



Prerequisites and Guidelines

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Overview

Before you upgrade the Cisco HX Data Platform and the Cisco UCS server firmware in your Cisco HyperFlex System, consider the guidelines, best practices, and recommendations listed in this chapter.

Prerequisites

1. See *Resolved Caveats* and *Open Caveats* before upgrading and review the *New Features* for this release. Refer to the latest [Cisco HX Data Platform Release Notes](#).
2. Review supported versions and system requirements. See [Hardware and Software Interoperability for Cisco HyperFlex HX-Series](#) for more details.



Important

- Verify that you have the latest software bundle versions, review the software versions. Refer to the latest [Cisco HX Data Platform Release Notes](#).
 - Ensure that the operating systems on all servers have the right driver levels for the release of Cisco UCS to which you plan to upgrade. See [Cisco UCS Driver Installation Guide](#) for identifying the server hardware.
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3. Back up the configuration into an **All Configuration** backup file. See [Cisco UCS Manager Backing Up and Restoring the Configuration Guide](#) for the detailed steps.

4. Before you perform firmware updates, use the Cisco UCS Manager Firmware Management interface to download relevant images to the fabric interconnect. Images are stored in bootflash partitions in the fabric interconnect. See [Downloading Software](#) for more details.
5. An ESXi upgrade may be required when upgrading to newer Cisco HyperFlex HX Data Platform versions. See the supported versions for each HX Data Platform version in [HyperFlex Software Versions, on page 4](#).
6. Keep SSH enabled on all ESXi Hosts.
7. Only default TCP/IP stack is supported for vMotion vmkernel adapters.
8. Enable vMotion so that the VMs can be moved automatically during the upgrade and MTUs are set as required in the environment.
9. If you have reregistered a cluster which has compute nodes, ensure that the compute nodes were re-added. Use the `stcli node add` command, before you attempt to upgrade the cluster.

Example:

```
# stcli node add --node-ips <computeNodeIP> --controller-root-password <ctlvm-pwd>
--esx-username <esx-user> --esx-password <esx-pwd>
```

10. Verify that the HyperFlex cluster is healthy.
11. Verify that the cluster is in lenient mode. If not, set the cluster to lenient mode, refer [Configure Lenient Mode](#).

Upgrade Guidelines

The list below is a highlight of critical criteria for performing an upgrade of your HyperFlex system.

- **Hypercheck Health Check Utility**— Cisco recommends running this proactive health check utility on your HyperFlex cluster prior to upgrade. These checks provide early visibility into any areas that may need attention and will help ensure a seamless upgrade experience. See the [technote](#) for full instructions on how to install and run Hypercheck.
- **Software Advisory for M5 ESXi 6.0 Clusters**—For clusters running on ESXi 6.0, carefully review the related [Software Advisory](#).
- **Required vCenter upgrade**—For enhanced security, HXDP release 3.0(1a) and later requires the use of TLS 1.2. Therefore, vCenter must be upgraded to 6.0 U3c or later prior to upgrading to HX 3.0. In addition, ESXi should be upgraded to 6.0 U3 or 6.5 U1 to meet HXDP 3.0 compatibility requirements.
- **Minimum HXDP version for upgrade**—HXDP clusters running 1.8(1f) or later may upgrade directly to 3.0.
- **HX Data Platform 1.7.x and 1.8.x clusters**—Users upgrading from 1.7.x or 1.8.x prior to 1.8(1f) must step through an intermediate version before upgrading to 3.0 or later releases. For more information, see the [Cisco HyperFlex Systems Upgrade Guide](#).
- **Cluster Readiness**—Ensure that the cluster is properly bootstrapped and the updated plug-in loaded before proceeding. **Cluster bootstrap is required for every upgrade.**

- **Initiating Upgrade**—Use either the CLI `stcli` commands or the HX Data Platform Plug-in to the vSphere Web Client when upgrading from a pre-2.5(1a) release. Use the HX Connect UI when upgrading from 2.5(1a) or later releases. Do not use the Tech Preview UI (pre-2.5) for upgrades.
- **Complete your Upgrade**—The self-healing (or rebalance) capability is disabled temporarily during the upgrade window; If the upgrade fails, you should complete the upgrade as soon as possible.
- **vSphere 5.5 Upgrades**—Users on vSphere 5.5 must upgrade to 6.0 U3/6.5 U1 before starting HX Data Platform upgrade. vSphere 5.5 support was deprecated with HX Data Platform 2.5(1a) and upgrade fails if attempted.
 - For HX220 users running 5.5, contact TAC for upgrade assistance.
 - For HX240 users running 5.5, upgrade components in the following order.
 1. Upgrade vCenter to 6.0 U3c or 6.5 U1. If upgrading to 6.5, you must upgrade your vCenter in place. Using a new vCenter 6.5 is not supported for users migrating from 5.5.
 2. Upgrade ESXi to 6.0/6.5 using the offline zip bundle.



Note During upgrade, it might be necessary to reconnect ESXi host manually in vCenter after ESXi upgrade and host reboot.

3. Upgrade HX Data Platform (and optionally the UCS firmware).
- **If Upgrading to vSphere 6.5:**
 - Certain cluster functions such as native and scheduled snapshots, ReadyClones, and Enter/Exit HX Maintenance Mode will not operate from the time the upgrade is started until the HX Data Platform upgrade to 2.5 or later is complete.
 - After upgrading ESXi using the offline zip bundle, use the ESX Exit Maintenance Mode option. The HX Exit Maintenance Mode option does not operate in the vSphere Web Client until the HX Data Platform upgrade is complete.
 - **vSphere 6.0 Upgrades**—Users on vSphere 6.0 migrating to 6.5, upgrade components in the following order:
 1. HX Data Platform upgrade (and optionally the UCS firmware).
 2. Upgrade vCenter Server following VMware documentation and best practices. Optionally, deploy a new vCenter server and perform `stcli cluster reregister`.
 3. Upgrade ESXi to 6.5 using the offline zip bundle.
 - **M4 Server Firmware Upgrades**—Server firmware should be upgraded to ensure smooth operation and to correct known issues. Specifically, newer SAS HBA firmware is available in this release and is recommended for long-term stability.

**Note**

- Users are encouraged to upgrade to 3.1(3c) C-bundle or later whenever possible.
- Users running C-bundle versions prior to 3.1(2f) must upgrade server firmware by performing a combined upgrade of UCS server firmware (C-bundle) to 3.1(3c) or later and HX Data Platform to 2.5. Do not split the upgrade into two separate operations.
- If the cluster is already on 3.1(2f) C-bundle or later, you may perform an HX Data Platform only or combined upgrade, as required.

- **M5 Server Firmware Upgrades**—M5 generation servers must run firmware version 3.2(1d) or later.
- **Firmware Downgrades** — Downgrading UCSM from the HX-installer is not supported.
- **M4/M5 Mixed Domains**—A mixed domain occurs when a new, separate M5 cluster is installed under the same UCS domain that contains existing M4 cluster(s). Under these conditions, orchestrated UCS server firmware upgrade will not operate until HX Data Platform 2.6 or later is installed on the M4 clusters. Therefore, it is best practice to first upgrade UCS server firmware to the latest 4.0(1) patch release prior to adding a new M5 cluster to the existing UCS domain. Additionally, any 1.7 HX Data Platform clusters must first be upgraded prior to adding any new M5 clusters to the same domain.
- **Maintenance Window**—If upgrading both HX Data Platform and UCS firmware, either a combined or split upgrade can be selected through the vSphere HX Data Platform Plug-in depending on the length of the maintenance window. Direct firmware upgrade using server firmware auto install through Cisco UCS Manager should not be attempted. Instead, use the UCS server upgrade orchestration framework provided by the HX Data Platform.
- **HX Data Platform 2.1(1b) with SED**—Upgrading SED-ready systems running 2.1 require UCS infrastructure and server firmware upgrades.

HyperFlex Software Versions

The HX components—Cisco HX Data Platform Installer, Cisco HX Data Platform, and Cisco UCS firmware—are installed on different servers. Verify that each component on each server used with and within an HX Storage Cluster are compatible.

- **HyperFlex does not support UCS Manager and UCS Server Firmware versions 4.0(4a), 4.0(4b), and 4.0(4c).**

**Important**

Do not upgrade to these versions of firmware.

Do not upgrade to these versions of UCS Manager.

- Verify that the preconfigured HX servers have the same version of Cisco UCS server firmware installed. If the Cisco UCS Fabric Interconnects (FI) firmware versions are different, see the [Cisco HyperFlex Systems Upgrade Guide](#) for steps to align the firmware versions.

- **M4:** For NEW hybrid or All Flash (Cisco HyperFlex HX240c M4 or HX220c M4) deployments, verify that Cisco UCS Manager 3.1(3j) or later is installed. Contact Cisco TAC for guidance.
- **M5:** For NEW hybrid or All Flash (Cisco HyperFlex HX240c M5 or HX220c M5) deployments, verify that Cisco UCS Manager 3.2(3i) or later is installed.
- For SED-based HyperFlex systems, ensure that the A (Infrastructure) and C (Rack server) bundles are at Cisco UCS Manager version 3.1(3h) or higher for M4 SED systems. Ensure that all bundles are at Cisco UCS Manager version 3.2(3i) or higher for M5 SED systems.
- To reinstall an HX server, download supported and compatible versions of the software. See the [Cisco HyperFlex Systems Installation Guide for VMware ESXi](#) for the requirements and steps.
- Cisco UCS Manager version 4.0(1a) is supported on HX Data Platform version 3.0(1e) and later.

Table 1: HyperFlex Software Versions for M4/M5 Servers

HyperFlex Release	M4 Recommended FI/Server Firmware *(be sure to review important notes above)	M5 Recommended FI/Server Firmware *(be sure to review important notes above)
3.0(1i)	3.2(3h), 3.1(3j)	3.2(3h)
3.0(1h)	3.2(3h), 3.1(3j)	3.2(3h)
3.0(1e)	3.2(3h), 3.1(3j)	3.2(3h)
3.0(1d)	3.2(3h), 3.1(3h)	3.2(3h)
3.0(1c)	3.2(3h), 3.1(3h)	3.2(3h)
3.0(1b)	3.2(3d), 3.1(3h)	3.2(3d)
3.0(1a)	3.2(3d), 3.1(3f)	3.2(3d)
2.6(1e)	3.2(3d), 3.1(3f)	3.2(3d)
2.6(1d)	3.2(3d), 3.1(3c)	3.2(3d)
2.6(1b)	3.2(2d), 3.1(3c)	3.2(2d)
2.6(1a)	3.2(2d), 3.1(3c)	3.2(2d)

Supported Upgrade Paths

The following four table matrices map the supported upgrade paths for Cisco HyperFlex Systems.

Cisco HX Data Platform Matrix

Cisco HX Data Platform Current Version	Supported Upgrade Paths Desired version					
	3.0(1x)	2.6(1x)	2.5(1x)	2.1(1x)	2.0(1x)	1.8(1x)
2.6(1x)	Yes	—	—	—	—	—
2.5(1x)	Yes	Yes	—	—	—	—
2.1(1x)	Yes	Yes	Yes	—	—	—
2.0(1x)	Yes	Yes	Yes	Yes	—	—
1.8(1f)	Yes	Yes	Yes	Yes	Yes	—
1.8(1a) to 1.8(1e) 1	—	Yes	Yes	Yes	Yes	—
1.7.x 2	—	—	—	Yes	Yes	Yes

¹ Direct upgrade from 1.8.1a to 1.8.1e to any release beyond 2.6(1x) is not supported. See [Upgrading a 1.8.x HyperFlex Cluster, on page 9](#) for more details.

² Direct upgrade from 1.7.x to any release beyond 2.1(1x) is not supported. See [Upgrading a 1.7.x HyperFlex Cluster, on page 9](#) for more details.

Cisco UCS Manager Matrix

Cisco UCS Manager Current Version	Supported Upgrade Paths Desired Version									
	3.2(3g)	3.2(3d)	3.2(2d)	3.1(3j)	3.1(3h)	3.1(3f)	3.1(3c)	3.1(2g)	3.1(2f)	3.1(2b)
3.2(3d)	Yes	—	—	—	—	—	—	—	—	—
3.2(2d)	Yes	Yes	—	—	—	—	—	—	—	—
3.1(3h)	Yes	Yes	Yes	Yes	—	—	—	—	—	—
3.1(3f)	Yes	Yes	Yes	Yes	Yes	—	—	—	—	—
3.1(3c)	Yes	Yes	Yes	Yes	Yes	Yes	—	—	—	—
3.1(2g)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	—

Cisco UCS Manager Current Version	Supported Upgrade Paths									
	Desired Version									
3.1(2f)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—
3.1(2b)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—

VMware ESXi Matrix

- ESXi 5.5 support is deprecated with HXDP 2.5.
 - If running ESXi 5.5 U3 on HX220, contact TAC for upgrade guidance.
 - If running ESXi 5.5 U3 on HX240, see [Upgrade Guidelines, on page 2](#) for further details.
- If you have the ESXi 6.0 U1 version, we recommend an ESXi upgrade. There is a known VMware issue where the node becomes unresponsive due to a PSOD and OS crash. See VMware KB article, [VMware ESXi 6.0, Patch ESXi600-201608401-BG: Updates esx-base, vsanhealth, vsan VIBs \(2145664\)](#).



Attention

Upgrade to vCenter 6.0 U3c or later is required, due to TLS 1.2 support. Be sure to upgrade vCenter prior to upgrading the HX cluster.

VMware ESXi Current Version	Supported Upgrade Paths				
	Desired Version				
	6.5 U2	6.5 U1	6.0 U3	6.0 U2 (All Patch Levels)	6.0 U1b
6.5 U1	Yes	—	—	—	—
6.0 U3	Yes	Yes	—	—	—
6.0 U2 (All Patch Levels)	Yes	Yes	Yes	—	—
6.0 U1b	Yes	Yes	Yes	Yes	—
5.5 U3 (Only on HX240c)	Yes	Yes	Yes	Yes	Yes

Cisco HX Data Platform Versions Supported by Cisco UCS Manager

Cisco UCS Manager Version	Cisco HX Data Platform						
		3.0(1x)	2.6(1x)	2.5(1x)	2.1(1x)	2.0(1x)	1.8(1x)

Cisco UCS Manager Version	Cisco HX Data Platform						
3.2(3g)	Yes Supports hybrid, All Flash, M4 and M5 servers	Yes Supports hybrid, All Flash, M4 and M5 servers	—	—	—	—	—
3.2(3d)	Yes Supports hybrid, All Flash, M4 and M5 servers	Yes Supports hybrid, All Flash, M4 and M5 servers	—	—	—	—	—
3.2(2d)	Yes Supports hybrid, All Flash, M4 and M5 servers	Yes Supports hybrid, All Flash, M4 and M5 servers	Yes Supports hybrid, All Flash and M4 servers	Yes Supports hybrid, All Flash, and M4 servers	Yes Supports hybrid, All Flash and M4 servers	Yes	—
3.1(3j)	Yes Supports hybrid, All Flash, and M4 servers	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes	—
3.1(3h)	Yes Supports hybrid, All Flash, and M4 servers	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes	—
3.1(3f)	Yes Supports hybrid, All Flash, and M4 servers	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes	—
3.1(3e)	Yes Supports hybrid, All Flash, and M4 servers	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes	—

Cisco UCS Manager Version	Cisco HX Data Platform						
	3.1(2g)	—	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes Supports hybrid and All Flash	Yes
3.1(2f)	—	—	—	—	Yes Supports hybrid and All Flash	Yes	—
3.1(2b)	—	—	—	—	Yes Supports hybrid	Yes	—

Upgrading a 1.8.x HyperFlex Cluster

Users with clusters running HXDP 1.8.x need to follow the current upgrade path located in the [Cisco HyperFlex Systems Upgrade Guide for Unsupported Cisco HX Releases](#) guide.

Upgrading a 1.7.x HyperFlex Cluster

Users with clusters running HXDP 1.7.x need to refer to the [Upgrading Cisco HyperFlex 1.7](#) section of the [Cisco HyperFlex Systems Upgrade Guide for Unsupported Cisco HX Releases](#) guide.

Upgrading SED Ready Systems

SED-ready systems are HyperFlex clusters running HXDP 2.1(1b) with self-encrypting drives (SEDs) installed. UCS Manager must be upgraded to 3.1(3c) or later. In addition, UCS server firmware (C-bundle) must be upgraded to 3.1(3c) or later. Either combined or split upgrade may be used, so long as all the cluster nodes are upgraded prior to enabling key management in HX Connect.



Caution

During an upgrade, a flag-based check (True/False) is used to determine if the system is SED capable or not. If the system is SED-ready, this flag (set to true) will not allow the non-SED systems to become part of the cluster. If there is an issue when SED capability information for cluster is gathered, the upgrade script might toggle this flag to the default value (False). In which case, all the SED drives on the node are replaced with non-SED disks and the upgrade proceeds with non-SED disks as well. Eventually, this may result in the risk of writing data on that node in unencrypted form.

Cautions and Recommendations

Before you begin upgrade of a Cisco HyperFlex System, consider the following cautions, guidelines, and limitations.



Important

- If you have to upgrade from VMware ESXi version 5.5 U3 on HX220, contact Cisco TAC for assistance.
- If you are running HyperFlex release 3.5(1a) or later, you can upgrade the Cisco HX Data Platform by performing the auto-bootstrap process from the HX Connect UI ([Auto Bootstrap Upgrade Process from HX Connect UI](#)).
- Cisco recommends using GUI upgrade over CLI for ease of use and better reporting.
- When Upgrade is complete, for each browser interface you use, empty the cache and reload the browser to page to refresh the HX content.
- Ensure that all nodes (including compute nodes) are up and running and the cluster is healthy before starting an upgrade or other maintenance activities.
- The Cisco HX Data Platform and Cisco UCS firmware bundles must be compatible. Refer [UCS Hardware and Software Compatibility Matrix](#) for more details.
- For a split upgrade, Cisco HX Data Platform should be updated first before updating the Cisco UCS firmware.
- During online upgrade, as one node is being upgraded (put into maintenance mode), the number of tolerated node failures is reduced based on the **Data Replication Factor** and **Access Policy** settings.
- Only default TCP/IP stack is supported for vMotion vmkernel adapters.
- All endpoints in a Cisco HyperFlex domain must be fully functional and all processes must be complete before you begin a firmware upgrade on those endpoints. For example, the firmware on a server that has not been discovered cannot be upgraded or downgraded. Each endpoint is a component in the Cisco HyperFlex domain that requires firmware to function.
- In a three node cluster, if you shut down one node or put into maintenance mode it makes the cluster unhealthy, but the cluster is still online. If you need to perform manual maintenance, put the hosts in maintenance mode one at a time and move to the next host only after the cluster is healthy. For HXDP and UCS server firmware upgrades, this process is automatic.



Note You cannot remove a node from 3-node cluster by doing `stcli node remove` operation. To replace a node on a 3-node cluster, please contact Cisco TAC for assistance with the node replacement procedure.