



## Managing Firmware

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## Overview of Firmware

Cisco UCS uses firmware obtained from and certified by Cisco to support the endpoints in a Cisco UCS instance. Each endpoint is a component in the instance that requires firmware to function. A Cisco UCS instance includes the following firmware endpoints that need to be upgraded when you upgrade the firmware:

- Endpoints physically located on servers, such as the BIOS, storage controller (RAID controller), and Cisco Integrated Management Controller (CIMC)
- Endpoints physically located on adapters, including NIC and HBA firmware, and Option ROM (where applicable)
- I/O modules
- Fabric interconnects
- Cisco UCS Manager

**Note**

In Release 1.3(1) the BMC was renamed to CIMC Controller. After you upgrade to this release, Cisco UCS Manager no longer uses the term BMC. Because this document is aimed at Release 1.3(1), the term CIMC is sometimes used rather than BMC.

Cisco maintains a set of best practices for managing firmware images and updates in this document and in the following technical note: [Unified Computing System Firmware Management Best Practices](#).

This document uses the following definitions for managing firmware:

<b>Upgrade</b>	Changes the firmware running on an endpoint to another image, such as a release or patch. Upgrade includes both update and activation.
<b>Update</b>	Copies the firmware image to the backup partition on an endpoint.
<b>Activate</b>	Sets the firmware in the backup partition as the active firmware version on the endpoint. Activation can require or cause the reboot of an endpoint.

## Firmware Image Management

Cisco delivers all firmware updates or packages to Cisco UCS components in images. These images can be the following:

- Component image, which contains the firmware for one component
- Package, which is a collection of component images

Cisco also provides release notes with each image, which you can obtain from the same website from which you obtained the image.

Cisco UCS Manager provides mechanisms to download both component images and packages to the fabric interconnect.

## Firmware Image Headers

Every firmware image has a header, which includes the following:

- Checksum
- Version information
- Compatibility information that the system can use to verify the compatibility of component images and any dependencies

## Firmware Image Catalog

Cisco UCS Manager provides you with two views of the catalog of firmware images and their contents that have been downloaded to the fabric interconnect:

**Packages** This view provides you with a read-only representation of the packages that have been downloaded onto the fabric interconnect. This view is sorted by image, not by the contents of

the image. For packages, you can use this view to see which component images are (were) in each downloaded package.

### Images

The images view lists the component images available on the system. You cannot use this view to see packages. The information available about each component image includes the name of the component, the image size, the image version, and the vendor and model of the component.

You can use this view to identify the firmware updates available for each component. You can also use this view to delete obsolete and unneeded images. Cisco UCS Manager deletes a package after all images in the package have been deleted.



#### Tip

Cisco UCS Manager stores the images in bootflash on the fabric interconnect. In a cluster system, space usage in bootflash on both fabric interconnects is the same, because all images are synchronized between them. If Cisco UCS Manager reports that the bootflash is out of space, delete obsolete images to free up space.

## Firmware Upgrades

Cisco UCS firmware is upgraded through a combination of the following methods:

- Direct upgrade at the endpoints. For a cluster configuration with two fabric interconnects, a direct upgrade can be minimally disruptive to data traffic. However, it requires that the Cisco UCS instance does not include firmware policies for those endpoints that you upgrade directly. You cannot avoid disruption to traffic in a Cisco UCS instance with only one fabric interconnection.
- Upgrades to server endpoints through service profiles that include a host firmware package, a management firmware package, or both. This method is disruptive to data traffic and should be performed during a maintenance window.



#### Note

Direct upgrade is not available for all endpoints, including the server BIOS, storage controller, HBA firmware, and HBA option ROM. You must upgrade those endpoints through the host firmware package included in the service profile associated with the server.

## Guidelines and Cautions for Firmware Upgrades

Before you upgrade the firmware for any endpoint in a Cisco UCS instance, consider the following guidelines and cautions:

### Determine Appropriate Type of Firmware Upgrade for Each Endpoint

Some endpoints, such as adapters and the server CIMC, can be upgraded through either a direct firmware upgrade or a firmware package included in a service profile. The configuration of a Cisco UCS instance determines how you upgrade these endpoints. If the service profiles associated with the servers include a host firmware package, upgrade the adapters for those servers through the firmware package. In the same way, if

the service profiles associated with the servers include a management firmware package, upgrade the CIMC for those servers through the firmware package.

Upgrades of a CIMC through a management firmware package or an adapter through a firmware package in the service profile associated with the server take precedence over direct firmware upgrades. You cannot directly upgrade an endpoint if the service profile associated with the server includes a firmware package. To perform a direct upgrade, you must remove the firmware package from the service profile.

### No Server or Chassis Maintenance



#### Caution

Do not remove the hardware that contains the endpoint or perform any maintenance on it until the update process has completed. If the hardware is removed or otherwise unavailable due to maintenance, the firmware update fails. This failure may corrupt the backup partition. You cannot update the firmware on an endpoint with a corrupted backup partition.

### Number of Fabric Interconnects

For a cluster configuration with two fabric interconnects, you can take advantage of the failover between the fabric interconnects and perform a direct firmware upgrade of the endpoints without disrupting data traffic. However, you cannot avoid disrupting data traffic for those endpoints which must be upgraded through a host or management firmware package.

For a standalone configuration with a single fabric interconnect, you can minimize the disruption to data traffic when you perform a direct firmware upgrade of the endpoints. However, you must reboot the fabric interconnect to complete the upgrade and, therefore, cannot avoid disrupting traffic.

### Do Not Activate All Endpoints Simultaneously in Cisco UCS Manager GUI

If you use Cisco UCS Manager GUI to update the firmware, do not select **ALL** from the **Filter** drop-down list in the **Activate Firmware** dialog box to activate all endpoints simultaneously. Many firmware releases and patches have dependencies that require the endpoints to be activated in a specific order for the firmware update to succeed. This order can change depending upon the contents of the release or patch. Activating all endpoints does not guarantee that the updates occur in the required order and can disrupt communications between the endpoints and the fabric interconnects and Cisco UCS Manager. For information about the dependencies in a specific release or patch, see the release notes provided with that release or patch.

### Impact of Activation

During a direct upgrade, you should configure **Set Startup Version Only** for an adapter. With this setting, the activated firmware moves into the pending-next-boot state, and the server is not immediately rebooted. The activated firmware does not become the running version of firmware on the adapter until the server is rebooted. You cannot configure **Set Startup Version Only** for an adapter in the host firmware package.

If a server is not associated with a service profile, the activated firmware moves into the pending-next-boot state. Cisco UCS Manager does not reboot the endpoints or activate the firmware until the server is associated with a service profile. If necessary, you can manually reboot an unassociated server to activate the firmware.

When you configure **Set Startup Version Only** for an I/O module, the I/O module is rebooted when the fabric interconnect in its data path is rebooted. If you do not configure **Set Startup Version Only** for an I/O module, the I/O module reboots and disrupts traffic. In addition, if Cisco UCS Manager detects a protocol and firmware version mismatch between it and the I/O module, Cisco UCS Manager automatically updates

the I/O module with the firmware version that matches its own and then activates the firmware and reboots the I/O module again.

### Impact of Upgrade to Release 1.3(1i) or Higher

An upgrade from an earlier Cisco UCS firmware release to release 1.3(1i) or higher has the following impact on the Protect Configuration property of the local disk configuration policy the first time servers are associated with service profiles after the upgrade:

**Unassociated Servers** After you upgrade the Cisco UCS instance, the initial server association proceeds without configuration errors whether or not the local disk configuration policy matches the server hardware. Even if you enable the Protect Configuration property, Cisco UCS does not protect the user data on the server if there are configuration mismatches between the local disk configuration policy on the previous service profile and the policy in the new service profile.



#### Note

If you enable the Protect Configuration property and the local disk configuration policy encounters mismatches between the previous service profile and the new service profile, all subsequent service profile associations with the server are blocked.

**Associated Servers** Any servers that are already associated with service profiles do not reboot after the upgrade. Cisco UCS Manager does not report any configuration errors if there is a mismatch between the local disk configuration policy and the server hardware.

When a service profile is disassociated from a server and a new service profile associated, the setting for the Protect Configuration property in the new service profile takes precedence and overwrites the setting in the previous service profile.

### Cannot Upgrade Cisco UCS 82598KR-CI 10-Gigabit Ethernet Adapter

The firmware on the Cisco UCS 82598KR-CI 10-Gigabit Ethernet Adapter (N20-AI0002) is burned into the hardware at manufacture. You cannot upgrade the firmware on this adapter.

## Firmware Versions

The firmware versions on an endpoint depend upon the type of endpoint. The endpoints physically located on a fabric interconnect have different versions than those physically located on a server or I/O module.

### Firmware Versions in CIMC, I/O Modules, and Adapters

Each CIMC, I/O module, and adapter has two slots for firmware in flash. Each slot holds a version of firmware. One slot is active and the other is the backup slot. A component boots from whichever slot is designated as active.

The following firmware version terminology is used in Cisco UCS Manager:

**Running Version** The running version is the firmware that is active and in use by the endpoint.

**Startup Version** The startup version is the firmware that will be used when the endpoint next boots up. Cisco UCS Manager uses the activate operation to change the startup version.

**Backup Version**

The backup version is the firmware in the other slot and is not in use by the endpoint. This version can be firmware that you have updated to the endpoint but have not yet activated, or it can be an older firmware version that was replaced by a recent activate. Cisco UCS Manager uses the update operation to replace the image in the backup slot.

If the endpoint cannot boot from the startup version, it boots from the backup version.

**Firmware Versions in the Fabric Interconnect and Cisco UCS Manager**

You can only activate the fabric interconnect firmware and Cisco UCS Manager on the fabric interconnect. The fabric interconnect and Cisco UCS Manager firmware do not have backup versions, because all the images are stored on the fabric interconnect. As a result, the number of bootable fabric interconnect images is not limited to two, like the server CIMC and adapters. Instead, the number of bootable fabric interconnect images is limited by the available space in the memory of the fabric interconnect and the number of images stored there.

The fabric interconnect and Cisco UCS Manager firmware have running and startup versions of the kernel and system firmware. The kernel and system firmware must run the same versions of firmware.

## Direct Firmware Upgrade at Endpoints

If you follow the correct procedure and apply the upgrades in the correct order, a direct firmware upgrade and the activation of the new firmware version on the endpoints is minimally disruptive to traffic in a Cisco UCS instance.

You can directly upgrade the firmware on the following endpoints:

- Adapters
- CIMCs
- I/O modules
- Board controllers
- Cisco UCS Manager
- Fabric interconnects

The adapter and board controller firmware can also be upgraded through the host firmware package in the service profile. If you use a host firmware package to upgrade this firmware, you can reduce the number of times a server needs to be rebooted during the firmware upgrade process.

**Note**

Upgrades of a CIMC through a management firmware package or an adapter through a firmware package in the service profile associated with the server take precedence over direct firmware upgrades. You cannot directly upgrade an endpoint if the service profile associated with the server includes a firmware package. To perform a direct upgrade, you must remove the firmware package from the service profile.

## Stages of a Direct Firmware Upgrade

Cisco UCS Manager separates the direct upgrade process into two stages to ensure that you can push the firmware to an endpoint while the system is running without affecting uptime on the server or other endpoints.

### Update

During this stage, the system copies the selected firmware version from the primary fabric interconnect to the backup partition in the endpoint and verifies that the firmware image is not corrupt. The update process always overwrites the firmware in the backup slot.

The update stage applies only to the following endpoints:

- Adapters
- CIMCs
- I/O modules

You can set the update as Startup Version Only to avoid rebooting the endpoint immediately. This allows you to perform the update at any time and then activate and reboot during a maintenance period.



#### Caution

Do not remove the hardware that contains the endpoint or perform any maintenance on it until the update process has completed. If the hardware is removed or otherwise unavailable due to maintenance, the firmware update fails. This failure may corrupt the backup partition. You cannot update the firmware on an endpoint with a corrupted backup partition.

### Activate

During this stage, the system sets the specified image version (normally the backup version) as the startup version and, if you do not specify **Set Startup Version Only**, immediately reboots the endpoint. When the endpoint is rebooted, the backup partition becomes the active partition, and the active partition becomes the backup partition. The firmware in the new active partition becomes the startup version and the running version.

The following endpoints only require activation because the specified firmware image already exists on the endpoint:

- Cisco UCS Manager
- Fabric interconnects
- Board controllers on those servers that support them

When the firmware is activated, the endpoint is rebooted and the new firmware becomes the active kernel version and system version. If the endpoint cannot boot from the startup firmware, it defaults to the backup version and raises a fault.

**Caution**

When you configure **Set Startup Version Only** for an I/O module, the I/O module is rebooted when the fabric interconnect in its data path is rebooted. If you do not configure **Set Startup Version Only** for an I/O module, the I/O module reboots and disrupts traffic. In addition, if Cisco UCS Manager detects a protocol and firmware version mismatch between it and the I/O module, Cisco UCS Manager automatically updates the I/O module with the firmware version that matches its own and then activates the firmware and reboots the I/O module again.

## Recommended Order of Components for Firmware Activation

If you upgrade firmware by individual components in a Cisco UCS instance, we recommend that you activate the updates in the required order for quicker activation and to avoid potential issues with conflicting firmware versions.

### Recommended Order when Updating from Cisco UCS, Release 1.0(2) Onwards

- 1 Adapter (interface card)—If you plan to upgrade the adapters directly, perform this step first. However, if you prefer, you can omit this step and upgrade the adapters as part of the last step, in a host firmware package.
- 2 BMC—If you upgrade the adapters in the host firmware package, perform this step first.
- 3 I/O module.
- 4 Cisco UCS Manager.
- 5 Fabric interconnect.
- 6 Host firmware package—Must be the last step in the upgrade process. We recommend that you upgrade the board controller firmware during this step to avoid an additional reboot of the server. You must upgrade the BIOS and storage controller firmware in a host firmware package.

### Recommended Order when Updating from Cisco UCS, Release 1.0(1)

- 1 Adapter (interface card)—If you plan to upgrade the adapters directly, perform this step first. However, if you prefer, you can omit this step and upgrade the adapters as part of the last step, in a host firmware package.
- 2 BMC—If you upgrade the adapters in the host firmware package, perform this step first.
- 3 I/O module.
- 4 Fabric interconnect.
- 5 Cisco UCS Manager.
- 6 Host firmware package—Must be the last step in the upgrade process. We recommend that you upgrade the board controller firmware during this step to avoid an additional reboot of the server. You must upgrade the BIOS and storage controller firmware in a host firmware package.



## Outage Impacts of Direct Firmware Upgrades

When you perform a direct firmware upgrade on an endpoint, you can disrupt traffic or cause an outage in one or more of the endpoints in the Cisco UCS instance.

### Outage Impact of a Fabric Interconnect Firmware Upgrade

When you upgrade the firmware for a fabric interconnect, you cause the following outage impacts and disruptions:

- The fabric interconnect reboots.
- The corresponding I/O modules reboot.

### Outage Impact of a Cisco UCS Manager Firmware Upgrade

A firmware upgrade to Cisco UCS Manager causes the following disruptions:

#### Cisco UCS Manager GUI

- All users logged in to Cisco UCS Manager GUI are logged out and their sessions ended.
- Any unsaved work in progress is lost.

#### Cisco UCS Manager CLI

All users logged in through telnet are logged out and their sessions ended. Console sessions are not ended.

### Outage Impact of an I/O Module Firmware Upgrade

When you upgrade the firmware for an I/O module, you cause the following outage impacts and disruptions:

- For a standalone configuration with a single fabric interconnect, data traffic is disrupted when the I/O module reboots. For a cluster configuration with two fabric interconnects, data traffic fails over to the other I/O module and the fabric interconnect in its data path.
- If you activate the new firmware as the startup version only, the I/O module reboots when the corresponding fabric interconnect is rebooted.
- If you activate the new firmware as the running and startup version, the I/O module reboots immediately.
- An I/O module can take up to ten minutes to become available after a firmware upgrade.

### Outage Impact of a CIMC Firmware Upgrade

When you upgrade the firmware for a CIMC in a server, you impact only the CIMC and internal processes. You do not interrupt server traffic. This firmware upgrade causes the following outage impacts and disruptions to the CIMC:

- Any activities being performed on the server through the KVM console and vMedia are interrupted.
- Any monitoring or IPMI polling is interrupted.

### Outage Impact of an Adapter Firmware Upgrade

If you activate the firmware for an adapter and do not configure the **Set Startup Version Only** option, you cause the following outage impacts and disruptions:

- The server reboots.
- Server traffic is disrupted.

## Firmware Upgrades through Service Profiles

You can use service profiles to upgrade the server and adapter firmware, including the BIOS on the server, by defining the following policies and including them in the service profile associated with a server:

- Host Firmware Package policy
- Management Firmware Package policy

**Note**

You cannot upgrade the firmware on an I/O module, fabric interconnect, or Cisco UCS Manager through service profiles. You must upgrade the firmware on those endpoints directly.

## Host Firmware Package

This policy enables you to specify a set of firmware versions that make up the host firmware package (also known as the host firmware pack). The host firmware includes the following firmware for server and adapter endpoints:

- **Adapter Firmware Packages**
- **Storage Controller Firmware Packages**
- **Fibre Channel Adapters Firmware Packages**
- **BIOS Firmware Packages**
- **HBA Option ROM Packages**
- **Board Controller Packages**

**Tip**

You can include more than one type of firmware in the same host firmware package. For example, a host firmware package can include both BIOS firmware and storage controller firmware or adapter firmware for two different models of adapters. However, you can only have one firmware version with the same type, vendor, and model number. The system recognizes which firmware version is required for an endpoint and ignores all other firmware versions.

The firmware package is pushed to all servers associated with service profiles that include this policy.

This policy ensures that the host firmware is identical on all servers associated with service profiles which use the same policy. Therefore, if you move the service profile from one server to another, the firmware versions are maintained. Also, if you change the firmware version for an endpoint in the firmware package, new versions are applied to all the affected service profiles immediately, which could cause server reboots.

You must include this policy in a service profile, and that service profile must be associated with a server for it to take effect.

### Prerequisites

This policy is not dependent upon any other policies. However, you must ensure that the appropriate firmware has been downloaded to the fabric interconnect. If the firmware image is not available when Cisco UCS Manager is associating a server with a service profile, Cisco UCS Manager ignores the firmware upgrade and completes the association.

## Management Firmware Package

This policy enables you to specify a set of firmware versions that make up the management firmware package (also known as a management firmware pack). The management firmware package includes the Cisco Integrated Management Controller (CIMC) on the server. You do not need to use this package if you upgrade the CIMC directly.

The firmware package is pushed to all servers associated with service profiles that include this policy. This policy ensures that the CIMC firmware is identical on all servers associated with service profiles which use the same policy. Therefore, if you move the service profile from one server to another, the firmware versions are maintained.

You must include this policy in a service profile, and that service profile must be associated with a server for it to take effect.

This policy is not dependent upon any other policies. However, you must ensure that the appropriate firmware has been downloaded to the fabric interconnect.

## Stages of a Firmware Upgrade through Service Profiles

You can use the host and management firmware package policies in service profiles to upgrade server and adapter firmware.



### Caution

If you modify a host firmware package by adding an endpoint or changing firmware versions for an existing endpoint, Cisco UCS Manager upgrades the endpoints and reboots all servers associated with that firmware package as soon as the changes are saved, disrupting data traffic to and from the servers.

### New Service Profile

For a new service profile, this upgrade takes place over the following stages:

- |   |  |
|---|--|
| <b>Firmware Package Policy Creation</b> | During this stage, you create the host and/or management firmware packages and include them in the appropriate firmware policies.  |
| <b>Service Profile Association</b>      | During this stage, you include the firmware packages in a service profile, and then associate the service profile with a server. The system pushes the selected firmware versions to the endpoints. For a host firmware package, the server is rebooted to ensure that the endpoints are running the versions specified in the firmware package. |

### Existing Service Profile

If the service profile is already associated with a server, Cisco UCS Manager upgrades the firmware as soon as you save the changes to the host firmware packages. For a host firmware package, Cisco UCS Manager reboots the server as soon as the change is saved.

## Firmware Downgrades

You downgrade firmware in a Cisco UCS instance in the same way that you upgrade firmware. The package or version that you select when you update the firmware determines whether you are performing an upgrade or a downgrade.

## Completing the Prerequisites for Upgrading the Firmware

### Prerequisites for Upgrading and Downgrading Firmware

All endpoints in a Cisco UCS instance must be fully functional and all processes must be complete before you begin a firmware upgrade or downgrade on those endpoints. You cannot upgrade or downgrade an endpoint that is not in a functional state. For example, the firmware on a server that has not been discovered cannot be upgraded or downgraded. An incomplete process, such as an FSM that has failed after the maximum number of retries, can cause the upgrade or downgrade on an endpoint to fail. If an FSM is in progress, Cisco UCS Manager queues up the update and activation and runs them when the FSM has completed successfully.

Colored boxes around components on the **Equipment** tab may indicate that an endpoint on that component cannot be upgraded or downgraded. Verify the status of that component before you attempt to upgrade the endpoints.

**Note**

The **Installed Firmware** tab in Cisco UCS Manager GUI does not provide sufficient information to complete these prerequisites.

Before you upgrade or downgrade firmware in a Cisco UCS instance, complete the following prerequisites:

- Back up the configuration into an All Configuration backup file.
- For a cluster configuration, verify that the high availability status of the fabric interconnects shows that both are up and running.
- For a standalone configuration, verify that the Overall Status of the fabric interconnect is Operable.
- Verify that all servers, I/O modules, and adapters are fully functional. An inoperable server cannot be upgraded.
- Verify that all servers have been discovered. They do not need to be powered on or associated with a service profile.

## Creating an All Configuration Backup File

This procedure assumes that you do not have an existing backup operation for an All Configuration backup file.

## Before You Begin

Obtain the backup server IP address and authentication credentials.

## Procedure

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- Step 1** In the **Navigation** pane, click the **Admin** tab.
- Step 2** Click the **All** node.
- Step 3** In the **Work** pane, click the **General** tab.
- Step 4** In the **Actions** area, click **Backup Configuration**.
- Step 5** In the **Backup Configuration** dialog box, click **Create Backup Operation**.
- Step 6** In the **Create Backup Operation** dialog box, do the following:
- Complete the following fields:
    - **Admin State** field—Click the **enabled** radio button to run the backup operation as soon as you click OK.
    - **Type** field—Click the **All Configuration** radio button to create an XML backup file that includes all system and logical configuration information.
    - **Preserve Identities** check box—If the Cisco UCS instance includes any identities derived from pools that you need to preserve, check this check box.

Identities such as MAC addresses, WWNNs, WWPNS, or UUIDS are assigned at runtime. If you do not want these identities to change after you import the backup file, you must check this check box. If you do not, these identities may be changed after the import and operations such as a PXE boot or a SAN boot may no longer function.
    - **Protocol** field—Click the one of the following radio buttons to indicate the protocol you want to use to transfer the file to the backup server:
      - **FTP**
      - **TFTP**
      - **SCP**
      - **SFTP**
    - **Hostname** field—Enter the IP address or hostname of the location where the backup file is to be stored. This can be a server, storage array, local drive, or any read/write media that the fabric interconnect can access through the network. If you use a hostname, you must configure Cisco UCS Manager to use a DNS server.
    - **Remote File** field—Enter the full path to the backup configuration file. This field can contain the filename as well as the path. If you omit the filename, the backup procedure assigns a name to the file.
    - **User** field—Enter the username that Cisco UCS Manager should use to log in to the backup location. You do not need to complete this field if you selected TFTP for the protocol.
    - **Password** field—Enter the password associated with the username. You do not need to complete this field if you selected TFTP for the protocol.

b) Click **OK**.

**Step 7** If Cisco UCS Manager displays a confirmation dialog box, click **OK**.  
If you set the **Admin State** field to enabled, Cisco UCS Manager takes a snapshot of the configuration type that you selected and exports the file to the network location. The backup operation displays in the **Backup Operations** table in the **Backup Configuration** dialog box.

**Step 8** (Optional) To view the progress of the backup operation, do the following:

- a) If the operation does not display in the **Properties** area, click the operation in the **Backup Operations** table.
- b) In the **Properties** area, click the down arrows on the **FSM Details** bar.  
The **FSM Details** area expands and displays the operation status.

**Step 9** Click **OK** to close the **Backup Configuration** dialog box.  
The backup operation continues to run until it is completed. To view the progress, re-open the **Backup Configuration** dialog box.

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## Verifying the Overall Status of the Fabric Interconnects

### Procedure

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- Step 1** In the **Navigation** pane, click the **Equipment** tab.
  - Step 2** On the **Equipment** tab, expand **Equipment ► Fabric Interconnects**.
  - Step 3** Click the node for the fabric interconnect that you want to verify.
  - Step 4** In the **Work** pane, click the **General** tab.
  - Step 5** In the **Status** area, verify that the **Overall Status** is **operable**.  
If the status is not **operable**, run a **show tech-support** command and contact Cisco Technical Support. Do not proceed with the firmware upgrade. For more information about the **show tech-support** command, see *Cisco UCS Troubleshooting Guide*.
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## Verifying the High Availability Status and Roles of a Cluster Configuration

The high availability status is the same for both fabric interconnects in a cluster configuration.

### Procedure

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, expand **Equipment ► Fabric Interconnects**.
- Step 3** Click the node for one of the fabric interconnects in the cluster.
- Step 4** In the **Work** pane, click the **General** tab.
- Step 5** If the fields in the **High Availability Details** area are not displayed, click the **Expand** icon to the right of the heading.
- Step 6** Verify that the following fields display the following values:

Field Name	Required Value
Ready field	Yes
State field	Up

If the values are different, run a **show tech-support** command and contact Cisco Technical Support. Do not proceed with the firmware upgrade.

- Step 7** Note the value in the **Leadership** field to determine whether the fabric interconnect is the primary or subordinate.  
You need to know this information to upgrade the firmware on the fabric interconnects.

## Verifying the Status of I/O Modules

### Procedure

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, expand **Equipment ► Chassis**.
- Step 3** Click on the chassis for which you want to verify the status of the I/O modules.
- Step 4** In the **Work** pane, click the **IO Modules** tab.
- Step 5** For each I/O module, verify that the following columns display the following values:

Field Name	Desired Value
Overall Status column	ok
Operability column	operable

If the values are different, run a **show tech-support** command and contact Cisco Technical Support. Do not proceed with the firmware upgrade.

- Step 6** Repeat Steps 3 through 5 to verify the status of the I/O modules in each chassis.

## Verifying the Status of Servers

If a server is inoperable, you can proceed with the upgrade for other servers in the Cisco UCS instance. However, you cannot upgrade the inoperable server.

### Procedure

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, click **Equipment**.
- Step 3** In the **Work** pane, click the **Servers** tab to display a list of all servers in all chassis.
- Step 4** For each server, verify that the following columns display the following values:

Field Name	Desired Value
<b>Overall Status</b> column	<b>ok</b> , <b>unassociated</b> , or any value that does not indicate a failure.  If the value indicates a failure, such as <b>discovery-failed</b> , the endpoints on that server cannot be upgraded.
<b>Operability</b> column	<b>operable</b>

- Step 5** If you need to verify that a server has been discovered, do the following:
- Right-click the server for which you want to verify the discovery status and choose **Show Navigator**.
  - In the **Status Details** area of the **General** tab, verify that the **Discovery State** field displays a value of **complete**.  
If the fields in the **Status Details** area are not displayed, click the **Expand** icon to the right of the heading.

## Verifying the Status of Adapters on Servers in a Chassis

### Procedure

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, expand **Equipment** ► **Chassis** ► *Chassis Number* ► **Servers**.
- Step 3** Click the server for which you want to verify the status of the adapters.
- Step 4** In the **Work** pane, click the **Inventory** tab.
- Step 5** In the **Inventory** tab, click the **Interface Cards** subtab.
- Step 6** For each adapter, verify that the following columns display the following values:



Field Name	Desired Value
Overall Status column	ok
Operability column	operable

If the fields show a different value and the adapter is inoperable, you can proceed with the upgrade for other adapters on the servers in the Cisco UCS instance. However, you cannot upgrade the inoperable adapter.

# Downloading and Managing Firmware Packages

## Obtaining Firmware Packages from Cisco

### Procedure

- Step 1** In a web browser, navigate to <http://www.cisco.com>.
- Step 2** Under **Support**, click **Download Software**.
- Step 3** Click **Unified Computing**.
- Step 4** Enter your Cisco.com username and password to log in.
- Step 5** Click **Cisco Unified Computing System**.  
If you prefer to download an image for a single component, expand the node for that component and click the link to the appropriate image.
- Step 6** Click **Unified Computing System (UCS) Complete Software Bundle**.
- Step 7** Under the **Latest Releases** folder, click the link for the latest release of Cisco UCS.  
Images for earlier releases are archived under the **All Releases** link.
- Step 8** Click the Release Notes link to download the latest version of the Release Notes.
- Step 9** Click one of the following buttons and follow the instructions provided:
  - **Download Now**—Allows you to download the firmware image immediately
  - **Add to Cart**—Adds the firmware image to your cart to be downloaded at a later time
- Step 10** Follow the prompts to complete your download of the image.
- Step 11** Read the release notes before upgrading the Cisco UCS instance.

### What to Do Next

Download the firmware image to the fabric interconnect.

## Downloading Firmware Packages to the Fabric Interconnect

You can use the same procedure to download a single firmware image to the fabric interconnect.



### Note

In a cluster setup, the firmware package is downloaded to both fabric interconnects, regardless of which fabric interconnect is used to initiate the download. Cisco UCS Manager maintains all packages and images in both fabric interconnects in sync. If one fabric interconnect is down, the download still finishes successfully. The images are synced to the other fabric interconnect when it comes back online.

### Before You Begin

Obtain the firmware packages or images from Cisco.

### Procedure

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** Click the **Equipment** node.
- Step 3** In the **Work** pane, click the **Firmware Management** tab.
- Step 4** Click the **Installed Firmware** tab.
- Step 5** Click **Download Firmware**.
- Step 6** In the **Download Firmware** dialog box, complete the following fields:

Name	Description
<b>Protocol</b> field	<p>The protocol to use when communicating with the remote server. This can be:</p> <ul style="list-style-type: none"> <li>• <b>FTP</b></li> <li>• <b>TFTP</b></li> <li>• <b>SCP</b></li> <li>• <b>SFTP</b></li> </ul> <p><b>Note</b> TFTP has a file size limitation of 32 MB. Because firmware bundles can be much larger than that, we recommend that you do not select TFTP for firmware downloads.</p>
<b>Server</b> field	<p>The IP address or hostname of the remote server on which the files resides.</p> <p><b>Note</b> If you use a hostname rather than an IP address, you must configure a DNS server in Cisco UCS Manager.</p>
<b>Filename</b> field	The name of the firmware executable you want to download.
<b>Remote Path</b> field	<p>The absolute path to the file on the remote server, if required.</p> <p>If you use SCP, the absolute path is always required. If you use any other protocol, you may not need to specify a remote path if the file</p>

Name	Description
	resides in the default download folder. For details about how your file server is configured, contact your system administrator.
User field	The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP.
Password field	The password for the remote server username. This field does not apply if the protocol is TFTP.

Cisco UCS Manager GUI begins downloading the firmware bundle to the fabric interconnect.

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

**Step 8** (Optional) Monitor the status of the image download on the **Download Tasks** tab.

**Note** If Cisco UCS Manager reports that the bootflash is out of space, delete obsolete images to free up space. To view the available space in bootflash, navigate to the fabric interconnect on the **Equipment** tab and expand the **Local Storage Information** area on the **General** tab.

---

### What to Do Next

Update the firmware on the endpoints.

## Canceling an Image Download

You can cancel an image download only while it is in progress. After the image has downloaded, deleting the download task does not delete the image that was downloaded.

### Procedure

---

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

**Step 2** Expand the **Equipment** node.

**Step 3** In the **Work** pane, select the **Firmware Management** tab.

**Step 4** On the **Download Tasks** tab, right-click the task you want to cancel and select **Delete**.

---

## Determining the Contents of a Firmware Package

### Procedure

---

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
  - Step 2** On the **Admin** tab, click the **Equipment** node.
  - Step 3** In the **Work** pane, click the **Firmware Management** tab.
  - Step 4** On the **Packages** subtab, click the + icon next to a package to view its contents.
  - Step 5** To take a snapshot of the package contents, do the following:
    - a) Highlight the rows that include the image name and its contents.
    - b) Right-click and choose **Copy**.
    - c) Paste the contents of your clipboard into a text file or other document.
- 

## Checking the Available Space on a Fabric Interconnect

If an image download fails, check whether the bootflash on the fabric interconnect or fabric interconnects in the Cisco UCS has sufficient available space.

### Procedure

---

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
  - Step 2** On the **Equipment** tab, expand **Equipment ► Fabric Interconnects**.
  - Step 3** Click the fabric interconnect on which you want to check the available space.
  - Step 4** In the **Work** pane, click the **General** tab.
  - Step 5** Expand the **Local Storage Information** area.

When you download a firmware image bundle, a fabric interconnect needs at least twice as much available space as the size of the firmware image bundle. If the bootflash does not have sufficient space, delete the obsolete firmware, core files, and other unneeded objects from the fabric interconnect.
- 

## Deleting Firmware Packages from a Fabric Interconnect

Use this procedure if you want to delete only a single image from a package. If you prefer you can also delete the entire package.

### Procedure

- 
- Step 1** In the **Navigation** pane, click the **Equipment** tab.
  - Step 2** On the **Equipment** tab, click the **Equipment** node.
  - Step 3** In the **Work** pane, click the **Firmware Management** tab.
  - Step 4** On the **Firmware Management** tab, click the **Packages** tab.
  - Step 5** In the table, click the package that you want to delete.  
You can use the Shift key or Ctrl key to select multiple entries.
  - Step 6** Right-click the highlighted package or packages and choose **Delete**.
  - Step 7** If Cisco UCS Manager GUI displays a confirmation dialog box, click **Yes**.
- 

Cisco UCS Manager deletes the selected package or packages and all images contained within each package.

## Deleting Firmware Images from a Fabric Interconnect

Use this procedure if you want to delete only a single image from a package. If you prefer you can also delete the entire package.

### Procedure

- 
- Step 1** In the **Navigation** pane, click the **Equipment** tab.
  - Step 2** On the **Equipment** tab, click the **Equipment** node.
  - Step 3** In the **Work** pane, click the **Firmware Management** tab.
  - Step 4** On the **Firmware Management** tab, click the **Images** tab.
  - Step 5** In the table, click the image that you want to delete.  
You can use the Shift key or Ctrl key to select multiple entries.
  - Step 6** Right-click the highlighted image or images and choose **Delete**.
  - Step 7** If Cisco UCS Manager GUI displays a confirmation dialog box, click **Yes**.
- 

## Directly Updating Firmware at Endpoints

### Updating the Firmware on Multiple Endpoints

You can use this procedure to update the firmware on the following endpoints:

- Adapters
- CIMCs
- I/O modules

**Caution**

Do not remove the hardware that contains the endpoint or perform any maintenance on it until the update process has completed. If the hardware is removed or otherwise unavailable due to maintenance, the firmware update fails. This failure may corrupt the backup partition. You cannot update the firmware on an endpoint with a corrupted backup partition.

---

**Procedure**

- 
- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, click the **Equipment** node.
- Step 3** In the **Work** pane, click the **Firmware Management** tab.
- Step 4** On the **Installed Firmware** subtab, click **Update Firmware**.  
Cisco UCS Manager GUI opens the **Update Firmware** dialog box and verifies the firmware versions for all endpoints in the Cisco UCS instance. This step may take a few minutes, depending upon the number of chassis and servers.
- Step 5** In the **Update Firmware** dialog box, do the following:
- From the **Filter** drop-down list on the menu bar, select **ALL**.  
If you want to update all endpoints of a specific type, such as all adapters, select that type from the drop-down list.
  - From the **Set Version** drop-down list on the menu bar, select the firmware version to which you want to update the endpoints.
  - Click **OK**.  
If the service profile for the server includes a host firmware package, Cisco UCS Manager cannot update the adapter firmware for that server. After you acknowledge the notification message, Cisco UCS Manager updates the firmware for all other endpoints on servers that do not have associated host firmware packages. If you want to update the adapter firmware for a server directly, you must remove all host firmware packages from the associated service profiles. Removing the adapter firmware from the host firmware package is not sufficient to enable you to update the adapters directly.
- Cisco UCS Manager copies the selected firmware image to the backup memory partition and verifies that the image is not corrupt. The image remains as the backup version until you explicitly activate it. Cisco UCS Manager begins all updates at the same time. However, some updates may complete at different times.
- The update is complete when the **Update Firmware** dialog box displays **ready** in the **Update Status** column for all updated endpoints.
- Step 6** (Optional) To monitor the progress of the update to a specific endpoint, right-click on the endpoint and choose **Show Navigator**.  
Cisco UCS Manager displays the progress in the **Update Status** area on the **General** tab. If the navigator has an **FSM** tab, you can also monitor the progress there. An entry in the **Retry #** field may not indicate that the update has failed. The retry count also includes retries that occur when Cisco UCS Manager retrieves the update status.
- 

**What to Do Next**

Activate the firmware.

## Updating the Firmware on an Adapter

**Caution**

Do not remove the hardware that contains the endpoint or perform any maintenance on it until the update process has completed. If the hardware is removed or otherwise unavailable due to maintenance, the firmware update fails. This failure may corrupt the backup partition. You cannot update the firmware on an endpoint with a corrupted backup partition.

---

**Procedure**

- 
- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, expand **Equipment** ► **Chassis** ► *Chassis Number* ► **Servers**.
- Step 3** Expand the node for the server which includes the adapter you want to update.
- Step 4** Expand **Interface Cards** and select the interface card for the adapter you want to upgrade.
- Step 5** In the **General** tab, click **Update Firmware**.
- Step 6** In the **Update Firmware** dialog box, do the following:
- From the **Version** drop-down list, select the firmware version to which you want to update the endpoint.
  - (Optional) If you want to update the firmware regardless of any possible incompatibilities or currently executing tasks, check the **Ignore Compatibility Check** check box.
  - Click **OK**.
- If the service profile for the server includes a host firmware package, Cisco UCS Manager cannot update the adapter firmware for that server. After you acknowledge the notification message, Cisco UCS Manager updates the firmware for all other endpoints on servers that do not have associated host firmware packages. If you want to update the adapter firmware for a server directly, you must remove all host firmware packages from the associated service profiles. Removing the adapter firmware from the host firmware package is not sufficient to enable you to update the adapters directly.
- Cisco UCS Manager copies the selected firmware package to the backup memory slot, where it remains until you explicitly activate it.
- Step 7** (Optional) Monitor the status of the update in the **Update Status** area. The update process can take several minutes. Do not activate the firmware until the selected firmware package displays in the **Backup Version** field in the **Firmware** area of the **General** tab.
- 

**What to Do Next**

Activate the firmware.

## Activating the Firmware on an Adapter

### Procedure

- 
- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, expand **Equipment** ► **Chassis** ► **Chassis Number** ► **Servers**.
- Step 3** Expand the node for the server that includes the adapter for which you want to activate the updated firmware.
- Step 4** Expand **Interface Cards** and select the interface card for the adapter.
- Step 5** In the **General** tab, click **Activate Firmware**.
- Step 6** In the **Activate Firmware** dialog box, do the following:
- Select the appropriate version from the **Version To Be Activated** drop-down list.  
If one or more of the selected endpoints are not configured with the desired version as the backup version, Cisco UCS Manager GUI does not display that version in the **Set Version** drop-down list. You must select the version from the **Startup Version** column for each individual endpoint.
  - (Optional) If you want to activate the firmware regardless of any possible incompatibilities or currently executing tasks, check the **Ignore Compatibility Check** check box.
  - If you want to set the start up version and not change the version running on the endpoint, check the **Set Startup Version Only** check box.  
During a direct upgrade, you should configure **Set Startup Version Only** for an adapter. With this setting, the activated firmware moves into the pending-next-boot state, and the server is not immediately rebooted. The activated firmware does not become the running version of firmware on the adapter until the server is rebooted. You cannot configure **Set Startup Version Only** for an adapter in the host firmware package.
  - Click **OK**.
- 

## Updating the CIMC Firmware on a Server



### Caution

Do not remove the hardware that contains the endpoint or perform any maintenance on it until the update process has completed. If the hardware is removed or otherwise unavailable due to maintenance, the firmware update fails. This failure may corrupt the backup partition. You cannot update the firmware on an endpoint with a corrupted backup partition.

---



### Procedure

- 
- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, expand **Equipment** ► **Chassis** ► *Chassis Number* ► **Servers**.
- Step 3** Expand the node for the server for which you want to update the CIMC.
- Step 4** In the **General** tab, click the **Inventory** tab.
- Step 5** Click the **CIMC** tab.
- Step 6** In the **Actions** area, click **Update Firmware**.
- Step 7** In the **Update Firmware** dialog box, do the following:
- From the **Version** drop-down list, select the firmware version to which you want to update the endpoint.
  - (Optional) If you want to update the firmware regardless of any possible incompatibilities or currently executing tasks, check the **Ignore Compatibility Check** check box.
  - Click **OK**.
- Cisco UCS Manager copies the selected firmware package to the backup memory slot, where it remains until you explicitly activate it.
- Step 8** (Optional) Monitor the status of the update in the **Update Status** area.  
The update process can take several minutes. Do not activate the firmware until the selected firmware package displays in the **Backup Version** field in the **Firmware** area of the **General** tab.
- 

### What to Do Next

Activate the firmware.

## Activating the CIMC Firmware on a Server

### Procedure

- 
- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, expand **Equipment** ► **Chassis** ► *Chassis Number* ► **Servers**.
- Step 3** Expand the node for the server that includes the CIMC for which you want to activate the updated firmware.
- Step 4** On the **General** tab, click the **Inventory** tab.
- Step 5** Click the **CIMC** tab.
- Step 6** In the **Actions** area, click **Activate Firmware**.
- Step 7** In the **Activate Firmware** dialog box, do the following:
- Select the appropriate version from the **Version To Be Activated** drop-down list.  
If one or more of the selected endpoints are not configured with the desired version as the backup version, Cisco UCS Manager GUI does not display that version in the **Set Version** drop-down list. You must select the version from the **Startup Version** column for each individual endpoint.
  - (Optional) If you want to activate the firmware regardless of any possible incompatibilities or currently executing tasks, check the **Ignore Compatibility Check** check box.

- c) If you want to set the start up version and not change the version running on the endpoint, check the **Set Startup Version Only** check box.  
If you configure **Set Startup Version Only**, the activated firmware moves into the pending-next-reboot state and the endpoint is not immediately rebooted. The activated firmware does not become the running version of firmware until the endpoint is rebooted.
  - d) Click **OK**.
- 

## Updating the Firmware on an IOM



### Caution

Do not remove the hardware that contains the endpoint or perform any maintenance on it until the update process has completed. If the hardware is removed or otherwise unavailable due to maintenance, the firmware update fails. This failure may corrupt the backup partition. You cannot update the firmware on an endpoint with a corrupted backup partition.

---

### Procedure

---

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
  - Step 2** On the **Equipment** tab, expand **Equipment** ► **Chassis** ► *Chassis Number* ► **IO Modules**.
  - Step 3** Click the I/O module that you want to update.
  - Step 4** In the **General** tab, click **Update Firmware**.
  - Step 5** In the **Update Firmware** dialog box, do the following:
    - a) From the **Version** drop-down list, select the firmware version to which you want to update the endpoint.
    - b) (Optional) If you want to update the firmware regardless of any possible incompatibilities or currently executing tasks, check the **Ignore Compatibility Check** check box.
    - c) Click **OK**.

Cisco UCS Manager copies the selected firmware package to the backup memory slot, where it remains until you explicitly activate it.
  - Step 6** (Optional) Monitor the status of the update in the **Update Status** area.  
The update process can take several minutes. Do not activate the firmware until the selected firmware package displays in the **Backup Version** field in the **Firmware** area of the **General** tab.
- 

### What to Do Next

Activate the firmware.

## Activating the Firmware on an IOM

### Procedure

- 
- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, expand **Equipment** ► **Chassis** ► *Chassis Number* ► **IO Modules**.
- Step 3** Select the **IO Module** node that includes the I/O module for which you want to activate the updated firmware.
- Step 4** In the **General** tab, click **Activate Firmware**.
- Step 5** In the **Activate Firmware** dialog box, do the following:
- Select the appropriate version from the **Version To Be Activated** drop-down list.  
If one or more of the selected endpoints are not configured with the desired version as the backup version, Cisco UCS Manager GUI does not display that version in the **Set Version** drop-down list. You must select the version from the **Startup Version** column for each individual endpoint.
  - (Optional) If you want to activate the firmware regardless of any possible incompatibilities or currently executing tasks, check the **Ignore Compatibility Check** check box.
  - If you want to set the start up version and not change the version running on the endpoint, check the **Set Startup Version Only** check box.  
If you configure **Set Startup Version Only**, the activated firmware moves into the pending-next-reboot state and the endpoint is not immediately rebooted. The activated firmware does not become the running version of firmware until the endpoint is rebooted.
  - Click **OK**.
- 

## Activating the Board Controller Firmware on a Server

Only certain servers, such as the Cisco UCS B440 High Performance blade server, have board controller firmware. The board controller firmware controls the algorithms for functions such as lighting the front panel LEDs on the server.



### Note

This activation procedure causes the server to reboot immediately. To reduce the number of times a server needs to be rebooted during the upgrade process, we recommend that you upgrade the board controller firmware through the host firmware package in the service profile.

### Procedure

- 
- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, click the **Equipment** node.
- Step 3** In the **Work** pane, click the **Firmware Management** tab.
- Step 4** On the **Installed Firmware** subtab, click **Activate Firmware**.

Cisco UCS Manager GUI opens the **Update Firmware** dialog box and verifies the firmware versions for all endpoints in the Cisco UCS instance. This step may take a few minutes, depending upon the number of chassis and servers.

- Step 5** From the **Filter** drop-down list on the menu bar of the **Activate Firmware** dialog box, select **Board Controller**. Cisco UCS Manager GUI displays all servers that have board controllers in the **Activate Firmware** dialog box.
  - Step 6** From the drop-down list in the **Startup Version** column, select the version to which you want to update the software.
  - Step 7** If you want to activate the firmware regardless of any possible incompatibilities or currently executing tasks, check the **Ignore Compatibility Check** check box.
  - Step 8** Click **OK**.  
Cisco UCS Manager disconnects all active sessions, logs out all users, and then activates the software. When the upgrade is complete, you are prompted to log back in.
- 

## Activating the Cisco UCS Manager Software

### Procedure

---

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
  - Step 2** On the **Equipment** tab, click the **Equipment** node.
  - Step 3** In the **Work** pane, click the **Firmware Management** tab.
  - Step 4** On the **Installed Firmware** subtab, click **Activate Firmware**.  
Cisco UCS Manager GUI opens the **Update Firmware** dialog box and verifies the firmware versions for all endpoints in the Cisco UCS instance. This step may take a few minutes, depending upon the number of chassis and servers.
  - Step 5** On the **UCS Manager** row of the **Activate Firmware** dialog box, do the following:
    - a) From the drop-down list in the **Startup Version** column, select the version to which you want to update the software.
    - b) (Optional) If you want to activate the firmware regardless of any possible incompatibilities or currently executing tasks, check the **Ignore Compatibility Check** check box.
    - c) Click **OK**.
 Cisco UCS Manager makes the selected version the startup version and schedules the activation to occur when the fabric interconnects are upgraded.
- 

## Activating the Firmware on a Subordinate Fabric Interconnect

### Before You Begin

Determine which fabric interconnect in the cluster is the subordinate fabric interconnect.

## Procedure

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, click the **Equipment** node.
- Step 3** In the **Work** pane, click the **Firmware Management** tab.
- Step 4** On the **Installed Firmware** subtab, click **Activate Firmware**.  
Cisco UCS Manager GUI opens the **Update Firmware** dialog box and verifies the firmware versions for all endpoints in the Cisco UCS instance. This step may take a few minutes, depending upon the number of chassis and servers.
- Step 5** From the **Filter** drop-down list on the menu bar, choose **Fabric Interconnects**.
- Step 6** On the menu bar, check the **Ignore Compatibility Check** check box.
- Step 7** On the row of the **Activate Firmware** dialog box for the subordinate fabric interconnect, do the following:
- In the **Kernel** row, choose the firmware version to which you want to upgrade from the drop-down list in the **Startup Version** column.
  - In the **System** row, choose the firmware version to which you want to upgrade from the drop-down list in the **Startup Version** column.
- Step 8** Click **Apply**.  
Cisco UCS Manager updates and activates the firmware, and then reboots the fabric interconnect and any I/O module in the data path to that fabric interconnect, disrupting data traffic to and from that fabric interconnect. However, assuming the Cisco UCS instance is configured to permit traffic and port failover, data traffic fails over to the primary fabric interconnect and is not disrupted.
- Step 9** Verify the high availability status of the subordinate fabric interconnect.  
If the **High Availability Status** area for the fabric interconnect does not show the following values, contact Cisco Technical Support immediately. Do not continue to update the primary fabric interconnect.

Field Name	Required Value
Ready field	Yes
State field	Up

## What to Do Next

If the high availability status of the subordinate fabric interconnect contains the required values, update and activate the primary fabric interconnect.

# Activating the Firmware on a Primary Fabric Interconnect

This procedure continues directly from [Activating the Firmware on a Subordinate Fabric Interconnect](#), page 28 and assumes you are on the **Firmware Management** tab.

## Before You Begin

Activate the subordinate fabric interconnect.

## Procedure

- Step 1** On the **Installed Firmware** subtab, click **Activate Firmware**.  
Cisco UCS Manager GUI opens the **Update Firmware** dialog box and verifies the firmware versions for all endpoints in the Cisco UCS instance. This step may take a few minutes, depending upon the number of chassis and servers.
- Step 2** From the **Filter** drop-down list on the menu bar, choose **Fabric Interconnects**.
- Step 3** On the menu bar, check the **Ignore Compatibility Check** check box.
- Step 4** On the row of the **Activate Firmware** dialog box for the subordinate fabric interconnect, do the following:
- In the **Kernel** row, choose the firmware version to which you want to upgrade from the drop-down list in the **Startup Version** column.
  - In the **System** row, choose the firmware version to which you want to upgrade from the drop-down list in the **Startup Version** column.
- Step 5** Click **Apply**.  
Cisco UCS Manager updates and activates the firmware, and then reboots the fabric interconnect and any I/O module in the data path to that fabric interconnect, disrupting data traffic to and from that fabric interconnect. However, assuming the Cisco UCS instance is configured to permit traffic and port failover, data traffic fails over to the other fabric interconnect, which becomes the primary. When it comes back up, this fabric interconnect is the subordinate fabric interconnect.
- Step 6** Verify the high availability status of the fabric interconnect.  
If the **High Availability Status** area for the fabric interconnect does not show the following values, contact Cisco Technical Support immediately.

Field Name	Required Value
Ready field	Yes
State field	Up

## Activating the Firmware on a Standalone Fabric Interconnect

For a standalone configuration with a single fabric interconnect, you can minimize the disruption to data traffic when you perform a direct firmware upgrade of the endpoints. However, you must reboot the fabric interconnect to complete the upgrade and, therefore, cannot avoid disrupting traffic.



### Tip

If you ever need to recover the password to the admin account that was created when you configured the fabric interconnects for the Cisco UCS instance, you must know the running kernel version and the running system version. If you do not plan to create additional accounts, we recommend that you save the path to these firmware versions in a text file so that you can access them if required.

## Procedure

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, click the **Equipment** node.
- Step 3** Expand the **Fabric Interconnects** node and click the standalone fabric interconnect.
- Step 4** On the **General** tab, click **Activate Firmware**.
- Step 5** In the **Activate Firmware** dialog box, complete the following fields:

Name	Description
<b>Kernel Version</b> drop-down list	Choose the version that you want to use for the kernel.
<b>System Version</b> drop-down list	Choose the version you want to use for the system.
<b>Ignore Compatibility Check</b> check box	<p>By default, Cisco UCS makes sure that the firmware version is compatible with everything running on the server before it activates that version.</p> <p>Check this check box if you want Cisco UCS to activate the firmware without making sure that it is compatible first.</p> <p><b>Note</b> We recommend that you use this option only when explicitly directed to do so by a technical support representative.</p>

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

Cisco UCS Manager activates the firmware, and then reboots the fabric interconnect and any I/O module in the data path to that fabric interconnect. For a standalone fabric interconnect, this disrupts all data traffic in the Cisco UCS instance.

# Updating Firmware through Service Profiles

## Host Firmware Package

This policy enables you to specify a set of firmware versions that make up the host firmware package (also known as the host firmware pack). The host firmware includes the following firmware for server and adapter endpoints:

- **Adapter Firmware Packages**
- **Storage Controller Firmware Packages**
- **Fibre Channel Adapters Firmware Packages**
- **BIOS Firmware Packages**
- **HBA Option ROM Packages**
- **Board Controller Packages**

**Tip**

You can include more than one type of firmware in the same host firmware package. For example, a host firmware package can include both BIOS firmware and storage controller firmware or adapter firmware for two different models of adapters. However, you can only have one firmware version with the same type, vendor, and model number. The system recognizes which firmware version is required for an endpoint and ignores all other firmware versions.

The firmware package is pushed to all servers associated with service profiles that include this policy.

This policy ensures that the host firmware is identical on all servers associated with service profiles which use the same policy. Therefore, if you move the service profile from one server to another, the firmware versions are maintained. Also, if you change the firmware version for an endpoint in the firmware package, new versions are applied to all the affected service profiles immediately, which could cause server reboots.

You must include this policy in a service profile, and that service profile must be associated with a server for it to take effect.

**Prerequisites**

This policy is not dependent upon any other policies. However, you must ensure that the appropriate firmware has been downloaded to the fabric interconnect. If the firmware image is not available when Cisco UCS Manager is associating a server with a service profile, Cisco UCS Manager ignores the firmware upgrade and completes the association.

## Creating a Host Firmware Package

**Before You Begin**

Ensure that the appropriate firmware has been downloaded to the fabric interconnect.

**Procedure**

- 
- Step 1** In the **Navigation** pane, click the **Servers** tab.
  - Step 2** On the **Servers** tab, expand **Servers ► Policies**.
  - Step 3** Expand the node for the organization where you want to create the policy.  
If the system does not include multi-tenancy, expand the **root** node.
  - Step 4** Right-click **Host Firmware Packages** and select **Create Package**.
  - Step 5** In the **Create Host Firmware Package** dialog box, enter a unique name and description for the package. This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters, and you cannot change this name after the object has been saved.
  - Step 6** Click the down arrows to expand one or more of the following sections on the left of the dialog box:
    - **Adapter Firmware Packages**
    - **Storage Controller Firmware Packages**
    - **Fibre Channel Adapters Firmware Packages**
    - **BIOS Firmware Packages**
    - **HBA Option ROM Packages**



- **Board Controller Packages**

**Tip** You can include more than one type of firmware in the same host firmware package. For example, a host firmware package can include both BIOS firmware and storage controller firmware or adapter firmware for two different models of adapters. However, you can only have one firmware version with the same type, vendor, and model number. The system recognizes which firmware version is required for an endpoint and ignores all other firmware versions.

- Step 7** In each section for the endpoint to which you want to include firmware in the package, do the following:
- Select the line in the table which lists the firmware version that you want to add to the package. By default, the entries are sorted by vendor name. To sort the entries, click on a column heading.
  - Drag the line to the table on the right.
  - Click **Yes** to confirm that you selected the correct version.
- Step 8** When you have added all the desired firmware to the package, click **OK**.
- 

### What to Do Next

Include the policy in a service profile and/or template.

## Updating a Host Firmware Package

If the policy is included in one or more service profiles associated with a server, Cisco UCS Manager updates and activates the firmware in the server and adapter with the new versions and reboots the server as soon as you save the host firmware package policy.

### Before You Begin

Ensure that the appropriate firmware has been downloaded to the fabric interconnect.

### Procedure

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- Step 1** In the **Navigation** pane, click the **Servers** tab.
- Step 2** On the **Servers** tab, expand **Servers ► Policies**.
- Step 3** Expand the node for the organization that includes the policy you want to update. If the system does not include multi-tenancy, expand the **root** node.
- Step 4** Expand **Host Firmware Packages** and select the policy you want to update.
- Step 5** In the table on the right, delete the existing entries for the firmware you want to update:
- Select the line in the table for the firmware version that you want to change.
  - Right-click and select **Delete**.
  - Click **Yes** to confirm that you want to delete that entry.
- Step 6** On the **General** tab, click the down arrows to expand one or more of the following sections on the left:
- **Adapter Firmware Packages**
  - **Storage Controller Firmware Packages**
  - **Fibre Channel Adapters Firmware Packages**

- BIOS Firmware Packages
- HBA Option ROM Packages
- Board Controller Packages

- Step 7** In each section for the endpoint to which you want to include firmware in the package:
- a) Select the line in the table for the firmware version that you want to add to the package.  
By default, the entries are sorted by vendor name. To sort the entries, click on a column heading.
  - b) Drag the line to the table on the right.
  - c) Click **Yes** to confirm that you selected the correct version.

- Step 8** Click **Save Changes**.
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## Management Firmware Package

This policy enables you to specify a set of firmware versions that make up the management firmware package (also known as a management firmware pack). The management firmware package includes the Cisco Integrated Management Controller (CIMC) on the server. You do not need to use this package if you upgrade the CIMC directly.

The firmware package is pushed to all servers associated with service profiles that include this policy. This policy ensures that the CIMC firmware is identical on all servers associated with service profiles which use the same policy. Therefore, if you move the service profile from one server to another, the firmware versions are maintained.

You must include this policy in a service profile, and that service profile must be associated with a server for it to take effect.

This policy is not dependent upon any other policies. However, you must ensure that the appropriate firmware has been downloaded to the fabric interconnect.

## Creating a Management Firmware Package

### Before You Begin

Ensure that the appropriate firmware has been downloaded to the fabric interconnect.

### Procedure

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- Step 1** In the **Navigation** pane, click the **Servers** tab.
- Step 2** On the **Servers** tab, expand **Servers ► Policies**.
- Step 3** Expand the node for the organization where you want to create the policy.  
If the system does not include multi-tenancy, expand the **root** node.
- Step 4** Right-click **Management Firmware Packages** and select **Create Package**.
- Step 5** In the **Create Management Firmware Package** dialog box, enter a unique name and description for the package.

This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters, and you cannot change this name after the object has been saved.

- Step 6** In the **CIMC Firmware Packages** section on the left of the dialog box, do the following:
- a) Click the down arrows to expand the section.  
By default, the entries are sorted by vendor name. To sort the entries, click on a column heading.
  - b) Select the line in the table which lists the firmware version that you want to add to the package.  
The firmware version must match the model numbers (PID) on the servers that are associated with this firmware pack. If you select a firmware version with the wrong model number, Cisco UCS Manager cannot install the firmware update.
  - c) Drag the line to the table on the right.
  - d) Click **Yes** to confirm that you selected the correct version.
- Step 7** If you need to include CIMC firmware for servers with different model numbers (PIDs) in this management firmware package, repeat Step 6.
- Step 8** When you have added the desired firmware to the package, click **OK**.
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### What to Do Next

Include the policy in a service profile and/or template.

## Updating a Management Firmware Package

If the policy is included in a one or more service profiles associated with a server, as soon as you save the management firmware package policy, Cisco UCS Manager updates and activates the CIMC firmware in the server with the new version.

### Before You Begin

Ensure that the appropriate firmware has been downloaded to the fabric interconnect.

### Procedure

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- Step 1** In the **Navigation** pane, click the **Servers** tab.
- Step 2** On the **Servers** tab, expand **Servers ► Policies**.
- Step 3** Expand the node for the organization that includes the policy you want to update.  
If the system does not include multi-tenancy, expand the **root** node.
- Step 4** Expand **Management Firmware Packages** and select the policy you want to update.
- Step 5** In the table on the right, delete the existing entry for the firmware you want to update:
- a) Select the line in the table for the firmware version that you want to change.
  - b) Right-click and select **Delete**.
  - c) Click **Yes** to confirm that you want to delete that entry.
- Step 6** In the **CIMC Firmware Packages** section on the left:
- a) Click the down arrows to expand the section.

By default, the entries in a section are sorted by vendor name. To sort the entries, click on a column heading.

- b) Select the line in the table which lists the firmware version that you want to add to the pack.  
The firmware version must match the model numbers (PID) on the servers that are associated with this firmware pack. If you select a firmware version with the wrong model number, Cisco UCS Manager cannot install the firmware update.
- c) Drag the line to the table on the right.
- d) Click **Yes** to confirm that you selected the correct version.

**Step 7** If you need to include CIMC firmware for servers with different model numbers (PIDs) in this management firmware package, repeat Step 6.

**Step 8** Click **Save Changes**.  
Cisco UCS Manager verifies the model numbers and vendor against all servers associated with service profiles that include this policy. If the model numbers and vendor match a firmware version in the policy, Cisco UCS Manager updates the firmware.

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## Adding Firmware Packages to an Existing Service Profile

If the service profile is associated with a server, Cisco UCS Manager updates and activates the firmware in the server with the new versions and reboots the server as soon as you save the changes to the service profile.

### Procedure

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- Step 1** In the **Navigation** pane, click the **Servers** tab.
  - Step 2** On the **Servers** tab, expand **Servers ► Service Profiles**.
  - Step 3** Expand the node for the organization that includes the service profile that you want to update.  
If the system does not include multi-tenancy, expand the **root** node.
  - Step 4** Click the service profile to which you want to add the firmware packages.
  - Step 5** In the **Work** pane, click the **Policies** tab.
  - Step 6** Click the down arrows to expand the **Firmware Policies** section.
  - Step 7** To add a host firmware package, select the desired policy from the **Host Firmware** drop-down list.
  - Step 8** To add a management firmware package, select the desired policy from the **Management Firmware** drop-down list.
  - Step 9** Click **Save Changes**.
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# Verifying Firmware Versions on Components

## Procedure

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- |               |   |
|---------------|---|
| <b>Step 1</b> | In the <b>Navigation</b> pane, click the <b>Equipment</b> tab.                                |
| <b>Step 2</b> | On the <b>Equipment</b> tab, click the <b>Equipment</b> node.                                 |
| <b>Step 3</b> | In the <b>Work</b> pane, click the <b>Firmware Management</b> tab.                            |
| <b>Step 4</b> | On the <b>Installed Firmware</b> tab, review the firmware versions listed for each component. |
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## Managing the Capability Catalog

### Capability Catalog

The capability catalog is a set of tunable parameters, strings, and rules. Cisco UCS Manager uses the catalog to update the display and configurability of components such as newly qualified DIMMs and disk drives for servers.

The catalog is divided by hardware components, such as the chassis, CPU, local disk, and I/O module. You can use the catalog to view the list of providers available for that component. There is one provider per hardware component. Each provider is identified by the vendor, model (PID), and revision. For each provider, you can also view details of the equipment manufacture and the form factor.

### Contents of the Capability Catalog

The contents of the capability catalog include the following:

#### Implementation-Specific Tunable Parameters

- Power and thermal constraints
- Slot ranges and numbering
- Adaptor capacities

#### Hardware-Specific Rules

- Firmware compatibility for components such as the BIOS, CIMC, RAID controller, and adapters
- Diagnostics
- Hardware-specific reboot

#### User Display Strings

- Part numbers, such as the CPN, PID/VID
- Component descriptions
- Physical layout/dimensions

- OEM information

## Updates to the Capability Catalog

Each Cisco UCS Manager release contains a baseline catalog. When appropriate, Cisco releases an update to the capability catalog and makes it available on the same site where you download firmware images. The catalog update is compatible with Cisco UCS, Release 1.3(1) and above.

As soon as you download a capability catalog update, Cisco UCS Manager immediately updates to the new baseline catalog. You do not have to perform any further tasks. Updates to the capability catalog do not require you to reboot any component in the Cisco UCS instance, or reinstall Cisco UCS Manager.

## Obtaining Capability Catalog Updates from Cisco

### Procedure

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- Step 1** In a web browser, navigate to <http://www.cisco.com>.
- Step 2** Under **Support**, click **Download Software**.
- Step 3** Click **Unified Computing**.
- Step 4** Enter your Cisco.com username and password to log in.
- Step 5** Click **Cisco Unified Computing System**.
- Step 6** Click **Unified Computing System (UCS) Manager Capability Catalog**.
- Step 7** Under the **Latest Releases** folder, click the link for the latest release of the capability catalog. Images for earlier releases are archived under the **All Releases** link.
- Step 8** Click one of the following buttons and follow the instructions provided:
- **Download Now**—Allows you to download the catalog update immediately
  - **Add to Cart**—Adds the catalog update to your cart to be downloaded at a later time
- Step 9** Follow the prompts to complete your download of the catalog update.
- 

### What to Do Next

Update the capability catalog.

## Updating the Capability Catalog

You cannot perform a partial update to the capability catalog. When you update the capability catalog, all components included in the catalog image are updated.

### Before You Begin

Obtain the capability catalog update from [Cisco.com](http://Cisco.com).

## Procedure

- Step 1** In the **Navigation** pane, click the **Admin** tab.
- Step 2** On the **Admin** tab, expand **All**.
- Step 3** Click the **Capability Catalog** node.
- Step 4** In the **Work** pane, click the **Catalog Update Tasks** tab.
- Step 5** Click **Update Catalog**.
- Step 6** In the **Update Catalog** dialog box, complete the following fields:

Name	Description
<b>Protocol</b> field	The protocol to use when communicating with the remote server. This can be: <ul style="list-style-type: none"> <li>• <b>FTP</b></li> <li>• <b>TFTP</b></li> <li>• <b>SCP</b></li> <li>• <b>SFTP</b></li> </ul>
<b>Server</b> field	The IP address or hostname of the remote server on which the catalog image resides.
<b>Filename</b> field	The name of the catalog executable you want to download.
<b>Remote Path</b> field	The absolute path to the catalog image file on the remote server, if required.  If you use SCP, the absolute path is always required. If you use any other protocol, you may not need to specify a remote path if the file resides in the default download folder. For details about how your file server is configured, contact your system administrator.
<b>User</b> field	The username the system should use to log in to the remote server. This field does not apply if the protocol is TFTP.
<b>Password</b> field	The password for the remote server username. This field does not apply if the protocol is TFTP.

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

Cisco UCS Manager downloads the image and immediately updates the capability catalog. You do not need to reboot any hardware components or perform any other tasks for the update to take effect.

## Verifying that the Capability Catalog Is Current

### Before You Begin

### Procedure

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- Step 1** In the **Navigation** pane, click the **Admin** tab.
- Step 2** On the **Admin** tab, expand **All**.
- Step 3** Click the **Capability Catalog** node.
- Step 4** In the **Work** pane, click the **Catalog Update Tasks** tab.  
The current version of the capability catalog is located on the upper right of that tab.
- Step 5** On [Cisco.com](https://www.cisco.com), determine the latest release of the capability catalog available.  
For more information about the location of capability catalog updates, see [Obtaining Capability Catalog Updates from Cisco](#), page 38.
- Step 6** If a more recent version of the capability catalog is available on Cisco.com, update the capability catalog with that version.
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## Viewing a Capability Catalog Provider

### Procedure

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- Step 1** In the **Navigation** pane, click the **Admin** tab.
- Step 2** On the **Admin** tab, expand **All ► Capability Catalog**.
- Step 3** In the **Work** pane, click the tab for the provider you want to view.
- Step 4** To view the details of a provider, do the following:
- In the table, click the row with the vendor, model, and revision of the provider you want to view.
  - Click the **Expand** icon to the right of the heading to display the properties for the following areas:
    - **Equipment Manufacturing** area
    - **Form Factor** area
-