Cisco UCS Manager Administration Management Using the CLI, Release 3.1 (3)

First Published: 2016-01-20
Last Modified: 2018-11-14

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883
CONTENTS

PREFACE

Preface xi

Audience xi

Conventions xi

Related Cisco UCS Documentation xiii

Documentation Feedback xiii

CHAPTER 1

New and Changed Information for This Release 1

CHAPTER 2

Administration Management Overview 3

Administration Management Overview 3

Cisco UCS Manager User CLI Documentation 4

CHAPTER 3

Password Management 5

Guidelines for Cisco UCS Passwords 5

Guidelines for Cisco UCS Usernames 7

Configuring the Maximum Number of Password Changes for a Change Interval 8

Configuring a No Change Interval for Passwords 9

Configuring the Password History Count 9

Password Profile for Locally Authenticated Users 10

Clearing the Password History for a Locally Authenticated User 11

Recovering a Lost Password 12

Password Recovery for the Admin Account 12

Determining the Leadership Role of a Fabric Interconnect 12

Recovering the Admin Account Password in a Standalone Configuration in 6200 and 6300 FI Series 13

Recovering the Admin Account Password in a Cluster Configuration for 6200 and 6300 FI Series 15
CHAPTER 4  
Role-Based Access Configuration  19  
Role-Based Access Control Overview  19  
User Accounts for Cisco UCS  19  
  Reserved Words: Locally Authenticated User Accounts  20  
  Web Session Limits for User Accounts  21  
User Roles  21  
  Default User Roles  22  
  Reserved Words: User Roles  23  
  Privileges  23  
Creating a User Role  25  
Adding Privileges to a User Role  26  
Replacing Privileges for a User Role  26  
Removing Privileges from a User Role  27  
Deleting a User Role  28  
Locales  28  
  User Locales  28  
  Creating a Locale  29  
  Assigning an Organization to a Locale  30  
  Deleting an Organization from a Locale  30  
  Deleting a Locale  31  
Locally Authenticated User Accounts  31  
  Creating a User Account  31  
  Enabling the Password Strength Check for Locally Authenticated Users  33  
Setting Web Session Limits for User Accounts  34  
Assigning a Role to a User Account  34  
Assigning a Locale to a User Account  35  
Removing a Role from a User Account  36  
Removing a Locale from a User Account  36  
Enabling or Disabling a User Account  37  
Deleting a User Account  38  
Monitoring User Sessions from the CLI  38  

CHAPTER 5  
Remote Authentication  41
Primary Authentication Service 70
  Selecting the Console Authentication Service 70
  Selecting the Default Authentication Service 71
  Role Policy for Remote Users 73
  Configuring the Role Policy for Remote Users 73

CHAPTER 6
How to Enable and Disable the Call Home Feature 75
  Call Home in UCS Overview 75
  Enabling Call Home 76
  Disabling Call Home 77

CHAPTER 7
UCS Manager Communication Services 79
  Communication Services 79
  NonSecure Communication Services 81
    Setting Web Session Limits 81
    Viewing Web Session Limits 82
    Setting Shell Session Limits 82
    Viewing Shell Session Limits 83
    Configuring CIM XML 84
    Configuring HTTP 84
    Unconfiguring HTTP 85
  Secure Communication Services 86
    Configuring HTTPS 86
    Unconfiguring HTTPS 87
    Certificates, Key Rings, and Trusted Points 88
    Creating an Untrusted CA-Signed Certificate 89
    Creating a Key Ring 90
    Regenerating the Default Key Ring 91
    Creating a Certificate Request for a Key Ring with Basic Options 92
    Creating a Certificate Request for a Key Ring with Advanced Options 93
    Creating a KVM Certificate 95
    Clearing a KVM Certificate 96
    Creating a Trusted Point 96
    Importing a Certificate into a Key Ring 98
Preface

- Audience, on page xi
- Conventions, on page xi
- Related Cisco UCS Documentation, on page xiii
- Documentation Feedback, on page xiii

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.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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>
### Table

<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.
CHAPTER 1

New and Changed Information for This Release
CHAPTER 2

Administration Management Overview

This chapter includes the following sections:

• Administration Management Overview, on page 3
• Cisco UCS Manager User CLI Documentation, on page 4

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.

Cisco UCS Manager User CLI Documentation

Cisco UCS Manager offers you a new set of smaller, use-case based documentation described in the following table:

<table>
<thead>
<tr>
<th>Guide</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco UCS Manager Getting Started Guide</td>
<td>Discusses Cisco UCS architecture and Day 0 operations, including Cisco UCS Manager initial configuration, and configuration best practices.</td>
</tr>
<tr>
<td>Cisco UCS Manager Administration Guide</td>
<td>Discusses password management, role-based access configuration, remote authentication, communication services, CIMC session management, organizations, backup and restore, scheduling options, BIOS tokens and deferred deployments.</td>
</tr>
<tr>
<td>Cisco UCS Manager Infrastructure Management Guide</td>
<td>Discusses physical and virtual infrastructure components used and managed by Cisco UCS Manager.</td>
</tr>
<tr>
<td>Cisco UCS Manager Firmware Management Guide</td>
<td>Discusses downloading and managing firmware, upgrading through Auto Install, upgrading through service profiles, directly upgrading at endpoints using firmware auto sync, managing the capability catalog, deployment scenarios, and troubleshooting.</td>
</tr>
<tr>
<td>Cisco UCS Manager Server Management Guide</td>
<td>Discusses the new licenses, registering Cisco UCS domains with Cisco UCS Central, power capping, server boot, server profiles and server-related policies.</td>
</tr>
<tr>
<td>Cisco UCS Manager Storage Management Guide</td>
<td>Discusses all aspects of storage management such as SAN and VSAN in Cisco UCS Manager.</td>
</tr>
<tr>
<td>Cisco UCS Manager Network Management Guide</td>
<td>Discusses all aspects of network management such as LAN and VLAN connectivity in Cisco UCS Manager.</td>
</tr>
<tr>
<td>Cisco UCS Manager System Monitoring Guide</td>
<td>Discusses all aspects of system and health monitoring including system statistics in Cisco UCS Manager.</td>
</tr>
</tbody>
</table>
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 9
- Configuring the Password History Count, on page 9
- Password Profile for Locally Authenticated Users, on page 10
- Clearing the Password History for a Locally Authenticated User, on page 11
- Recovering a Lost Password, on page 12

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 1: ASCII Table of Allowed Characters for UCS Passwords, on page 5 are the allowed ASCII characters for UCS passwords.

Table 1: 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>
</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.

<table>
<thead>
<tr>
<th>ASCII Printable Characters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<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>
• 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.

**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

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>2</td>
<td>UCS-A /security # scope password-profile</td>
<td>Enters password profile security mode.</td>
</tr>
<tr>
<td>3</td>
<td>UCS-A /security/password-profile # set change-during-interval enable</td>
<td>Restricts the number of password changes a locally authenticated user can make within a given number of hours.</td>
</tr>
<tr>
<td>4</td>
<td>UCS-A /security/password-profile # set change-count pass-change-num</td>
<td>Specifies 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.</td>
</tr>
<tr>
<td>5</td>
<td>UCS-A /security/password-profile # set change-interval num-of-hours</td>
<td>Specifies 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.</td>
</tr>
<tr>
<td>6</td>
<td>UCS-A /security/password-profile # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

### Example

The following example enables the change during interval option, sets the change count to 5, sets the change interval to 72 hours, and commits the transaction:

```
UCS-A # scope security
UCS-A /security # scope password-profile
UCS-A /security/password-profile # set change-during-interval enable
UCS-A /security/password-profile* # set change-count 5
UCS-A /security/password-profile* # set change-interval 72
UCS-A /security/password-profile* # commit-buffer
```
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

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # scope password-profile</td>
<td>Enters password profile security mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security/password-profile # set change-during-interval disable</td>
<td>Disables the change during interval feature.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /security/password-profile # set no-change-interval min-num-hours</td>
<td>Specifies 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.</td>
</tr>
<tr>
<td><strong>Step 5</strong> UCS-A /security/password-profile # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

### Example

The following example disables the change during interval option, sets the no change interval to 72 hours, and commits the transaction:

UCS-A # scope security
UCS-A /security # scope password-profile
UCS-A /security/password-profile # set change-during-interval disable
UCS-A /security/password-profile* # set no-change-interval 72
UCS-A /security/password-profile* # commit-buffer
UCS-A /security/password-profile #

Configuring the Password History Count

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

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
</tbody>
</table>
## 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.

### Purpose

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 2</strong></td>
<td><strong>UCS-A /security # scope password-profile</strong></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td><strong>UCS-A /security/password-profile # set history-count num-of-passwords</strong></td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td><strong>UCS-A /security/password-profile # commit-buffer</strong></td>
</tr>
</tbody>
</table>

### Example

The following example configures the password history count and commits the transaction:

```
UCS-A # scope security
UCS-A /security # scope password-profile
UCS-A /security/password-profile # set history-count 5
UCS-A /security/password-profile* # commit-buffer
```

## 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.

### 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.
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**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2 UCS-A/security # scope local-user user-name</td>
<td>Enters local user security mode for the specified user account.</td>
</tr>
<tr>
<td>Step 3 UCS-A/security/local-user # set clear password-history yes</td>
<td>Clears the password history for the specified user account.</td>
</tr>
<tr>
<td>Step 4 UCS-A/security/local-user # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>
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

Note
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

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 UCS-A# show cluster state</td>
<td>Displays the operational state and leadership role for both fabric interconnects in a cluster.</td>
</tr>
</tbody>
</table>
Example
The following example displays the leadership role for both fabric interconnects in a cluster, where fabric interconnect A has the primary role and fabric interconnect B has the subordinate role:

```
UCS-A# show cluster state
Cluster Id: 0x4432f72a371511de-0xb97c000de1b1ada4
A: UP, PRIMARY
B: UP, SUBORDINATE
HA READY
```

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
   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/
kernelfirmware_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
```
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

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Connect to the console port of the subordinate fabric interconnect.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>For the subordinate fabric interconnect:</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>c) In the console, press one of the following key combinations as it boots to get the loader prompt:</td>
</tr>
<tr>
<td></td>
<td>- Ctrl+l</td>
</tr>
<tr>
<td></td>
<td>- Ctrl+Shift+r</td>
</tr>
<tr>
<td></td>
<td>You may need to press the selected key combination multiple times before your screen displays the loader prompt.</td>
</tr>
</tbody>
</table>

| 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
Recovering the Admin Account Password in a Cluster Configuration for 6200 and 6300 F1 Series
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
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 Role 2 has server-related privileges, users with Role1 and Role 2 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.

**Note**
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.

**Note**
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
Detailed information about these privileges and the tasks that they enable users to perform is available in Privileges in Cisco UCS available at the following URL: http://www.cisco.com/en/US/products/ps10281/prod_technical_reference_list.html.

Table 2: User Privileges

<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>Privilege</td>
<td>Description</td>
<td>Default Role Assignment</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------</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>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>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>Privilege</td>
<td>Description</td>
<td>Default Role Assignment</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------------------------</td>
<td>-----------------------------------</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>
<tr>
<td>service-profile-server-oper</td>
<td>Service profile consumer</td>
<td>Server Profile Administrator</td>
</tr>
<tr>
<td>service-profile-server-policy</td>
<td>Service profile pool policy</td>
<td>Server Security Administrator</td>
</tr>
<tr>
<td>service-profile-storage</td>
<td>Service profile storage</td>
<td>Storage Administrator</td>
</tr>
<tr>
<td>service-profile-storage-policy</td>
<td>Service profile storage policy</td>
<td>Storage Administrator</td>
</tr>
</tbody>
</table>

Creating a User Role

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # create role name</td>
<td>Creates the user role and enters security role mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security/role # add privilege privilege-name</td>
<td>Adds one or more privileges to the role.</td>
</tr>
<tr>
<td><strong>Note</strong> You can specify more than one privilege-name on the same command line to add multiple privileges to the role, or you can add privileges to the same role using multiple add commands.</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /security/role # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example creates the service-profile-security-admin role, adds the service profile security and service profile security policy privileges to the role, and commits the transaction:

```
UCS-A# scope security
UCS-A /security # create role ls-security-admin
UCS-A /security/role* # add privilege service-profile-security service-profile-security-policy
UCS-A /security/role* # commit-buffer
UCS-A /security/role #
```
## Adding Privileges to a User Role

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# <code>scope security</code></td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # <code>scope role name</code></td>
<td>Enters security role mode for the specified role.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security/role # <code>add privilege privilege-name</code></td>
<td>Adds one or more privileges to the existing privileges of the user role. <strong>Note</strong> You can specify more than one <code>privilege-name</code> on the same command line to add multiple privileges to the role, or you can add privileges to the same role using multiple <code>add privilege</code> commands.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /security/role # <code>commit-buffer</code></td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

### Example

The following example shows how to add the server security and server policy privileges to the service-profile-security-admin role and commit the transaction:

```
UCS-A# `scope security`
UCS-A /security # `scope role service-profile-security-admin`
UCS-A /security/role # `add privilege server-security server-policy`
UCS-A /security/role # `commit-buffer`
```

## Replacing Privileges for a User Role

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# <code>scope security</code></td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # <code>scope role name</code></td>
<td>Enters security role mode for the specified role.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security/role # <code>set privilege privilege-name</code></td>
<td>Replaces the existing privileges of the user role.</td>
</tr>
</tbody>
</table>
Removing Privileges from a User Role

**Purpose**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Note</strong></td>
<td>You can specify more than one <code>privilege-name</code> on the same command line to replace the existing privilege with multiple privileges. After replacing the privileges, you can add privileges to the same role using the <code>add privilege</code> command.</td>
</tr>
</tbody>
</table>

**Step 4**

UCS-A /security/role # commit-buffer

Commits the transaction to the system configuration.

---

**Example**

The following example shows how to replace the existing privileges for the service-profile-security-admin role with the server security and server policy privileges and commit the transaction:

```
UCS-A# scope security
UCS-A /security # scope role service-profile-security-admin
UCS-A /security/role # set privilege server-security server-policy
UCS-A /security/role* # commit-buffer
UCS-A /security/role #
```

---

## Removing Privileges from a User Role

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>UCS-A# scope security</td>
</tr>
<tr>
<td><strong>Enter security mode.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>UCS-A /security # scope role name</td>
</tr>
<tr>
<td><strong>Enter security role mode for the specified role.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>UCS-A /security/role # remove privilege privilege-name</td>
</tr>
<tr>
<td><strong>Removes one or more privileges from the existing user role privileges.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>You can specify more than one <code>privilege-name</code> on the same command line to remove multiple privileges from the role, or you can remove privileges from the same role using multiple <code>remove privilege</code> commands.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>UCS-A /security/role # commit-buffer</td>
</tr>
<tr>
<td><strong>Commits the transaction to the system configuration.</strong></td>
<td></td>
</tr>
</tbody>
</table>
Example

The following example removes the server security and server policy privileges from the service-profile-security-admin role and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope role service-profile-security-admin
UCS-A /security/role # remove privilege server-security server-policy
UCS-A /security/role* # commit-buffer
UCS-A /security/role #
```

Deleting a User Role

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # delete role name</td>
<td>Deletes the user role.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example deletes the service-profile-security-admin role and commits the transaction:

```
UCS-A# scope security
UCS-A /security # delete role service-profile-security-admin
UCS-A /security* # commit-buffer
UCS-A /security #
```

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.
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.

### Creating a Locale

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # create locale locale-name</td>
<td>Creates a locale and enters security locale mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security/locale # create org-ref org-ref-name orgdn orgdn org-root/org-ref-name</td>
<td>References (binds) an organization to the locale. The org-ref-name argument is the name used to identify the organization reference, and the orgdn-name argument is the distinguished name of the organization being referenced.</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /security/locale # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

**Example**

The following example creates the western locale, references the finance organization to the locale, names the reference finance-ref, and commits the transaction:

```
UCS-A# scope security
UCS-A /security # create locale western
UCS-A /security/locale* # create org-ref finance-ref orgdn org-root/org-finance
UCS-A /security/locale* # commit-buffer
UCS-A /security/locale #
```
Assigning an Organization to a Locale

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A# scope locale locale-name</td>
<td>Enters security locale mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security/locale # create org-ref org-ref-name orgdn org-root/org-ref-name</td>
<td>References (binds) an organization to the locale. The org-ref-name argument is the name used to identify the organization reference, and the orgdn-name argument is the distinguished name of the organization being referenced.</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /security/locale # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

**Example**

The following example enters the western locale, adds (references) the marketing organization to the locale, names the reference marketing-ref, and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope locale western
UCS-A /security/locale* # create org-ref marketing-ref orgdn org-root/org-marketing
UCS-A /security/locale* # commit-buffer
```

Deleting an Organization from a Locale

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # scope locale locale-name</td>
<td>Enters security locale mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security/locale # delete org-ref org-ref-name</td>
<td>Deletes the organization from the locale.</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /security/locale # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

**Example**

The following example deletes the finance organization from the western locale and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope locale western
UCS-A /security/locale* # delete org-ref finance-ref
UCS-A /security/locale* # commit-buffer
```
Deleting a Locale

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # delete locale locale-name</td>
<td>Deletes the locale.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example deletes the western locale and commits the transaction:

UCS-A# scope security
UCS-A /security # delete locale western
UCS-A /security* # commit-buffer
UCS-A /security #

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

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

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # create local-user local-user-name</td>
<td>Creates a user account for the specified local user and enters security local user mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security/local-user # set account-status {active</td>
<td>inactive}</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /security/local-user # set password password</td>
<td>Sets the password for the user account</td>
</tr>
<tr>
<td>Step 5</td>
<td>(Optional) UCS-A /security/local-user # set firstname first-name</td>
<td>Specifies the first name of the user.</td>
</tr>
<tr>
<td>Step 6</td>
<td>(Optional) UCS-A /security/local-user # set lastname last-name</td>
<td>Specifies the last name of the user.</td>
</tr>
<tr>
<td>Step 7</td>
<td>(Optional) UCS-A /security/local-user # set expiration month day-of-month year</td>
<td>Specifies the date that the user account expires. The month argument is the first three letters of the month name. <strong>Note</strong> 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.</td>
</tr>
<tr>
<td>Step 8</td>
<td>(Optional) UCS-A /security/local-user # set email email-addr</td>
<td>Specifies the user e-mail address.</td>
</tr>
<tr>
<td>Step 9</td>
<td>(Optional) UCS-A /security/local-user # set phone phone-num</td>
<td>Specifies the user phone number.</td>
</tr>
<tr>
<td>Step 10</td>
<td>(Optional) UCS-A /security/local-user # set sshkey ssh-key</td>
<td>Specifies the SSH key used for passwordless access.</td>
</tr>
<tr>
<td>Step 11</td>
<td>UCS-A security/local-user # commit-buffer</td>
<td>Commits the transaction.</td>
</tr>
</tbody>
</table>

### Example

The following example creates the user account named kikipopo, enables the user account, sets the password to foo12345, and commits the transaction:

```
UCS-A# scope security
UCS-A /security # create local-user kikipopo
```
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**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # enforce-strong-password {yes</td>
<td>no}</td>
</tr>
</tbody>
</table>

**Example**

The following example enables the password strength check:
Setting Web Session Limits for User Accounts

### Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A#  <code>scope system</code></td>
<td>Enters system mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /system #  <code>scope services</code></td>
<td>Enters system services mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /system/services #  <code>scope web-session-limits</code></td>
<td>Enters system services web session limits mode.</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /system/services/web-session-limits #  <code>set peruser num-of-logins-per-user</code></td>
<td>Sets the maximum number of concurrent HTTP and HTTPS sessions allowed for each user. Enter an integer between 1 and 256. By default, this value is set to 32.</td>
</tr>
<tr>
<td>Step 5</td>
<td>UCS-A /system/services/web-session-limits #  <code>commit-buffer</code></td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

### Example

The following example sets the maximum number of HTTP and HTTPS sessions allowed by each user account to 60 and commits the transaction:

```
UCS-A#  `scope system`  
UCS-A /system #  `scope services`  
UCS-A /system/services #  `scope web-session-limits`  
UCS-A /system/services/web-session-limits* #  `set peruser 60`  
UCS-A /system/services/web-session-limits* #  `commit-buffer`  
```

Assigning a Role to a 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

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A#  <code>scope security</code></td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security #  <code>scope local-user local-user-name</code></td>
<td>Enters security local user mode for the specified local user account.</td>
</tr>
</tbody>
</table>
### Role-Based Access Configuration

#### Assigning a Locale to a User Account

<table>
<thead>
<tr>
<th>Step 3</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>UoS-A# security/local-user # create role role-name</td>
<td>Assigns the specified role to the user account.</td>
<td></td>
</tr>
</tbody>
</table>

**Note** The `create role` command can be entered multiple times to assign more than one role to a user account.

<table>
<thead>
<tr>
<th>Step 4</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>UoS-A security/local-user # commit-buffer</td>
<td>Commits the transaction.</td>
<td></td>
</tr>
</tbody>
</table>

#### Example

The following example assigns the operations role to the kikipopo local user account and commits the transaction:

```text
UoS-A# scope security
UoS-A /security # scope local-user kikipopo
UoS-A /security/local-user # create role operations
UoS-A /security/local-user* # commit-buffer
```

---

### Assigning a Locale to a User Account

**Note**

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

#### Procedure

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>UoS-A# scope security</td>
<td>Enters security mode.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>UoS-A /security # scope local-user local-user-name</td>
<td>Enters security local user mode for the specified local user account.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 3</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>UoS-A /security/local-user # create locale locale-name</td>
<td>Assigns the specified locale to the user account.</td>
<td></td>
</tr>
</tbody>
</table>

**Note** The `create locale` command can be entered multiple times to assign more than one locale to a user account.

<table>
<thead>
<tr>
<th>Step 4</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>UoS-A security/local-user # commit-buffer</td>
<td>Commits the transaction.</td>
<td></td>
</tr>
</tbody>
</table>

#### Example

The following example assigns the western locale to the kikipopo local user account and commits the transaction:

```text
UoS-A# scope security
UoS-A /security # scope local-user kikipopo
UoS-A /security/local-user # create locale western
UoS-A /security/local-user* # commit-buffer
```
Removing a Role from a 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**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>UCS-A# scope security</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>UCS-A /security # scope local-user local-user-name</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>UCS-A /security/local-user # delete role role-name</td>
</tr>
<tr>
<td><strong>Note</strong> The delete role command can be entered multiple times to remove more than one role from a user account.</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>UCS-A security/local-user # commit-buffer</td>
</tr>
</tbody>
</table>

**Example**

The following example removes the operations role from the kikipopo local user account and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope local-user kikipopo
UCS-A /security/local-user # create locale western
UCS-A /security/local-user* # commit-buffer
UCS-A /security/local-user #
```

Removing a Locale from a User Account

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>UCS-A# scope security</td>
</tr>
</tbody>
</table>
### Enabling or Disabling 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**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# <code>scope security</code></td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A <code>/security # scope local-user</code></td>
<td>Enters local-user security mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A `/security/local-user # set account-status {active</td>
<td>inactive}`</td>
</tr>
</tbody>
</table>
Example

The following example enables a local user account called accounting:

```
UCS-A# scope security
UCS-A /security # scope local-user accounting
UCS-A /security/local-user # set account-status active
```

Deleting a User Account

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # delete local-user local-user-name</td>
<td>Deletes the local-user account.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example deletes the foo user account and commits the transaction:

```
UCS-A# scope security
UCS-A /security # delete local-user foo
UCS-A /security* # commit-buffer
UCS-A /security #
```

Monitoring User Sessions from the CLI

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # show user-session {local</td>
<td>remote} [detail]</td>
</tr>
</tbody>
</table>

Example

The following example lists all local users logged into the system. The asterisk indicates which session is the current login session.
The following example displays detailed information on all local users logged in to the system:

```plaintext
UCS-A# scope security
UCS-A /security # show user-session local detail
Session Id pts_25_1_31264:
    Fabric Id: A
    Term: pts/25
    User: steve
    Host: 64.101.53.93
    Pid: 31264
    Login Time: 2009-05-09T14:06:59

Session Id ttyS0_1_3532:
    Fabric Id: A
    Term: ttyS0
    User: jeff
    Host: console
    Pid: 3532
    Login Time: 2009-05-02T15:11:08

Session Id web_25277_A:
    Fabric Id: A
    Term: web_25277
    User: faye
    Host: 192.168.100.112
    Pid: 3518
```
Remote Authentication

- Authentication Services, on page 41
- Guidelines and Recommendations for Remote Authentication Providers, on page 41
- User Attributes in Remote Authentication Providers, on page 42
- Two-Factor Authentication, on page 44
- LDAP Providers and Groups, on page 44
- RADIUS Providers, on page 55
- TACACS+ Providers, on page 58
- Configuring Multiple Authentication Systems, on page 61
- Configuring Multiple Authentication Systems, on page 62
- Primary Authentication Service, on page 70

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 3: 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>
<tbody>
<tr>
<td>LDAP</td>
<td>Not required if group mapping is used</td>
<td>Optional. You can choose to do one of the following:</td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>Optional if group mapping is not used</td>
<td>• Do not extend the LDAP schema and configure an existing, unused attribute that meets the requirements.</td>
<td>A sample OID is provided in the following section.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Extend the LDAP schema and create a custom attribute with a unique name, such as CiscoAVPair.</td>
<td></td>
</tr>
<tr>
<td>Authentication Provider</td>
<td>Custom Attribute</td>
<td>Schema Extension</td>
<td>Attribute ID Requirements</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>--------------------------</td>
</tr>
</tbody>
</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:

```ini
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  
oSMSyntax: 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 regenerating 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.

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**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A#  <code>scope security</code></td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # <code>scope ldap</code></td>
<td>Enters security LDAP mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security/ldap # <code>set attribute attribute</code></td>
<td>Restricts database searches to records that contain the specified attribute.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /security/ldap # <code>set basedn distinguished-name</code></td>
<td>Restricts database searches to records that contain the specified distinguished name.</td>
</tr>
<tr>
<td><strong>Step 5</strong> UCS-A /security/ldap # <code>set filter filter</code></td>
<td>Restricts database searches to records that contain the specified filter.</td>
</tr>
<tr>
<td><strong>Step 6</strong> (Optional) UCS-A /security/ldap # <code>set timeout seconds</code></td>
<td>Sets the time interval the system waits for a response from the LDAP server before noting the server as down.</td>
</tr>
<tr>
<td><strong>Step 7</strong> UCS-A /security/ldap # <code>commit-buffer</code></td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

**Example**

The following example sets the LDAP attribute to CiscoAvPair, the base distinguished name to "DC=cisco-ucsm-aaa3,DC=qalab,DC=com", the filter to sAMAccountName=Suserid, and the timeout interval to 5 seconds, and commits the transaction:
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, you need to change the authentication realm for the domain to local, make the changes to the providers, and then change the domain authentication realm back to LDAP.

  - If you want to use the special characters listed in the following table for defining the attributes of an Active Directory bind distinguished name, you must replace the special character with an escape, by using a backslash (\) followed by the corresponding hexadecimal value of the character.

What to do next

Create an LDAP provider.
Remote Authentication

Creating an LDAP Provider

<table>
<thead>
<tr>
<th>Special Character</th>
<th>Description</th>
<th>Hexadecimal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>``, <code>+</code>, <code>&quot;</code>, <code>\</code>, <code>&lt;</code>, <code>&gt;</code>, <code>;</code>, <code>LF</code>, <code>CR</code>, <code>=</code></td>
<td>comma, plus sign, double quote, backslash, left angle bracket, right angle bracket, semicolon, line feed, carriage return, equals sign</td>
<td>0x2C, 0x2B, 0x22, 0x5C, 0x3C, 0x3E, 0x3B, 0x0A, 0x0D, 0x3D</td>
</tr>
</tbody>
</table>


### Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A/security # scope ldap</td>
<td>Enters security LDAP mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A/security/ldap # create server server-name</td>
<td>Creates an LDAP server instance and enters security LDAP server mode. If SSL is enabled, the <code>server-name</code>, typically an IP address or FQDN, must exactly match a Common Name (CN) in the LDAP server's security certificate. Unless an IP address is specified, a DNS server must be configured in Cisco UCS Manager.</td>
</tr>
<tr>
<td>Step 4</td>
<td>(Optional) UCS-A/security/ldap/server # set attribute attr-name</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...</td>
</tr>
</tbody>
</table>
### Command or Action | Purpose
---|---
| | 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.

**Step 5** | (Optional) UCS-A /security/ldap/server # set basedn basedn-name
| | 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.

**Step 6** | (Optional) UCS-A /security/ldap/server # set binddn binddn-name
| | 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.

**Step 7** | (Optional) UCS-A /security/ldap/server # set filter filter-value
| | 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.

**Step 8** | Required: UCS-A /security/ldap/server # set password
| | 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).

To set the password, press Enter after typing the `set password` command and enter the key value at the prompt.

**Step 9** | (Optional) UCS-A /security/ldap/server # set order order-num
| | The order that the Cisco UCS uses this provider to authenticate users.

**Step 10** | (Optional) UCS-A /security/ldap/server # set port port-num
| | The port through which Cisco UCS communicates with the LDAP database. The standard port number is 389.

**Step 11** | UCS-A /security/ldap/server # set ssl {yes no}
| | Enables or disables the use of encryption when communicating with the LDAP server. The options are as follows:
### Purpose

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>• yes — Encryption is required. If encryption cannot be negotiated, the connection fails. If enabled, 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>
<td></td>
</tr>
<tr>
<td>• no — Encryption is disabled. Authentication information is sent as clear text. LDAP uses STARTTLS. This allows encrypted communication using port 389.</td>
<td></td>
</tr>
</tbody>
</table>

### Step 12

UCS-A /security/ldap/server # set timeout

<table>
<thead>
<tr>
<th>timeout-num</th>
</tr>
</thead>
</table>

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.

### Step 13

UCS-A /security/ldap/server # set vendor {ms-ad | openldap}

Enables or disables the use of the nested LDAP group search capability on the LDAP server. The options are as follows:

- **ms-ad** — Nested LDAP group searches are supported with this option. If you set the vendor to ms-ad (Microsoft Active Directory), and enable and set the ldap-group-rule to recursive, Cisco UCS Manager can search through any nested LDAP groups.

- **openldap** — Nested LDAP group searches are not supported with this option. If you set the vendor to openldap, and enable and set the ldap-group-rule to recursive, Cisco UCS Manager will not search through any nested LDAP groups. If you choose this option, you must create each LDAP subgroup as an LDAP group map in Cisco UCS Manager, even if the parent group is already set up in a group map.
Creating an LDAP Provider

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you upgrade Cisco UCS Manager from an earlier version to release 2.1(2), the LDAP provider's vendor attribute is set to openldap by default, and LDAP authentication continues to operate successfully.</td>
<td></td>
</tr>
</tbody>
</table>

**Step 14**

UCS-A/security/ldap/server # commit-buffer

Commits the transaction to the system configuration.

**Example**

The following example creates an LDAP server instance named 10.193.169.246, configures the binddn, password, order, port, SSL settings, vendor attribute, and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope ldap
UCS-A /security/ldap* # create server 10.193.169.246
UCS-A /security/ldap/server* # set binddn
"cn=Administrator,cn=Users,DC=cisco-ucsm-aaa3,DC=qalab,DC=com"
UCS-A /security/ldap/server* # set password
Enter the password:
Confirm the password:
UCS-A /security/ldap/server* # set order 2
UCS-A /security/ldap/server* # set port 389
UCS-A /security/ldap/server* # set ssl yes
UCS-A /security/ldap/server* # set timeout 30
UCS-A /security/ldap/server* # set vendor ms-ad
UCS-A /security/ldap/server* # commit-buffer
UCS-A /security/ldap/server #
```

The following example creates an LDAP server instance named 12:31:71:1231:45b1:0011:011:900, configures the binddn, password, order, port, SSL settings, vendor attribute, and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope ldap
UCS-A /security/ldap/server* # set binddn
"cn=Administrator,cn=Users,DC=cisco-ucsm-aaa3,DC=qalab,DC=com"
UCS-A /security/ldap/server* # set password
Enter the password:
Confirm the password:
UCS-A /security/ldap/server* # set order 1
UCS-A /security/ldap/server* # set port 389
UCS-A /security/ldap/server* # set ssl yes
UCS-A /security/ldap/server* # set timeout 45
UCS-A /security/ldap/server* # set vendor ms-ad
UCS-A /security/ldap/server* # commit-buffer
UCS-A /security/ldap/server #
```

**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>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # scope ldap</td>
<td>Enters security LDAP mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security/ldap # scope server ldap-provider</td>
<td>Enters security LDAP provider mode.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /security/ldap/server # scope ldap-group-rule</td>
<td>Enters LDAP group rule mode.</td>
</tr>
<tr>
<td><strong>Step 5</strong> UCS-A /security/ldap/server/ldap-group-rule # set authorization {enable</td>
<td>disable}</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 the LDAP provider 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><strong>Step 6</strong> UCS-A /security/ldap/server/ldap-group-rule # set member-of-attribute attr-name</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 <strong>memberOf</strong>.</td>
</tr>
<tr>
<td><strong>Step 7</strong> UCS-A /security/ldap/server/ldap-group-rule # set traversal {non-recursive</td>
<td>recursive}</td>
</tr>
<tr>
<td></td>
<td>• non-recursive—Cisco UCS only searches those groups that the user belongs to.</td>
</tr>
</tbody>
</table>
Deleting an LDAP Provider

### Purpose

**Command or Action**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Command or Action</th>
</tr>
</thead>
</table>
| Recursive — Cisco UCS searches all the ancestor groups belonging to the user. | *recursive*  
Cisco UCS searches all the ancestor groups belonging to the user. |

### Step 8

- **UCS-A /security/ldap/server/ldap-group-rule**
- set use-primary-group {yes | no}

Confirms the primary group as an LDAP group map in Cisco UCS domain for membership validation. You can enable Cisco UCS Manager to download and verify the user primary group membership.

### Step 9

- **UCS-A /security/ldap/server/ldap-group-rule**
- commit-buffer

Commits the transaction to the system configuration.

### Example

The following example sets the LDAP group rule to enable authorization, sets the member of attribute to memberOf, sets the traversal to non-recursive, and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope ldap
UCS-A /security/ldap # scope server ldapprovider
UCS-A /security/ldap/server # scope ldap-group-rule
UCS-A /security/ldap/server/ldap-group-rule # set authorization enable
UCS-A /security/ldap/server/ldap-group-rule* # set member-of-attribute memberOf
UCS-A /security/ldap/server/ldap-group-rule* # set traversal non-recursive
UCS-A /security/ldap/server/ldap-group-rule* # set use-primary-group yes
UCS-A /security/ldap/server/ldap-group-rule* # commit-buffer
```

### Deleting an LDAP Provider

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope security</td>
<td>Enters security mode</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # scope ldap</td>
<td>Enters security LDAP mode</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security/ldap # delete server serv-name</td>
<td>Deletes the specified server.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /security/ldap # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

### Example

The following example deletes the LDAP server called ldap1 and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope ldap
```
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 into 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).
Deleting an LDAP Group Map

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # scope ldap</td>
<td>Enters security LDAP mode.</td>
</tr>
</tbody>
</table>
| **Step 3** UCS-A /security/ldap # create ldap-group group-dn | Creates an LDAP group map for the specified DN. 
The maximum number of characters for group-dn is 240.  
**Note** If you plan to enter a special character for this command, you need to prefix the special character with an escape character `\` (double back slash). |
| **Step 4** UCS-A /security/ldap/ldap-group# create locale locale-name | Maps the LDAP group to the specified locale. |
| **Step 5** UCS-A /security/ldap/ldap-group# create role role-name | Maps the LDAP group to the specified role. |
| **Step 6** UCS-A /security/ldap/ldap-group# commit-buffer | Commits the transaction to the system configuration. |

### Example

The following example maps the LDAP group mapped to a DN, sets the locale to pacific, sets the role to admin, and commits the transaction:

UCS-A# scope security
UCS-A /security # scope ldap
UCS-A /security/ldap # create ldap-group group-dn cn=security,cn=users,dc=lab,dc=com
UCS-A /security/ldap/ldap-group* # create locale pacific
UCS-A /security/ldap/ldap-group* # create role admin
UCS-A /security/ldap/ldap-group* # commit-buffer
UCS-A /security/ldap/ldap-group #

### What to do next
Set the LDAP group rule.

Deleting an LDAP Group Map

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
</tbody>
</table>
### Purpose

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2 UCS-A /security # scope ldap</td>
<td>Enters security LDAP mode.</td>
</tr>
<tr>
<td>Step 3 UCS-A /security/ldap # delete ldap-group group-dn</td>
<td>Deletes the LDAP group map for the specified DN.</td>
</tr>
<tr>
<td>Step 4 UCS-A /security/ldap # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

#### Example

The following example deletes an LDAP group map and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope ldap
UCS-A /security/ldap # delete ldap-group cn=security,cn=users,dc=lab,dc=com
UCS-A /security/ldap* # commit-buffer
UCS-A /security/ldap #
```

### 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.

#### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2 UCS-A /security # scope radius</td>
<td>Enters security RADIUS mode.</td>
</tr>
<tr>
<td>Step 3 (Optional) UCS-A /security/radius # set retries retry-num</td>
<td>Sets the number of times to retry communicating with the RADIUS server before noting the server as down.</td>
</tr>
<tr>
<td>Step 4 (Optional) UCS-A /security/radius # set timeout seconds</td>
<td>Sets the time interval that the system waits for a response from the RADIUS server before noting the server as down.</td>
</tr>
<tr>
<td>Step 5 UCS-A /security/radius # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>
Example

The following example sets the RADIUS retries to 4, sets the timeout interval to 30 seconds, and commits the transaction:

UCS-A# scope security
UCS-A /security # scope radius
UCS-A /security/radius # set retries 4
UCS-A /security/radius* # set timeout 30
UCS-A /security/radius* # commit-buffer

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

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # scope radius</td>
<td>Enters security RADIUS mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security/radius # create server server-name</td>
<td>Creates a RADIUS server instance and enters security RADIUS server mode</td>
</tr>
<tr>
<td>Step 4</td>
<td>(Optional) UCS-A /security/radius/server # set authport authport-num</td>
<td>Specifies the port used to communicate with the RADIUS server.</td>
</tr>
</tbody>
</table>
Remote Authentication

Creating a RADIUS Provider

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 5</strong> UCS-A/security/radius/server # set key</td>
<td>Sets the RADIUS server key. To set the key value, press Enter after typing the set key command and enter the key value at the prompt.</td>
</tr>
<tr>
<td><strong>Step 6</strong> (Optional) UCS-A/security/radius/server # set order order-num</td>
<td>Specifies when in the order this server will be tried.</td>
</tr>
<tr>
<td><strong>Step 7</strong> (Optional) UCS-A/security/radius/server # set retries retry-num</td>
<td>Sets the number of times to retry communicating with the RADIUS server before noting the server as down.</td>
</tr>
<tr>
<td><strong>Step 8</strong> (Optional) UCS-A/security/radius/server # set timeout seconds</td>
<td>Sets the time interval that the system waits for a response from the RADIUS server before noting the server as down.</td>
</tr>
<tr>
<td><strong>Step 9</strong> UCS-A/security/radius/server # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example creates a server instance named radiusserv7, sets the authentication port to 5858, sets the key to radiuskey321, sets the order to 2, sets the retries to 4, sets the timeout to 30, enables two-factor authentication, and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope radius
UCS-A /security/radius # create server radiusserv7
UCS-A /security/radius/server* # set authport 5858
UCS-A /security/radius/server* # set key
Enter the key: radiuskey321
Confirm the key: radiuskey321
UCS-A /security/radius/server* # set order 2
UCS-A /security/radius/server* # set retries 4
UCS-A /security/radius/server* # set timeout 30
UCS-A /security/radius/server* # commit-buffer
```

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

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # scope RADIUS</td>
<td>Enters security RADIUS mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security/radius # delete server serv-name</td>
<td>Deletes the specified server.</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /security/radius # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

**Example**

The following example deletes the RADIUS server called radius1 and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope radius
UCS-A /security/radius # delete server radius1
UCS-A /security/radius* # commit-buffer
UCS-A /security/radius #
```

### TACACS+ Providers

#### Configuring Properties for TACACS+ 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.

### Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # scope tacacs</td>
<td>Enters security TACACS+ mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>(Optional) UCS-A /security/tacacs # set timeout seconds</td>
<td>Sets the time interval that the system waits for a response from the TACACS+ server before noting the server as down.</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /security/tacacs # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>
Example

The following example sets the TACACS+ timeout interval to 45 seconds and commits the transaction:

```plaintext
UCS-A# scope security
UCS-A /security # scope tacacs
UCS-A /security/tacacs # set timeout 45
UCS-A /security/tacacs* # commit-buffer
```

What to do next

Create a TACACS+ provider.

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 multiple 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</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # scope tacacs</td>
<td>Enters security TACACS+ mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security/tacacs # create server server-name</td>
<td>Creates a TACACS+ server instance and enters security TACACS+ server mode</td>
</tr>
<tr>
<td>Step 4</td>
<td>(Optional) UCS-A /security/tacacs/server # set key</td>
<td>Sets the TACACS+ server key. To set the key value, press Enter after typing the set key command and enter the key value at the prompt.</td>
</tr>
<tr>
<td>Step 5</td>
<td>(Optional) UCS-A /security/tacacs/server # set order</td>
<td>Specifies when in the order this server will be tried.</td>
</tr>
</tbody>
</table>
Deleting a TACACS+ Provider

### Purpose

**Command or Action**

<table>
<thead>
<tr>
<th>Step 6</th>
<th>(Optional) UCS-A /security/tacacs/server # set timeout seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>Sets the time interval that the system waits for a response from the TACACS+ server before noting the server as down.</td>
</tr>
<tr>
<td>Tip</td>
<td>It is recommended that you configure a higher timeout value if you select two-factor authentication for TACACS+ providers.</td>
</tr>
</tbody>
</table>

**Step 7**

<table>
<thead>
<tr>
<th>UCS-A /security/tacacs/server # set port port-num</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifies the port used to communicate with the TACACS+ server.</td>
</tr>
</tbody>
</table>

**Step 8**

<table>
<thead>
<tr>
<th>UCS-A /security/tacacs/server # commit-buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

### Example

The following example creates a server instance named tacacsserv680, sets the key to tacacsk321 and confirms the key, sets the order to 4, sets the authentication port to 5859, and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope tacacs
UCS-A /security/tacacs # create server tacacsserv680
UCS-A /security/tacacs/server* # set key
Enter the key: tacacsk321
Confirm the key: tacacsk321
UCS-A /security/tacacs/server* # set order 4
UCS-A /security/tacacs/server* # set port 5859
UCS-A /security/tacacs/server* # commit-buffer
```

### 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

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2 UCS-A /security # scope tacacs</td>
<td>Enters security TACACS mode.</td>
</tr>
<tr>
<td>Step 3 UCS-A /security/tacacs # delete server serv-name</td>
<td>Deletes the specified server.</td>
</tr>
</tbody>
</table>
### Purpose

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCS-A /security/tacacs # <strong>commit-buffer</strong></td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

### Example

The following example deletes the TACACS server called tacacs1 and commits the transaction:

```plaintext
UCS-A# **scope security**  
UCS-A /security # **scope tacacs**  
UCS-A /security/tacacs # **delete server TACACS1**  
UCS-A /security/tacacs* # **commit-buffer**  
UCS-A /security/tacacs #
```

### Configuring Multiple Authentication Systems

#### Multiple Authentication Services

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

- Provider groups
- Authentication domains

After provider groups and authentication domains are configured in Cisco UCS Manager, you can use the following syntax to log in to the system using Cisco UCS Manager CLI: `ucs: auth-domain \ username`.

When multiple authentication domains and native authentication are configured with a remote authentication service, use one of the following syntax examples to log in with SSH, Telnet or Putty.

**Note**

SSH log in is case-sensitive.

From a Linux terminal using SSH:

- `ssh ucs-auth-domain\ \username@[UCSM-ip-address | UCMS-ipv6-address]`
  
  `ssh ucs-example\jsmith@192.0.20.11`  
  `ssh ucs-example\jsmith@2001::1`

- `ssh -l ucs-auth-domain\ \username \UCSM-ip-address|UCSM-ipv6-address|UCSM-host-name`  
  
  `ssh -l ucs-example\jsmith 192.0.20.11`  
  `ssh -l ucs-example\jsmith 2001::1`

- `ssh {UCSM-ip-address | UCMS-ipv6-address | UCSM-host-name} -l ucs-auth-domain\ \username`
  
  `ssh 192.0.20.11 -l ucs-example\jsmith`  
  `ssh 2001::1 -l ucs-example\jsmith`

- `ssh ucs-auth-domain\ \username@[UCSM-ip-address | UCMS-ipv6-address]`
  
  `ssh ucs-example\jsmith@192.0.20.11`  
  `ssh ucs-example\jsmith@2001::1`
ssh ucs-ldap23\jsmith@192.0.20.11
ssh ucs-ldap23\jsmith@2001::1

From a Linux terminal using Telnet:

- `telnet ucs-{UCSM-host-name|UCSM-ip-address|UCSM-ipv6-address} auth-domain\username`
  - `telnet ucs-qa-10`  
    - login: ucs-ldap23\blradmin
  - `telnet 10.106.19.12 2052`  
    - ucs-qa-10-A login: ucs-ldap23\blradmin

From a Putty client:

- Login as: `ucs-auth-domain\username`
  - Login as: `ucs-example\jsmith`

---

**Note**: If the default authentication is set to local, and the console authentication is set to LDAP, you can log in to the fabric interconnect from a Putty client using `ucs-local\admin`, where admin is the name of the local account.

---

### Configuring Multiple Authentication Systems

#### 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**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# <code>scope security</code></td>
<td>Enters security mode.</td>
</tr>
</tbody>
</table>
Deleting an LDAP Provider Group

Before you begin

Remove the provider group from an authentication configuration.

What to do next

Configure an authentication domain or select a default authentication service.
### 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

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>UCS-A /security # scope radius</td>
<td>Enters security RADIUS mode.</td>
</tr>
<tr>
<td>UCS-A /security/radius # create auth-server-group auth-server-group-name</td>
<td>Creates a RADIUS provider group and enters authentication server group security RADIUS mode.</td>
</tr>
<tr>
<td>UCS-A /security/radius/RADIUS/auth-server-group # create-server-ref radius-provider-name</td>
<td>Adds the specified RADIUS provider to the RADIUS provider group and enters server reference authentication server group security RADIUS mode.</td>
</tr>
<tr>
<td>UCS-A /security/radius/auth-server-group/server-ref # set order order-num</td>
<td>Specifies the order in which Cisco UCS uses this provider to authenticate users. Valid values include no-value and 0-16, with the lowest value indicating the highest priority.</td>
</tr>
</tbody>
</table>
Setting the order to no-value is equivalent to giving that server reference the highest priority.

**Step 6**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCS-A /security/radius/auth-server-group/server-ref# commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

**Example**

The following example creates a RADIUS provider group called `radiusgroup`, adds two previously configured providers called `radius1` and `radius2` to the provider group, sets the order, and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope radius
UCS-A /security/radius # create auth-server-group radiusgroup
UCS-A /security/radius/auth-server-group* # create server-ref radius1
UCS-A /security/radius/auth-server-group/server-ref* # set order 1
UCS-A /security/radius/auth-server-group/server-ref* # up
UCS-A /security/radius/auth-server-group* # create server-ref radius2
UCS-A /security/radius/auth-server-group/server-ref* # set order 2
UCS-A /security/radius/auth-server-group/server-ref* # commit-buffer
UCS-A /security/radius/auth-server-group/server-ref #
```

**What to do next**

Configure an authentication domain or select a default authentication service.

### Deleting a RADIUS Provider Group

Remove the provider group from an authentication configuration.

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2 UCS-A /security # scope radius</td>
<td>Enters security RADIUS mode.</td>
</tr>
<tr>
<td>Step 3 UCS-A /security/radius # delete</td>
<td>Deletes the RADIUS provider group.</td>
</tr>
<tr>
<td>auth-server-group auth-server-group-name</td>
<td></td>
</tr>
<tr>
<td>Step 4 UCS-A /security/radius # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

**Example**

The following example deletes a RADIUS provider group called `radiusgroup` and commits the transaction:
Creating a TACACS Provider Group

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

Before you begin
Create a TACACS provider.

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # scope tacacs</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security/tacacs # create auth-server-group auth-server-group-name</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /security/tacacs/auth-server-group # create server-ref tacacs-provider-name</td>
</tr>
<tr>
<td>Step 5</td>
<td>UCS-A /security/tacacs/auth-server-group/server-ref # set order order-num</td>
</tr>
<tr>
<td>Step 6</td>
<td>UCS-A /security/tacacs/auth-server-group/server-ref # commit-buffer</td>
</tr>
</tbody>
</table>

Example

The following example creates a TACACS provider group called tacacsgroup, adds two previously configured providers called tacacs1 and tacacs2 to the provider group, sets the order, and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope tacacs
UCS-A /security/tacacs # create auth-server-group tacacsgroup
UCS-A /security/tacacs/auth-server-group # create server-ref tacacs1
UCS-A /security/tacacs/auth-server-group/server-ref # set order 1
```
Deleting a TACACS Provider Group

Remove the provider group from an authentication configuration.

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # scope tacacs</td>
<td>Enters security TACACS mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security/tacacs # delete auth-server-group</td>
<td>Deletes the TACACS provider group.</td>
</tr>
<tr>
<td></td>
<td>auth-server-group-name</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /security/tacacs # commit-buffer</td>
<td>Commits the transaction to the system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>configuration.</td>
</tr>
</tbody>
</table>

Example

The following example deletes a TACACS provider group called tacacsgroup and commits the transaction:

UCS-A# scope security
UCS-A /security # scope tacacs
UCS-A /security/tacacs # delete auth-server-group tacacsgroup
UCS-A /security/tacacs* # commit-buffer
UCS-A /security/tacacs #

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

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # create auth-domain domain-name</td>
<td>Creates an authentication domain and enters authentication domain mode. &lt;br&gt;<strong>Note</strong> 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.</td>
</tr>
<tr>
<td>Step 3</td>
<td>(Optional) UCS-A /security/auth-domain # set refresh-period seconds</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. &lt;br&gt;If this time limit is exceeded, Cisco UCS Manager considers the web session inactive, but it does not terminate the session. &lt;br&gt;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. &lt;br&gt;<strong>Note</strong> 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.</td>
</tr>
<tr>
<td>Step 4</td>
<td>(Optional) UCS-A /security/auth-domain # set session-timeout seconds</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>
</tbody>
</table>
Remote Authentication

### Purpose

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<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>
<td></td>
</tr>
</tbody>
</table>

**Note** If you set two-factor authentication for a RADIUS or TACACS+ realm, consider increasing the `session-refresh` and `session-timeout` periods so that remote users will not have to re-authenticate too frequently.

### Step 5

(Optional) UCS-A /security/auth-domain #

`create default-auth`

Creates a default authentication for the authentication domain.

### Step 6

(Optional) UCS-A /security/auth-domain/default-auth #

`set auth-server-group auth-serv-group-name`

Sets the provider group for the authentication domain.

### Step 7

UCS-A /security/auth-domain/default-auth #

`set realm {ldap | local | radius | tacacs}`

Sets the realm for the authentication domain.

### Step 8

(Optional) UCS-A /security/auth-domain/default-auth #

`set use-2-factor yes`

Sets the authentication method to two-factor authentication for the realm.

**Note** Two-factor authentication applies only to the RADIUS and TACACS+ realms.

### Step 9

UCS-A /security/auth-domain/default-auth #

`commit-buffer`

Commits the transaction to the system configuration.

### Example

The following example creates an authentication domain called domain1 with a web refresh period of 3600 seconds (1 hour) and a session timeout period of 14400 seconds (4 hours). It then configures domain1 to use the providers in radius1, sets the realm type to radius, enables two-factor authentication, and commits the transaction:

```console
UCS-A# scope security
UCS-A /security # create auth-domain domain1
UCS-A /security/auth-domain* # set refresh-period 3600
UCS-A /security/auth-domain* # set session-timeout 14400
UCS-A /security/auth-domain* # create default-auth
UCS-A /security/auth-domain/auth-domain* # set auth-server-group radius1
UCS-A /security/auth-domain/auth-domain* # set realm radius
UCS-A /security/auth-domain/auth-domain* # set user-2-factor yes
UCS-A /security/auth-domain/auth-domain* # commit-buffer
UCS-A /security/auth-domain/auth-domain #
```
## 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

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A/security # scope console-auth</td>
<td>Enters console authorization security mode.</td>
</tr>
</tbody>
</table>
| Step 3 | UCS-A/security/console-auth # set realm auth-type | Specifies the console authentication, where the auth-type argument is one of the following keywords:  
- ldap — Specifies LDAP authentication  
- local — Specifies local authentication  
- none — Allows local users to log on without specifying a password  
- radius — Specifies RADIUS authentication  
- tacacs — Specifies TACACS+ authentication  

The associated provider group, if any. (Optional) UCS-A/security/console-auth # set auth-server-group auth-serv-group-name | |
| Step 5 | (Optional) UCS-A/security/default-auth # set use-2-factor yes | Sets the authentication method to two-factor authentication for the realm.  
**Note** Two-factor authentication applies only to the RADIUS and TACACS+ realms. |
| Step 6 | UCS-A/security/console-auth # commit-buffer | Commits the transaction to the system configuration. |
Example

The following example sets the authentication realm to TACACS+, sets the console authentication provider group to provider1, enables two-factor authentication, and commits the transaction:

```
UCS-A# scope security
UCS-A /security # scope console-auth
UCS-A /security/console-auth # set realm tacacs
UCS-A /security/console-auth # set auth-server-group provider1
UCS-A /security/console-auth* # set use-2-factor yes
UCS-A /security/console-auth* # commit-buffer
```

Selecting the Default Authentication Service

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # scope default-auth</td>
<td>Enters default authorization security mode.</td>
</tr>
</tbody>
</table>
| **Step 3** UCS-A /security/default-auth # set realm auth-type | Specifies the default authentication, where auth-type is one of the following keywords:  
   - ldap—Specifies LDAP authentication  
   - local—Specifies local authentication  
   - none—Allows local users to log on without specifying a password  
   - radius—Specifies RADIUS authentication  
   - tacacs—Specifies TACACS+ authentication |
| (Optional) UCS-A /security/default-auth # set auth-server-group auth-serv-group-name | The associated provider group, if any. |
| (Optional) UCS-A /security/default-auth # set refresh-period seconds | 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 |
Purpose

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Authentication is not enabled and 7200 seconds when it is enabled.</td>
</tr>
</tbody>
</table>

**Step 6**

(Optional) UCS-A /security/default-auth # set session-timeout seconds

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.

**Note** If you set two-factor authentication for a RADIUS or TACACS+ realm, consider increasing the session-refresh and session-timeout periods so that remote users will not have to re-authenticate too frequently.

**Step 7**

(Optional) UCS-A /security/default-auth # set use-2-factor yes

Sets the authentication method to two-factor authentication for the realm.

**Note** Two-factor authentication applies only to the RADIUS and TACACS+ realms.

**Step 8**

UCS-A /security/default-auth # commit-buffer

Commits the transaction to the system configuration.

**Example**

The following example sets the default authentication to RADIUS, the default authentication provider group to provider1, enables two-factor authentications, sets the refresh period to 7200 seconds (2 hours), the session timeout period to 28800 seconds (8 hours), and enables two-factor authentication. It then commits the transaction.

```
UCS-A# scope security
UCS-A /security # scope default-auth
UCS-A /security/default-auth # set realm radius
UCS-A /security/default-auth* # set auth-server-group provider1
UCS-A /security/default-auth* # set use-2-factor yes
UCS-A /security/default-auth* # set refresh-period 7200
UCS-A /security/default-auth* # set session-timeout 28800
UCS-A /security/default-auth* # commit-buffer
UCS-A /security/default-auth #
```
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

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A/security# set remote-user default-role {assign-default-role</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A/security# commit-buffer</td>
</tr>
</tbody>
</table>

Example

The following example sets the role policy for remote users and commits the transaction:

UCS-A# scope security
UCS-A/security# set remote-user default-role assign-default-role
UCS-A/security# commit-buffer
UCS-A/security#
How to Enable and Disable the Call Home Feature

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:
Enabling Call Home

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UCS-A# scope monitoring</td>
<td>Enters monitoring mode.</td>
</tr>
<tr>
<td>2</td>
<td>UCS-A/monitoring # scope callhome</td>
<td>Enters monitoring call home mode.</td>
</tr>
<tr>
<td>3</td>
<td>UCS-A/monitoring/callhome # enable</td>
<td>Enables Call Home.</td>
</tr>
<tr>
<td>4</td>
<td>UCS-A/monitoring/callhome # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>
Example

The following example enables Call Home and commits the transaction:

```
UCS-A# scope monitoring
UCS-A /monitoring # scope callhome
UCS-A /monitoring/callhome # enable
UCS-A /monitoring/callhome* # commit-buffer
UCS-A /monitoring/callhome #
```

What to do next

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

Disabling Call Home

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope monitoring</td>
<td>Enters monitoring mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /monitoring # scope callhome</td>
<td>Enters monitoring call home mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /monitoring/callhome # disable</td>
<td>Enables Call Home.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /monitoring/callhome # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example disables Call Home and commits the transaction:

```
UCS-A# scope monitoring
UCS-A /monitoring # scope callhome
UCS-A /monitoring/callhome # disable
UCS-A /monitoring/callhome* # commit-buffer
UCS-A /monitoring/callhome #
```

What to do next

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

This chapter includes the following sections:

- Communication Services, on page 79
- NonSecure Communication Services, on page 81
- Secure Communication Services, on page 86
- Network-Related Services, on page 101

Communication Services

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>
</tbody>
</table>
| CIMC Web Service      | 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.  
**Note** CIMC Web Service can only be enabled or disabled globally. You cannot configure KVM direct access for individual CIMC IP addresses. |
| HTTP                  | 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.  
**Note** 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. |
| HTTPS                 | 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. |
| SMASH CLP             | 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. |
| SNMP                  | 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. |
| SSH                   | 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. |
| Telnet                | By default, this service is disabled.  
This service provides access to the Cisco UCS Manager CLI. |
NonSecure Communication Services

Setting Web Session Limits

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>UCS-A# scope system .</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>UCS-A/system # scope services .</td>
<td>Enters services mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>UCS-A/system/services # scope web-session-limits .</td>
<td>Enters webs session limits mode.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>UCS-A/system/services/web-session-limits # set {maximum-event-interval</td>
<td>per-user</td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td>UCS-A/system/services/web-session-limits # commit-buffer .</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Sessions Per User</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>Maximum Sessions</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>Maximum Event Interval (in seconds)</td>
<td>The maximum time interval between two events. 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>
Example

The following example shows how to set the maximum-event-interval:

```
UCS-A# scope system
UCS-A /system # scope services
UCS-A /system/services # scope web-session-limits
UCS-A /system/services/web-session-limits # set maximum-event-interval 300
UCS-A /system/services/web-session-limits # commit buffer
```

Viewing Web Session Limits

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /system # scope services</td>
<td>Enters services mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> /system/services # show web-session-limits</td>
<td>Shows the web session settings.</td>
</tr>
</tbody>
</table>

Example

The following example shows how to view web session limits:

```
UCS-A# scope system
UCS-A /system # scope services
UCS-A /system/services # show web-session-limits
Web Sessions:
  Maximum logins for single user Maximum Sessions Maximum Event Interval (sec)
  ------------------------------- ------------------------------- -------------------------------
  32 256 600
UCS-A /system/services #
```

Setting Shell Session Limits

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /system # scope services</td>
<td>Enters services mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /system/services # scope shell-session-limits</td>
<td>Enables you to set the following shell session limits:</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /system/services/shell-session-limits #</td>
<td></td>
</tr>
<tr>
<td>set {per-user</td>
<td>total} number.</td>
</tr>
<tr>
<td>Command or Action</td>
<td>Purpose</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Name</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>Maximum Sessions Per User</td>
<td>The maximum number of concurrent shell sessions allowed per user. Enter an integer between 1-32.</td>
</tr>
<tr>
<td>Maximum Sessions</td>
<td>The maximum number of concurrent shell sessions allowed for all users within the system. Enter an integer between 1-32.</td>
</tr>
</tbody>
</table>

**Step 5** UCS-A /system/services/shell-session-limits # commit-buffer . Commits the transaction to the system configuration.

**Example**

The following example shows how to set the maximum sessions:

```
UCS-A# scope system
UCS-A /system # scope services
UCS-A /system/services # scope shell-session-limits
UCS-A /system/services/shell-session-limits # set maximum-sessions 20
UCS-A /system/services/shell-session-limits # commit buffer
```

### Viewing Shell Session Limits

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /system # scope services</td>
<td>Enters services mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> /system/services # show shell-session-limits</td>
<td>Shows the shell session settings.</td>
</tr>
</tbody>
</table>

**Example**

The following example shows how to view shell session limits:

```
UCS-A# scope system
UCS-A /system # scope services
```
Configuring CIM XML

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /system # scope services</td>
<td>Enters system services mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /system/services # enable cimxml</td>
<td>Enables the CIM XLM service.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /system/services # set cimxml port port-num</td>
<td>Specifies the port for the CIM XML connection.</td>
</tr>
<tr>
<td><strong>Step 5</strong> UCS-A /system/services # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example enables CIM XML, sets the port number to 5988, and commits the transaction:

```
UCS-A# scope system
UCS-A /system # scope services
UCS-A /system/services # enable cimxml
UCS-A /system/services* # set cimxml port 5988
UCS-A /system/services* # commit-buffer
UCS-A /system/services #
```

Configuring HTTP

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /system # scope services</td>
<td>Enters system services mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /system/services # enable http</td>
<td>Enables the HTTP service.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /system/services # set http port port-num</td>
<td>Specifies the port to be used for the HTTP connection.</td>
</tr>
</tbody>
</table>
### Purpose

<table>
<thead>
<tr>
<th>Step 5</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UCS-A /system/services # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

### Example

The following example enables HTTP, sets the port number to 80, and commits the transaction:

```
UCS-A# scope system
UCS-A /system # scope services
UCS-A /system/services # enable http
UCS-A /system/services* # set http port 80
```

Warning: When committed, this closes all the web sessions.

```
UCS-A /system/services* # commit-buffer
UCS-A /system/services #
```

### Unconfiguring HTTP

#### Procedure

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UCS-A /system # scope services</td>
<td>Enters system services mode.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 3</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UCS-A /system/services # disable http</td>
<td>Disables the HTTP service.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 4</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UCS-A /system/services # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

#### Example

The following example disables HTTP and commits the transaction:

```
UCS-A# scope system
UCS-A /system # scope services
UCS-A /system/services # disable http
UCS-A /system/services* # commit-buffer
UCS-A /system/services #
```
Secure Communication Services

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

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /system # scope services</td>
<td>Enters system services mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /system/services # enable https</td>
<td>Enables the HTTPS service.</td>
</tr>
<tr>
<td>Step 4</td>
<td>(Optional) UCS-A /system/services # set https port port-num</td>
<td>Specifies the port to be used for the HTTPS connection.</td>
</tr>
<tr>
<td>Step 5</td>
<td>(Optional) UCS-A /system/services # set https keyring keyring-name</td>
<td>Specifies the name of the key ring you created for HTTPS.</td>
</tr>
<tr>
<td>Step 6</td>
<td>(Optional) UCS-A /system/services # set https cipher-suite-mode cipher-suite-mode</td>
<td>The level of Cipher Suite security used by the Cisco UCS domain. cipher-suite-mode can be one of the following keywords:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• high-strength</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• medium-strength</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• low-strength</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• custom—Allows you to specify a user-defined Cipher Suite specification string.</td>
</tr>
<tr>
<td>Step 7</td>
<td>(Optional) UCS-A /system/services # set https cipher-suite cipher-suite-spec-string</td>
<td>Specifies a custom level of Cipher Suite security for this Cisco UCS domain if cipher-suite-mode is set to custom. cipher-suite-spec-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 <a href="http://httpd.apache.org/docs/2.0/mod/mod_ssl.html#sslciphersuite">http://httpd.apache.org/docs/2.0/mod/mod_ssl.html#sslciphersuite</a>.</td>
</tr>
</tbody>
</table>
**Unconfiguring HTTPS**

**Before you begin**

Disable HTTP to HTTPS redirection.

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /system # scope services</td>
<td>Enters system services mode.</td>
</tr>
</tbody>
</table>

---

**Purpose**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 8</strong> (Optional) UCS-A /system/services # set https ssl-protocol</td>
<td>Enables you to choose which SSL protocols UCSM allows. Values are Default (Allow all except SSLv2 and SSLv3) and Only TLSV1.2. If you choose Only TLSv1.2, connections from web clients using lower versions of the TLS protocol will not be established.</td>
</tr>
<tr>
<td><strong>Step 9</strong> UCS-A /system/services # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

---

**Example**

The following example enables HTTPS, sets the port number to 443, sets the key ring name to kring7984, sets the Cipher Suite security level to high, configures the web server to accept only connections using TLSv1.2, and commits the transaction:

```
UCS-A# scope system
UCS-A /system # scope services
UCS-A /system/services # enable https
UCS-A /system/services* # set https port 443
Warning: When committed, this closes all the web sessions.
UCS-A /system/services* # set https keyring kring7984
UCS-A /system/services* # set https cipher-suite-mode high
UCS-A /system/services* # set https ssl-protocol tls1-2
UCS-A /system/services* # commit-buffer
```

---

**Unconfiguring HTTPS**

**Before you begin**

Disable HTTP to HTTPS redirection.

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /system # scope services</td>
<td>Enters system services mode.</td>
</tr>
<tr>
<td>Step</td>
<td>Command or Action</td>
</tr>
<tr>
<td>------</td>
<td>------------------</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /system/services # disable https</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /system/services # commit-buffer</td>
</tr>
</tbody>
</table>

**Example**

The following example disables HTTPS and commits the transaction:

```
UCS-A# scope system
UCS-A /system # scope services
UCS-A /system/services # disable https
UCS-A /system/services* # commit-buffer
```

**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. Creating a KVM Certificate, on page 95 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 an Untrusted CA-Signed Certificate**

As an alternative to using a public Certificate Authority (CA) to generate and sign a certificate, you can operate your own CA and sign your own certificates. To generate the certificate-key pair, you must generate a 2048 bit RSA key and an x.509 PEM certificate. This section shows commands for creating a CA and generating a certificate using the OpenSSL certificate server running on Linux. For detailed information about OpenSSL, see [http://www.openssl.org](http://www.openssl.org).

**Note**

These commands are to be entered on a Linux server with the OpenSSL package.

**Before you begin**

Obtain and install a certificate server software package on a server within your organization.

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> openssl genrsa -out CA_keyfilename keysize</td>
<td>This command generates an RSA private key that will be used by the CA. The specified file name contains an RSA key of the specified key size.</td>
</tr>
</tbody>
</table>
| Example: 
  # openssl genrsa -out cert.private 2048 | |
| **Step 2** openssl req -new -x509 -days numdays -key CA_keyfilename -out CA_certfilename | This command generates a new self-signed certificate for the CA using the specified key. The certificate is valid for the specified period. The command prompts the user for additional certificate information. The certificate server is an active CA. |
| Example: 
  # openssl req -new -x509 -days 365 -key cert.private -out cert.pem | |
| **Step 3** (Optional) openssl x509 -req -days numdays -in CSR_filename -CA CA_certfilename -set_serial 04 -CAkey CA_keyfilename -out server_certfilename -extfile openssl.conf | This command directs the CA to use your CSR file to generate a server certificate. Your server certificate is contained in the output file. |
| Example: | |
Creating a Key Ring

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

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# <code>scope security</code></td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # <code>create keyring keyring-name</code></td>
<td>Creates and names the key ring.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security/keyring # `set modulus {mod1024</td>
<td>mod1536</td>
</tr>
</tbody>
</table>


### Purpose

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 4</td>
<td>UCS-A /security/keyring # commit-buffer</td>
</tr>
<tr>
<td></td>
<td>Commits the transaction.</td>
</tr>
</tbody>
</table>

### Example

The following example creates a keyring with a key size of 1024 bits:

```
UCS-A# scope security
UCS-A /security # create keyring kr220
UCS-A /security/keyring* # set modulus mod1024
UCS-A /security/keyring* # commit-buffer
UCS-A /security/keyring #
```

### What to do next

Create a certificate request for this key ring.

### Regenerating the Default Key Ring

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

#### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
</tr>
<tr>
<td></td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # scope keyring default</td>
</tr>
<tr>
<td></td>
<td>Enters key ring security mode for the default key ring.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security/keyring # set regenerate yes</td>
</tr>
<tr>
<td></td>
<td>Regenerates the default key ring.</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /security/keyring # commit-buffer</td>
</tr>
<tr>
<td></td>
<td>Commits the transaction.</td>
</tr>
</tbody>
</table>

#### Example

The following example regenerates the default key ring:

```
UCS-A# scope security
UCS-A /security # scope keyring default
UCS-A /security/keyring* # set regenerate yes
UCS-A /security/keyring* # commit-buffer
UCS-A /security/keyring #
```
## Creating a Certificate Request for a Key Ring with Basic Options

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2 UCS-A /security # scope keyring keyring-name</td>
<td>Enters configuration mode for the key ring.</td>
</tr>
<tr>
<td>Step 3 UCS-A /security/keyring # create certreq {ip [ipv4-addr</td>
<td>ipv6-v6]</td>
</tr>
<tr>
<td>Step 4 UCS-A /security/keyring/certreq # commit-buffer</td>
<td>Commits the transaction.</td>
</tr>
<tr>
<td>Step 5 UCS-A /security/keyring # show certreq</td>
<td>Displays the certificate request, which you can copy and send to a trust anchor or certificate authority.</td>
</tr>
</tbody>
</table>

**Example**

The following example creates and displays a certificate request with an IPv4 address for a key ring, with basic options:

```plaintext
UCS-A# scope security
UCS-A /security # scope keyring kr220
UCS-A /security/keyring # create certreq ip 192.168.200.123 subject-name sjc04
Certificate request password:
Confirm certificate request password:
UCS-A /security/keyring* # commit-buffer
UCS-A /security/keyring # show certreq
Certificate request subject name: sjc04
Certificate request ip address: 192.168.200.123
Certificate request e-mail name: 
Certificate request country name: 
State, province or county (full name): 
Locality (eg, city): 
Organization name (eg, company): 
Organization Unit name (eg, section): 
Request: 
-----BEGIN CERTIFICATE REQUEST-----
MIIBfTCB5wIBADARMQ8wDQYDVQQDEwZzYW1jMDQwgZ8wDQYJKoZIhvcNAQEBBQAD 
gY0AMIGJAoGBALpKn1t8qMZO4UGqILKFQqC2c8b/vM2rRgW0PhXbhqgLAIYZ1F 
JqcYE/G5yly+F/vGHzhBtds4sOGCm4RTLJWio4Swcc/AUX5Zngf45YtXlWyblWUwV4 
0rze/ygT/kVc656mBfW2dtztzu2pGA14sd76izLxt29K7Rmzj6CAUVAgaMBAAAg 
LTaRbGhkgkii9W0CBQXhJAcMBGBA1uDQEB/w/QQMA6C6BnHbWvN1cEcSxlaE 
BkgkXhki9W0BAQFQFAO6gQcsnxN0UHYGFoQyW56RwQuELTPnqndqUwzEFU03Teg 
nsyU4astpHfVqV9v1K2+sPvec6x5FWntWgHh8BimOb/00KuG8wflIGGsdBIAv 
TTIv0F+b30PfBRIAT1S+S+V8ndXrHejGx1DNqoN+odCPxkjoXD0lZTL09H 
Ba--
-----END CERTIFICATE REQUEST-----

UCS-A /security/keyring #
```
## Creating a Certificate Request for a Key Ring with Advanced Options

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A/security # scope keyring keyring-name</td>
<td>Enters configuration mode for the key ring.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A/security/keyring # create certreq</td>
<td>Creates a certificate request.</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A/security/keyring/certreq* # set country country name</td>
<td>Specifies the country code of the country in which the company resides.</td>
</tr>
<tr>
<td>Step 5</td>
<td>UCS-A/security/keyring/certreq* # set dns DNS Name</td>
<td>Specifies the Domain Name Server (DNS) address associated with the request.</td>
</tr>
<tr>
<td>Step 6</td>
<td>UCS-A/security/keyring/certreq* # set e-mail E-mail name</td>
<td>Specifies the email address associated with the certificate request.</td>
</tr>
<tr>
<td>Step 7</td>
<td>UCS-A/security/keyring/certreq* # set ip certificate request ip-address</td>
<td>Specifies the IPv4 or IPv6 address of the Cisco UCS domain.</td>
</tr>
<tr>
<td></td>
<td>certificate request ipv6-address</td>
<td></td>
</tr>
<tr>
<td>Step 8</td>
<td>UCS-A/security/keyring/certreq* # set fi-a-ip certificate request FI A ip-address</td>
<td>The IPv4 or IPv6 address of fabric interconnect A.</td>
</tr>
<tr>
<td></td>
<td>fi-a-ipv6 certificate request FI A ipv6-address</td>
<td></td>
</tr>
<tr>
<td>Step 9</td>
<td>UCS-A/security/keyring/certreq* # set fi-b-ip certificate request FI B ip-address</td>
<td>The IPv4 or IPv6 address of fabric interconnect B.</td>
</tr>
<tr>
<td></td>
<td>fi-b-ipv6 certificate request FI B ipv6-address</td>
<td></td>
</tr>
<tr>
<td>Step 10</td>
<td>UCS-A/security/keyring/certreq* # set locality locality name (eg, city)</td>
<td>Specifies the city or town in which the company requesting the certificate is headquartered.</td>
</tr>
<tr>
<td>Step 11</td>
<td>UCS-A/security/keyring/certreq* # set org-name organization name</td>
<td>Specifies the organization requesting the certificate.</td>
</tr>
<tr>
<td>Step 12</td>
<td>UCS-A/security/keyring/certreq* # set org-unit-name organizational unit name</td>
<td>Specifies the organizational unit.</td>
</tr>
<tr>
<td>Step 13</td>
<td>UCS-A/security/keyring/certreq* # set password certificate request password</td>
<td>Specifies an optional password for the certificate request.</td>
</tr>
<tr>
<td>Step 14</td>
<td>UCS-A/security/keyring/certreq* # set state state, province or county</td>
<td>Specifies the state or province in which the company requesting the certificate is headquartered.</td>
</tr>
<tr>
<td>Step 15</td>
<td>UCS-A/security/keyring/certreq* # set subject-name certificate request name</td>
<td>Specifies the fully qualified domain name of the Fabric Interconnect.</td>
</tr>
</tbody>
</table>
## Creating a Certificate Request for a Key Ring with Advanced Options

<table>
<thead>
<tr>
<th>Step 16</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UCS-A /security/keyring/certreq* # commit-buffer</td>
<td>Commits the transaction.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 17</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UCS-A /security/keyring # show certreq</td>
<td>Displays the certificate request, which you can copy and send to a trust anchor or certificate authority.</td>
</tr>
</tbody>
</table>

### Example

The following example creates and displays a certificate request with an IPv4 address for a key ring, with advanced options:

```
UCS-A# scope security
UCS-A /security # scope keyring kr220
UCS-A /security/keyring # create certreq
UCS-A /security/keyring/certreq* # set ip 192.168.200.123
UCS-A /security/keyring/certreq* # set fi-a-ip 192.168.200.124
UCS-A /security/keyring/certreq* # set fi-b-ip 192.168.200.125
UCS-A /security/keyring/certreq* # set subject-name sjc04
UCS-A /security/keyring/certreq* # set country US
UCS-A /security/keyring/certreq* # set dns bg1-samc-15A
UCS-A /security/keyring/certreq* # set e-mail test@cisco.com
UCS-A /security/keyring/certreq* # set locality new york city
UCS-A /security/keyring/certreq* # set org-name "Cisco Systems"
UCS-A /security/keyring/certreq* # set org-unit-name Testing
UCS-A /security/keyring/certreq* # set state new york
UCS-A /security/keyring/certreq* # commit-buffer
UCS-A /security/keyring/certreq # show certreq
```

Certificate request subject name: sjc04
Certificate request ip address: 192.168.200.123
Certificate request FI A ip address: 192.168.200.124
Certificate request FI B ip address: 192.168.200.125
Certificate request e-mail name: test@cisco.com
Certificate request ipv6 address: ::
Certificate request FI A ipv6 address: ::
Certificate request FI B ipv6 address: ::
Certificate request country name: US
State, province or county (full name): New York
Locality name (eg, city): new york city
Organization name (eg, company): Cisco
Organization Unit name (eg, section): Testing

Request:
```
-----BEGIN CERTIFICATE REQUEST-----
MIIBfTCCsSwIBADARBgQEQGCAQAwHDAgGBAsGA1UdEwEB/wQFMAMBAf8wDQYJKoZIh
vcNAQEBBQADggIBgkqhkiG9w0BAQEFAAOCAQ8wDQYJKoZIhvcNAQEBBQADggIBAgIB
kaqhkiG9w0BAQEFAAOCAQ8wDQYJKoZIhvcNAQEBBQADggIBAnIBgkqhkiG9w0BAQEFA
AOCAQ8wDQYJKoZIhvcNAQEBBQADggIBAwhi8bGAnIBgkqhkiG9w0BAQEFAAOCAQ8wDQY
JKoZIhvcNAQEBBQADggIBAwhi8bGAnIBgkqhkiG9w0BAQEFAAOCAQ8wDQYJKoZIhvcNAQ
EBBQADggIBAwhi8bGAnIBgkqhkiG9w0BAQEFAAOCAQ8wDQYJKoZIhvcNAQEBBQADggIBA
whi8bGAnIBgkqhkiG9w0BAQEFAAOCAQ8wDQYJKoZIhvcNAQEBBQADggIBAwhi8bGAnIBg
kqhkiG9w0BAQEFAAOCAQ8wDQYJKoZIhvcNAQEBBQADggIBAwhi8bGAnIBgkqhkiG9w0B
AQFAAOCAQ8wDQYJKoZIhvcNAQEBBQADggIBAwhi8bGAnIBgkqhkiG9w0BAQEFAAOCAQ8w
DQYJKoZIhvcNAQEBBQADggIBAwhi8bGAnIBgkqhkiG9w0BAQEFAAOCAQ8wDQYJKoZIhvcN
AQBgQEFoqgw456RwQuelTLPnOqndgUwHU0003e6g
-----END CERTIFICATE REQUEST-----
```

UCS-A /security/keyring/certreq #
What to do next

- Copy the text of the certificate request, including the BEGIN and END lines, and save it in a file. Send the file with the certificate request to a trust anchor or certificate authority to obtain a certificate for the key ring.
- Create a trusted point and set the certificate chain for the certificate of trust received from the trust anchor.

Creating a KVM Certificate

You can use this procedure to create the KVM certificate. This operation will result in a reboot of the CIMC.

**Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UCS-A# scope server chassis-id / blade-id</td>
</tr>
<tr>
<td>2</td>
<td>UCS-A /chassis/server # scope cimc</td>
</tr>
<tr>
<td>3</td>
<td>UCS-A /chassis/server/cimc # create kvm-certificate</td>
</tr>
<tr>
<td>4</td>
<td>UCS-A /chassis/server/cimc/kvm-certificate* # set certificate</td>
</tr>
<tr>
<td>5</td>
<td>UCS-A /chassis/server/cimc/kvm-certificate* # set key</td>
</tr>
<tr>
<td>6</td>
<td>UCS-A /chassis/server/cimc/kvm-certificate* # commit-buffer</td>
</tr>
</tbody>
</table>

**Purpose**

- Enters chassis server mode for the specified server.
- Enters chassis server CIMC mode.
- Creates the KVM certificate.
- Sets the specified user-generated public certificate.
- Sets the corresponding user-generated private key.

**Note**

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

**Step 6**

Commits the transaction to the system configuration.

This operation will result in a reboot of the CIMC.

**Example**

The following example creates a KVM certificate and commits the transaction:

```
UCS-A# scope server 1/3
UCS-A /chassis/server # scope cimc
UCS-A /chassis/server/cimc # create kvm-certificate
UCS-A /chassis/server/cimc/kvm-certificate* # set certificate
Enter lines one at a time. Enter ENDOFBUF to finish. Press ^C to abort.
Prompt Certificate:
> ...
UCS-A /chassis/server/cimc/kvm-certificate* # set key
Enter lines one at a time. Enter ENDOFBUF to finish. Press ^C to abort.
Prompt Key:
```
Clearing a KVM Certificate

This operation will result in a reboot of the CIMC.

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope server 1/3 blade-id</td>
<td>Enters chassis server mode for the specified server.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /chassis/server/cimc # scope cimc</td>
<td>Enters chassis server CIMC mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /chassis/server/cimc # clear kvm-certificate</td>
<td>Clears the KVM certificate.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /chassis/server/cimc* # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
<tr>
<td></td>
<td>This operation will result in a reboot of the CIMC.</td>
</tr>
</tbody>
</table>

Example

The following example clears a KVM certificate and commits the transaction:

UCS-A# scope server 1/3
UCS-A /chassis/server/ # scope cimc
UCS-A /chassis/server/cimc # clear kvm-certificate
Warning: When committed, this operation will result in CIMC reboot.
UCS-A /chassis/server/cimc* # commit-buffer
UCS-A /chassis/server/cimc#

Creating a Trusted Point

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope security</td>
<td>Enters security mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # create trustpoint name</td>
<td>Creates and names a trusted point.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security/trustpoint # set certchain [certchain]</td>
<td>Specifies certificate information for this trusted point.</td>
</tr>
</tbody>
</table>
If you do not specify certificate information in the command, you are prompted to enter a certificate or a list of trustpoints defining a certification path to the root certificate authority (CA). On the next line following your input, type ENDOFBUF to finish.

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

| Step 4 | UCS-A /security/trustpoint* # commit-buffer | Commits the transaction. |

### Example

The following example creates a trusted point and provides a certificate for the trusted point:

```
UCS-A> scope security
UCS-A# /security # create trustpoint tPoint10
UCS-A# /security/trustpoint* # set certchain
```

Enter lines one at a time. Enter ENDOFBUF to finish. Press ^C to abort.

Trustpoint Certificate Chain:

```
> -----BEGIN CERTIFICATE-----
> MIIDMDCCApmgAwIBAgIBADANBgkqhkiG9w0BAQQFADB0MQswCQYDVQQGEwJVUzEL
> BxMMU2FuEpvc2ZUSIENBMGRwEwIDQIKXRwFEFtcGxlIExluy4xExARBgNVBAgT
> C1Rlc3p6qR3vdXATaGTXBqNVBAFEXl01LC10Q5ZxihhXBoxaS55jbm20xHdAdBgkqhkiG
> 9w0BCQEWHVzEJLAZjwBBzEzS3j20wg82wQYJKoZIhvcNAQEEBQAdY0AMEGJ
> AoGABMSw4nTeIbVzboj7jZJe4xAGS6zHSHRMR0eZGhmdh66u/XAoLx7TyCzYU
> ZgAAMivyCsKgb/6CjQtsoftrmc/eAehuK3/SINv7w6Vv2pBt62tKpG04VBNKODL
> GMkePAYW1jgb4M2dx2+H8EH31MtdZrgKvPF+TE+bF5sZVNAgMBAAGjTAjBqko
> hkiG9w0BCQeczFrHMQS8bjgaFzgBuZ2UgcFzc3dWc6QYJKoZihvcNAQEEBFQAD
> gYEA6S1CaJoVzWzxC19036Md5z1zXcz75+VFj2I6h9a5ckC1d3mkGVx5gJU
> Ptt5CVqgNgNlvdhDsXxKryt3shyOhm9+CI+VFlFupy1CdyFuaLtv1WfhevskV0j6
> jtcEMzX+f7+3yh421ido3n04MlGwBqNHSVMEq2YzQAlFLNjtcEMyZ+f7+3yh42
> 1ido3n04x1kdjB0MQswCQYDVQQGEwJYJwEIMakGAIUEBMCQ0ExFDASBgiNVAcT
> C1HmbnRhE4N3YjXHMr6wGQIDQQQEhuxJb92DSrBpEN0W1zIEIuYx4FDSASBGjN
> Ba8TCVUzL2zu2WnYw65mQw82QDlQDQQDe20ZXN0Q0GCqA2wyADYVR0TBAoAwEB
> /zANBgkqhkiG9w0BAQQAFAcBqA7AhAWxWnXN688Pfhn+vpHv+WiBi5KqGQQKc
> Wr4pYo42j4/jIjnh75cCMkSw1a8BocpF1EmoGycyuf5c6vasenn1ddkkYT4
> PRDwGo4kwhuozBolensmmjBBeUCqgdFDWhDZjW5+N3x/kf42EU6idlAvt
> 4LYL5g==
> -----END CERTIFICATE-----
```

### What to do next

Obtain a key ring certificate from the trust anchor or certificate authority and import it into the key ring.
Importing a Certificate into a Key Ring

Before you begin

- Configure a trusted point that contains the certificate chain for the key ring certificate.
- Obtain a key ring certificate from a trust anchor or certificate authority.

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td><strong>UCS-A# scope security</strong></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td><strong>UCS-A /security # scope keyring keyring-name</strong></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td><strong>UCS-A /security/keyring # set trustpoint name</strong></td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td><strong>UCS-A /security/keyring # set cert</strong></td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td><strong>UCS-A /security/keyring # commit-buffer</strong></td>
</tr>
</tbody>
</table>

Example

The following example specifies the trust point and imports a certificate into a key ring:

```
UCS-A# scope security
UCS-A /security # scope keyring kr220
UCS-A /security/keyring # set trustpoint tPoint10
UCS-A /security/keyring* # set cert
```

Enter lines one at a time. Enter ENDOFBUF to finish. Press ^C to abort.

Keyring certificate:

```
> -----BEGIN CERTIFICATE-----
> MIIB/zCCAQwCAQAw2xXzA7BqNVBAYTA1VTMQsCQYDVQQIEwJDQTEVMBMGA1UE
> BxMMU2PuIEpve2UaIENBMRUwEwYDVQQKEwFeGFTcGx1IEluYy4xZARBgNVBAAt
> C1Rlc3QgR3JvdXAxGTAXBgNVTEBEMTEHRlc3QuZXhhbXBsZS5jbi20hHRAzBgkqhkiG
> 9w0BCQWEPHEVzZXJAlXhBbZS5jib20wq28wDQYJKoZIhvcNAQELBQADQyY0AMIGJ
> AoGBAMZw4nTepNIDhVzboj7z2Je4xAG6zSHRMQeOHEmz66u2/XAoLx7YCCzYU
> ZgAMivy8CsKgb/6cjctoftrcm/AehuhK3/SINv7w6Vv2pBt26zXgD4VBNKON01
> GMbkFayYlqjgbGMD2dx2hHEH3LMtd26qyPzrm+bF5wZVNAaMBAaGgJ7AtJbgkq
> kgEi9w0BCQcxFiHMQS1jaGFbGvZu22UgcJHbc3vcmQwDQYJKoZIhvcNAQELBQAD
> gYEA61CaJoAvmhzC190306Mg51zq1zXcz75+VFj2I6rH9aseCld3mkOVx5gJU
```
Deleting a Key Ring

What to do next
Configure your HTTPS service with the key ring.

Deleting a Key Ring

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 1</th>
<th>UCS-A# scope security</th>
<th>Enters security mode.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>UCS-A /security # delete keyring name</td>
<td>Deletes the named key ring.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security # commit-buffer</td>
<td>Commits the transaction.</td>
</tr>
</tbody>
</table>

Example
The following example deletes a key ring:

UCS-A# scope security
UCS-A /security # delete keyring key10
UCS-A /security # commit-buffer
UCS-A /security #

Deleting a Trusted Point

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

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 1</th>
<th>UCS-A# scope security</th>
<th>Enters security mode.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>UCS-A /security # delete trustpoint name</td>
<td>Deletes the named trusted point.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security # commit-buffer</td>
<td>Commits the transaction.</td>
</tr>
</tbody>
</table>
Example

The following example deletes a trusted point:

UCS-A# scope security
UCS-A/security # delete trustpoint tPoint10
UCS-A/security* # commit-buffer
UCS-A/security #

Enabling HTTP Redirection to HTTPS

Before you begin

Enable both HTTP and HTTPS.

Procedure

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A / system # scope services</td>
<td>Enters system services mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A / system/services # enable http-redirect</td>
<td>Enables the HTTP redirect service. If enabled, all attempts to communicate via HTTP are redirected to the equivalent HTTPS address. This option effectively disables HTTP access to this Cisco UCS domain.</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A / system/services # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example enables HTTP to HTTPS redirection and commits the transaction:

UCS-A# scope system
UCS-A / system # scope services
UCS-A / system/services # enable http-redirect
Warning: When committed, this closes all the web sessions.
UCS-A / system/services* # commit-buffer
UCS-A / system/services #
Network-Related Services

SNMP Functional Overview

The SNMP framework consists of three parts:

- **An SNMP manager**—The system used to control and monitor the activities of network devices using SNMP.

- **An SNMP agent**—The software component within Cisco UCS, the managed device that maintains the data for Cisco UCS, and reports the data as needed to the SNMP manager. Cisco UCS includes the agent and a collection of MIBs. To enable the SNMP agent and create the relationship between the manager and agent, enable and configure SNMP in Cisco UCS Manager.

- **A managed information base (MIB)**—The collection of managed objects on the SNMP agent. Cisco UCS release 1.4(1) and higher supports a larger number of MIBs than earlier releases.

Cisco UCS supports SNMPv1, SNMPv2c and SNMPv3. Both SNMPv1 and SNMPv2c use a community-based form of security. SNMP is defined in the following:


SNMP Notifications

A key feature of SNMP is the ability to generate notifications from an SNMP agent. These notifications do not require that requests be sent from the SNMP manager. Notifications can indicate improper user authentication, restarts, the closing of a connection, loss of connection to a neighbor router, or other significant events.

Cisco UCS Manager generates SNMP notifications as either traps or informs. Traps are less reliable than informs because the SNMP manager does not send any acknowledgment when it receives a trap, and Cisco UCS Manager cannot determine if the trap was received. An SNMP manager that receives an inform request acknowledges the message with an SNMP response Protocol Data Unit (PDU). If the Cisco UCS Manager does not receive the PDU, it can send the inform request again.
SNMP Security Levels and Privileges

SNMPv1, SNMPv2c, and SNMPv3 each represent a different security model. The security model combines with the selected security level to determine the security mechanism applied when the SNMP message is processed.

The security level determines the privileges required to view the message associated with an SNMP trap. The privilege level determines whether the message requires protection from disclosure or whether the message is authenticated. The supported security level depends on which security model is implemented. SNMP security levels support one or more of the following privileges:

- **noAuthNoPriv**—No authentication or encryption
- **authNoPriv**—Authentication but no encryption
- **authPriv**—Authentication and encryption

SNMPv3 provides for both security models and security levels. A security model is an authentication strategy that is set up for a user and the role in which the user resides. A security level is the permitted level of security within a security model. A combination of a security model and a security level determines which security mechanism is employed when handling an SNMP packet.

Supported Combinations of SNMP Security Models and Levels

The following table identifies the combinations of security models and levels.

<table>
<thead>
<tr>
<th>Model</th>
<th>Level</th>
<th>Authentication</th>
<th>Encryption</th>
<th>What Happens</th>
</tr>
</thead>
<tbody>
<tr>
<td>v1</td>
<td>noAuthNoPriv</td>
<td>Community string</td>
<td>No</td>
<td>Uses a community string match for authentication.</td>
</tr>
<tr>
<td>v2c</td>
<td>noAuthNoPriv</td>
<td>Community string</td>
<td>No</td>
<td>Uses a community string match for authentication.</td>
</tr>
<tr>
<td>v3</td>
<td>noAuthNoPriv</td>
<td>Username</td>
<td>No</td>
<td>Uses a username match for authentication.</td>
</tr>
<tr>
<td>v3</td>
<td>authNoPriv</td>
<td>HMAC-MD5 or HMAC-SHA</td>
<td>No</td>
<td>Provides authentication based on the Hash-Based Message Authentication Code (HMAC) Message Digest 5 (MD5) algorithm or the HMAC Secure Hash Algorithm (SHA).</td>
</tr>
<tr>
<td>v3</td>
<td>authPriv</td>
<td>HMAC-MD5 or HMAC-SHA</td>
<td>DES</td>
<td>Provides authentication based on the HMAC-MD5 or HMAC-SHA algorithms. Provides Data Encryption Standard (DES) 56-bit encryption in addition to authentication based on the Cipher Block Chaining (CBC) DES (DES-56) standard.</td>
</tr>
</tbody>
</table>

SNMPv3 Security Features

SNMPv3 provides secure access to devices through a combination of authenticating and encrypting frames over the network. SNMPv3 authorizes only configured users to perform management operations and encrypts...
SNMP messages. The SNMPv3 User-Based Security Model (USM) refers to SNMP message-level security and offers the following services:

- **Message integrity**—Ensures that messages are not altered or destroyed in an unauthorized manner, and that data sequences are not altered beyond what can occur non-maliciously.
- **Message origin authentication**—Ensures that the identity of a message originator is verifiable.
- **Message confidentiality and encryption**—Ensures that information is not made available or disclosed to unauthorized individuals, entities, or processes.

## SNMP Support in Cisco UCS

Cisco UCS provides the following support for SNMP:

### Support for MIBs
Cisco UCS supports read-only access to MIBs.


### Authentication Protocols for SNMPv3 Users
Cisco UCS supports the following authentication protocols for SNMPv3 users:

- HMAC-MD5-96 (MD5)
- HMAC-SHA-96 (SHA)

### AES Privacy Protocol for SNMPv3 Users
Cisco UCS uses Advanced Encryption Standard (AES) as one of the privacy protocols for SNMPv3 message encryption and conforms with RFC 3826.

The privacy password, or priv option, offers a choice of DES or 128-bit AES encryption for SNMP security encryption. If you enable AES-128 configuration and include a privacy password for an SNMPv3 user, Cisco UCS Manager uses the privacy password to generate a 128-bit AES key. The AES privacy password can have a minimum of eight characters. If the passphrases are specified in clear text, you can specify a maximum of 64 characters.

To deploy such a user, enable **AES-128** encryption.

## 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>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope monitoring</td>
<td>Enters monitoring mode.</td>
</tr>
</tbody>
</table>
### Creating an SNMP Trap

**Purpose**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2  UCS-A /monitoring # enable snmp</td>
<td>Enables SNMP.</td>
</tr>
<tr>
<td>Step 3  UCS-A /monitoring # set snmp community</td>
<td>Enters snmp community mode.</td>
</tr>
<tr>
<td>Step 4  UCS-A /monitoring # Enter a snmp community: community-name</td>
<td>Specifies SNMP community. Use the community name as a password. The community name can be any alphanumeric string up to 32 characters.</td>
</tr>
<tr>
<td>Step 5  UCS-A /monitoring # set snmp syscontact system-contact-name</td>
<td>Specifies the system contact person responsible for the SNMP. The system contact name can be any alphanumeric string up to 255 characters, such as an email address or name and telephone number.</td>
</tr>
<tr>
<td>Step 6  UCS-A /monitoring # set snmp syslocation system-location-name</td>
<td>Specifies the location of the host on which the SNMP agent (server) runs. The system location name can be any alphanumeric string up to 512 characters.</td>
</tr>
<tr>
<td>Step 7  UCS-A /monitoring # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

**Example**

The following example enables SNMP, configures an SNMP community named SnmpCommSystem2, configures a system contact named contactperson, configures a contact location named systemlocation, and commits the transaction:

```
UCS-A# scope monitoring
UCS-A /monitoring # enable snmp
UCS-A /monitoring* # set snmp community
UCS-A /monitoring* # Enter a snmp community: SnmpCommSystem2
UCS-A /monitoring* # set snmp syscontact contactperson1
UCS-A /monitoring* # set snmp syslocation systemlocation
UCS-A /monitoring* # commit-buffer
```

**What to do next**

Create SNMP traps and users.

---

### Creating an SNMP Trap

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1  UCS-A# scope monitoring</td>
<td>Enters monitoring mode.</td>
</tr>
</tbody>
</table>

---

**Cisco UCS Manager Administration Management Using the CLI, Release 3.1 (3)**
### Command or Action | Purpose
---|---
**Step 2** UCS-A /monitoring # `enable snmp` | Enables SNMP.
**Step 3** UCS-A /monitoring # `create snmp-trap {hostname | ip-addr | ip6-addr}` | Creates an SNMP trap host with the specified host name, IPv4 address, or IPv6 address.  
The host name can be a fully qualified domain name of an IPv4 address.
**Step 4** UCS-A /monitoring/snmp-trap # `set community community-name` | Specifies the SNMP community name to be used for the SNMP trap.
**Step 5** UCS-A /monitoring/snmp-trap # `set port port-num` | Specifies the port to be used for the SNMP trap.
**Step 6** UCS-A /monitoring/snmp-trap # `set version {v1 | v2c | v3}` | Specifies the SNMP version and model used for the trap.
**Step 7** (Optional) UCS-A /monitoring/snmp-trap # `set notificationtype {traps | informs}` | The type of trap to send. If you select v2c or v3 for the version, this can be:
- `traps`—SNMP trap notifications
- `informs`—SNMP inform notifications
**Step 8** (Optional) UCS-A /monitoring/snmp-trap # `set v3 privilege {auth | noauth | priv}` | If you select v3 for the version, the privilege associated with the trap.
This can be:
- `auth`—Authentication but no encryption
- `noauth`—No authentication or encryption
- `priv`—Authentication and encryption
**Step 9** UCS-A /monitoring/snmp-trap # `commit-buffer` | Commits the transaction to the system configuration.

### Example
The following example enables SNMP, creates an SNMP trap using an IPv4 address, specifies that the trap will use the SnmpCommSystem2 community on port 2, sets the version to v3, sets the notification type to traps, sets the v3 privilege to priv, and commits the transaction:

```
UCS-A# scope monitoring
UCS-A /monitoring # enable snmp
UCS-A /monitoring* # create snmp-trap 192.168.100.112
UCS-A /monitoring/snmp-trap* # set community SnmpCommSystem2
UCS-A /monitoring/snmp-trap* # set port 2
UCS-A /monitoring/snmp-trap* # set version v3
UCS-A /monitoring/snmp-trap* # set notificationtype traps
UCS-A /monitoring/snmp-trap* # set v3 privilege priv
UCS-A /monitoring/snmp-trap* # commit-buffer
UCS-A /monitoring/snmp-trap #
```
The following example enables SNMP, creates an SNMP trap using an IPv6 address, specifies that the trap will use the SnmpCommSystem3 community on port 2, sets the version to v3, sets the notification type to traps, sets the v3 privilege to priv, and commits the transaction:

UCS-A# scope monitoring
UCS-A /monitoring # enable snmp
UCS-A /monitoring* # create snmp-trap 2001::1
UCS-A /monitoring/snmp-trap* # set community SnmpCommSystem3
UCS-A /monitoring/snmp-trap* # set port 2
UCS-A /monitoring/snmp-trap* # set version v3
UCS-A /monitoring/snmp-trap* # set notificationtype traps
UCS-A /monitoring/snmp-trap* # set v3 privilege priv
UCS-A /monitoring/snmp-trap* # commit-buffer

Deleting an SNMP Trap

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>UCS-A# scope monitoring</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>UCS-A /monitoring # delete snmp-trap {hostname</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>UCS-A /monitoring # commit-buffer</td>
</tr>
</tbody>
</table>

Example

The following example deletes the SNMP trap at IP address 192.168.100.112 and commits the transaction:

UCS-A# scope monitoring
UCS-A /monitoring # delete snmp-trap 192.168.100.112
UCS-A /monitoring* # commit-buffer
UCS-A /monitoring #

Creating an SNMPv3 User

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>UCS-A# scope monitoring</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>UCS-A /monitoring # enable snmp</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>UCS-A /monitoring # create snmp-user user-name</td>
</tr>
</tbody>
</table>
Deleting an SNMPv3 User

Purpose

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 4</td>
<td>Enables or disables the use of AES-128 encryption.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Specifies the use of MD5 or DHA authentication.</td>
</tr>
<tr>
<td>Step 6</td>
<td>Specifies the user password. After you enter the set password command, you are prompted to enter and confirm the password.</td>
</tr>
<tr>
<td>Step 7</td>
<td>Specifies the user privacy password. After you enter the set priv-password command, you are prompted to enter and confirm the privacy password.</td>
</tr>
<tr>
<td>Step 8</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example enables SNMP, creates an SNMPv3 user named snmp-user14, disables AES-128 encryption, specifies the use of MD5 authentication, sets the password and privacy password, and commits the transaction:

```
UCS-A# scope monitoring
UCS-A /monitoring # enable snmp
UCS-A /monitoring* # create snmp-user snmp-user14
UCS-A /monitoring/snmp-user* # set aes-128 no
UCS-A /monitoring/snmp-user* # set auth md5
UCS-A /monitoring/snmp-user* # set password
Enter a password:
Confirm the password:
UCS-A /monitoring/snmp-user* # set priv-password
Enter a password:
Confirm the password:
UCS-A /monitoring/snmp-user* # commit-buffer
UCS-A /monitoring/snmp-user \
```

Deleting an SNMPv3 User

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Enters monitoring mode.</td>
</tr>
</tbody>
</table>
### Enabling Telnet

**Purpose**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 2</strong> UCS-A /monitoring # delete snmp-user user-name</td>
<td>Deletes the specified SNMPv3 user.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /monitoring # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

**Example**

The following example deletes the SNMPv3 user named snmp-user14 and commits the transaction:

```
UCS-A# scope monitoring
UCS-A /monitoring # delete snmp-user snmp-user14
UCS-A /monitoring* # commit-buffer
UCS-A /monitoring #
```

---

### Enabling Telnet

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /system # scope services</td>
<td>Enters system services mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /services # enable telnet-server</td>
<td>Enables the Telnet service.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /services # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

**Example**

The following example enables Telnet and commits the transaction:

```
UCS-A# scope system
UCS-A /system # scope services
UCS-A /services # enable telnet-server
UCS-A /services* # commit-buffer
UCS-A /services #
```

---

### Enabling the CIMC Web Service

To enable the CIMC Web Service:

- You must be logged in with admin privileges.
- The CIMC web service must be disabled, as it is enabled by default.
Disabling the CIMC Web Service

To disable the CIMC Web Service:

- You must be logged in with admin privileges.
- The CIMC web service must be enabled.

Disabling the CIMC Web Service

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: UCS-A# scope system /</td>
<td>Enters the system mode.</td>
</tr>
<tr>
<td>Step 2: UCS-A/system #scope services/</td>
<td>Enters the services mode for the system.</td>
</tr>
<tr>
<td>Step 3: UCS-A/system/services #enable cimcwebsvc/</td>
<td>Enables the CIMC web service.</td>
</tr>
<tr>
<td>Step 4: UCS-A/system/services *# commit-buffer/</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example shows how to disable the CIMC web service and save the transaction:

UCS-A# scope system
UCS-A# scope services
UCS-A/system/services # enable cimcwebsvc
UCS-A/system/services *# commit-buffer
UCS-A/system/services # commit-buffer
UCS-A/system/services *# commit-buffer
Name: cimcwebsvc
  Admin State: Enabled

Note

The CIMC web service is enabled by default.

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: UCS-A# scope system /</td>
<td>Enters the system mode.</td>
</tr>
<tr>
<td>Step 2: UCS-A/system #scope services/</td>
<td>Enters the services mode for the system.</td>
</tr>
<tr>
<td>Step 3: UCS-A/system/services #disable cimcwebsvc/</td>
<td>Disables the CIMC web service.</td>
</tr>
<tr>
<td>Step 4: UCS-A/system/services *# commit-buffer/</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example shows how to disable the CIMC web service and save the transaction:
### Disabling Communication Services

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# <code>scope system</code></td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A/system # <code>scope services</code></td>
<td>Enters system services mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A/system/services # <code>disable service-name</code></td>
<td>Disables the specified service, where the <code>service-name</code> argument is one of the following keywords:</td>
</tr>
<tr>
<td></td>
<td>- <code>cimxml</code> — Disables CIM XML service</td>
</tr>
<tr>
<td></td>
<td>- <code>http</code> — Disables HTTP service</td>
</tr>
<tr>
<td></td>
<td>- <code>https</code> — Disables HTTPS service</td>
</tr>
<tr>
<td></td>
<td>- <code>telnet-server</code> — Disables Telnet service</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A/system/services # <code>commit-buffer</code></td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

**Example**

The following example disables CIM XML and commits the transaction:

UCS-A# `scope system`
UCS-A# `scope services`
UCS-A/system/services # `disable cimxml`
UCS-A/system/services* # `commit-buffer`
UCS-A/system/services #

---

UCS-A# `scope system`
UCS-A/system # `scope services`
UCS-A/system/services # `disable cimcwebsvc`
UCS-A/system/services# `commit-buffer`
UCS-A/system/services # `show cimcwebsvc`
Name: cimcwebservice  
Admin State: Disabled
CIMC Session 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(11) and above is required for the rack-servers.

---

### Viewing the CIMC Sessions Opened by the Local Users

Follow this task to view all the CIMC sessions opened by the local users or the CIMC sessions opened by a specific local user.

---

**Note**

Viewing CIMC sessions of a specific server or a service-profile option is not present in CLI. It is available in GUI.

---

#### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A # scope security</td>
<td>Enters security configuration mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # show cimc-sessions local</td>
<td>Displays all CIMC sessions opened by the local users.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security # show cimc-sessions local user-name</td>
<td>Displays all CIMC sessions opened by a specific local user.</td>
</tr>
</tbody>
</table>

#### Example

The following examples show how to view:

- All CIMC sessions opened by local users
- CIMC session opened by a specific local user
- Details of the CIMC session opened by a specific local user.

**All sessions opened by local users:**

```
UCS-A # scope security
UCS-A /security # show cimc-sessions local
```

<table>
<thead>
<tr>
<th>Session ID</th>
<th>Type</th>
<th>User</th>
<th>Source Addr</th>
<th>Admin State</th>
</tr>
</thead>
<tbody>
<tr>
<td>42_1_1</td>
<td>Kvm</td>
<td>admin</td>
<td>10.106.22.117</td>
<td>Active</td>
</tr>
<tr>
<td>4_1_5</td>
<td>Kvm</td>
<td>admin</td>
<td>10.106.22.117</td>
<td>Active</td>
</tr>
<tr>
<td>5_1_5</td>
<td>Vmedia</td>
<td>admin</td>
<td>10.106.22.117</td>
<td>Active</td>
</tr>
</tbody>
</table>

**Session opened by a specific local user:**

```
UCS-A /security # show cimc-sessions local admin
```
Details of session opened by a specific local user:
UCS-A /security # show cimc-sessions local admin detail
Session ID 42_1_1
Type: Kvm
User: admin
Source Addr: 10.106.22.117
Login Time: 2013-06-28T06:09:53.000
Last Updated Time: 2013-06-28T06:21:52.000
Admin State: Active
Priv: RW
Server: sys/chassis-1/blade-1
Service Profile:

Viewing the CIMC Sessions Opened by the Remote Users

Follow this task to view all the CIMC sessions opened by the remote users or the CIMC sessions opened by a specific remote user.

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 UCS-A # scope security</td>
<td>Enters security configuration mode.</td>
</tr>
<tr>
<td>Step 2 UCS-A /security # show cimc-sessions remote</td>
<td>Displays all CIMC sessions opened by the remote users.</td>
</tr>
<tr>
<td>Step 3 UCS-A /security # show cimc-sessions remote user-name</td>
<td>Displays all CIMC sessions opened by a specific remote user.</td>
</tr>
</tbody>
</table>

Example

The following examples show how to view:

- All CIMC sessions opened by remote users
- CIMC session opened by a specific remote user
- Details of the CIMC session opened by a specific remote user.

All sessions opened by remote users:
UCS-A # scope security
UCS-A /security # show cimc-sessions remote

<table>
<thead>
<tr>
<th>Session ID</th>
<th>Type</th>
<th>User</th>
<th>Source Addr</th>
<th>Admin State</th>
</tr>
</thead>
<tbody>
<tr>
<td>42_1_1</td>
<td>Kvm</td>
<td>admin</td>
<td>10.106.22.117</td>
<td>Active</td>
</tr>
<tr>
<td>6_1_5</td>
<td>Kvm</td>
<td>test-remote</td>
<td>10.106.22.117</td>
<td>Active</td>
</tr>
<tr>
<td>7_1_5</td>
<td>Vmedia</td>
<td>test-remote</td>
<td>10.106.22.117</td>
<td>Active</td>
</tr>
</tbody>
</table>

Session opened by a specific remote user:
UCS-A /security # show cimc-sessions remote administrator
Viewing the CIMC Sessions Opened by an IPMI User

To view the CIMC sessions opened by an IPMI user, complete the following steps:

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A # scope org org-name</td>
<td>Enters the root organization mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /org # scope ipmi-access-profile profile-name</td>
<td>Enters the IPMI access profile name.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /org/ipmi-access-profile # scope ipmi-user user-name</td>
<td>Enters an IPMI user name.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /org/ipmi-access-profile/ipmi-user # show cimc-sessions</td>
<td>Displays all CIMC sessions opened by the specified IPMI User.</td>
</tr>
</tbody>
</table>

**Example**

The following example shows how to view all the CIMC sessions opened by an IPMI user:

```
UCS-A # scope org Finance
UCS-A /org* # scope ipmi-access-profile ReadOnly
UCS-A /org/ipmi-access-profile* # scope ipmi-user alice
UCS-A /org/ipmi-access-profile/ipmi-user # show cimc-sessions
```

<table>
<thead>
<tr>
<th>Session ID</th>
<th>Type</th>
<th>User</th>
<th>Source Addr</th>
<th>Admin State</th>
</tr>
</thead>
<tbody>
<tr>
<td>45_1_1</td>
<td>sol</td>
<td>alice</td>
<td>10.106.22.117</td>
<td>Active</td>
</tr>
</tbody>
</table>
Clearing the CIMC Sessions of a Server

This task shows how to clear all CIMC sessions opened on a server. You can also clear the CIMC sessions on a server based on the session type and the user name.

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCS-A # scope security</td>
<td>Enters security configuration mode.</td>
</tr>
<tr>
<td>UCS-A /security # terminate cimc-sessions server chassis-id/blade-id</td>
<td>Clears the CIMC sessions on a specific blade server of a chassis.</td>
</tr>
<tr>
<td>UCS-A /security # terminate cimc-sessions server Rack-server-id</td>
<td>Clears the CIMC sessions on a specific rack server.</td>
</tr>
<tr>
<td>UCS-A /security # terminate cimc-sessions server server-id type session-type</td>
<td>Clears the CIMC sessions of a specific type on a server.</td>
</tr>
<tr>
<td>UCS-A /security # terminate cimc-sessions server server-id user-name user-name</td>
<td>Clears the CIMC sessions of a specific user on a server.</td>
</tr>
</tbody>
</table>

Example

The first example shows how to clear all CIMC sessions on a server. The second example shows how to clear the CIMC sessions of a specific type on a server. The third example shows how to clear the CIMC sessions of a specific user on a server:

```
UCS-A /security # scope security
UCS-A /security # terminate cimc-sessions server 2/1
This will close KVM sessions. Are you sure? (yes/no): yes
UCS-A /security

UCS-A # scope security
UCS-A /security # terminate cimc-sessions server 2/1 type kvm
This will close KVM sessions. Are you sure? (yes/no): yes

UCS-A # scope security
UCS-A /security # terminate cimc-sessions server 2/1 user-name test-user
This will close KVM sessions. Are you sure? (yes/no): yes
```

Clearing the CIMC Sessions of a Modular Server

This task shows how to clear all CIMC sessions opened on a server. You can also clear the CIMC sessions on a server based on the session type and the user name.

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCS-A # scope security</td>
<td>Enters security configuration mode.</td>
</tr>
</tbody>
</table>
### Clearing All CIMC Sessions Opened by a Local User

This task shows how to clear the sessions opened by a local user.

#### Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A # scope security</td>
<td>Enters security configuration mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /security # terminate cimc-sessions local-user user-name</td>
<td>Clears all CIMC sessions opened by a local user.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /security # terminate cimc-sessions local-user user-name type {kvm</td>
<td>vmedia sol</td>
</tr>
</tbody>
</table>

#### Example

The following example shows how to clear the CIMC sessions opened by a local user:

```
UCS-A /security # scope security
UCS-A /security # terminate cimc-sessions local-user test-user
This will close cimc sessions. Are you sure? (yes/no):yes
```
Clearing All CIMC Sessions Opened by a Remote User

This task shows how to clear CIMC sessions opened by a remote user.

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A # scope security</td>
<td>Enters security configuration mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /security # terminate cimc-sessions remote-user user-name</td>
<td>Clears all CIMC sessions opened by a remote user.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /security # terminate cimc-sessions remote-user user-name type {kvm</td>
<td>vmedia</td>
</tr>
</tbody>
</table>

**Example**

The following example shows how to clear all CIMC sessions opened by a remote user:

UCS-A /security# scope security
UCS-A /security# terminate cimc-sessions remote-user testuser
This will close cimc sessions. Are you sure? (yes/no):yes
UCS-A /security#

Clearing a Specific CIMC Session Opened by a Local User

This task shows how to clear a specific CIMC session opened by a local user.

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A # scope security</td>
<td>Enters security configuration mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A/security # scope local-user user-name</td>
<td>Enters local user mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A/security/local user # terminate cimc-session session-id</td>
<td>Clears the chosen CIMC session.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A/security/local user* # commit-buffer</td>
<td>Commits the transaction.</td>
</tr>
</tbody>
</table>
Clearing a Specific CIMC Session Opened by a Remote User

This task shows how to clear a specific CIMC session opened by a remote user.

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Entrysecurityconfigurationmode.</td>
</tr>
<tr>
<td>UCS-A # scope security</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Enterremotepasswordmode.</td>
</tr>
<tr>
<td>UCS-A /security # scope remote-user</td>
<td></td>
</tr>
<tr>
<td>user-name</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>ClearsthechosenCIMCsession.</td>
</tr>
<tr>
<td>UCS-A /security/remote user # terminate</td>
<td></td>
</tr>
<tr>
<td>cimc-session session-id</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>Commits the transaction.</td>
</tr>
<tr>
<td>UCS-A /security/remote user* # commit-buffer</td>
<td></td>
</tr>
</tbody>
</table>

Example

The following example shows how to clear a specific CIMC session opened by a remote user and commits the transaction:

UCS-A /security# scope security
UCS-A /security# scope local-user admin
UCS-A /security/remote user # terminate cimc-session 6_1_2
UCS-A /security/remote user*# commit-buffer
UCS-A /security/remote user#

Clearing a CIMC Session Opened by an IPMI User

To clear a CIMC session opened by an IPMI user, complete the following steps:

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Enterstherootorganizationmode.</td>
</tr>
<tr>
<td>UCS-A # scope org org-name</td>
<td></td>
</tr>
</tbody>
</table>

Example

The following example shows how to clear a specific CIMC session opened by a remote user and commits the transaction:

UCS-A /security# scope security
UCS-A /security# scope remote-user admin
UCS-A /security/remote user # terminate cimc-session 6_1_3
UCS-A /security/remote user*# commit-buffer
UCS-A /security/remote user#
### Clearing a CIMC Session Opened by an IPMI User

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>UCS-A /org # scope ipmi-access-profile profile-name</td>
<td>Enters the IPMI access profile name.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /org/ipmi-access-profile # scope ipmi-user user-name</td>
<td>Enters the IPMI user.</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /org/ipmi-access-profile/ipmi-user # terminate cimc-sessions session-id</td>
<td>Terminates a specific CIMC session opened by an IPMI user.</td>
</tr>
<tr>
<td>Step 5</td>
<td>UCS-A /org/ipmi-access-profile/ipmi-user * commit-buffer</td>
<td>Commits the changes.</td>
</tr>
</tbody>
</table>

### Example

The following example displays how to clear a specific CIMC session opened by an IPMI user and commits the changes:

```
UCS-A # scope org Finance
UCS-A /org* # scope ipmi-access-profile ReadOnly
UCS-A /org/ipmi-access-profile* # scope ipmi-user alice
UCS-A /org/ipmi-access-profile/ipmi-user # terminate cimc-sessions 5_1_2
UCS-A /org/ipmi-access-profile/ipmi-user* # commit-buffer
```
Clearing a CIMC Session Opened by an IPMI User
Setting the Management IP Address

- Management IP Address, on page 121
- Configuring the Management IP Address on a Modular Server, on page 122
- Setting the Management IP Address on a Service Profile or Service Profile Template, on page 125
- Configuring the Management IP Pool, on page 126
- Changing the System Name, on page 129
- Changing the Management Subnet of a Cluster, on page 130
- Changing the Management Prefix of a Cluster, on page 131

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 Modular Server

Configuring a Modular Server to Use a Static IP Address

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A#  scope server  chassis-id / cartridge-id / server-id</td>
<td>Enters server mode for the specified server.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /chassis/cartridge/server #  scope cimc</td>
<td>Enters server CIMC mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /chassis/cartridge/server/cimc #  create ext-static-ip</td>
<td>Creates a static management IP address for the specified server.</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /chassis/cartridge/server/cimc/ext-static-ip #  set addr  ip-addr</td>
<td>Specifies the static IPv4 address to be assigned to the server.</td>
</tr>
<tr>
<td>Step 5</td>
<td>UCS-A /chassis/cartridge/server/cimc/ext-static-ip #  set default-gw  ip-addr</td>
<td>Specifies the default gateway that the IP address should use.</td>
</tr>
<tr>
<td>Step 6</td>
<td>UCS-A /chassis/cartridge/server/cimc/ext-static-ip #  set subnet  ip-addr</td>
<td>Specifies the subnet mask for the IP address.</td>
</tr>
<tr>
<td>Step 7</td>
<td>UCS-A /chassis/cartridge/server/cimc/ext-static-ip #  commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>
Example

The following example configures a static management IP address for chassis 1 cartridge 1 server 1, sets the static IPv4 address, sets the default gateway, sets the subnet mask, and commits the transaction:

```
UCS-A# scope server 1/1/1
UCS-A /chassis/cartridge/server # scope cimc
UCS-A /chassis/cartridge/server/cimc # create ext-static-ip
UCS-A /chassis/cartridge/server/cimc/ext-static-ip* # set addr 192.168.10.10
UCS-A /chassis/cartridge/server/cimc/ext-static-ip* # set default-gw 192.168.10.1
UCS-A /chassis/cartridge/server/cimc/ext-static-ip* # set subnet 255.255.255.0
UCS-A /chassis/cartridge/server/cimc/ext-static-ip #
```

Configuring a Modular Server to Use a Static IPv6 Address

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope server 1/1/1</td>
<td>Enters server mode for the specified server.</td>
</tr>
<tr>
<td>UCS-A /chassis/cartridge/server # scope cimc</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /chassis/cartridge/server/cimc # create ext-static-ip6</td>
<td>Enters server CIMC mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /chassis/cartridge/server/cimc # set addr ipv6-addr</td>
<td>Creates a static management IPv6 address for the specified server.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /chassis/cartridge/server/cimc/ext-static-ip6 # set default-gw ip6-addr</td>
<td>Specifies the default gateway that the IPv6 address should use.</td>
</tr>
<tr>
<td><strong>Step 5</strong> UCS-A /chassis/cartridge/server/cimc/ext-static-ip6 # set prefix ip6-addr</td>
<td>Specifies the network prefix for an IPv6 address.</td>
</tr>
<tr>
<td><strong>Step 6</strong> UCS-A /chassis/cartridge/server/cimc/ext-static-ip6 # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example configures a static management IPv6 address for chassis 1 cartridge 1 server 1, sets a static IPv6 address, sets the default gateway, sets the network prefix, and commits the transaction:

```
UCS-A# scope server 1/1/1
UCS-A /chassis/cartridge/server # scope cimc
```
Configuring a Server to Use the Management IP Pool

Deleting the static management IP address returns the specified server to the management IP pool.

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# <code>scope server chassis-id / cartridge-id / server-id</code></td>
<td>Enters server mode for the specified server.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /chassis/cartridge/server # <code>scope cimc</code></td>
<td>Enters server CIMC mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /chassis/cartridge/server/cimc # `delete {ext-static-ip</td>
<td>ext-static-ip6}`</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /chassis/cartridge/server/cimc/ # <code>commit-buffer</code></td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example deletes the static management IP address for chassis 1 cartridge 1 server 1 and commits the transaction:

```
UCS-A# `scope server 1/1/1`
UCS-A /chassis/cartridge/server # `scope cimc`
UCS-A /chassis/cartridge/server/cimc # `delete ext-static-ip`
UCS-A /chassis/cartridge/server/cimc/ # `commit-buffer`
```

The following example deletes the static management IPv6 address for chassis 1 cartridge 1 server 1 and commits the transaction:

```
UCS-A# `scope server 1/1/1`
UCS-A /chassis/cartridge/server # `scope cimc`
UCS-A /chassis/cartridge/server/cimc # `delete ext-static-ip6`
UCS-A /chassis/cartridge/server/cimc/ # `commit-buffer`
```
# Setting the Management IP Address on a Service Profile or Service Profile Template

## Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# <code>scope org org-name</code></td>
<td>Enters organization mode for the specified organization.</td>
</tr>
<tr>
<td></td>
<td>To enter the root organization mode, type <code>/#</code> as the org-name.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /org # <code>scope service-profile</code></td>
<td>Enters organization service profile mode for the specified service.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /org/service-profile # <code>set ext-mgmt-ip-state</code> {none</td>
<td>ext-pooled-ip</td>
</tr>
<tr>
<td></td>
<td>You can set the management IP address policy using the following options:</td>
</tr>
<tr>
<td></td>
<td>• None--The service profile is not assigned an IP address.</td>
</tr>
<tr>
<td></td>
<td>• Pooled--The service profile is assigned an IP address from the management IPv4 or IPv6 pool.</td>
</tr>
<tr>
<td></td>
<td>• Static--The service profile is assigned the configured static IPv4 or IPv6 address.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong> Setting the ext-management-ip-state to static for a service profile template is not supported and will result in an error.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /org/service-profile # <code>commit-buffer</code></td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

## Example

The following example sets the management address policy for a service profile called accounting to static IPv4 and then commits the transaction:

```bash
UCS-A# scope org /
UCS-A /org # scope service-profile accounting
UCS-A /org/service-profile # set ext-mgmt-ip-state ext-static-ip
UCS-A /org/service-profile* # commit-buffer
UCS-A /org/service-profile #
```
What to do next

If you have set the management IP address to static, configure a server to use a static IP address.

Configuring the Management IP Pool

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.

Configuring IP Address Blocks for 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

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope org /</td>
<td>Enters root organization mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /org # scope ip-pool ext-mgmt</td>
<td>Enters organization IP pool mode.</td>
</tr>
</tbody>
</table>
### Configuring IP Address Blocks for the Management IP Pool

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Note</strong></td>
<td>You cannot create (or delete) a management IP pool. You can only enter (scope to) the existing default pool.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>(Optional) UCS-A /org/ip-pool # set descr description</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks will not appear in the description field of any show command output.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>UCS-A /org/ip-pool # set assignmentorder {default</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td>UCS-A /org/ip-pool # create block first-ip-addr last-ip-addr gateway-ip-addr subnet-mask</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>An IP pool can contain more than one IP block. To create multiple blocks, enter multiple create block commands from organization IP pool mode.</td>
</tr>
<tr>
<td><strong>Step 6</strong></td>
<td>UCS-A /org/ip-pool/block # set primary-dns ip-address</td>
</tr>
<tr>
<td></td>
<td>secondary-dns ip-address</td>
</tr>
<tr>
<td><strong>Step 7</strong></td>
<td>UCS-A /org/ip-pool/ ipv6-block # commit-buffer</td>
</tr>
<tr>
<td><strong>Step 8</strong></td>
<td>UCS-A /org/ip-pool/block # exit</td>
</tr>
<tr>
<td><strong>Step 9</strong></td>
<td>UCS-A /org/ip-pool # create ipv6-block first-ip6-addr last-ip6-addr gateway-ip6-addr prefix</td>
</tr>
</tbody>
</table>
An IP pool can contain more than one IPv6 block. To create multiple IPv6 blocks, enter multiple `create ipv6-block` commands from organization IP pool mode.

### Step 10

UCS-A /org/ip-pool/ipv6-block # set primary-dns ip6-address secondary-dns ip6-address

Specifies the primary DNS and secondary DNS IPv6 addresses.

### Step 11

UCS-A /org/ip-pool/ipv6-block # commit-buffer

Commits the transaction to the system configuration.

### Example

The following example configures an IPv4 address block for the management IP pool, specifies the primary and secondary IPv4 addresses, creates an IPv6 block, specifies the primary and secondary IPv6 addresses and commits the transaction:

UCS-A# scope org /
UCS-A /org # scope ip-pool ext-mgmt-ip
UCS-A /org/ip-pool* # set descr "This is a management ip pool example."
UCS-A /org/ip-pool* # create block 192.168.100.1 192.168.100.200 192.168.100.10 255.255.255.0
UCS-A /org/ip-pool/block* # set primary-dns 192.168.100.1 secondary-dns 192.168.100.20
UCS-A /org/ip-pool/block* commit-buffer
UCS-A /org/ip-pool/block exit
UCS-A /org/ip-pool/block* # create ipv6-block 2001:888::10 2001:888::100 2001:888::1 64
UCS-A /org/ip-pool/ipv6- block* commit-buffer
UCS-A /org/ip-pool/ipv6- block #UCS-A /org/ip-pool/block* # commit-buffer
UCS-A /org/ip-pool/block#

The following example configures an IPv6 address block for the management IP pool and commits the transaction:

UCS-A# scope org /
UCS-A /org #scope ip-pool ext-mgmt-ip
UCS-A /org/ip-pool* # set descr "This is a management IPv6 pool example."
UCS-A /org/ip-pool* # create ipv6-block 2001:888::10 2001:888::100 2001:888::1 64
UCS-A /org/ip-pool/ipv6- block* # commit-buffer
UCS-A /org/ip-pool/ipv6- block#

### 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.
Deleting an IP Address Block from the Management IP Pool

### Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope org org-name</td>
<td>Enters organization mode for the specified organization. To enter the root organization mode, type / as the org-name.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /org # scope ip-pool ext-mgmt</td>
<td>Enters the management IP pool.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /org/ip-pool # delete {ip-block</td>
<td>ipv6-block} {first-ip-addr</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /org/ip-pool # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

### Example

The following example deletes an IP address block from the management IP pool and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope ip-pool ext-mgmt
UCS-A /org/ip-pool # delete block 192.168.100.1 192.168.100.200
UCS-A /org/ip-pool* # commit-buffer
UCS-A /org/ip-pool #
```

This example shows how to delete an IPv6 address block from the management IP pool and commit the transaction:

```
UCS-A# scope org /
UCS-A /org # scope ip-pool pool4
UCS-A /org/ip-pool # delete ipv6-block 2001::1 2001::10
UCS-A /org/ip-pool* # commit-buffer
UCS-A /org/ip-pool #
```

### Changing the System Name

### Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A # scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /system # set name name</td>
<td>Sets the system name.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /system # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>
The name is updated on both fabric interconnects within about 30 seconds after the transaction is committed.

Example

The following example changes the system name and commits the transaction:

```
UCS-A# scope system
UCS-A /system* # set name SanJose5
UCS-A /system* # commit-buffer
UCS-A /system #
```

Changing the Management Subnet of a Cluster

When changing the IPv4 management subnet in a cluster configuration, you must change the following three IPv4 addresses simultaneously and you must configure all three in the same subnet:

- Management port IP address for fabric interconnect A
- Management port IP address for fabric interconnect B
- Cluster IP (virtual IP) address

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope fabric-interconnect a</td>
<td>Enters fabric interconnect mode for fabric A.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /fabric-interconnect # set out-of-band ip ip-address netmask netmask gw gateway-ip-address</td>
<td>Sets the IP address, network mask, and gateway IP address of the fabric interconnect.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /fabric-interconnect # set out-of-band ip ip-address netmask netmask gw gateway-ip-address</td>
<td>Sets the IP address, netmask, and gateway IP address of the fabric interconnect.</td>
</tr>
<tr>
<td><strong>Step 5</strong> UCS-A /fabric-interconnect # scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 6</strong> UCS-A /system # set virtual-ip vip-address</td>
<td>Sets the virtual IP address for the cluster.</td>
</tr>
<tr>
<td><strong>Step 7</strong> UCS-A /system # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

When you commit the transaction, you are disconnected from the management session. Reconnect at the new management IP address.

Example

This example changes both fabric-interconnect IP addresses, changes the virtual IP address, and commits the transaction, disconnecting the session:
Changing the Management Prefix of a Cluster

When changing the IPv6 management prefix in a cluster configuration, you must change the following three IPv6 addresses simultaneously and you must configure all three with the same network prefix:

- Management port IPv6 address for fabric interconnect A
- Management port IPv6 address for fabric interconnect B
- Cluster IPv6 (virtual IPv6) address

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>UCS-A# <code>scope fabric-interconnect a</code> Enters fabric interconnect mode for fabric A.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>UCS-A/fabric-interconnect # <code>scope ipv6-config</code> Enters IPv6 configuration mode for fabric A.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>UCS-A/fabric-interconnect/ipv6-config # <code>set out-of-band ipv6 ipv6-addr ipv6-gw ipv6-gw-addr ipv6-prefix prefix</code> Sets the management IPv6 address, gateway IPv6 address, and network prefix for fabric A.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>UCS-A/fabric-interconnect/ipv6-config # <code>scope fabric-interconnect b</code> Enter fabric interconnect mode for fabric B.</td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td>UCS-A/fabric-interconnect/ # <code>scope ipv6-config</code> Enter IPv6 configuration mode for fabric B</td>
</tr>
<tr>
<td><strong>Step 6</strong></td>
<td>UCS-A/fabric-interconnect/ipv6-config # <code>set out-of-band ipv6 ipv6-addr ipv6-gw ipv6-gw-addr ipv6-prefix prefix</code> Sets the management IPv6 address, gateway IPv6 address, and network prefix for fabric B.</td>
</tr>
<tr>
<td><strong>Step 7</strong></td>
<td>UCS-A/fabric-interconnect/ipv6-config # <code>scope system</code> Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 8</strong></td>
<td>UCS-A/system # <code>set virtual-ip ipv6 virtual-ipv6-addr</code> Sets the virtual IPv6 address for the cluster.</td>
</tr>
<tr>
<td><strong>Step 9</strong></td>
<td>UCS-A/system # <code>commit-buffer</code> Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

When you commit the transaction, you are disconnected from the management session. Reconnect at the new management IPv6 address.
Example

This example changes both management IPv6 addresses, changes the virtual IPv6 address, and commits the transaction:

```
UCS-A# scope fabric-interconnect a
UCS-A /fabric-interconnect # scope ipv6-config
UCS-A /fabric-interconnect/ipv6-config # set out-of-band ipv6 2001:10::157
UCS-A /fabric-interconnect/ipv6-config* # set out-of-band ipv6-gw 2001:10::1
UCS-A /fabric-interconnect/ipv6-config* # set out-of-band ipv6-prefix 64
UCS-A /fabric-interconnect/ipv6-config* # scope fabric-interconnect b
UCS-A /fabric-interconnect* # scope ipv6-config
UCS-A /fabric-interconnect/ipv6-config* # set out-of-band ipv6 2001:10::158
UCS-A /fabric-interconnect/ipv6-config* # set out-of-band ipv6-gw 2001:10::1
UCS-A /fabric-interconnect/ipv6-config* # set out-of-band ipv6-prefix 64
UCS-A /fabric-interconnect/ipv6-config* # scope system
UCS-A /system* # set virtual-ip ipv6 2001:10::156
UCS-A /system* # commit-buffer
UCS-A /system #
```
CHAPTER 10

Organizations in UCS Manager

• Organizations in a Multitenancy Environment, on page 133
• Hierarchical Name Resolution in a Multi-Tenancy Environment, on page 134
• Configuring an Organization Under the Root Organization, on page 136
• Configuring an Organization Under an Organization that is not Root, on page 136
• Deleting an Organization, on page 137

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.
# Configuring an Organization Under the Root Organization

## Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>UCS-A# scope org /</td>
<td>Enters the root organization mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>UCS-A /org # create org org-name</td>
<td>Creates the specified organization under the root organization and enters organization mode for the specified organization. <strong>Note</strong> When you move from one organization mode to another, the command prompt does not change.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>UCS-A /org # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

## Example

The following example creates an organization named Finance under the root organization and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # create org Finance
UCS-A /org* # commit-buffer
UCS-A /org 
```

# Configuring an Organization Under an Organization that is not Root

## Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>UCS-A# scope org /</td>
<td>Enters the root organization mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>UCS-A /org # scope org org-name</td>
<td>Enters organization mode for the specified organization. <strong>Note</strong> When you move from one organization mode to another, the command prompt does not change.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>UCS-A /org # create org org-name</td>
<td>Creates the specified organization under the previously configured non-root organization</td>
</tr>
</tbody>
</table>
Deleting an Organization

### Purpose

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>and enters organization mode for the specified organization.</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /org # <strong>commit-buffer</strong></td>
</tr>
</tbody>
</table>

### Example

The following example creates an organization named Finance under the NorthAmerica organization and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # scope org NorthAmerica
UCS-A /org # create org Finance
UCS-A /org* # commit-buffer
UCS-A /org#
```

### Deleting an Organization

#### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# <strong>scope org /</strong></td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /org # <strong>delete org org-name</strong></td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /org # <strong>commit-buffer</strong></td>
</tr>
</tbody>
</table>

#### Example

The following example deletes the organization under the root organization named Finance and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # delete org Finance
UCS-A /org* # commit-buffer
UCS-A /org#
```
Deleting an Organization
Backup and Restore Operations

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 back up 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>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
</tr>
<tr>
<td>UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
</tbody>
</table>
Creating a Backup Operation

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Creates a backup operation. Specify the URL for the backup file using one of the following syntax:</td>
</tr>
<tr>
<td></td>
<td>- ftp://username@hostname / path</td>
</tr>
<tr>
<td></td>
<td>- scp://username@hostname / path</td>
</tr>
<tr>
<td></td>
<td>- sftp://username@hostname / path</td>
</tr>
<tr>
<td></td>
<td>- tftp://hostname : port-num / path</td>
</tr>
<tr>
<td>UCS-A /system # create backup URL backup-type {disabled</td>
<td>enabled}</td>
</tr>
<tr>
<td></td>
<td>- all-configuration — Backs up the server-, fabric-, and system-related configuration</td>
</tr>
<tr>
<td></td>
<td>- logical-configuration — Backs up the fabric- and service profile-related configuration</td>
</tr>
<tr>
<td></td>
<td>- system-configuration — Backs up the system-related configuration</td>
</tr>
<tr>
<td></td>
<td>- full-state — Backs up the full state for disaster recovery</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong></td>
</tr>
<tr>
<td></td>
<td>- Full-state backup files cannot be imported using an import operation. They are used only to restore the configuration for a fabric interconnect.</td>
</tr>
<tr>
<td></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>
</tbody>
</table>

You can save multiple backup operations, but only one operation for each hostname is saved.

If you use the **enable** keyword, the backup operation automatically runs as soon as you enter the **commit-buffer** command. If you use the **disable** keyword, the backup operation will not run until it is enabled. When enabling a backup operation, you must specify the hostname you used when creating the backup operation.
Running a Backup Operation

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
</tr>
<tr>
<td>UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
</tr>
<tr>
<td>UCS-A /system # scope backup hostname</td>
<td>Enters system backup mode for the specified hostname.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
</tr>
<tr>
<td>UCS-A /system/backup # enable</td>
<td>Enables the backup operation. <strong>Note</strong> For backup operations using FTP, SCP, SFTP, you are prompted for the password. Enter the password before committing the transaction.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td></td>
</tr>
<tr>
<td>UCS-A /system/backup # commit-buffer</td>
<td>Commits the transaction.</td>
</tr>
</tbody>
</table>

### Example

The following example enables a backup operation named host35, enters the password for the SCP protocol, and commits the transaction:

```
UCS-A# scope system
UCS-A /system # scope backup host35
UCS-A /system/backup # enable
Password:
UCS-A /system/backup* # commit-buffer
UCS-A /system/backup #
```
# 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.

## Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /system # scope backup hostname</td>
<td>Enters system backup mode for the specified hostname.</td>
</tr>
<tr>
<td>Step 3</td>
<td>(Optional) UCS-A /system/backup # disable</td>
<td>Disables an enabled backup operation so that it does not automatically run when the transaction is committed.</td>
</tr>
<tr>
<td>Step 4</td>
<td>(Optional) UCS-A /system/backup # enable</td>
<td>Automatically runs the backup operation as soon as you commit the transaction.</td>
</tr>
<tr>
<td>Step 5</td>
<td>(Optional) UCS-A /system/backup # set descr description</td>
<td>Provides a description for the backup operation. <strong>Note</strong> If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks will not appear in the description field of any show command output.</td>
</tr>
<tr>
<td>Step 6</td>
<td>(Optional) UCS-A /system/backup # set protocol {ftp</td>
<td>scp</td>
</tr>
<tr>
<td>Step 7</td>
<td>(Optional) UCS-A /system/backup # set remote-file filename</td>
<td>Specifies the name of the configuration file that is being backed up.</td>
</tr>
</tbody>
</table>
| Step 8 | (Optional) UCS-A /system/backup # set type backup-type | Specifies the type of backup file to be made. The `backup-type` argument can be one of the following values:  
- **all-configuration** — Backs up the server, fabric, and system related configuration  
- **logical-configuration** — Backs up the fabric and service profile related configuration  
- **system-configuration** — Backs up the system related configuration  
- **full-state** — Backs up the full state for disaster recovery |
### Modifying a Backup Operation

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Note** | • Full-state backup files cannot be imported using an import operation. They are used only to restore the configuration for a fabric interconnect.  
• 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. |

#### Step 9 (Optional) UCS-A /system/backup # set preserve-pooled-values {no | yes}
Specifies whether pool-derived identity values, such as vHBA WWPN, vNIC MAC, WWNN, and UUID, will be saved with the backup.

#### Step 10 (Optional) UCS-A /system/backup # set user username
Specifies the username the system should use to log in to the remote server. This step does not apply if the TFTP protocol is used.

#### Step 11 (Optional) UCS-A /system/backup # set password
After you press Enter, you are prompted to enter the password. Specifies the password for the remote server username. This step does not apply if the TFTP protocol is used.

#### Step 12 UCS-A /system/backup # commit-buffer
Commits the transaction.

### Example

The following example adds a description and changes the protocol, username, and password for the host35 backup operation and commits the transaction:

```
UCS-A# scope system
UCS-A /system # scope backup host35
UCS-A /system/backup # set descr "This is a backup operation for host35."
UCS-A /system/backup* # set protocol sftp
UCS-A /system/backup* # set user UserName32
UCS-A /system/backup* # set password
Password:
UCS-A /system/backup* # set preserve-pooled-values no
UCS-A /system/backup* # commit-buffer
```

---

Cisco UCS Manager Administration Management Using the CLI, Release 3.1 (3)
Deleting a Backup Operation

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /system # delete backup hostname</td>
<td>Deletes the backup operation for the specified hostname.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /system # commit-buffer</td>
<td>Commits the transaction.</td>
</tr>
</tbody>
</table>

Example

The following example deletes a backup operation for the host35 hostname and commits the transaction:

UCS-A# scope system
UCS-A /system # delete backup host35
UCS-A /system* # commit-buffer
UCS-A /system #

Scheduled Backups

You can configure policies in Cisco UCS to schedule the following types of backups:

- **Full state**
- **All configuration**

You cannot schedule any other type of backup.

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.

### Full State Backup Policy

The full state backup policy allows you to schedule regular full state backups of a snapshot of the entire system. You can choose whether to configure the full state backup to occur on a daily, weekly, or biweekly basis.

Cisco UCS Manager maintains a maximum number of backup files on the remote server. The maxfiles parameter is used when Cisco UCS Manager is registered with Cisco UCS Central. The maxfiles parameter is user configurable on Cisco UCS Central and controls the number of backup files stored on Cisco UCS Central.

If Cisco UCS Manager is not registered with Cisco UCS Central, and the user is storing backup files on a remote backup server, the backup files are not managed by Cisco UCS Manager. The remote machine server administrator must monitor the disk usage and rotate the backup files to create space for new backup files.

### Configuring the Full State Backup Policy

**Before you begin**

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

**Procedure**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCS-A# scope org org-name</td>
<td>Enters the organization mode for the specified organization. To enter the root organization mode, enter / as the org-name.</td>
<td></td>
</tr>
<tr>
<td>UCS-A /org/# scope backup-policy default</td>
<td>Enters the all configuration export policy mode.</td>
<td></td>
</tr>
<tr>
<td>UCS-A /org/backup-policy # set hostname {hostname</td>
<td>ip-addr</td>
<td>ip6-addr}</td>
</tr>
<tr>
<td>Command or Action</td>
<td>Purpose</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /org/backup-policy # set protocol {ftp</td>
<td>scp</td>
<td>sftp</td>
</tr>
<tr>
<td><strong>Step 5</strong> UCS-A /org/backup-policy # set user username</td>
<td>Specifies the username the system should use to log in to the remote server. This step does not apply if the TFTP protocol is used.</td>
<td></td>
</tr>
<tr>
<td><strong>Step 6</strong> UCS-A /system/backup-policy # set password</td>
<td>After you press Enter, you are prompted to enter the password. Specifies the password for the remote server username. This step does not apply if the TFTP protocol is used.</td>
<td></td>
</tr>
<tr>
<td><strong>Step 7</strong> UCS-A /system/backup-policy # set remote-file filename</td>
<td>Specifies the full path to the 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.</td>
<td></td>
</tr>
<tr>
<td><strong>Step 8</strong> UCS-A /system/backup-policy # set adminstate {disabled</td>
<td>enabled}</td>
<td>Specifies the admin state for the policy. This can be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• enabled—Cisco UCS Manager exports the backup file using the schedule specified in the Schedule field.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• disabled—Cisco UCS Manager does not export the file.</td>
<td></td>
</tr>
<tr>
<td><strong>Step 9</strong> UCS-A /system/backup-policy # set schedule {daily</td>
<td>weekly</td>
<td>bi-weekly}</td>
</tr>
<tr>
<td><strong>Step 10</strong> UCS-A /system/backup-policy # set descr description</td>
<td>Specifies a description for the backup 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>
<td></td>
</tr>
</tbody>
</table>
### Configuring the All Configuration Export Policy

#### Before you begin

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

#### Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope org org-name</td>
<td>Enters the organization mode for the specified organization. To enter the root organization mode, enter / as the org-name.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A/org # scope cfg-export-policy default</td>
<td>Enters the all configuration export policy mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A/org/cfg-export-policy # set hostname {hostname</td>
<td>ip-addr</td>
</tr>
</tbody>
</table>
### Configuring the All Configuration Export Policy

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>UCS-A /org/cfg-export-policy # set protocol {ftp</td>
<td>scp</td>
</tr>
<tr>
<td>5</td>
<td>UCS-A /org/cfg-export-policy # set user username</td>
<td>Specifies the username the system should use to log in to the remote server. This step does not apply if the TFTP protocol is used.</td>
</tr>
<tr>
<td>6</td>
<td>UCS-A /system/cfg-export-policy # set password</td>
<td>After you press Enter, you are prompted to enter the password. Specifies the password for the remote server username. This step does not apply if the TFTP protocol is used.</td>
</tr>
<tr>
<td>7</td>
<td>UCS-A /system/cfg-export-policy # set remote-file filename</td>
<td>Specifies the full path to the exported 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>
</tbody>
</table>
| 8    | UCS-A /system/cfg-export-policy # set adminstate {disabled | enabled} | Specifies the admin state for the policy. This can be one of the following:  
  - enabled—Cisco UCS Manager exports the configuration information using the schedule specified in the Schedule field.  
  - disabled—Cisco UCS Manager does not export the information. |
| 9    | UCS-A /system/cfg-export-policy # set schedule {daily | weekly | bi-weekly} | Specifies the frequency with which Cisco UCS Manager exports the configuration information. |
| 10   | UCS-A /system/cfg-export-policy # set descr description | Specifies a description for the configuration export policy. Enter up to 256 characters. You can use any characters or spaces except ` (accent mark), \ (backslash), ^ (carat), " (double quote), =  

**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.
### All Configuration Export Policy

The all configuration backup policy allows you to schedule a regular backup and export of all system and logical configuration settings. This backup does not include passwords for locally authenticated users. You can choose whether to configure the all configuration backup to occur on a daily, weekly, or bi-weekly basis.

Cisco UCS maintains a maximum number of backup files on the remote server. When that number is exceeded, Cisco UCS overwrites the oldest backup file.

### Configuring Backup/Export Configuration Reminders

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: UCS-A# scope org org-name</td>
<td>Enters the organization mode for the specified organization. To enter the root organization mode, enter / as the org-name.</td>
</tr>
<tr>
<td>Step 2: UCS-A /org # scope backup-exp-policy</td>
<td>Enters the backup/export configuration policy mode.</td>
</tr>
<tr>
<td>Step 3: UCS-A /org/backup-exp-policy # show</td>
<td>Displays the existing backup/export configuration policy.</td>
</tr>
<tr>
<td>Step 4: UCS-A /org/backup-exp-policy # set adminstate {disable</td>
<td>enable}</td>
</tr>
</tbody>
</table>
### Import Operations

#### 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.
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

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
</tbody>
</table>
| **Step 2** UCS-A/system # create import-config URL    | Creates an import operation. Specify the URL for the file being imported using one of the following syntax:
| {disabled | enabled} {merge | replace}                  |   - ftp:// username@hostname / path                                     |
|                                                      |   - scp:// username@hostname / path                                     |
|                                                      |   - sftp:// username@hostname / path                                    |
|                                                      |   - tftp:// hostname : port-num / path                                  |

You can save multiple import operations, but only one operation for each hostname is saved.
Purpose

Command or Action | Purpose
---|---
If you use the `enable` keyword, the import operation automatically runs as soon as you enter the `commit-buffer` command. If you use the `disable` keyword, the import operation will not run until it is enabled. When enabling an import operation, you must specify the hostname you used when creating the import operation.

If you use the `merge` keyword, 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. If you use the `replace` keyword, the system takes each object in the import configuration file and overwrites the corresponding object in the current configuration.

Provides a description for the import operation.

### Step 3

(Optional) UCS-A /system/import-config# set
descr description

*Note* If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks will not appear in the description field of any show command output.

Commits the transaction.

### Step 4

UCS-A /system/import-config #

**Example**

The following example creates a disabled import operation for hostname host35 that replaces the existing configuration and commits the transaction:

```
UCS-A# scope system
UCS-A /system* # create import-config scp://user@host35/backups/all-config9.bak disabled replace
Password:
UCS-A /system/import-config* # commit-buffer
UCS-A /system/import-config #
```

### 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
• Logical configuration

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /system # scope import-config hostname</td>
<td>Enters system backup mode for the specified hostname.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /system/import-config # enable</td>
<td>Enables the import operation.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /system/import-config # commit-buffer</td>
<td>Commits the transaction.</td>
</tr>
</tbody>
</table>

### Example

The following example enables an import operation for the host35 hostname and commits the transaction:

```
UCS-A# scope system
UCS-A /system # scope import-config host35
UCS-A /system/import-config # enable
UCS-A /system/import-config* # commit-buffer
UCS-A /system/import-config #
```

### Modifying an Import Operation

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /system # scope import-config hostname</td>
<td>Enters system import configuration mode for the specified hostname.</td>
</tr>
<tr>
<td><strong>Step 3</strong> (Optional) UCS-A /system/import-config # disable</td>
<td>Disables an enabled import operation so that it does not automatically run when the transaction is committed.</td>
</tr>
<tr>
<td><strong>Step 4</strong> (Optional) UCS-A /system/import-config # enable</td>
<td>Automatically runs the import operation as soon as you commit the transaction.</td>
</tr>
</tbody>
</table>
| **Step 5** (Optional) UCS-A /system/import-config # set action {merge | replace} | Specifies one of the following action types to use for the import operation:
  • Merge —The configuration information is merged with the existing information. If there are conflicts, the system replaces |
### Command or Action

<table>
<thead>
<tr>
<th>Step 6</th>
<th>(Optional) UCS-A /system/import-config # set descr  description</th>
</tr>
</thead>
</table>
| Purpose | Provides a description for the import operation.  
*Note* If your description includes spaces, special characters, or punctuation, you must begin and end your description with quotation marks. The quotation marks will not appear in the description field of any show command output. |

<table>
<thead>
<tr>
<th>Step 7</th>
<th>(Optional) UCS-A /system/import-config # set password</th>
</tr>
</thead>
</table>
| Purpose | After you press Enter, you are prompted to enter the password.  
Specifies the password for the remote server username. This step does not apply if the TFTP protocol is used.  
*Note* 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. |

| Step 8 | (Optional) UCS-A /system/import-config # set protocol {ftp | scp | sftp | tftp} |
|---|---|
| Purpose | Specifies the protocol to use when communicating with the remote server. |

<table>
<thead>
<tr>
<th>Step 9</th>
<th>(Optional) UCS-A /system/import-config # set remote-file  filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>Specifies the name of the configuration file that is being imported.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 10</th>
<th>(Optional) UCS-A /system/import-config # set user  username</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>Specifies the username the system should use to log in to the remote server. This step does not apply if the TFTP protocol is used.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 11</th>
<th>UCS-A /system/import-config # commit-buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>Commits the transaction.</td>
</tr>
</tbody>
</table>

### Example
The following example adds a description, changes the password, protocol and username for the host35 import operation, and commits the transaction:
Deleting an Import Operation

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope system</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /system # delete import-config hostname</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /system # commit-buffer</td>
</tr>
</tbody>
</table>

Example

The following example deletes the import operation for the host35 hostname and commits the transaction:

UCS-A# scope system
UCS-A /system # delete import-config host35
UCS-A /system # commit-buffer
UCS-A /system #

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.
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

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 `console`.

**Step 4** Enter `restore` to restore the configuration from a full-state backup.

**Step 5** Enter `y` to confirm that you want to restore from a full-state backup.

**Step 6** Enter the IP address for the management port on the fabric interconnect.

**Step 7** Enter the subnet mask for the management port on the fabric interconnect.

**Step 8** Enter the IP address for the default gateway.

**Step 9** Enter one of the following protocols to use when retrieving the backup configuration file:

- `scp`
Restoring the Configuration for a Fabric Interconnect

- ftp
- tftp
- sftp

**Step 10**
Enter the IP address of the backup server.

**Step 11**
Enter the full path and filename of the Full State backup file.

**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.

**Step 12**
Enter the username and password to access the backup server.

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 synchronizes the configuration with the primary fabric interconnect.

**Example**
The following example restores a system configuration from the Backup.bak file, which was retrieved from the 20.10.20.10 backup server using FTP:

Enter the configuration method. (console/gui) ? console

Enter the setup mode; setup newly or restore from backup. (setup/restore) ? restore

**NOTE:**
To configure Fabric interconnect using a backup file on a remote server, you will need to setup management interface. The management interface will be re-configured (if necessary), based on information stored in the backup file.

Continue to restore this Fabric interconnect from a backup file (yes/no) ? yes

Physical Switch Mgmt0 IPv4 address : 192.168.10.10

Physical Switch Mgmt0 IPv4 netmask : 255.255.255.0

IPv4 address of the default gateway : 192.168.10.1

Enter the protocol to get backup file (scp/ftp/tftp/sftp) ? scp

Enter the IP address of backup server: 20.10.20.10

Enter fully qualified backup file name: Backup.bak

Enter user ID: user

Enter password:
- Retrieved backup configuration file.
- Configuration file - Ok

Cisco UCS 6100 Series Fabric Interconnect
UCS-A login:
Erasing the Configuration

⚠ Caution

You should erase the configuration only when it is necessary. Erasing the configuration completely removes the configuration and reboots the system in an unconfigured state. You must then either restore the configuration from a backup file or perform an initial system setup.

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 UCS-A# connect local-mgmt</td>
<td>Enters the local management CLI.</td>
</tr>
<tr>
<td>Step 2 UCS-A(local-mgmt)# erase configuration</td>
<td>Erases the configuration. You are prompted to confirm that you want to erase the configuration. Entering yes erases the configuration and reboots the system in an unconfigured state.</td>
</tr>
</tbody>
</table>

Example

The following example erases the configuration:

UCS-A# connect local-mgmt
UCS-A(local-mgmt)# erase configuration

All UCS configurations will be erased and system will reboot. Are you sure? (yes/no): yes
Scheduling Options

Creating a Schedule

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td>Step 2 UCS-A/system # create scheduler sched-name</td>
<td>Creates a scheduler and enters scheduler mode.</td>
</tr>
<tr>
<td>Step 3 UCS-A/system/scheduler # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example creates a scheduler named maintenancesched and commits the transaction:

UCS-A# scope system
UCS-A/system # create scheduler maintenancesched
UCS-A/system/scheduler* # commit-buffer
UCS-A /system/scheduler #

What to do next

Create a one time occurrence or recurring occurrence for the schedule.
## Creating a One Time Occurrence for a Schedule

### Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /system # scope schedule sched-name</td>
<td>Enters scheduler system mode.</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /system/scheduler # create occurrence one-time occurrence-name</td>
<td>Creates a one-time occurrence.</td>
</tr>
<tr>
<td>Step 4</td>
<td>UCS-A /system/scheduler/one-time # set date month day-of-month year hour minute</td>
<td>Sets the date and time this occurrence should run.</td>
</tr>
<tr>
<td>Step 5</td>
<td>(Optional) UCS-A /system/scheduler/one-time # set concur-tasks {unlimited</td>
<td>max-num-concur-tasks</td>
</tr>
<tr>
<td>Step 6</td>
<td>(Optional) UCS-A /system/scheduler/one-time # set max-duration {none</td>
<td>num-of-days num-of-hours num-of-minutes num-of-seconds}</td>
</tr>
<tr>
<td>Step 7</td>
<td>(Optional) UCS-A /system/scheduler/one-time # set min-interval {none</td>
<td>num-of-days num-of-hours num-of-minutes num-of-seconds}</td>
</tr>
<tr>
<td>Step 8</td>
<td>(Optional) UCS-A /system/scheduler/one-time # set proc-cap {unlimited</td>
<td>max-num-of-tasks}</td>
</tr>
<tr>
<td>Step 9</td>
<td>UCS-A /system/scheduler/one-time # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

### Example

The following example creates a one time occurrence named onetimemaint for a scheduler named maintsched, sets the maximum number of concurrent tasks to 5, sets the start date to April 1, 2011 at 11:00, and commits the transaction:

```
UCS-A# scope system
UCS-A /system # scope scheduler maintsched
UCS-A /system/scheduler # create occurrence one-time onetimemaint
UCS-A /system/scheduler/one-time* # set date apr 1 2011 11 00
UCS-A /system/scheduler/one-time* # set concur-tasks 5
UCS-A /system/scheduler/one-time* # commit-buffer
UCS-A /system/scheduler/one-time #
```
## Creating a Recurring Occurrence for a Schedule

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /system # scope schedule sched-name</td>
<td>Enters scheduler system mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /system/scheduler # create occurrence recurring occurrence-name</td>
<td>Creates a recurring occurrence.</td>
</tr>
<tr>
<td><strong>Step 4</strong> (Optional) UCS-A /system/scheduler/recurring # set day {even-day</td>
<td>every-day</td>
</tr>
<tr>
<td><strong>Step 5</strong> (Optional) UCS-A /system/scheduler/recurring # set hour hour</td>
<td>Specifies the hour at which this occurrence starts. <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.</td>
</tr>
<tr>
<td><strong>Step 6</strong> (Optional) UCS-A /system/scheduler/recurring # set minute minute</td>
<td>Specifies the minute at which this occurrence starts.</td>
</tr>
<tr>
<td><strong>Step 7</strong> (Optional) UCS-A /system/scheduler/recurring # set concur-tasks {unlimited</td>
<td>max-num-concur-tasks}</td>
</tr>
<tr>
<td><strong>Step 8</strong> (Optional) UCS-A /system/scheduler/recurring # set max-duration {none</td>
<td>num-of-hours num-of-minutes num-of-seconds}</td>
</tr>
<tr>
<td><strong>Step 9</strong> (Optional) UCS-A /system/scheduler/recurring # set min-interval {none</td>
<td>num-of-days num-of-hours num-of-minutes num-of-seconds}</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 UCS-A# scope system</td>
<td>Enters system mode.</td>
</tr>
<tr>
<td>Step 2 UCS-A /system # scope scheduler sched-name</td>
<td>Enters scheduler system mode.</td>
</tr>
<tr>
<td>Step 3 UCS-A /system/scheduler # delete occurrence one-time occurrence-name</td>
<td>Deletes the specified one-time occurrence.</td>
</tr>
<tr>
<td>Step 4 UCS-A /system/scheduler # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example deletes a one time occurrence called onetimemaint from scheduler maintsched and commits the transaction:

```bash
UCS-A# scope system
UCS-A /system # scope scheduler maintsched
UCS-A /system/scheduler # delete occurrence one-time onetimemaint
UCS-A /system/scheduler # commit-buffer
```
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.

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# <code>scope system</code></td>
<td>Enters system mode.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A <code>/system # scope scheduler sched-name</code></td>
<td>Enters scheduler system mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A <code>/system/scheduler # delete occurrence recurring occurrence-name</code></td>
<td>Deletes the specified recurring occurrence.</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A <code>/system/scheduler # commit-buffer</code></td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

Example

The following example deletes a recurring occurrence named onetimemaint from scheduler maintsched and commits the transaction:

```text
UCS-A# `scope system`
UCS-A `/system # scope scheduler maintsched`
UCS-A `/system/scheduler # delete occurrence recurring onetimemaint`
UCS-A `/system/scheduler # commit-buffer`
```

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

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# <code>scope system</code></td>
<td>Enters system mode.</td>
</tr>
</tbody>
</table>
## Deleting a Schedule

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 2</strong> UCS-A /system # delete scheduler sched-name</td>
<td>Deletes a scheduler and enters scheduler mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /system # commit-buffer</td>
<td>Commits the transaction to the system configuration.</td>
</tr>
</tbody>
</table>

### Example

The following example deletes a scheduler named maintenancesched and commits the transaction:

```
UCS-A# scope system
UCS-A /system # delete scheduler maintenancesched
UCS-A /system* # commit-buffer
UCS-A /system #
```
Deferred Deployments of Service Profile Updates

- Service Profile Deferred Deployments, on page 167
- Maintenance Policy Configuration, on page 169
- Pending Activities, on page 173

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.

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.
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 Configuration

**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.

---

**Note**

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 deferred deployment, create a schedule.
## Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>UCS-A# <code>scope org org-name</code></td>
<td>Enters organization mode for the specified organization. To enter the root organization mode, type <code>/</code> as the <code>org-name</code>.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>UCS-A <code>/org # create maint-policy policy-name</code></td>
<td>Creates the specified maintenance policy and enters maintenance policy mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>UCS-A `/org/maint-policy # set reboot-policy {immediate</td>
<td>timer-automatic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>immediate</strong> -- The server reboots as soon as the change is made to the service profile.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>timer-automatic</strong> -- You select the schedule that specifies when maintenance operations can be applied to the server using the <code>set scheduler</code> command. Cisco UCS reboots the server and completes the service profile changes at the scheduled time.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>user-ack</strong> -- The user must explicitly acknowledge the changes by using the <code>apply pending-changes</code> command before changes are applied.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>UCS-A `/org/maint-policy # {enable</td>
<td>disable} on-next-boot`</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note</strong> De-selecting the <strong>On Next Boot</strong> option disables the Maintenance Policy on the BMC.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the <code>reboot-policy</code> is set to <strong>timer-automatic</strong> or <strong>user-ack</strong>, enabling this option means the changes will be applied whenever the server reboots, even if that reboot occurs outside a scheduled maintenance window or without user acknowledgment.</td>
</tr>
</tbody>
</table>
Deleting a Maintenance Policy

### Purpose

If the reboot-policy property is set to timer-automatic, you must select the schedule that 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.

### Command or Action

<table>
<thead>
<tr>
<th>Step 5</th>
<th>(Optional) UCS-A /org/maint-policy # set scheduler scheduler-name</th>
<th>Purpose</th>
</tr>
</thead>
</table>

Cisco UCS reboots the server and completes the service profile changes at the scheduled time.

### Command or Action

<table>
<thead>
<tr>
<th>Step 6</th>
<th>UCS-A /org/maint-policy # commit-buffer</th>
<th>Purpose</th>
</tr>
</thead>
</table>

Commits the transaction to the system configuration.

### Example

The following example creates a maintenance policy called maintenance, sets the system to reboot immediately when a service profile is associated with a server, and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # create maint-policy maintenance
UCS-A /org/maint-policy* # set reboot-policy immediate
UCS-A /org/maint-policy* # commit-buffer
UCS-A /org/maint-policy #
```

### Deleting a Maintenance Policy

### Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>UCS-A# scope org org-name</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>UCS-A /org # delete maint-policy policy-name</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>UCS-A /org # commit-buffer</td>
</tr>
</tbody>
</table>

### Example

The following example deletes a maintenance policy called maintenance and commits the transaction:

```
UCS-A# scope org /
UCS-A /org # delete maint-policy maintenance
UCS-A /org/maint-policy* # commit-buffer
UCS-A /org/maint-policy #
```
Pending Activities

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

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>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope org org-name</td>
</tr>
<tr>
<td>Step 2</td>
<td>UCS-A /org # scope service-profile profile-name</td>
</tr>
<tr>
<td>Step 3</td>
<td>UCS-A /org/service-profile # show pending-changes [detail</td>
</tr>
</tbody>
</table>

Example

The following example shows how to display pending changes for a service profile called accounting:
Deploying a Service Profile Change Waiting for User Acknowledgement

Cisco UCS Manager CLI cannot deploy all pending service profile changes (for multiple service profiles) waiting for user acknowledgement. To simultaneously deploy all pending service profile changes for multiple service profiles, use Cisco UCS Manager GUI.

---

**Important**

You cannot stop Cisco UCS Manager from rebooting the affected server after you acknowledge a pending activity.

**Procedure**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope org org-name</td>
<td>Enters organization mode. To enter the root organization mode, type / as the org-name.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /org # scope service-profile profile-name</td>
<td>Enters organization service profile mode for the specified service.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /org/service-profile # apply pending-changes immediate</td>
<td>Applies the pending changes immediately. Cisco UCS Manager immediately reboots the server affected by the pending activity.</td>
</tr>
</tbody>
</table>

**Example**

The following example shows how to apply pending changes for a service profile named accounting:

UCS-A# scope org /
UCS-A /org # scope service-profile accounting
UCS-A /org/service-profile # apply pending-changes immediate
UCS-A /org/service-profile #
Deploying a Scheduled Service Profile Change Immediately

Cisco UCS Manager CLI cannot deploy all scheduled service profile changes (for multiple service profiles) at the same time. To simultaneously deploy all scheduled service profile changes for multiple service profiles, use Cisco UCS Manager GUI.

Important
You cannot stop Cisco UCS Manager from rebooting the affected server after you acknowledge a pending activity.

Procedure

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> UCS-A# scope org org-name</td>
<td>Enters organization mode. To enter the root organization mode, type / as the org-name.</td>
</tr>
<tr>
<td><strong>Step 2</strong> UCS-A /org # scope service-profile profile-name</td>
<td>Enters organization service profile mode for the specified service.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /org/service-profile # apply pending-changes immediate</td>
<td>Applies the pending changes immediately. Cisco UCS Manager immediately reboots the server affected by the pending activity.</td>
</tr>
</tbody>
</table>

Example
The following example shows how to apply pending changes for a service profile called accounting:

```
UCS-A# scope org /
UCS-A /org # scope service-profile accounting
UCS-A /org/service-profile # apply pending-changes immediate
UCS-A /org/service-profile #
```
CHAPTER 14

UCS Fault Suppression

Fault Suppression for System Maintenance

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 Fault Collection Policy

Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>UCS-A# scope monitoring</td>
<td>Enters monitoring mode.</td>
</tr>
</tbody>
</table>
### Configuring the Fault Collection Policy

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 2</strong> UCS-A /monitoring # scope fault policy</td>
<td>Enters monitoring fault policy mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong> UCS-A /monitoring/fault-policy # set clear-action {delete</td>
<td>retain}</td>
</tr>
<tr>
<td><strong>Step 4</strong> UCS-A /monitoring/fault-policy # set flap-interval seconds</td>
<td>Specifies the time interval (in seconds) the system waits before changing a fault state. Flapping occurs when a fault is raised and cleared several times in rapid succession. To prevent this, the system does not allow a fault to change state until the flapping interval has elapsed after the last state change. If the fault is raised again during the flapping interval, it returns to the active state, otherwise, the fault is cleared.</td>
</tr>
<tr>
<td><strong>Step 5</strong> UCS-A /monitoring/fault-policy # set retention-interval {days hours minutes seconds</td>
<td>forever}</td>
</tr>
<tr>
<td><strong>Step 6</strong> UCS-A /monitoring/fault-policy # commit-buffer</td>
<td>Commits the transaction.</td>
</tr>
</tbody>
</table>

### Example

This example configures the fault collection policy to retain cleared fault messages for 30 days, sets the flapping interval to 10 seconds, and commits the transaction.

```bash
UCS-A# scope monitoring
UCS-A /monitoring # scope fault policy
UCS-A /monitoring/fault-policy # set clear-action retain
UCS-A /monitoring/fault-policy* # set flap-interval 10
UCS-A /monitoring/fault-policy* # set retention-interval 30 0 0 0
UCS-A /monitoring/fault-policy* # commit-buffer
UCS-A /monitoring/fault-policy #
```