



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 5](#).
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. See [Configuring vMotion Interfaces](#) for details on adding VMkernel interface.
9. Verify that the HyperFlex cluster is healthy. See [HyperFlex Node Upgrade Validations](#) for more details.
10. Verify that the cluster is in lenient mode. If not, set the cluster to lenient mode, refer [Configure Lenient Mode](#).

Upgrade Guidelines

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

- **CPU upgrade from First Generation Intel Xeon Scalable Processors to Second Generation Intel Xeon Scalable Processors is not supported**—In place CPU upgrade or swap from First Generation Intel Xeon Scalable Processors to Second Generation Intel Xeon Scalable Processors (for example, HX-CPU-6148 to HX-CPU-I6248) is not supported for HX converged nodes.
- **Upgrade to the latest Witness VM for Stretch Clusters only**—For customers implementing stretch clusters on Cisco HX Data Platform release 3.5(2f), upgrading to the latest Witness VM - 1.0.6 is mandated.
- **HX Data Platform 1.7.x, 1.8.x, 2.0 and 2.1x clusters**—Users from any version prior to 2.6(1a) must step through an intermediate version before upgrading to 4.0 or later releases. If you need to upgrade your environment from a Cisco HyperFlex HX Data Platform software release that is past the last date of support, to the latest suggested release on the Cisco Software Download site, see [Cisco HyperFlex Systems Upgrade Guide for Unsupported Cisco HX Releases](#). For more information, see the [Software Advisory for CSCvq66867: WARNING: Only Use HXDP 2.6\(1e\) Upgrade Package When Upgrading From HXDP 1.8\(1a\)-1.8\(1e\)](#).
- **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. For more information see the [Hyperflex Health & Pre-Upgrade Check Tool](#) TechNote for full instructions on how to install and run Hypercheck.
- **Required vCenter upgrade**—For enhanced security, Cisco HX Data Platform release 3.5(1a) or later requires the use of TLS 1.2. Therefore, vCenter must be upgraded to 6.0 U3f or later before upgrading to HX 3.5. In addition, ESXi should be upgraded as required to meet HX Data Platform compatibility requirements.
- **Required vCenter upgrade**—For enhanced security, Cisco HX Data Platform release 3.0(1a) and later requires the use of TLS 1.2. Therefore, vCenter must be upgraded to 6.0 U3c or later before upgrading

to Cisco HX Data Platform release 3.0. In addition, ESXi should be upgraded as required to meet HX Data Platform compatibility requirements.

- **Minimum HXDP version for upgrade**—HX Data Platform clusters running 2.1(1x) or later may upgrade directly to 3.5 using the vCenter plug-in.
- **Minimum HXDP version for upgrade**—HX Data Platform 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 before 2.0(1a) 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 is loaded before proceeding. Manual cluster bootstrap is required for upgrade from a pre-3.5 release to 3.5.
- **Cluster Readiness**—For all upgrades from Cisco HX Data Platform releases prior to release 3.5(1a), ensure that the cluster is properly bootstrapped following the procedure in the [Cisco HyperFlex Systems Upgrade Guide](#). Do not skip this cluster bootstrap step as it is required for every upgrade until release 3.5(1a). Upgrades from 3.5(1a) and later will be automatically bootstrapped using the HX Connect UI. For more information, see the [Cisco HyperFlex Systems Upgrade Guide](#).
- **Initiating Upgrade**—Use the HX Connect UI or CLI `stcli` commands when upgrading from 2.5(1a) or later releases. 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. The vCenter plug-in should not be used for upgrades starting with the 2.5(1a) release.
- **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 U3f or later. 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 or Exit HX Maintenance Mode will not operate from the time the upgrade is started until the HX Data Platform upgrade to 3.5 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.
- **If Upgrading to vSphere 6.5:**
 - Certain cluster functions such as native and scheduled snapshots, ReadyClones, and Enter or 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. Upgrade HX Data Platform and UCS firmware.
 2. Upgrade HX Data Platform and ESXi.
 3. Upgrade HX Data Platform only first, then upgrade ESXi or UCS firmware or both.
- **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 Release 3.1(3c) C-bundle or later whenever possible.
 - Users running C-bundle versions before 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.
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- **M5 Server Firmware Upgrades**—M5 generation servers must run firmware version 3.2(2d) 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 Cisco HX Data Platform, Release 2.6 or later is installed on the M4 clusters. Therefore, it is best practice to first upgrade UCS server firmware to the latest 3.1(3) or 3.2(2) patch release before adding a new M5 cluster to the existing UCS domain. Additionally, any 1.7 HX Data Platform clusters must first be upgraded before 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. Cisco UCS Manager infrastructure upgrade is only supported using AutoInstall and the direct server firmware upgrade should be performed only through the upgrade orchestration framework provided by the HX Data Platform Plug-in.

- **Cisco HX Data Platform 2.1(1b) with Self-Encrypting Drives (SEDs)**—Upgrading SED-ready systems running 2.1 requires UCS infrastructure and server firmware upgrades. For more information, see [Field Notice \(70234\)](#) and [CSCvk17250](#).
- **Unsupported Self-Encrypting Drives (SEDs)**—If adding or replacing self-encrypting drives (SEDs) that have been recently qualified in newer versions of HX Data Platform, insert the new drives only after upgrading HX Data Platform to a compatible version.
- **Admin User Account** - Users may need to reset the cluster admin password if upgrading from a cluster initially deployed with Cisco HX Data Platform, Release 1.7, or if the password was manually changed after deployment. For more information, see the [Cisco HyperFlex Systems Upgrade Guide](#).

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(3k), 3.2(3i), or 4.0(2d) is installed.
 - **M5:** For NEW hybrid or All Flash (Cisco HyperFlex HX240c M5 or HX220c M5) deployments, verify that the recommended UCS firmware version is installed.



Important If you are upgrading Cisco UCS Manager 4.0(2a) or 4.0(2b) in the presence of more than one Nvidia GPUs, please remove the GPUs, perform the upgrade and reinstall. For more details, see [CSCvo13678](#).



Important For SED-based HyperFlex systems, ensure that the A (Infrastructure), B (Blade server) and C (Rack server) bundles are at Cisco UCS Manager version 4.0(2b) or later for all SED M4/M5 systems. For more details, see [CSCvh04307](#). For SED-based HyperFlex systems, also ensure that all clusters are at HyperFlex Release 3.5(2b) or later. For more information, see [Field Notice \(70234\)](#) and [CSCvk17250](#).

- 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.
- Please review the [Release Notes](#) for the recommended FI/Server Firmware.

Table 1: HyperFlex Software Versions for M4/M5 Servers (Non-SED)

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)
3.5(2h)	4.0(4g)	4.0(4g)
3.5(2g)	4.0(4e)	4.0(4e)
3.5(2f)	4.0(4e)	4.0(4e)
3.5(2e)	4.0(4e)	4.0(4e)
3.5(2d)	4.0(4e)	4.0(4e)
3.5(2c)	Release Deferred	
3.5(2b)	4.0(2d), 3.2(3i), 3.1(3k)	4.0(2d)
3.5(2a)	4.0(1c), 3.2(3i), 3.1(3k)	4.0(1c)
3.5(1a)	4.0(1b), 3.2(3h), 3.1(3j)	4.0(1a)

Supported Upgrade Paths

When upgrading from a previous Cisco HyperFlex release, please follow these guidelines:

- For customers on Release 1.8(1e) or earlier, upgrade to Release 2.6(1e) as the first hop, then follow through by upgrading to the latest support release, for example, Release 3.5(2x) or Release 4.0(1x).
- For customers on Releases between 1.8(1f) and 2.0(1x), upgrade to Release 3.0(1i) as the first hop, then follow through by upgrading to the latest support release, for example, Release 3.5(2x) or Release 4.0(1x).
- For customers on Release 2.1(1a) or later, upgrade to the latest supported Release 3.5(x) directly.

Cisco UCS Manager Matrix

Cisco UCS Manager Current Version	Supported Upgrade Paths										
	Desired Version										
	4.0(1a)	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(3g)	Yes	—	—	—	—	—	—	—	—	—	—
3.2(3d)	Yes	Yes	—	—	—	—	—	—	—	—	—
3.2(2d)	Yes	Yes	Yes	—	—	—	—	—	—	—	—
3.1(3j)	Yes	Yes	Yes	Yes	—	—	—	—	—	—	—
3.1(3h)	Yes	Yes	Yes	Yes	Yes	—	—	—	—	—	—
3.1(3f)	Yes	Yes	Yes	Yes	Yes	Yes	—	—	—	—	—
3.1(3c)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	—	—
3.1(2g)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—	—
3.1(2f)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	—	—
3.1(2b)	Yes	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 U3f 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					
	6.7 U1	6.5 U2	6.5 U1	6.0 U3	6.0 U2 (All Patch Levels)	6.0 U1b

VMware ESXi Current Version	Supported Upgrade Paths					
	Desired Version					
6.5 U2	Yes	Yes	Yes	—	—	—
6.5 U1	Yes	Yes	Yes	—	—	—
6.0 U3	Yes	Yes	Yes	—	—	—
6.0 U2 (All Patch Levels)	Yes	Yes	Yes	Yes	—	—
6.0 U1b	Yes	Yes	Yes	Yes	Yes	—
5.5 U3 (Only on HX240c)	No	Yes	Yes	Yes	Yes	Yes

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

Cisco HX Data Platform Versions Supported by Cisco UCS Manager

Cisco UCS Manager Version	Cisco HX Data Platform							
	3.5(x)	3.0(1x)	2.6(1x)	2.5(1x)	2.1(1x)	2.0(1x)	1.8(1x)	1.7.x
4.0(1a)	Yes Supports hybrid, All Flash, M4 and M5 servers	Yes Supports hybrid, All Flash, M4 and M5 servers	Yes Supports hybrid, All Flash, M4 and M5 servers	—	—	—	—	—

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	Yes Supports hybrid, All Flash, M4 and M5 servers	—	—	—	—	—
3.2(3g)	Yes Supports hybrid, All Flash, M4 and M5 servers	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	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, 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, M4 and M5 servers	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(3h)	Yes Supports hybrid, All Flash, M4 and M5 servers	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, M4 and M5 servers	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(3c)	Yes Supports hybrid, All Flash, M4 and M5 servers	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(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	—

Upgrade from Pre 3.5(1x) Releases

Clusters running HX Data Platform before 2.1(1c) must be first upgraded to an intermediate release. Refer to the following table to upgrade your existing HyperFlex cluster to 3.5(1x).

From Version	1.7(1x)	1.8(1x)	2.0(1x)	2.1(1c)	2.5(1x) and Up
To 3.5(1x)	<ol style="list-style-type: none"> Upgrade to 2.1(1c) Upgrade to 3.5(1x) using the vCenter plug-in. 	<ol style="list-style-type: none"> Cisco recommends upgrading to 2.5(1x). You may upgrade to either 2.1(1c), 2.5(1x), or 2.6(1x). Upgrade to 3.5(1x) using HX Connect. 	<ol style="list-style-type: none"> Cisco recommends upgrading to 2.6(1x). You may upgrade to either 2.5(1x), 2.6(1x), or 3.0(1x). Upgrade to 3.5(1x) using HX Connect. 	Directly upgrade to 3.5(1x) using the vCenter plug-in.	Directly upgrade to 3.5(1x) using HX Connect.

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.
