Overview

This chapter includes the following sections:

Overview of Firmware

Cisco UCS uses firmware obtained from and certified by Cisco to support the endpoints in a Cisco UCS domain. Each endpoint is a component in the Cisco UCS domain that requires firmware to function.

This document uses the following definitions for managing firmware:

Upgrade

Changes the firmware running on an endpoint to another image, such as a release or patch. Upgrade includes both update and activation.

Update

Copies the firmware image to the backup partition on an endpoint.

Activate

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.

For Management Extensions and Capability Catalog upgrades, update and activate occur simultaneously. You only need to update or activate those upgrades. You do not need to perform both steps.

Important Cisco UCS Manager Release 2.5 supports only Cisco UCS M-Series Servers. It does not support Cisco UCS B-Series Servers and Cisco C-Series Servers.

Components That Support Firmware Upgrade

The following components support firmware upgrade:

- Chassis:
  - Chassis Management Controller (CMC)
  - Shared Adapter
  - Storage Controller
  - Board Controller
- Server:
  - Cisco Integrated Management Controller (CIMC)
  - BIOS
  - Board Controller

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 firmware bundles 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 in each downloaded firmware bundle.

Images

The images view lists the component images available on the system. You cannot use this view to see complete firmware bundles or to group the images by bundle. 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 Versions

The firmware version terminology used depends upon the type of endpoint, as follows:

Firmware Versions in CIMC, BIOS, CMC and Shared Adapters

Each CIMC, BIOS, Shared Adapter, and CMC has two flashes for firmware. 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 recently activated version. 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.

The board controller and the storage controller do not have backup versions. Therefore, you can only activate them.

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.

Options for Firmware Upgrades

You can upgrade Cisco UCS firmware through one or more of the following methods:

Note For a summary of steps and the required order in which to perform them in order to upgrade one or more Cisco UCS domains from one release to another, see the Cisco UCS upgrade guide for that upgrade path. If an upgrade guide is not provided for upgrading from a particular release, contact Cisco TAC as a direct upgrade from that release may not be supported.

Upgrading a Cisco UCS domain through Cisco UCS Manager

If you want to upgrade a Cisco UCS domain through the Cisco UCS Manager in that domain, you can choose one of the following upgrade options:

- Upgrade infrastructure and servers with Auto Install—This option upgrades all infrastructure components in the first stage. Then you can upgrade all server endpoints through host firmware packages in the second stage.

  Note You cannot use Auto Install to update a Cisco UCS M-Series chassis.

- Upgrade servers through firmware packages in service profiles—This option enables you to upgrade all server endpoints in a single step, reducing the amount of disruption caused by a server reboot. You can combine this option with the deferred deployment of service profile updates to ensure that server reboots occur during scheduled maintenance windows.
- Direct upgrades of infrastructure and server endpoints—This option enables you to upgrade many infrastructure and server endpoints directly, including the fabric interconnects, shared adapters, and board controllers. However, direct upgrade is not available for all endpoints, including the server BIOS, storage controller, and local disk. You must upgrade those endpoints through the host firmware package included in the service profile associated with the server.

Configuration Changes and Settings that Can Impact Upgrades

Depending upon the configuration of your Cisco UCS domain, the following changes may require you to make configuration changes after you upgrade. To avoid faults and other issues, we recommend that you make any required changes before you upgrade.

Impact of Upgrade to Cisco UCS, Release 2.1(2) and Higher on Initiator IQNs Defined at the Service Profile Level

If there are two iSCSI vNICs and both use the same initiator IQN (which is supported in Cisco UCS Release 2.0(1)), upgrading creates a single service profile level initiator IQN and resets the initiator IQNs on the iSCSI vNICs to have no value.

If the same initiator IQNs are used in iSCSI vNICs across service profiles in Cisco UCS Release 2.0(1), the upgrade creates duplicate initiator IQNs at the service profile level. This configuration generates faults for each iSCSI vNIC that has a duplicate initiator IQN defined at the service profile level. Changing the duplicate initiator IQNs at the service profile level clears these faults. You must clear these faults before you perform any service profile related operations, such as updating a host firmware package.

Default Maintenance Policy Should be Configured for User Acknowledgment

The default maintenance policy is configured to immediately reboot the server when disruptive changes are made to the service profile, such as server firmware upgrades through a host maintenance policy. We recommend that you change the reboot policy setting in the default maintenance policy to user acknowledgment to avoid unexpected disruption of server traffic.

When you configure the reboot policy in the default maintenance policy to User Ack, the list of disruptive changes are listed with the pending activities. You can then control when the servers are rebooted.

Overlapping FCoE VLAN IDs and Ethernet VLAN IDs Are No Longer Allowed with Cisco UCS Release 2.0 and Higher

Caution In Cisco UCS 1.4 and earlier releases, Ethernet VLANs and FCoE VLANs could have overlapping VLAN IDs. However, starting with Cisco UCS release 2.0, overlapping VLAN IDs are not allowed. If Cisco UCS Manager detects overlapping VLAN IDs during an upgrade, it raises a critical fault. If you do not reconfigure your VLAN IDs, Cisco UCS Manager raises a critical fault and drops Ethernet traffic on the overlapped VLANs. Therefore, we recommend that you ensure there are no overlapping Ethernet and FCoE VLAN IDs before you upgrade to Cisco UCS Release 2.2.

Be aware that when an uplink trunk is configured with VLAN ID 1 defined and set as the native VLAN, changing the Ethernet VLAN 1 ID to another value can cause network disruption and flapping on the fabric interconnects, resulting in an HA event that introduces a large amount of traffic and makes services temporarily unavailable.

If you did not explicitly configure the FCoE VLAN ID for a VSAN in Cisco UCS 1.4 and earlier releases, Cisco UCS Manager assigned VLAN 1 as the default FCoE VLAN for the default VSAN (with default VSAN ID 1). In those releases, VLAN 1 was also used as the default VLAN for Ethernet traffic. Therefore, if you accepted the default VLAN ID for the FCoE VLAN and one or more Ethernet VLANs, you must reconfigure the VLAN IDs for either the FCoE VLAN(s) on the VSAN(s) or the Ethernet VLAN(s).

For a new installation of Cisco UCS Release 2.2, the default VLAN IDs are as follows:

- The default Ethernet VLAN ID is 1.
- The default FCoE VLAN ID is 4048.

After an upgrade from Cisco UCS Release 1.4, where VLAN ID 4048 was used for FCoE storage port native VLAN, to release 2.0, the default VLAN IDs are as follows:

- The default Ethernet VLAN ID is 1.
- The current default FCoE VLAN ID is preserved. Cisco UCS Manager raises a critical fault on the conflicting Ethernet VLAN, if any. You must change one of the VLAN IDs to a VLAN ID that is not used or reserved.

Note If a Cisco UCS domain uses one of the default VLAN IDs, which results in overlapping VLANs, you can change one or more of the default VLAN IDs to any VLAN ID that is not used or reserved. From release 2.0 and higher, VLANs with IDs from 4030 to 4047 are reserved.

Important VSAN, FC and FCoE are not supported in Cisco UCS Release 2.5.