences define a single maintenance window. These windows continue until the maximum duration of the window or the maximum number of tasks that can be run in the window is reached.

**Recurring Occurrence**

Recurring occurrences define a series of maintenance windows. These windows continue until the maximum number of tasks or the end of the day specified in the occurrence was reached.

Guidelines and Limitations for Deferred Deployments

**Service Profile Association Changes and Maintenance Policy Options**

When changing service profile association, the following maintenance policy options can affect how the changes are applied:

- If the **On Next Boot** and **User Ack** options are enabled in a maintenance policy, the service profile association change displays a warning that an acknowledgement is required. However, association will happen immediately.

- If the **On Next Boot** and **User Ack** options are not enabled in a maintenance policy, the service profile association change displays a warning that an acknowledgement is required, and will remain pending until acknowledged.

**Cannot Undo All Changes to Service Profiles or Service Profile Templates**

If you cancel a pending change, Cisco UCS Manager attempts to roll back the change without rebooting the server. However, for complex changes, Cisco UCS Manager may have to reboot the server a second time to roll back the change. For example, if you delete a vNIC, Cisco UCS Manager reboots the server according to the maintenance policy included in the service profile. You cannot cancel this reboot and change, even if you restore the original vNIC in the service profile. Instead, Cisco UCS Manager schedules a second deployment and reboot of the server.

**Association of Service Profile Can Exceed Boundaries of Maintenance Window**

After Cisco UCS Manager begins the association of the service profile, the scheduler and maintenance policy do not have any control over the procedure. If the service profile association does not complete within the
allotted maintenance window, the process continues until it is completed. For example, this can occur if the association does not complete in time because of retried stages or other issues.

**Cannot Specify Order of Pending Activities**

Scheduled deployments run in parallel and independently. You cannot specify the order in which the deployments occur. You also cannot make the deployment of one service profile change dependent upon the completion of another.

**Cannot Perform Partial Deployment of Pending Activity**

Cisco UCS Manager applies all changes made to a service profile in the scheduled maintenance window. You cannot make several changes to a service profile at the same time and then have those changes be spread across several maintenance windows. When Cisco UCS Manager deploys the service profile changes, it updates the service profile to match the most recent configuration in the database.

## Maintenance Policy

The maintenance policy specifies how deploys the service profile changes. The deployment can occur in one of the following ways:

- Immediately
- When acknowledged by a user with administrator privileges
- Automatically at the time specified in a schedule
- On the next reboot or shutdown without waiting for the user acknowledgment or the timer scheduling option

A UCSM and CIMC version on blade or rack server must be running firmware from 3.1.x bundle, for On Next Boot to work.

If the **On Next Boot** option is enabled in a maintenance policy, and you downgrade from Cisco UCS Manager Release 3.1(1) or later releases to any release earlier than Cisco UCS Manager Release 2.2(8), firmware downgrade will fail. Disable **On Next Boot** from the maintenance policy to continue with the downgrade.

You can use the soft shutdown timer in the maintenance policy to configure the wait time for performing a hard shutdown. The soft shutdown timer is applicable when you reboot the server for the following:

- Reset the server using the Gracefully Restart OS option.
- Shut down the server with the In case of graceful shutdown failure, a hard shutdown will be issued after X seconds option.
- Modify a service profile that requires a server reboot.

If the maintenance policy is configured to deploy the change during a scheduled maintenance window, the policy must include a valid schedule. The schedule deploys the changes in the first available maintenance window.
A maintenance policy only prevents an immediate server reboot when a configuration change is made to an associated service profile. However, a maintenance policy does not prevent the following actions from taking place right away:

- Deleting an associated service profile from the system
- Disassociating a server profile from a server
- Directly installing a firmware upgrade without using a service policy
- Resetting the server

**Creating a Maintenance Policy**

**Before you begin**

If you plan to configure this maintenance policy for automatic deferred deployment, create a schedule.

**Procedure**

**Step 1**  
In the Navigation pane, click **Servers**.

**Step 2**  
Expand **Servers > Policies**.

**Step 3**  
Expand the node for the organization where you want to create the policy. If the system does not include multitenancy, expand the **root** node.

**Step 4**  
Right-click **Maintenance Policies** and choose **Create Maintenance Policy**.

**Step 5**  
In the **Create Maintenance Policy** dialog box, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name field</td>
<td>The name of the policy. This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters other than - (hyphen), _ (underscore), : (colon), and . (period), and you cannot change this name after the object is saved.</td>
</tr>
<tr>
<td>Description field</td>
<td>A description of the policy. Cisco recommends including information about where and when to use the policy. Enter up to 256 characters. You can use any characters or spaces except ` ' (accent mark), \ (backslash), ^ (carat), &quot; (double quote), = (equal sign), &gt; (greater than), &lt; (less than), or ' (single quote).</td>
</tr>
<tr>
<td>Name</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Soft Shutdown Timer</strong></td>
<td>drop-down list</td>
</tr>
</tbody>
</table>

This timer allows you to specify the time in seconds when Cisco UCS Manager performs a server shutdown and reboot. Cisco UCS Manager waits until the specified time in the maintenance policy before performing a hard shutdown. This can be one of the following:

- **150 Secs**—Cisco UCS Manager waits until 150 seconds before performing a hard shut down and reboot of the server.
- **300 Secs**—Cisco UCS Manager waits until 300 seconds before performing a hard shut down and reboot of the server.
- **600 Secs**—Cisco UCS Manager waits for 600 seconds before performing a hard shut down and reboot of the server.
- **Never**—Cisco UCS Manager never performs a server shut down.
When a service profile is associated with a server, or when changes are made to a service profile that is already associated with a server, you must reboot the server to complete the process. The Reboot Policy field determines when the reboot occurs for servers associated with any service profiles that include this maintenance policy. This can be one of the following:

- **Immediate**—The server reboots automatically as soon as the service profile association is complete or when you save service profile changes.

- **User Ack**—You must explicitly acknowledge the pending activities for the changes made to the service profile to be applied to the associated server.

- **Timer Automatic**—Cisco UCS defers all service profile associations and changes until the maintenance window defined by the schedule shown in the Schedule field.

- **On Next Boot**—This option is used in combination with either User Ack or Timer Automatic. When the On Next Boot option is enabled, the host OS reboot, shutdown, and reset, or server reset and shutdown also triggers the associated FSM to apply the changes waiting for the User Ack, or the Timer Automatic maintenance window.

  **Note** De-selecting the On Next Boot option disables the Maintenance Policy on the BMC.

### Schedule drop-down list
If the Reboot Policy is set to Timer Automatic, the schedule specifies when maintenance operations can be applied to the server. Cisco UCS reboots the server and completes the service profile changes at the scheduled time.

### Create Schedule link
Creates a new schedule that is available to all objects in this Cisco UCS domain.

**Step 6** Click OK.

**What to do next**
Include the policy in a service profile or service profile template.
Deleting a Maintenance Policy

**Procedure**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>In the Navigation pane, click Servers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Expand Servers &gt; Policies &gt; Organization_Name.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Expand Maintenance Policies.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Right-click the maintenance policy you want to delete and choose Delete.</td>
</tr>
<tr>
<td>Step 5</td>
<td>If a confirmation dialog box displays, click Yes.</td>
</tr>
</tbody>
</table>

Pending Activities for Deferred Deployments

If you configure a deferred deployment in a Cisco UCS domain, Cisco UCS Manager enables you to view all pending activities. You can see activities that are waiting for user acknowledgement and those that are scheduled.

If a Cisco UCS domain has pending activities, Cisco UCS Manager GUI notifies users with admin privileges when they log in.

Cisco UCS Manager displays information about all pending activities, including the following:

- Name of the service profile to deploy and associate with a server
- Server affected by the deployment
- Disruption caused by the deployment
- Change performed by the deployment

**Note**

You cannot specify the maintenance window in which a specific pending activity is applied to the server. The maintenance window depends upon how many activities are pending and which maintenance policy is assigned to the service profile. However, any user with admin privileges can manually initiate a pending activity and reboot the server immediately, whether it is waiting for user acknowledgment or for a maintenance window.

Viewing Pending Activities

**Procedure**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>On the toolbar, click Pending Activities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Click one of the following tabs:</td>
</tr>
<tr>
<td></td>
<td>• User Acknowledged Activities—Contains the Service Profiles and Fabric Interconnects tabs that display the tasks requiring user acknowledgment before they can complete.</td>
</tr>
</tbody>
</table>
Scheduled Activities—Displays the tasks that will be performed based on the associated maintenance schedule.

Step 3
Click a row in the table to view the details of that pending activity.

If you click the link in the Server column, Cisco UCS Manager displays the properties of that server.

---

### Deploying a Service Profile Change Waiting for User Acknowledgement

**Important**

You cannot stop Cisco UCS Manager from rebooting the affected server after you acknowledge a pending activity.

**Procedure**

**Step 1**
On the toolbar, click Pending Activities.

**Step 2**
In the Pending Activities dialog box, click the User Acknowledged Activities tab and then the Service Profiles tab.

**Step 3**
Check the check box in the Reboot Now column for each pending activity you want to deploy immediately.

**Step 4**
Click OK.

Cisco UCS Manager immediately reboots the server affected by the pending activity.

---

### Deploying All Service Profile Changes Waiting for User Acknowledgement

**Important**

You cannot stop Cisco UCS Manager from rebooting the affected server after you acknowledge a pending activity.

**Procedure**

**Step 1**
On the toolbar, click Pending Activities.

**Step 2**
In the Pending Activities dialog box, click the User Acknowledged Activities tab and then the Service Profiles tab.

**Step 3**
In the toolbar, check the Acknowledge All check box.

Cisco UCS Manager GUI checks the Reboot Now check boxes for all pending activities listed in the table.

**Step 4**
Click OK.
Cisco UCS Manager immediately reboots all servers affected by the pending activities listed in the table.

### Deploying a Scheduled Service Profile Change Immediately

**Important**
You cannot stop Cisco UCS Manager from rebooting the affected server after you acknowledge a pending activity.

**Procedure**

**Step 1**
On the toolbar, click **Pending Activities**.

**Step 2**
In the **Pending Activities** dialog box, click the **Scheduled Activities** tab.

**Step 3**
Check the check box in the **Reboot Now** column for each pending activity you want to deploy immediately.

**Step 4**
Click **OK**.

Cisco UCS Manager immediately reboots the server affected by the pending activity.

### Deploying All Scheduled Service Profile Changes Immediately

**Important**
You cannot stop Cisco UCS Manager from rebooting the affected server after you acknowledge a pending activity.

**Procedure**

**Step 1**
On the toolbar, click **Pending Activities**.

**Step 2**
In the **Pending Activities** dialog box, click the **Scheduled Activities** tab.

**Step 3**
In the toolbar, check the **Acknowledge All** check box.

Cisco UCS Manager GUI checks the **Reboot Now** check boxes for all pending activities listed in the table.

**Step 4**
Click **OK**.

Cisco UCS Manager immediately reboots all servers affected by the pending activities listed in the table.
Deploying All Scheduled Service Profile Changes Immediately
CHAPTER 14

UCS Fault Suppression

- Global Fault Policy, on page 145
- Configuring the Global Fault Policy, on page 145

Global Fault Policy

The global fault policy controls the lifecycle of a fault in a Cisco UCS domain, including when faults are cleared, the flapping interval (the length of time between the fault being raised and the condition being cleared), and the retention interval (the length of time a fault is retained in the system).

A fault in Cisco UCS has the following lifecycle:

1. A condition occurs in the system and Cisco UCS Manager raises a fault. This is the active state.
2. When the fault is alleviated, it enters a flapping or soaking interval that is designed to prevent flapping. Flapping occurs when a fault is raised and cleared several times in rapid succession. During the flapping interval, the fault retains its severity for the length of time specified in the global fault policy.
3. If the condition reoccurs during the flapping interval, the fault returns to the active state. If the condition does not reoccur during the flapping interval, the fault is cleared.
4. The cleared fault enters the retention interval. This interval ensures that the fault reaches the attention of an administrator even if the condition that caused the fault has been alleviated and the fault has not been deleted prematurely. The retention interval retains the cleared fault for the length of time specified in the global fault policy.
5. If the condition reoccurs during the retention interval, the fault returns to the active state. If the condition does not reoccur, the fault is deleted.

Configuring the Global Fault Policy

Procedure

Step 1 In the Navigation pane, click Admin.
Step 2 Expand All > Faults, Events, and Audit Log.
Step 3  Click **Settings**.

Step 4  In the **Work** pane, click the **Global Fault Policy** tab.

Step 5  In the **Global Fault Policy** tab, complete the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flapping Interval</strong> field</td>
<td>Flapping occurs when a fault is raised and cleared several times in rapid succession. To prevent this, Cisco UCS Manager does not allow a fault to change its state until this amount of time has elapsed since the last state change. If the condition reoccurs during the flapping interval, the fault returns to the active state. If the condition does not reoccur during the flapping interval, the fault is cleared. What happens at that point depends on the setting in the <strong>Clear Action</strong> field. Enter an integer between 5 and 3,600. The default is 10.</td>
</tr>
<tr>
<td><strong>Initial Severity</strong> field</td>
<td>This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• Info</td>
</tr>
<tr>
<td></td>
<td>• Condition</td>
</tr>
<tr>
<td></td>
<td>• Warning</td>
</tr>
<tr>
<td><strong>Action on Acknowledgment</strong> field</td>
<td>Acknowledged actions are always deleted when the log is cleared. This option cannot be changed.</td>
</tr>
<tr>
<td><strong>Clear Action</strong> field</td>
<td>The action Cisco UCS Manager takes when a fault is cleared. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• Retain—Cisco UCS Manager GUI displays the <strong>Length of time to retain cleared faults</strong> section.</td>
</tr>
<tr>
<td></td>
<td>• Delete—Cisco UCS Manager immediately deletes all fault messages as soon as they are marked as cleared.</td>
</tr>
<tr>
<td><strong>Clear Interval</strong> field</td>
<td>Indicate whether Cisco UCS Manager automatically clears faults after a certain length of time. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• Never—Cisco UCS Manager does not automatically clear any faults.</td>
</tr>
<tr>
<td></td>
<td>• other—Cisco UCS Manager GUI displays the <strong>dd:hh:mm:ss</strong> field.</td>
</tr>
<tr>
<td><strong>dd:hh:mm:ss</strong> field</td>
<td>The number of days, hours, minutes, and seconds that should pass before Cisco UCS Manager automatically marks that fault as cleared. What happens then depends on the setting in the <strong>Clear Action</strong> field.</td>
</tr>
</tbody>
</table>

Step 6  Click **Save Changes**.
What to do next

For more information on fault suppression, see the *Cisco UCS System Monitoring Guide*. 
KVM Console

The KVM console is an interface accessible from the Cisco UCS Manager GUI or the KVM Launch Manager that emulates a direct KVM connection. Unlike the KVM dongle, which requires you to be physically connected to the server, the KVM console allows you to connect to the server from a remote location across the network.

You must ensure that either the server or the service profile associated with the server is configured with a CIMC IP address if you want to use the KVM console to access the server. The KVM console uses the CIMC IP address assigned to a server or a service profile to identify and connect with the correct server in a Cisco UCS domain.

Instead of using CD/DVD or floppy drives directly connected to the server, the KVM console uses virtual media, which are actual disk drives or disk image files that are mapped to virtual CD/DVD or floppy drives. You can map any of the following to virtual drives:

- CD/DVD or floppy drives on your computer
- Disk image files on your computer
- CD/DVD or floppy drives on the network
- Disk image files on the network
When you launch the KVM console from the physical server, the system checks if the server is associated to a service profile. If the server is associated to a service profile with an associated management IP address, the KVM console is launched using that management IP address. If no management IP address is associated in the service profile, then the system launches the KVM console using the physical server.

**Recommendations for Using the KVM Console to Install a Server OS**

To install an OS from a virtual CD/DVD or floppy drive, you must ensure that the virtual CD/DVD or floppy drive is set as the first boot device in the service profile.

Installing an OS using the KVM console may be slower than using the KVM dongle because the installation files must be downloaded across the network to the server. If you map a disk drive or disk image file from a network share to a virtual drive, the installation may be even slower because the installation files must be downloaded from the network to the KVM console (your computer) and then from the KVM console to the server. When using this installation method, we recommend that you have the installation media as close as possible to the system with the KVM console.

**Virtual KVM Console**

The KVM console is an interface accessible from Cisco IMC that emulates a direct keyboard, video, and mouse (KVM) connection to the server. It allows you to control the server from a remote location and to map physical locations to virtual drives that can by accessed by the server during this KVM session.

HTML5 KVM is only for M3 and higher servers running Cisco UCS Manager release 3.1(3). The minimum web browser version required for HTML5 KVM is Chrome 45, Firefox 45, IE 11, Opera 35, and Safari 9. For best results, use the latest browser version. The number of simultaneous sessions supported on a single browser depend on the browser settings and memory usage. Some older platforms cannot support the HTML5 KVM client, hence, Cisco UCS Manager does not show the Launch Java KVM Console option for the unsupported servers and directly launches the Java verison of KVM. The Java KVM console requires Java Runtime Environment (JRE) version 1.7.0 or higher.

**KVM Console Tab**

This tab provides command line access to the server. The menu options available in this tab are described below.

**Server Actions Menu**

Choose the remote server operation you want to execute on the system.

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boot Server</strong></td>
<td>Powers on the system from the virtual console session.</td>
</tr>
<tr>
<td><strong>Shutdown Server</strong></td>
<td>Powers off the system from the virtual console session.</td>
</tr>
<tr>
<td><strong>Reset</strong></td>
<td>Resets the system from the virtual console session.</td>
</tr>
</tbody>
</table>
### File Menu

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| Capture to File button | Opens the Save dialog box that allows you to save the current screen as a JPG image.  
  **Note**: This option is only available on the KVM tab. |
| Exit button        | Closes the KVM console.                                                       |

### View Menu

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refresh</td>
<td>Updates the console display with the server's current video output.</td>
</tr>
<tr>
<td>Full Screen</td>
<td>Expands the KVM console so that it fills the entire screen.</td>
</tr>
</tbody>
</table>

### Macros Menu

Choose the keyboard shortcut you want to execute on the remote system.

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static Macros   menu</td>
<td>Displays a predefined set of macros.</td>
</tr>
<tr>
<td>User Defined Macros menu</td>
<td>Displays the user-defined macros that have been created.</td>
</tr>
<tr>
<td>Server Defined Macros menu</td>
<td>Displays the server defined macros that have been created.</td>
</tr>
<tr>
<td>Manage button</td>
<td>Opens the Configure User Defined Macros dialog box, which allows you to create and manage macros. System-defined macros cannot be deleted.</td>
</tr>
</tbody>
</table>

### Tools Menu

<table>
<thead>
<tr>
<th>Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session Options</td>
<td>Opens the Session Settings dialog box that lets you specify:</td>
</tr>
<tr>
<td></td>
<td>• Scaling allows you to choose how the aspect ratio is displayed on the KVM screen.</td>
</tr>
<tr>
<td></td>
<td>• This defines which mouse acceleration to use on the target system.</td>
</tr>
<tr>
<td></td>
<td>The default is Absolute Positioning.</td>
</tr>
<tr>
<td>Session User List</td>
<td>Opens the Session User List dialog box that shows all the user IDs that have an active KVM session.</td>
</tr>
<tr>
<td>Chat</td>
<td>Opens group chat window for any admins logged into the current KVM session.</td>
</tr>
<tr>
<td>Virtual Keyboard</td>
<td>Opens an onscreen keyboard for the current KVM session.</td>
</tr>
</tbody>
</table>
### Menu Item  
**Playback Controls**  
Opens a dialog box to select DVC recording files created by Java KVM.

### Virtual Media Menu

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activate Virtual Devices</strong></td>
<td>Activates a vMedia session that allows you to attach a drive or image file from your local computer or network.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>If you have not allowed unsecured connections, you will be prompted to accept the session. If you reject the session, the virtual media session is terminated.</td>
</tr>
<tr>
<td><strong>CD/DVD</strong></td>
<td>Choose the CD/DVD that you want to access, and click the Map Drive button to map it to the host server device.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>If the Read Only checkbox is checked, the server cannot write to the vMedia device even if the device has write capability.</td>
</tr>
<tr>
<td><strong>Removable Disk</strong></td>
<td>Choose the removable disk that you want to access, and click the Map Drive button to map it to the host server device.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>If the Read Only checkbox is checked, the server cannot write to the vMedia device even if the device has write capability.</td>
</tr>
<tr>
<td><strong>Floppy Disk</strong></td>
<td>Choose the floppy that you want to access, and click the Map Drive button to map it to the host server device.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>If the Read Only checkbox is checked, the server cannot write to the vMedia device even if the device has write capability.</td>
</tr>
</tbody>
</table>

### Online Help Menu

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contents and Index</strong></td>
<td>Opens Online Help.</td>
</tr>
<tr>
<td><strong>About KVM Viewer</strong></td>
<td>Displays build version information about HTML5 KVM Viewer.</td>
</tr>
</tbody>
</table>
KVM Direct Access

KVM direct access allows the administrators that manage the blade and rack servers in your Cisco UCS Manager domain access the KVM for their servers directly using a web browser. This feature allows you to restrict access to the IP addresses of the fabric interconnects, while still allowing your administrators to access the KVM console for the servers they manage.

---

**Note**

Only out-of-band IPv4 management interface addresses are supported for KVM direct access.

KVM direct access also supports custom applications from which users can navigate to a server management IP address without using the Cisco UCS Manager GUI interface or the KVM Launch Manager.

KVM direct access is supported by providing a management IP address assigned directly to the server or associated to the server with a service profile, to the server's administrator. The server administrator enters the IP address in a browser, and navigates to the Cisco UCS KVM Direct log in page. In the log in page, the user enters their user name and password, and chooses an authentication domain. When they launch Cisco UCS KVM Direct, the console for the server is displayed, the same way it would if they had accessed the server from the Cisco UCS Manager GUI. After launching the HTML5 KVM, a list of service profiles is displayed. Next to the Launch button, you can select a list of available outband and inband addresses associated with the server. In order to launch the Java KVM console, select the “Launch Java KVM Console” checkbox and then click OK.

KVM direct access employs self-signed certificates for authentication. When users access a server management IP address or service profile IP address for the first time, a dialog box will be displayed to alert them that they need to add a certificate exception to their browser's cache.

The default communications service that supports Cisco UCS KVM direct access is HTTPS. This cannot be disabled. When a user enters a management IP in a browser using HTTP as part of the address, they will be automatically redirected to the HTTPS service.

To accommodate KVM direct access, be sure that the CIMC Web Service communication service in Cisco UCS Manager is enabled.

---

**Note**

The CIMC Web Service is enabled by default in Cisco UCS Manager.

Starting the KVM Console from a Server

You can start multiple KVM Console sessions using the addresses assigned to the server.

**Procedure**

**Step 1**

In the Navigation pane, click **Equipment**.

**Step 2**

Expand **Equipment > Chassis > Chassis Number > Servers**.

**Step 3**

Choose the server that you want to access through the **KVM Console**.
Starting the KVM Console from a Service Profile

Procedure

Step 1 In the Navigation pane, click Servers.
Step 2 Expand Servers > Service Profiles.
Step 3 Expand the node for the organization which contains the service profile for which you want to launch the KVM console.

If the system does not include multitenancy, expand the root node.

Step 4 Choose the service profile for which you need KVM access to the associated server.
Step 5 In the Work pane, click the General tab.
Step 6 Scroll down to the Actions area then click the >> button to the right of KVM Console.

The KVM Console opens in a separate window and displays a list of available out-of-band and inband addresses associated with the server. The "Launch Java KVM Console" checkbox is also available if you want to run Java KVM.

Note If you click KVM Console and not the >> button, your session will be started using server addresses in the preferential order of inband IPv6 first, inband IPv4 second, and out-band IPv4 third.
Step 7  Choose an address from the Select IP Address list.
Addresses displayed as (Inband) access the server via the uplink ports and those displayed as (Outband) access the server via the management interface port.

Step 8  Click OK.

The KVM Console is launched using the address you selected.

**Tip**  If the Caps Lock key on your keyboard is on when you open a KVM session, and you subsequently turn off your Caps Lock key, the KVM Console may continue to act as if Caps Lock is turned on. To synchronize the KVM Console and your keyboard, press Caps Lock once without the KVM Console in focus and then press Caps Lock again with the KVM Console in focus.

Step 9  To start another session for the same server, repeat steps 6 through 8.

Another KVM session is started. You can start up to six sessions for a server, depending on the number of addresses that have been configured for it.

#### Starting the KVM Console from the Cisco UCS KVM Direct Web Page

The Cisco UCS KVM Direct login page enables you to access a server directly from a web browser without logging in to Cisco UCS Manager.

**Before you begin**

To access the KVM console for a server using the Cisco UCS KVM Direct login page, you need the following:

- A Cisco UCS username and password.
- The server CIMC or service profile IPv4 outband or IPv4/IPv6 inband management address for the server you want to access.

**Procedure**

Step 1  In your web browser, type or select the web link for the management IP address of the server you want to access.

Step 2  If a Security Alert dialog box appears, click Yes to create a security exception.

The security exception is permanently stored in your browser's cache.

Step 3  In the Cisco UCS KVM Direct dialog box, specify the name, password, and domain.

Step 4  Click the Launch KVM button to start HTML5 KVM. Next to the Launch button, you can select a list of available outband and inband addresses associated with the server. The "Launch Java KVM Console" checkbox is also available if you want to run Java KVM.
Starting the KVM Console from the KVM Launch Manager

To access the KVM console for a server through the KVM Launch Manager, you need the following:

• Cisco UCS username and password.
• Name of the service profile associated with the server for which you want KVM access.

The KVM Launch Manager enables you to access a server through the KVM console without logging in to Cisco UCS Manager.

Procedure

Step 1  In your web browser, type or select the web link for Cisco UCS Manager GUI.

Example:
The default web link for HTTP access is http://UCSManager_IP for an IPv4 address, or http://UCSManager_IP6 for an IPv6 address. The default web link for HTTPS access is https://UCSManager_IP for an IPv4 address, or https://UCSManager_IP6 for an IPv6 address. In a standalone configuration, UCSManager_IP or UCSManager_IP6 are the IPv4 or IPv6 addresses, respectively, for the management port on the fabric interconnect. In a cluster configuration, UCSManager_IP or UCSManager_IP6 are the IPv4 or IPv6 addresses, respectively, assigned to Cisco UCS Manager.

Step 2  On the Cisco UCS Manager launch page, click Launch KVM Manager.

Step 3  If a Security Alert dialog box appears, click Yes to accept the security certificate and continue.

Step 4  On the UCS - KVM Launch Manager Login page, do the following:
   a) Enter your Cisco UCS username and password.
   b) (Optional) If your Cisco UCS implementation includes multiple domains, select the appropriate domain from the Domain drop-down list.
   c) Click OK.

Step 5  In the Service Profiles table of the KVM Launch Manager, do the following:
   a) Locate the row containing the service profile and associated server for which you need KVM access.
   b) In the Launch KVM column for that server, click Launch. Next to the Launch button, you can select a list of available outband and inband addresses associated with the server. The "Launch Java KVM Console" checkbox is also available if you want to run Java KVM.

The KVM console opens in a separate window.

Tip  If the Caps Lock key on your keyboard is on when you open a KVM session, and you subsequently turn off your Caps Lock key, the KVM Console may continue to act as if Caps Lock is turned on. To synchronize the KVM Console and your keyboard, press Caps Lock once without the KVM Console in focus and then press Caps Lock again with the KVM Console in focus.
KVM Folder Mapping

KVM Folder Mapping is supported in UCS Manager 3.2(1). Folder mapping provides external file access to the KVM console through the HTML5 KVM interface for remote system updates. This feature is available for B-series and C-series servers with systems running Google Chrome version 57 and higher.

Procedure

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Start the KVM console.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Click the Create Image button.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Drag and drop any files into the Create Image dialog box.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Click Download ISO Image File to create the ISO image. Only ISO images are available through the HTML5 KVM interface. For IMG image file creation use the Java KVM.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Click the Virtual Media button, then select Activate Virtual Devices. Wait a few seconds for the virtual devices to load.</td>
</tr>
<tr>
<td>Step 6</td>
<td>Click the Virtual Media button, then select CD/DVD.</td>
</tr>
<tr>
<td>Step 7</td>
<td>Drag the new ISO file or a folder into the Virtual Disk Management dialog box then click Map Drive. The new files are now mapped to this KVM session for read only access.</td>
</tr>
</tbody>
</table>

KVM Certificate

Changing the KVM Certificate

You can use this procedure to change the KVM certificate to a user-generated public certificate.

Procedure

<table>
<thead>
<tr>
<th>Step 1</th>
<th>In the Navigation pane, click Equipment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Expand Equipment &gt; Chassis &gt; Chassis Number &gt; Servers.</td>
</tr>
<tr>
<td>Step 3</td>
<td>Click the server for which you want to change the KVM certificate.</td>
</tr>
<tr>
<td>Step 4</td>
<td>In the Work pane, click the Inventory tab.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Click the CIMC subtab.</td>
</tr>
<tr>
<td>Step 6</td>
<td>In the Actions area, click Change KVM Certificate:</td>
</tr>
<tr>
<td>Step 7</td>
<td>In the Change KVM Certificate dialog box, complete the following fields:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certificate</td>
<td>A user-generated public certificate.</td>
</tr>
</tbody>
</table>
**Key Field**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key field</td>
<td>The corresponding user-generated private key.</td>
</tr>
<tr>
<td>Note</td>
<td>Password protected X.509 certificate private key is not supported.</td>
</tr>
</tbody>
</table>

**Step 8** Click OK.

**Step 9** If a confirmation dialog box appears, click Yes.

This operation will result in a reboot of the CIMC

---

## Clearing the KVM Certificate

### Procedure

- **Step 1** In the Navigation pane, click Equipment.
- **Step 2** Expand Equipment > Chassis > Chassis Number > Servers.
- **Step 3** Click the server for which you want to clear the KVM certificate.
- **Step 4** In the Work pane, click the Inventory tab.
- **Step 5** Click the CIMC subtab.
- **Step 6** In the Actions area, click Clear KVM Certificate:
- **Step 7** In the Clear KVM Certificate dialog box, click Yes.

This operation will result in a reboot of the CIMC
Device Connector

Device connector connects Cisco UCS Manager to Cisco Intersight, the cloud-hosted server management system. It enables Cisco UCS Manager to be managed and monitored through Cisco Intersight.

To register a device with Cisco Intersight in the cloud, you must do the following:

1. Connect Cisco UCS Manager with Cisco Intersight by configuring the device connector proxy settings, if they are required.

2. Use the device serial number and security code to validate your access to the device from Cisco Intersight and claim the device.

Enabling or Disabling Cisco Intersight Management

When you enable Cisco Intersight management, it establishes a bidirectional communication between the Intersight Cloud application and the device.

Before you begin

You must be an administrator to configure the device connector.

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>In the Navigation pane, click Admin.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Expand All &gt; Device Connector.</td>
</tr>
<tr>
<td>Step 3</td>
<td>In the Intersight Management area, click On to enable Intersight management or Off to disable Intersight management.</td>
</tr>
</tbody>
</table>
By default, the Cisco Intersight Management state is Enabled.

The Connection area displays the connection status of Intersight management. If the device connector has not been able to establish a connection to Intersight management, review the recommendations provided in the Details & Recommendations drop-down list to fix the connection issues.

Step 4 Select the Access Mode as Read-only or Allow Control.

You cannot configure the device through Cisco Intersight when the Read-only access mode is selected. Therefore, any configuration that comes to the device connector through the cloud is rejected with an error code.

You have full control to configure the device through Cisco Intersight when the Allow Control mode is selected.

Step 5 To disable the Intersight management, click Off.

When you disable the Intersight management, the Connection area displays the connection status as Administratively Disabled.

---

### Viewing Intersight Device Connector Properties

**Procedure**

**Step 1** In the Navigation pane, click Admin.

**Step 2** Expand All > Device Connector.

**Step 3** In the Intersight Management area, review the following information:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Enabled** radio button | The state of the connection between Cisco UCS Manager and Cisco Intersight. Allows you to enable or disable the Cisco Intersight management. This can be one of the following:  
  • **On**—Enables Cisco Intersight management. You can claim this system and leverage the capabilities of Cisco Intersight.  
    This is the default connection status.  
  • **Off**—Disables Cisco Intersight management. No communication will be allowed with Cisco Intersight. |

**Step 4** In the Connection area, review the following information:
**Table 5:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status field</td>
<td>Displays the status of the connection to Cisco Intersight. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• <strong>Administratively Disabled</strong>—Indicates that the Intersight management has been disabled.</td>
</tr>
<tr>
<td></td>
<td>• <strong>DNS Misconfigured</strong>—DNS has been configured incorrectly in Cisco UCS Manager.</td>
</tr>
<tr>
<td></td>
<td>• <strong>UCS Connect Network Error</strong>—Indicates the invalid network configurations.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Certificate Validation Error</strong>—Cisco UCS Manager is refusing to establish a connection to the Cisco Intersight platform because the certificate presented by the Cisco Intersight platform is invalid. Ensure that you allow https traffic from URL <code>svc.ucs-connect.com</code> to the devices that are in the path by making necessary changes to their SSL proxy, Web filtering, or transparent Web proxy.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Claimed</strong>—The connection to the Cisco Intersight platform is successful and you have claimed the connection.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Not Claimed</strong>—The connection to the Cisco Intersight platform is successful, but still not claimed. You can claim an unclaimed connection through Cisco Intersight.</td>
</tr>
</tbody>
</table>

| Details & Recommendations drop-down list | Lists the details and recommendations to fix the connection issues based on the status. |
| Access Mode field | Whether access permissions are set to **Read-Only** or **Allow Control**. The mode will be **Allow Control** by default. |
| Device ID field | The unique serial number of the device. |
| Claim Code | The security code provided to the device. Provide this security code to claim the device from Cisco Intersight. |

**Note** This code is available only when **Connection** status is **Not Claimed**.

**Step 5** In the **Settings** area, review the following information:
### General tab

Configures Access mode settings.

**Access Mode**—Configure access as **Read-only** or **Allow Control**.

- **Read-only**—When the Read-only access mode is selected, you cannot configure the device through Intersight.
- **Allow Control**—When the Allow Control access mode is selected, you have full control to configure the device through Intersight.

### Proxy Configuration tab

Whether HTTPS proxy settings are disabled or manually configured. This can be one of the following:

- **Off**—Select this option if you want to disable the HTTPS proxy settings configuration.
  - This is the default HTTPS proxy setting.
- **On**—Select this option if you want to enable the HTTPS proxy settings configuration.
  - **Proxy Hostname/IP**—Enter the proxy hostname or IP address.
  - **Proxy Port**—Enter the proxy port number.
  - **Authentication**—Enable this option to authenticate access to the proxy server.
    
    Enter the **Username** and **Password** to authenticate access.

**Note**

The device connector does not mandate the format of the login credentials, they are passed as-is to the configured HTTP proxy server. Whether or not the username must be qualified with a domain name will depend on the configuration of the HTTP proxy server.
### Certificate Manager tab

- **Import** — Allows you to select and import a CA signed certificate.

  **Important** The imported certificate must be in the *.pem (base64 encoded) format.

  - You can view the list of certificates with the following information:
    - **Name** — Common name of the CA certificate
    - **In Use** — Whether the certificate in the trust store was used to successfully verify the remote server
    - **Issued By** — The issuing authority for the certificate
    - **Expires** — The expiry date of the certificate

  **Note** You cannot delete bundled certificates.

---

### Updating Device Connector

When you upgrade Cisco UCS Manager, the device connector is automatically updated to the image integrated with the Cisco UCS Manager version. The device connector does not get downgraded when you downgrade the Cisco UCS Manager version.

You can update the device connector through the Cisco Intersight GUI. You can also update the device connector through the local management shell in Cisco UCS Manager CLI.

#### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Enters local management mode.</td>
</tr>
<tr>
<td>UCS-A# connect local-mgmt</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Copies the device connector image file from a remote server to a local destination by using the specified file transfer protocol. You need to copy the file to one fabric interconnect only.</td>
</tr>
<tr>
<td>UCS-A(local-mgmt)# copy [from-filesystem:] [from-path] filename to-path [dest-filename]</td>
<td></td>
</tr>
</tbody>
</table>

- **from-filesystem** — The remote file system containing the file to be copied.

  This file system can be specified by using one of the following options:
  - **ftp** : [ // [ username@ ] server ]
### Command or Action

<table>
<thead>
<tr>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>- scp: // [username@ server]</td>
</tr>
<tr>
<td>- sftp: // [username@ server]</td>
</tr>
<tr>
<td>- tftp: //server [ :port ]</td>
</tr>
</tbody>
</table>

If the file system is not specified, the current working file system is assumed. If a remote protocol is specified with no server name, you are prompted to enter the server name.

- **from-path**—Absolute or relative path to the file to be copied. If no path is specified, the current working directory is assumed.

- **filename**—The name of the source file to be copied.

- **to-path**—Absolute or relative path to the copied file. If no path is specified, the current working directory is assumed. The path includes the local file system to contain the copied file.

This file system can be specified from one of the following options:

- **volatile**:
- **workspace**:

- **dest-filename**—The new name for the copied file. If a dest-filename is specified, the copied file is renamed at the destination location.

**Note**
You cannot download the device connector image file through Cisco UCS Manager GUI.

### Step 3

| UCS-A(local-mgmt)# update-device-connector workspace: | volatile:/filename [skip-upgrade-on-peer] |

Updates the device connector image on the peer fabric interconnect and then the local fabric interconnect.

Using the **skip-upgrade-on-peer** option skips update on the peer fabric interconnect.

**Example**

The following example updates the device connector on both fabric interconnects:
UCS-A# connect local-mgmt
UCS-A(local-mgmt)# copy scp://username@10.100.100.100/filepath/filename.bin workspace:
UCS-A(local-mgmt)# update-device-connector workspace:/filename.bin
Update Started
Updating Device Connector on peer Fabric interconnect
Successfully updated device connector on peer Fabric interconnect
Updating Device Connector on local Fabric interconnect
Successfully updated device connector on local Fabric interconnect
UCS-A(local-mgmt)#

The following example updates the device connector on the local fabric interconnect only:

UCS-A# connect local-mgmt
UCS-A(local-mgmt)# copy scp://username@10.100.100.100/filepath/filename.bin workspace:
UCS-A(local-mgmt)# update-device-connector workspace:/filename.bin skip-upgrade-on-peer
Update Started
Updating Device Connector on local Fabric interconnect
Successfully updated device connector on local Fabric interconnect
UCS-A(local-mgmt)#