



Cisco HyperFlex Edge Deployment Guide, Release 3.5

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CHAPTER 1

Technology Use Case

- [Cisco HyperFlex Edge, on page 1](#)

Cisco HyperFlex Edge

Introduction

Cisco HyperFlex Edge brings the simplicity of hyperconvergence to remote and branch office (ROBO) and edge environments. This document describes the deployment for HyperFlex Edge.

Limitations and Supportability Summary

Limitation for	Support
Cluster type	HX220c M4 Hybrid Cluster HX220c M5 Hybrid Cluster HXAF220c M4 All-Flash Cluster HXAF220c M5 All-Flash Cluster
Cluster Size	3 nodes. Cluster expansion workflow is not supported in HyperFlex Edge configuration.
Replication Factor	2
Networking	1GE or 10GE networking without Cisco UCS Fabric Interconnects. HX Edge Systems do not implement QoS.
HX clusters per vCenter	Up to 100



CHAPTER 2

Deployment Options

- [HyperFlex Edge Deployment Options, on page 3](#)

HyperFlex Edge Deployment Options

HyperFlex Edge can be deployed using Cisco Intersight from the cloud or by using the on-premise installer appliance. You can choose between the following two options depending on your requirements:

- **HyperFlex On-Premise OVA Installer**—Use this option for on-premise Edge deployments for three and four node clusters. This type of deployment supports all three network topologies, and requires download and installation of the appliance along with local network access.



Note Use of the on-premises installer is not support for two node HyperFlex Edge clusters.

- **Intersight Installer**—Use this option for Edge to deploy HyperFlex Edge from the cloud. This deployment option supports all Edge cluster sizes and network topologies.

This guide covers deployment using the on-premise OVA installer only.

To deploy an HyperFlex Edge cluster using Cisco Intersight, see [Cisco HyperFlex Systems Installation Guide for Cisco Intersight](#) for detailed deployment instructions. The Cisco Intersight HX installer rapidly deploys HyperFlex Edge clusters. The installer constructs a pre-configuration definition of your cluster, called an HX Cluster Profile. This definition is a logical representation of the HX nodes in your HX Edge cluster. Each HX node provisioned in Cisco Intersight is specified in a HX Cluster profile.

Additional guest VM VLANs are optional. You may use the same management VLAN above for guest VM traffic in environments that wish to keep a simplified flat network design.



Note Each cluster should use a unique storage data VLAN to keep all storage traffic isolated. Reuse of this VLAN across multiple clusters is highly discouraged.



Note Due to the nature of the Cisco VIC carving up multiple vNICs from the same physical port, it is not possible for guest VM traffic configured on vswitch-hx-vm-network to communicate L2 to interfaces or services running on the same host. It is recommended to either a) use a separate VLAN and perform L3 routing or b) ensure any guest VMs that need access to management interfaces be placed on the vswitch-hx-inband-mgmt vSwitch. In general, guest VMs should not be put on any of the HyperFlex configured vSwitches except for the vm-network vSwitch. An example use case would be if you need to run vCenter on one of the nodes and it requires connectivity to manage the ESXi host it is running on. In this case, use one of the recommendations above to ensure uninterrupted connectivity.



CHAPTER 3

System Requirements and Pre-install Worksheet

- [About this chapter, on page 5](#)
- [Single Switch Configuration, on page 5](#)
- [Dual Switch Configuration, on page 8](#)
- [10/25GE Switch Configuration, on page 11](#)
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- [Intersight Connectivity, on page 21](#)

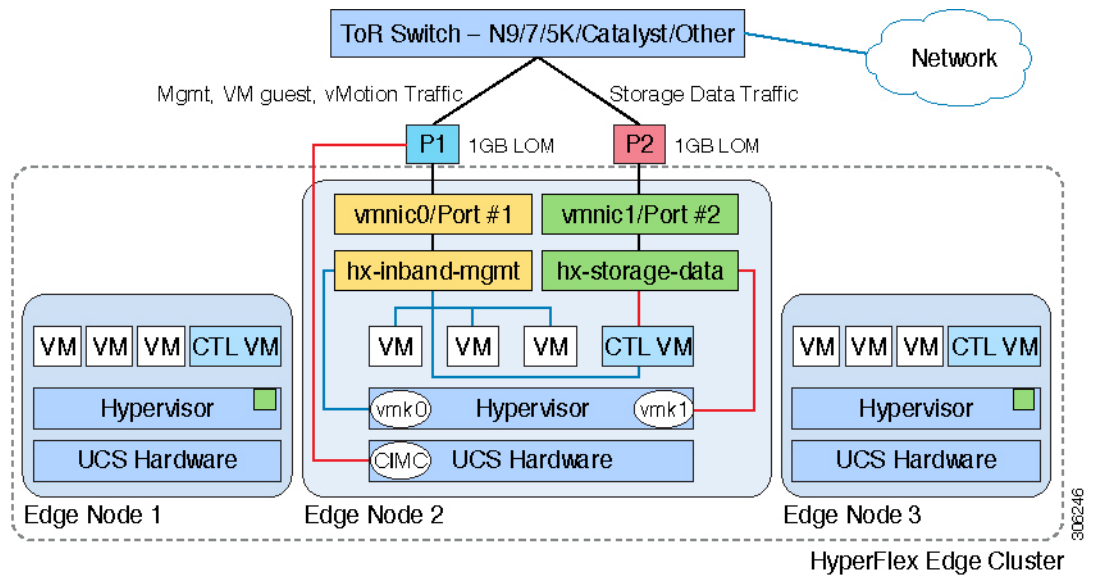
About this chapter

The Cisco HyperFlex Edge product supports three networking topologies: **Single 1GbE switch**, **Dual 1GbE**, and **10GbE switch (either single or dual)** configuration depending on requirements and the available switching hardware. This chapter describes specific requirements for each topology, as well as common network requirements that apply to all three topologies.

Single Switch Configuration

Single switch configuration provides a simple topology requiring only a single switch, and two 1GE ports per server. Link or switch redundancy is not provided. Access ports and trunk ports are the two supported network port configurations.

Network Topology



Upstream Network Requirements

- A managed switch with VLAN capability
- Six physical 1GE ports for three HyperFlex nodes
- Jumbo frames are not required to be configured
- Portfast or portfast trunk should be configured on all ports to ensure uninterrupted access to Cisco Integrated Management Controller (CIMC)

Virtual Network Requirements

The recommended configuration for each ESXi calls for the following networks to be separated:

- Management traffic network
- Data traffic network
- vMotion network
- VM network

The minimum network configuration requires at least two separate networks:

- Management network (includes vMotion and VM network)
- Data network (for storage traffic)

Two vSwitches each carrying different networks are required:

- **vswitch-hx-inband-mgmt**—ESXi management (vmk0), storage controller management, vMotion (vmk2), VM guest portgroups
- **vswitch-hx-storage-data**—HyperFlex storage data network, Hypervisor storage interface (vmk1)



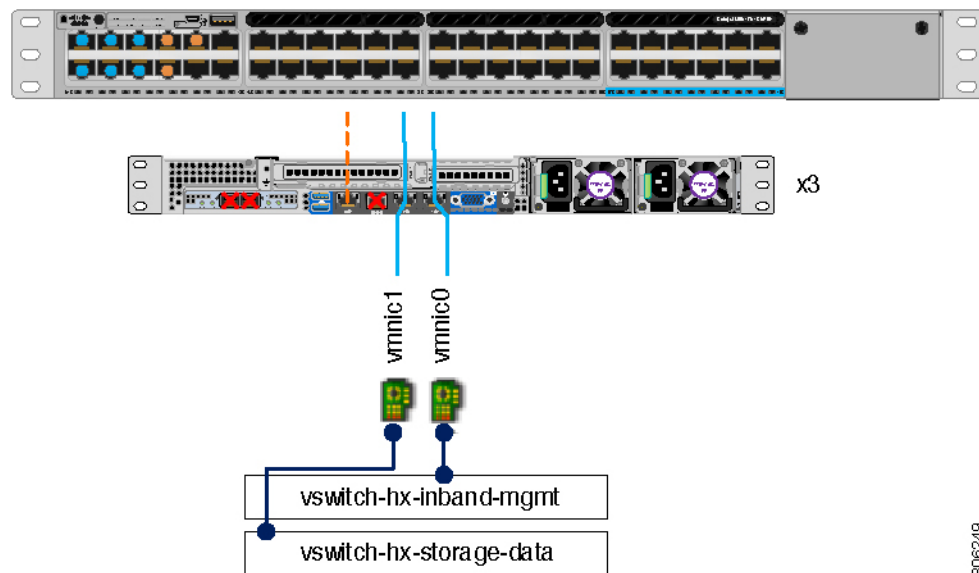
Note After some HyperFlex Edge deployments using the single switch configuration, it is normal to see the storage data vSwitch and associated portgroup failover order with only a standby adapter populated. The missing active adapter does not cause any functional issue with the cluster and we recommend leaving the failover order as configured by the installation process.

Port Requirements

Two 1GE ports are required per server:

- Port 1—management (ESXi and CIMC), vMotion traffic, and VM guest traffic
- Port 2—HyperFlex storage traffic
- There are two supported network port configurations: access ports or trunk ports.
- Spanning tree portfast (access ports) or portfast trunk (trunk ports) must be enabled for all network ports connected to HyperFlex servers.
 - Failure to configure portfast causes intermittent CIMC disconnects during ESXi bootup and longer than necessary network re-convergence during physical link failure.
- To decide if your deployment will use access ports or trunk ports, see the following section "About Access and Trunk Ports".

Physical network topology guidance:



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- Cable both integrated LOM ports to the same ToR switch.
- If desired, cable the dedicated CIMC port to the same switch or to an out-of-band management switch.
- Do not use the 10GE ports on the VIC.

About Access and Trunk Ports

Ethernet interfaces can be configured either as access ports or trunk ports, as follows:

- An access port can have only one VLAN configured on the interface; it can carry traffic for only one VLAN.
- A trunk port can have one or more VLANs configured on the interface; it can carry traffic for several VLANs simultaneously.

The following table summarizes the differences between access and trunk ports. You can use the details described in this table to determine which ports to use for your deployment.



Important

Trunk ports are assumed in this guide, and is highly recommended for your deployment.

Trunk Ports	Access Ports
Requires more setup and definition of VLAN tags within CIMC, ESXi, and HX Data Platform Installer.	Provides a simpler deployment process than trunk ports.
Provides the ability to logically separate management, vMotion, and VM guest traffic on separate subnets.	Requires that management, vMotion, and VM guest traffic must share a single subnet.
Provides flexibility to bring in additional L2 networks to ESXi.	Requires a managed switch to configure ports 1 and 2 on discrete VLANs; storage traffic must use a dedicated VLAN, no exceptions.



Note

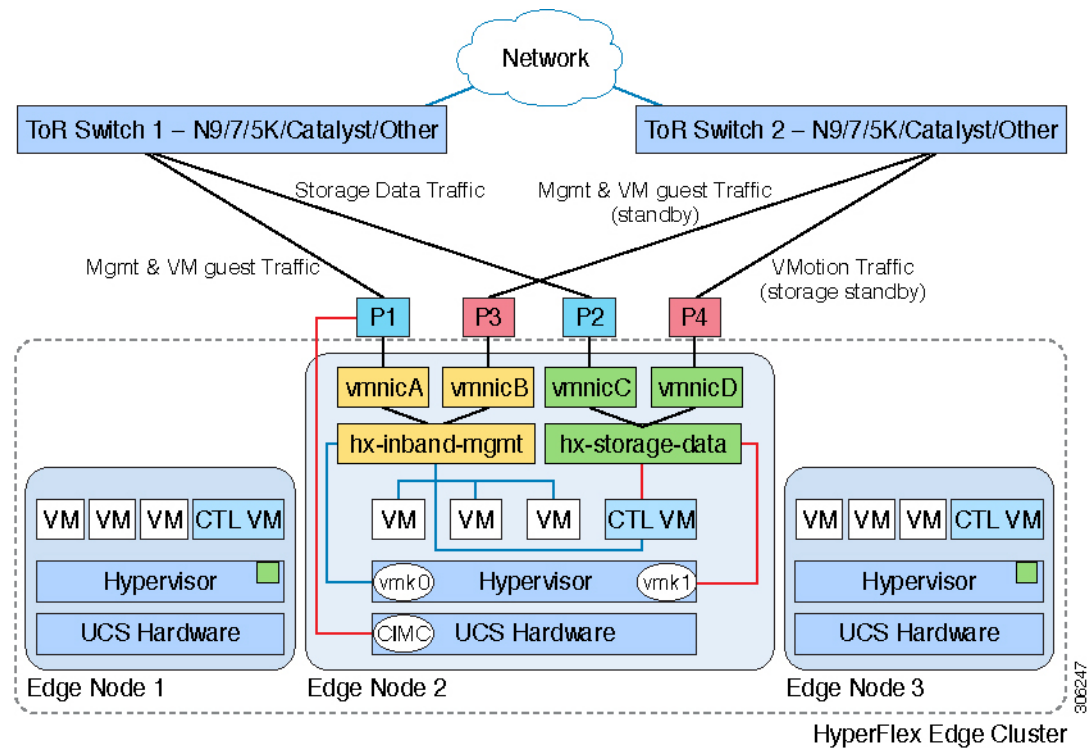
Both trunk and access ports require a managed switch to configure ports 1 and 2 on discrete VLANs.

See *Sample Network Configurations* for more details.

Dual Switch Configuration

Dual switch configuration provides a slightly more complex topology with full redundancy that protects against: switch failure, link and port failure, and LOM/PCIe NIC HW failures. It requires two switches that may be standalone or stacked, and four 1GE ports and one additional PCIe NIC per server. Trunk ports are the only supported network port configuration.

Network Topology



Upstream Network Requirements

- Two managed switches with VLAN capability (standalone or stacked)
- 12 physical 1GE ports for three HyperFlex nodes
All 12 ports must trunk and allow all applicable VLANs.
- Jumbo frames are not required to be configured
- Portfast trunk should be configured on all ports to ensure uninterrupted access to Cisco Integrated Management Controller (CIMC)

Virtual Network Requirements

The recommended configuration for each ESXi calls for the following networks to be separated:

- Management traffic network
- Data traffic network
- vMotion network
- VM network

The minimum network configuration requires at least two separate networks:

- Management network (includes vMotion and VM network)

- Data network (for storage traffic)

Two vSwitches each carrying different networks are required:

- **vswitch-hx-inband-mgmt**—ESXi management (vmk0), storage controller management, VM guest portgroups
- **vswitch-hx-storage-data**—HyperFlex storage data network, Hypervisor storage interface (vmk1), vMotion (vmk2)

Failover order:

- **vswitch-hx-inband-mgmt**—entire vSwitch is set for active/standby. All services by default consume a single uplink port and failover when needed. Failover order for VM portgroups may be overridden as needed.
- **vswitch-hx-storage-data**—HyperFlex storage data network and vmk1 are set to the same active/standby order. The vMotion VMKernel port is set to use the opposite order when configured using the `post_install` script.

Port Requirements

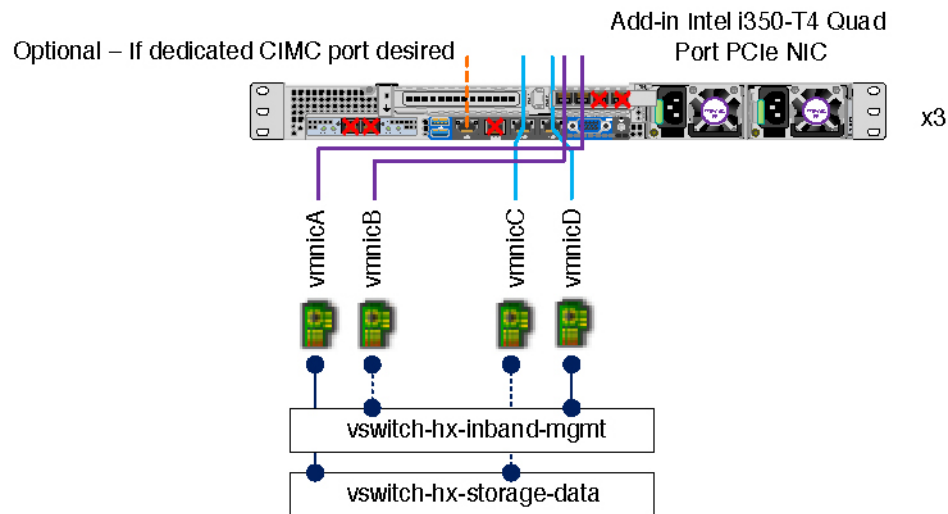
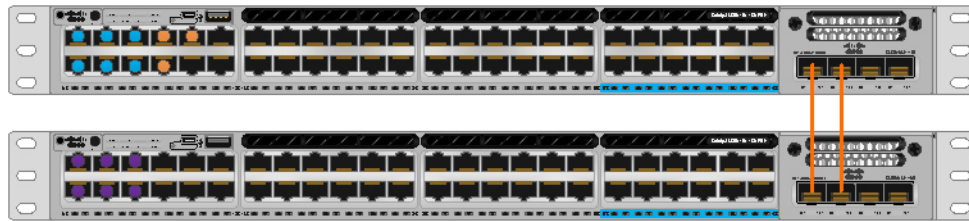
Four 1GE ports are required per server:

- Port 1—management (ESXi, HyperFlex controller, and CIMC) and VM guest traffic
- Port 2—HyperFlex storage traffic (and vMotion standby)
- Port 3—VM guest traffic (and management standby)
- Port 4—vMotion traffic (and storage standby)
- Two ports using LOM and two ports from a PCIe add-in NIC:
 - 1 LOM and 1 PCIe port serve management and VM guest traffic in a redundant configuration
 - 1 LOM and 1 PCIe port serve storage data and vMotion traffic in a redundant and load balanced configuration
- The Intel i350 quad port NIC (UCSC-PCIE-IRJ45) must be installed for this topology:
 - The NIC may be selected at ordering time and shipped preinstalled from the factory.
 - The NIC may also be field-installed if ordered separately. Either riser #1 or #2 may be used, although riser #1 is recommended.
- Only trunk ports are supported in the dual switch configuration.
- Spanning tree portfast trunk must be enabled for all network ports connected to HyperFlex servers.
 - Failure to configure portfast causes intermittent CIMC disconnects during ESXi bootup and longer than necessary network re-convergence during physical link failure.

Physical network topology guidance:

**Warning**

Proper cabling is important to ensure full network redundancy.



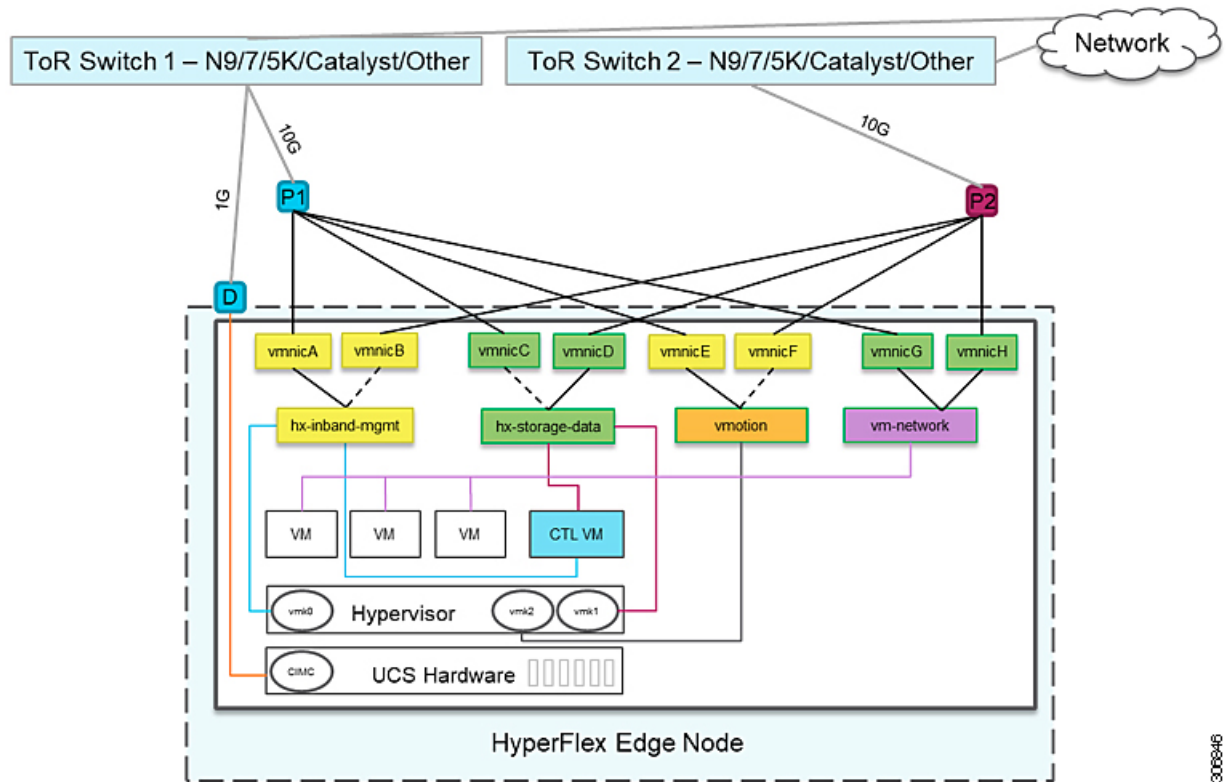
- Cable both integrated LOM ports to the same ToR switch.
- Cable any two out of four PCIe NIC ports to the same ToR switch. Do not connect more than two PCIe NIC ports prior to installation. Post cluster installation, you may freely use the remaining ports.
- Redundancy occurs at the vSwitch level and includes one uplink port from the onboard LOM and one uplink port from PCIe NIC for each vSwitch
- If desired, cable the dedicated CIMC port to the same switch or to an out-of-band management switch.
- Do not use the 10GE ports on the VIC.

10/25GE Switch Configuration

10GE switch configuration provides a fully redundant technology that protects against switch (if using dual or stacked switches), and link and port failures. The 10/25GE switch may be standalone or stacked. In addition, this configuration requires the following:

- Two 10/25GE ports and a VIC 1387 with 2x QSAs per server
- Use of trunk mode
- Deployment using On-premises OVA Installer and not through Intersight

Network Topology



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Upstream Network Requirements

- Two 10/25Gb ports are required per server using a VIC 1387
 - Each physical VIC port is logically divided into 4 vNICs as seen by the hypervisor
Only 10/25Gb speeds are supported [no 40Gb]
 - M5 servers require VIC 1387 and QTY 2 QSA to reach 10/25 Gb speeds
 - M4 servers require VIC 1227 to reach 10/25Gb speeds
- Additional NIC cards
 - Additional 3rd party NIC cards may be installed in the HX Edge nodes as needed
 - All non-VIC interfaces must be shutdown until install is completed
 - Only a single VIC is supported per HX Edge node
- Only trunk ports are supported in 10/25GE switch configurations
- Spanning tree portfast trunk should be enabled for all network ports connected to HX servers.



Note Failures to configure portfast will cause longer than necessary network re-convergence during physical link failure.

Virtual Network Requirements

Four vSwitches are required:

- **vswitch-hx-inband-mgmt**—ESXi management (vmk0), storage controller management
- **vswitch-hx-storage-data**—HyperFlex storage data network, Hypervisor storage interface (vmk1)
- **vmotion**—vMotion (vmk2)
- **vswitch-hx-vm-network**—VM guest portgroups



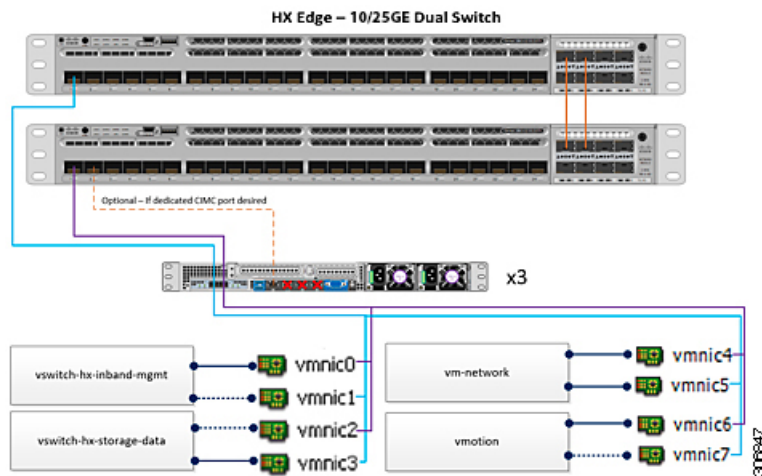
Note Due to the nature of the Cisco VIC carving up multiple vNICs from the same physical port, it is not possible for guest VM traffic configured on vswitch-hx-vm-network to communicate L2 to interfaces or services running on the same host. It is recommended to either a) use a separate VLAN and perform L3 routing or b) ensure any guest VMs that need access to management interfaces be placed on the vswitch-hx-inband-mgmt vSwitch. In general, guest VMs should not be put on any of the HyperFlex configured vSwitches except for the vm-network vSwitch. An example use case would be if you need to run vCenter on one of the nodes and it requires connectivity to manage the ESXi host it is running on. In this case, use one of the recommendations above to ensure uninterrupted connectivity.

Failover order:

- **vswitch-hx-inband-mgmt**—entire vSwitch is set for active/standby. All services by default consume a single uplink port and failover when needed. Failover order for VM portgroups may be overridden as needed.
- **vswitch-hx-storage-data**—HyperFlex storage data network and vmk1 are set to the same active/standby order.
- **vmotion**—The vMotion VMkernel port (vmk2) is configured when using the post_install script. Failover order is set for active/standby.
- **vswitch-hx-vm-network**—vSwitch is set for active/active. Individual portgroups can be overridden as needed.

Port Requirements

Physical network topology guidance:



- For M5 servers, ensure a Cisco 40G to 10G QSA is installed in both VIC ports.
- If using a single 10GE switch, cable both 10GE ports to the same switch.
- If using dual 10GE switches or stacked switches, cable 1X10GE port to each switch, ensuring that all port #1 from all nodes go to the same switch and all port #2 from all nodes are connected to the other switch.
- Cable the dedicated CIMC port to the same switch or to an out-of-band management switch.

Common Network Requirements

Before you begin installation, confirm that your environment meets the following specific software and hardware requirements.

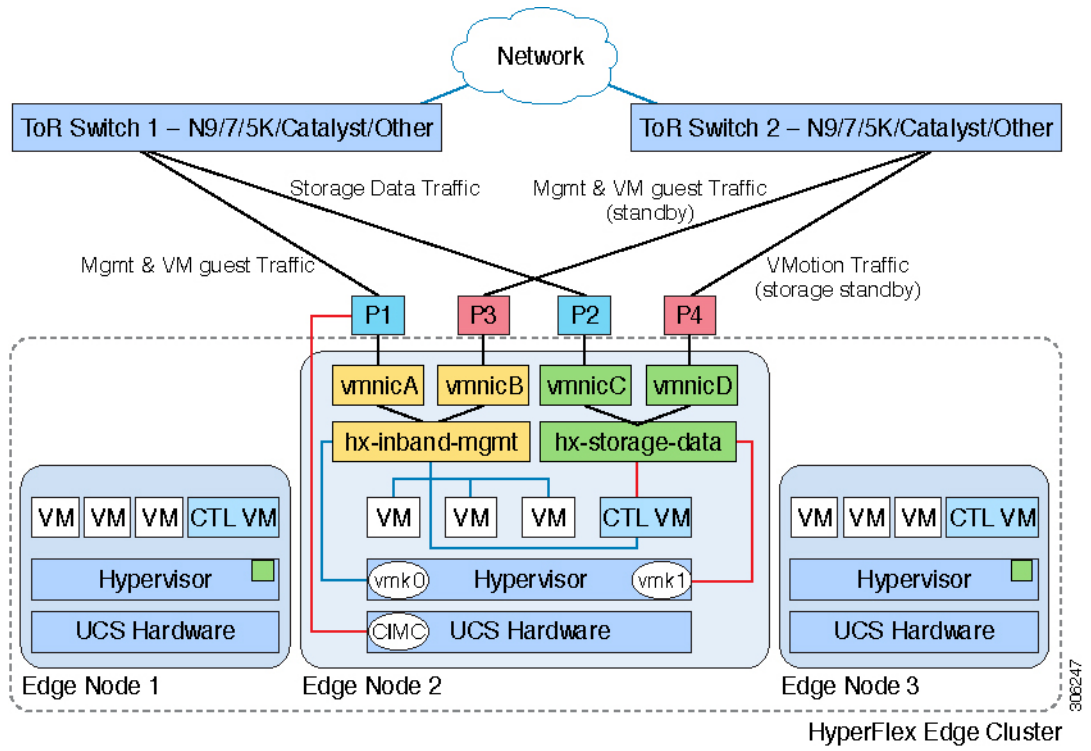


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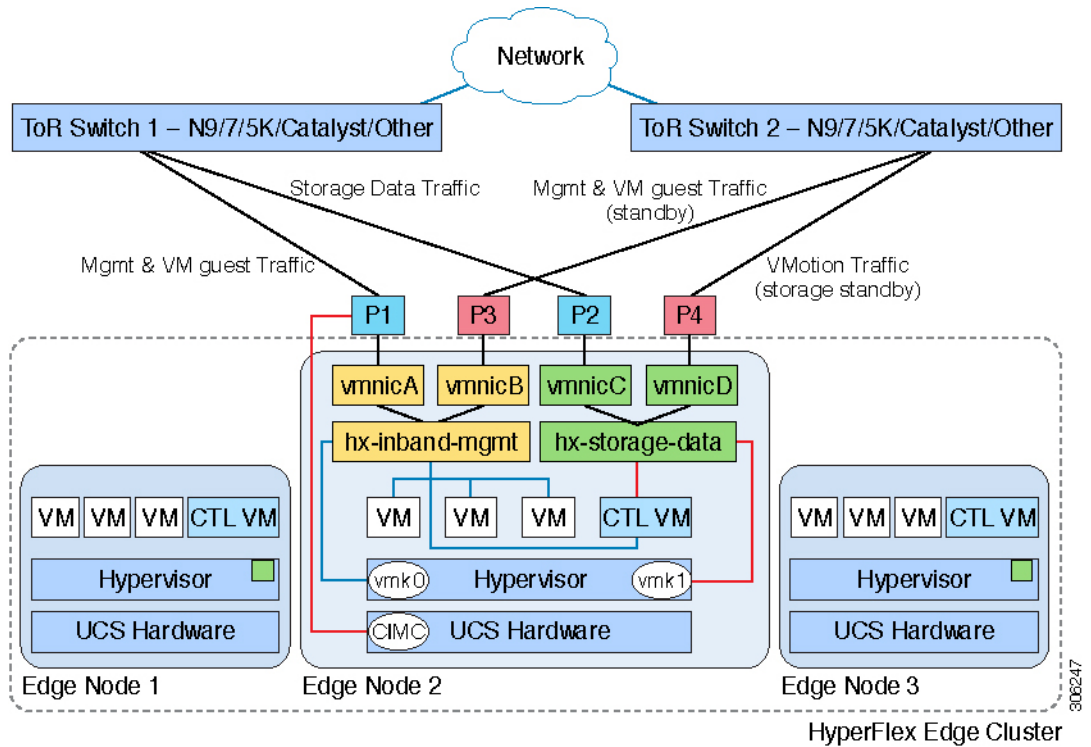
On HyperFlex M5 nodes, when using a 1GE topology manually configure the port speed to 1000/full on all switch ports. See the [Common Network Requirements, on page 14](#).

VLAN Requirements

Single Switch Network Topology



Dual Switch Network Topology



Network	VLAN ID	Description
Use a separate subnet and VLANs for each of the following networks:		
VLAN for VMware ESXi, and Cisco HyperFlex management		Used for management traffic among ESXi, HyperFlex, and VMware vCenter, and must be routable. Note This VLAN must have access to Intersight.
CIMC VLAN		Can be same or different from the Management VLAN. Note This VLAN must have access to Intersight.
VLAN for HX storage traffic		Used for storage traffic and requires only L2 connectivity.
VLAN for VMware vMotion		Used for vMotion VLAN, if applicable. Note Can be the same as the management VLAN but not recommended.
VLAN(s) for VM network(s)		Used for VM/application network. Note Can be multiple VLANs separated by a VM portgroup in ESXi.

Inband versus Out-of-Band CIMC

This guides assume the use of inband CIMC using Shared LOM Ext mode. The result is CIMC management traffic multiplexed with vSphere traffic onto the LOM ports, reducing cabling, switchports, and additional configuration.

Customers may opt to use the dedicated CIMC management port for out-of-band use. Users should account for this third 1GE port when planning their upstream switch configuration. Additionally, the user should set the CIMC to dedicated mode during CIMC configuration. Follow [Cisco UCS C-series documentation](#) to configure the CIMC in dedicated NIC mode. Under **NIC properties**, set the NIC mode to **dedicated** before saving the configuration.

In either case, CIMC must have network access to Intersight.

Supported vCenter Topologies

Use the following table to determine the topology supported for vCenter.

Topology	Description	Recommendation
Single vCenter	Virtual or physical vCenter that runs on an external server and is local to the site. A management rack mount server can be used for this purpose.	Highly recommended
Centralized vCenter	vCenter that manages multiple sites across a WAN.	Highly recommended
Nested vCenter	vCenter that runs within the cluster you plan to deploy.	Installation for a HyperFlex Edge cluster may be performed without a vCenter. Alternatively, you may deploy with an external vCenter and migrate it into the cluster. For the latest information, see the How to Deploy vCenter on the HX Data Platform tech note.

Customer Deployment Information

A typical three-node HyperFlex Edge deployment requires 13 IP addresses – 10 IP addresses for the management network and 3 IP addresses for the vMotion network.

CIMC Management IP Addresses

Server	CIMC Management IP Addresses
Server 1	
Server 2	
Server 3	
Subnet mask	
Gateway	
DNS Server	
NTP Server	
Note NTP configuration on CIMC is required for proper Intersight connectivity.	

Network IP Addresses



Note By default, the HX Installer automatically assigns IP addresses in the 169.254.1.X range, to the Hypervisor Data Network and the Storage Controller Data Network.



Note Spanning Tree portfast trunk (trunk ports) should be enabled for all network ports. Failure to configure portfast may cause intermittent disconnects during ESXi bootup and longer than necessary network re-convergence during physical link failure.

Management Network IP Addresses (must be routable)	
Hypervisor Management Network	Storage Controller Management Network
Server 1:	Server 1:
Server 2:	Server 2:
Server 3:	Server 3:
Storage Cluster Management IP address	
Subnet mask	
Default gateway	

VMware vMotion Network IP Addresses

For vMotion services, you may configure a unique VMkernel port or, if necessary, reuse the vmk0 if you are using the management VLAN for vMotion (not recommended).

Server	vMotion Network IP Addresses (configured using the post_install script)
Server 1	
Server 2	
Server 3	
Subnet mask	
Gateway	

Port Requirements



Important Ensure that the following port requirements are met in addition to the prerequisites listed for [Intersight Connectivity](#).

If your network is behind a firewall, in addition to the standard port requirements, VMware recommends ports for VMware ESXi and VMware vCenter.

- CIP-M is for the cluster management IP.

- SCVM is the management IP for the controller VM.
- ESXi is the management IP for the hypervisor.

The comprehensive list of ports required for component communication for the HyperFlex solution is located in Appendix A of the [HX Data Platform Security Hardening Guide](#)



Tip If you do not have standard configurations and need different port settings, refer to [Table C-5 Port Literal Values](#) for customizing your environment.

Hypervisor Credentials

root username	root
root password	Cisco123 Important Deployments based on Cisco HX Data Platform Release, 3.0 and higher, require a new custom password if you have not changed the default factory password prior to starting installation.

VMware vCenter Configuration



Note HyperFlex communicates with vCenter through standard ports. Port 80 is used for reverse HTTP proxy and may be changed with TAC assistance. Port 443 is used for secure communication to the vCenter SDK and may not be changed.

vCenter admin username <i>username@domain</i>	
vCenter admin password	
vCenter data center name	
VMware vSphere compute cluster and storage cluster name	

Network Services



Note

- DNS and NTP servers should reside outside of the HX storage cluster.
- Use an internally-hosted NTP server to provide a reliable source for the time.
- All DNS servers should be pre-configured with forward (A) and reverse (PTR) DNS records for each ESXi host before starting deployment. When DNS is configured correctly in advance, the ESXi hosts are added to vCenter via FQDN rather than IP address.

Skipping this step will result in the hosts being added to the vCenter inventory via IP address and require users to change to FQDN using the following procedure: [Changing Node Identification Form in vCenter Cluster from IP to FQDN](#).

DNS Servers <i><Primary DNS Server IP address, Secondary DNS Server IP address, ... ></i>	
NTP servers <i><Primary NTP Server IP address, Secondary NTP Server IP address, ... ></i>	
Time zone <i>Example: US/Eastern, US/Pacific</i>	

Connected Services

Enable Connected Services (Recommended) <i>Yes or No required</i>	
Email for service request notifications <i>Example: name@company.com</i>	

Supported VMware vSphere Versions and Editions

Confirm that a compatible version of vSphere is preinstalled on all HyperFlex servers. For the current list, see the Software Requirements for VMware ESXi chapter in the [Cisco HyperFlex Recommended Software Release and Requirements Guide](#).

Physical Requirements

HX220c nodes are 1 RU each. For a three-node cluster, 3 RU are required.

Reinstallation

To perform reinstallation of a HyperFlex Edge System, contact Cisco TAC.

HyperFlex Edge Compatibility and Software Requirements: HyperFlex Release 3.5(x)

For details about compatibility and software requirements for Cisco HX Release 3.5(x), review the [Cisco HX Release 3.5\(x\) - Software Requirements](#) chapter of the Cisco HyperFlex Recommended Software Release and Requirements Guide.

Intersight Connectivity

Consider the following prerequisites pertaining to Intersight connectivity:

- Before installing the HX cluster on a set of HX servers, make sure that the device connector on the corresponding Cisco IMC instance is properly configured to connect to Cisco Intersight and claimed.
- Communication between CIMC and vCenter via ports 80, 443 and 8089 during installation phase.
- All device connectors must properly resolve *svc.intersight.com* and allow outbound initiated HTTPS connections on port 443. The current version of the HX Installer supports the use of an HTTP proxy.
- All controller VM management interfaces must properly resolve *svc.intersight.com* and allow outbound initiated HTTPS connections on port 443. The current version of HX Installer supports the use of an HTTP proxy if direct Internet connectivity is unavailable.
- IP connectivity (L2 or L3) is required from the CIMC management IP on each server to all of the following: ESXi management interfaces, HyperFlex controller VM management interfaces, and vCenter server. Any firewalls in this path should be configured to allow the necessary ports as outlined in the [Hyperflex Hardening Guide](#).
- Starting with HXDP release 3.5(2a), the Intersight installer does not require a factory installed controller VM to be present on the HyperFlex servers.

When redeploying HyperFlex on the same servers, new controller VMs must be downloaded from Intersight into all ESXi hosts. This requires each ESXi host to be able to resolve *svc.intersight.com* and allow outbound initiated HTTPS connections on port 443. Use of a proxy server for controller VM downloads is supported and can be configured in the HyperFlex Cluster Profile if desired.

- Post-cluster deployment, the new HX cluster is automatically claimed in Intersight for ongoing management.



CHAPTER 4

Installation

- [Installation Overview, on page 23](#)
- [Applicable for 1GE and 10GE Switch Configurations, on page 24](#)
- [Applicable for 1GE Switch Configurations, on page 28](#)
- [Applicable for 10GE Switch Configurations, on page 34](#)
- [Logging into HX Connect, on page 38](#)

Installation Overview



Note If the HyperFlex cluster nodes were part of any other HyperFlex cluster before (or not factory shipped), follow the node cleanup procedure before starting the cluster deployment. For more information, see [HyperFlex Customer Cleanup Guides for FI and Edge](#).

Refer to the following table that summarizes the installation workflow for Edge deployments. The **Steps 1-3** are common between 1GE and 10GE deployments. However, **Step 4** is applicable for 1GE deployments, while the remaining **Steps 5-6** are for 10GE deployments.

Step#	Description	Reference	Applicable for 1GE & 10GE, 1GE, or 10GE
1	Complete preinstallation checklist.	Make a selection from below based on your switch configuration: <ul style="list-style-type: none">• Single Switch Configuration, on page 5 or,• Dual Switch Configuration, on page 8 or,• 10/25GE Switch Configuration, on page 11• Common Network Requirements, on page 14	1GE & 10GE

Step#	Description	Reference	Applicable for 1GE & 10GE, 1GE, or 10GE
2	Complete installation prerequisites.	<ul style="list-style-type: none"> • Rack Cisco HyperFlex Nodes, on page 24 • Cisco Integrated Management Controller Configuration • Verifying Firmware Versions, on page 26 	1GE & 10GE
3	Download and deploy Cisco HX Data Platform Installer.	Deploying Cisco HX Data Platform Installer, on page 27	1GE & 10GE
4	Deploy Cisco HyperFlex Edge cluster.	<p>Complete the following steps to configure your Edge cluster and verify successful installation.</p> <ul style="list-style-type: none"> • Configuring Your HyperFlex Cluster, on page 28 • Verifying Cisco HX Data Platform Software Installation, on page 34 	1GE only
5	SSH to the installer VM and run a script to complete specific configuration tasks.	(10/25GE Only) Run Configuration Script , on page 34	10GE only
6	Deploy Cisco HyperFlex Edge cluster.	(10/25GE only) Configuring Your HyperFlex Cluster, on page 35	10GE only

Applicable for 1GE and 10GE Switch Configurations

Rack Cisco HyperFlex Nodes

For details on installation of Cisco HX220c M5 HyperFlex Nodes or Cisco HX220c M6 HyperFlex Nodes, review the [Cisco Hardware Install Guides](#) .



Important

You can use a console dongle to connect the VGA monitor and keyboard for CIMC configuration. You can also directly connect to the VGA and USB ports on the rear of the server. Alternatively, you can perform a lights-out configuration of CIMC if a DHCP server is available in the network.

Cisco Integrated Management Controller Configuration

Choose one method for CIMC network configuration: static assignment or DHCP assignment.

Configuring CIMC: Static Assignment

To configure Cisco Integrated Management Controller (CIMC), you must enable CIMC standalone mode, configure the CIMC password and settings, and configure a static IP address manually using a KVM. This requires physical access to each server with a monitor and keyboard. Each server must be configured one at a time.

Customers may opt to use the dedicated CIMC management port for out-of-band use. Users should account for this third 1GE port when planning their upstream switch configuration. Additionally, the user should set the CIMC to dedicated mode during CIMC configuration. Follow [Cisco UCS C-series documentation](#) to configure the CIMC in dedicated NIC mode. Under **NIC properties**, set the NIC mode to **dedicated** before saving the configuration.

Before you begin

- Ensure that all Ethernet cables are connected as described in the Physical Cabling section of this guide that applies your deployment.
- Attach the VGA dongle to the server and connect a monitor and USB keyboard.

-
- Step 1** Power on the server, and wait for the screen with the Cisco logo to display.
- Step 2** When prompted for boot options, press **F8** to enter the **Cisco IMC Configuration** utility.
- Step 3** In **CIMC User Details**, enter **password** for the **current CIMC password**, enter your **new CIMC password** twice, and press **Enter** to save your new password.
- Important** Systems ship with a default password of *password* that must be changed during installation. You cannot continue installation unless you specify a new user supplied password.
- Step 4** For **IP (Basic)**, check **IPV4**, uncheck **DHCP enabled**, and enter values for **CIMC IP**, **Prefix/Subnet** mask, and **Gateway**.
- Step 5** For **VLAN (Advanced)**, check **VLAN enabled**, and:
- If you are using trunk ports, set the appropriate **VLAN ID**.
 - If you are using access ports, leave this field blank.
- Step 6** Leave the rest of the settings as default, press **F10** to save your configuration, and press **ESC** to exit the utility.
- Step 7** In a web browser, navigate directly to the CIMC page at **https://CIMC IP address**.
- Step 8** Enter the username **admin** and your new CIMC password, and click **Log In**.
- Step 9** Manually set the power policy to match the desired operation from **Server > Power Policies**.
- Servers default to the Power Off power-restore policy set at the factory.
-

What to do next

You can use the virtual KVM console or continue to use the physical KVM. The SD cards have ESXi preinstalled from the factory and boot automatically during installation.

Configuring CIMC: DHCP Assignment

To configure Cisco Integrated Management Controller (CIMC), you must enable CIMC standalone mode, configure the CIMC password and settings, and configure a dynamic IP address obtained through DHCP. This requires more network setup but eases configuration by enabling a lights-out setup of HyperFlex Edge nodes. All servers lease addresses automatically and in parallel, reducing deployment time.

Before you begin

- Ensure that all Ethernet cables are connected as described in the Physical Cabling section of this guide that applies your deployment.
- Ensure the DHCP server is properly configured and running with a valid scope.
- Ensure the DHCP server is directly listening on the management VLAN or you have an IP helper configured on your switch(es).
- Decide on inband versus out-of-band CIMC:
 - If using inband CIMC, configure the native VLAN for all HyperFlex Edge switch ports to match the correct DHCP VLAN. This is the only way to ensure that the CIMC can lease an address automatically.
 - If using out-of-band CIMC, configure the dedicated switch port for access mode on the DHCP VLAN.

-
- | | |
|---------------|---|
| Step 1 | Connect power cables. |
| Step 2 | Access the DHCP logs or lease table to determine the CIMC addresses obtained |
| Step 3 | Search the hostnames for C220-<i><S/N></i> to find your HyperFlex servers, and make note of the addresses for required inputs into the HX Data Platform Installer. |
-

What to do next

When using DHCP, you must manually set a user defined CIMC password before beginning HyperFlex Data Platform installation. Use either the web UI or a CLI session to set a new password. The default password of **password** must be changed or installation fails.

Verifying Firmware Versions

You need to view current BIOS, CIMC, SAS HBA, and drive firmware versions, and verify that those versions match data in the Release Notes.

-
- | | |
|---------------|---|
| Step 1 | In your browser, log in to the CIMC web UI by navigating to https://<i><CIMC IP></i> . |
| Step 2 | In the Navigation pane, click Server . |

- Step 3** On the **Server** page, click **Summary**.
- Step 4** In the **Cisco Integrated Management Controller (CIMC) Information** section of the **Server Summary** page, locate and make a note of the **BIOS Version** and **CIMC Firmware Version**.
- Step 5** In CIMC, navigate to **Inventory > PCIe Adapters**, and locate and make a note of the **SAS HBA Version**.
- Step 6** In CIMC, navigate to **Storage** depending on which server type you are using, navigate to one of the following:
- For M4, **Cisco 12G Modular SAS > Physical Drive Info**, and make a note of the drive type, manufacturer, and firmware version.
 - For M5 and M6, **Cisco 12G SAS HBA > Physical Drive Info**, and make a note of the drive type, manufacturer, and firmware version.
- Step 7** Compare the current BIOS, CIMC, SAS HBA, and drive firmware versions with the versions listed in the Release Notes.
- Step 8** If the minimum versions are not met, use the Host Update Utility (HUU) Download Links in the compatibility matrix to upgrade the firmware versions running on the system, including Cisco Virtual Interface Cards (VIC), PCI Adapter, RAID controllers, and drive (HDD/SSD) firmware. You can find current and previous releases of the Cisco HUU User Guide at this location: <http://www.cisco.com/c/en/us/support/servers-unified-computing/ucs-c-series-rack-servers/products-user-guide-list.html>.
-

Deploying Cisco HX Data Platform Installer

HX Data Platform Installer can be deployed on an ESXi server, as well as a VMware Workstation, VMware Fusion, or Virtual Box. The HyperFlex software is distributed as a deployable virtual machine, contained in an Open Virtual Appliance (OVA) file format. Use the following procedure to deploy HX Data Platform Installer using a VMware vSphere (thick) Client.

- Step 1** Download the HX Data Platform Installer OVA from Cisco.com, and save the package locally. Verify the downloaded version matches the recommended version for your deployment.
- Step 2** Log in to vCenter using the vSphere client.
- Step 3** Select **File > Deploy OVF Template**.
- Step 4** In the **Deploy OVF Template** wizard, on the **Source** page, specify the source location, and click **Next**.
- Step 5** On the **OVF Template Details** page, view the information, and click **Next**.
- Step 6** (Optional) On the **Name and Location** page, edit the name and location for the virtual appliance, and click **Next**.
- Step 7** On the **Host/Cluster** page, select the host or cluster on which you want to deploy, and click **Next**.
- Step 8** On the **Resource Pool** page, select the resource pool where you want to run the OVF template, and click **Next**.
- Step 9** On the **Storage** page, select a datastore to store the deployed OVF template, and click **Next**.
- Step 10** On the **Disk Format** page, select the disk format to store the virtual machine virtual disks, and click **Next**.
- Step 11** On the **Network Mapping** page, for each network specified in the OVF template, right-click the **Destination Network** column to select a network in your infrastructure, and click **Next**.
- Step 12** Provide the OVF properties for the installer VM, namely: hostname, default gateway, DNS server, IP address, and subnet mask.
- Alternatively, leave all of the OVF properties blank for a DHCP assigned address.
- Step 13** On the **Ready to Complete** page, select **Power On After Deployment**, and click **Finish**.
-

Applicable for 1GE Switch Configurations

Configuring Your HyperFlex Cluster

Step 1 In your web browser, enter the IP address of the installer VM, and click **Accept** or **Continue** to bypass any SSL certificate errors.

Step 2 Verify the HyperFlex installer **Build ID** in the lower right corner of the login screen.

Step 3 Log in to Cisco HX Data Platform Installer using username **root** and password **Cisco123**.

Important Systems ship with a default password of *Cisco123* that must be changed during installation. The HyperFlex on-premise installer requires changing the root password as part of deployment. You cannot continue installation unless you specify a new password. Use the new password at this point in the configuration procedure.

Step 4 Read the End User Licensing Agreement, check **I accept the terms and conditions**, and click **Login**.

Step 5 On the **Workflow** page, click **Cluster Creation with HyperFlex Edge**.

Step 6 To perform cluster creation, you can import a *JSON configuration* file with the required configuration data. The following two steps are optional if importing a JSON file, otherwise you can input data into the required fields manually.

Note For a first-time installation, contact your Cisco representative to procure the factory preinstallation JSON file.

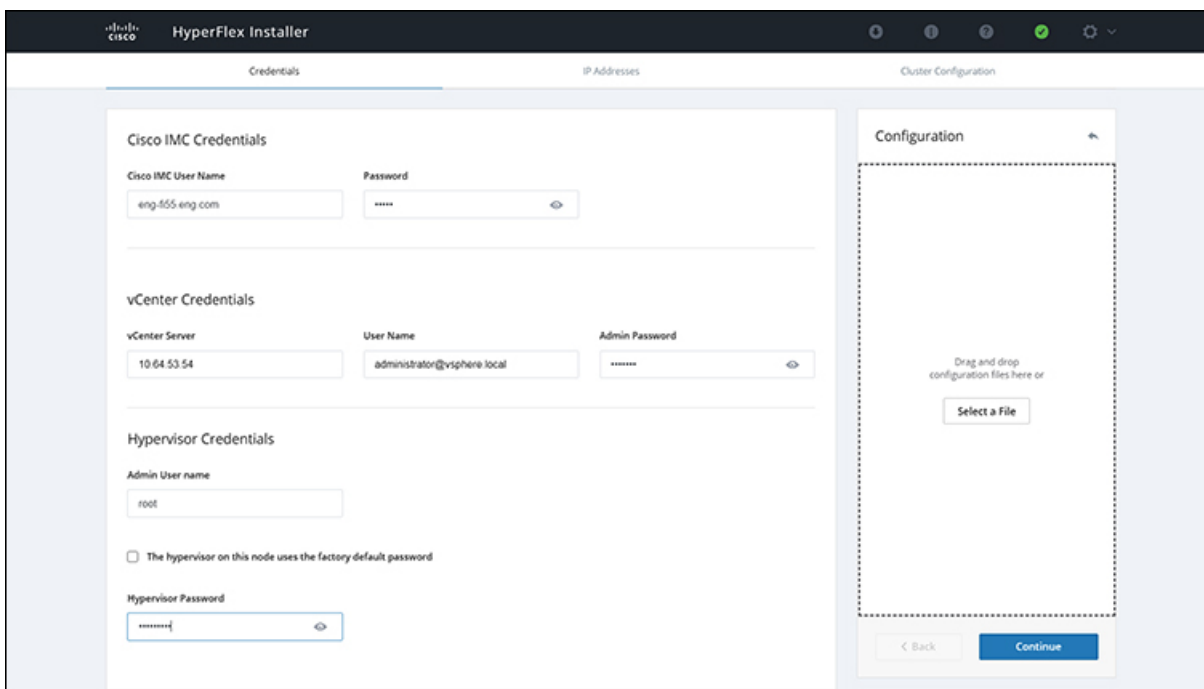
- a. Click **Select a file** and choose your *JSON file* to load the configuration. Select **Use Configuration**.
- b. An **Overwrite Imported Values** dialog box displays if your imported values for Cisco UCS Manager are different. Select **Use Discovered Values**.

Step 7 On the **Credentials** page, complete the following fields, and click **Continue**.

Name	Description
Cisco IMC Credentials	
Cisco IMC User Name	Cisco IMC username. By default, the user name is admin .
Password	CIMC password. By default, the password is password .
vCenter Credentials	
Configuring Your HyperFlex Cluster Server	FQDN or IP address of the vCenter server. You must use an account with vCenter root-level admin permissions.
User Name	Administrator username.
Admin Password	Administrator password.
Hypervisor Credentials	
Admin User Name	Administrator username. By default, the username is root .

Name	Description
Hypervisor Password	Default password is Cisco123. Important Systems ship with a default password of <i>Cisco123</i> that must be changed during installation. You cannot continue installation unless you specify a new user supplied password.

Use the following screenshot as a reference to complete the fields in this page.



Step 8

On the **IP Addresses** page, enter the assigned addresses for each server.

Name	Description
Cisco IMC	IP Address of Cisco IMC
Hypervisor	Management IP for Hypervisor
Storage Controller	Management IP for Storage Controller
Cluster IP Address	Cluster management IP address
Subnet mask	Subnet mask for cluster management
Gateway	Gateway IP address for cluster management IP

Use the following screenshot as a reference to complete the fields in this page.

Step 9 On the **Cluster Configuration** page, complete the following fields, and click **Continue**.

Note Complete all the fields using your pre-install worksheet.

Name	Description
Cisco HX Cluster	
Cluster Name	User-supplied name for the HyperFlex storage cluster.
Replication Factor	For HXDP 3.0(x) and 4.0(x), the Replication Factor must be set to 2 for HX Edge deployments. Replication factor 3 is not supported for HX Edge deployments until HXDP release 4.5.
Controller VM	
Create Admin Password	There is no default password for the Controller VM. User needs to set this field
Confirm Admin Password	Confirm the Administrator password.
vCenter Configuration	
vCenter Datacenter Name	The name of the vCenter datacenter where the HyperFlex hosts were added.
vCenter Cluster Name	The name of the vCenter cluster where the HyperFlex hosts were added.
System Services	

Name	Description
DNS Server(s)	A comma-separated list of IP addresses for each DNS Server.
NTP Server(s)	A comma-separated list of IP addresses for each NTP Server. Important A highly reliable NTP server is required.
Time Zone	The local time zone for the controller VM.
Connected Services	
Enable Connected Services (Recommended)	Check to Enable Connected Services. Note We highly recommend enabling Connected Services to enable sending email alerts to Cisco TAC.
Send service ticket notifications to: <i>Example: admin@cisco.com</i>	Email address to receive service request notifications.
Advanced Networking	
Management VLAN Tag Data VLAN Tag	Enter the correct VLAN tags if you are using trunk ports. The VLAN tags must be different when using trunk mode. Enter 0 for both VLAN tags if you are using access ports. Note Do not enter 0 if you are using trunk ports.
Management vSwitch Data vSwitch	Do not change the auto-populated vSwitch name.
Advanced Configuration	
Enable Jumbo Frames on Data Network	Do not check to ensure HyperFlex Edge deployments use regularly-sized packets. You may optionally enable jumbo frames for 10/25GE deployments depending on your network configuration. For ease of deployment, it is recommended to uncheck this option.
Clean up disk partitions	Check to remove all existing data and partitions from every node in the HX storage cluster. For example, if this is not the first time installing the software on the cluster.
Optimize for VDi only deployment	Check to optimize VDI deployments. By default HyperFlex is performance optimized for Virtual Server Infrastructure (VSI). Check this box to tune the performance parameters for VDI deployments. This option has no affect on all-flash HX models and only needs to be enabled for hybrid HX clusters. If you are running mixed VDI and VSI workloads, do not select this option.
vCenter Single-Sign-On Server	Fill in this field only if instructed by Cisco TAC.

Use the following screenshot as a reference to complete the fields in this page.

Cisco HX Cluster

Cluster Name: EDGE_CLUSTER
 Replication Factor: 2

Controller VM

Create Admin Password: [masked]
 Confirm Admin Password: [masked]

vCenter Configuration

vCenter Datacenter Name: datacenter
 vCenter Cluster Name: cluster

System Services

DNS Server(s): 10.64.48.21
 NTP Server(s): 10.64.1.48
 DNS Domain Name: [empty]
 Time Zone: (UTC+05:30) Chennai, Sri Jayawardenepura

Connected Services

Enable Connected Services (Recommended):
 Send service ticket notifications to: admin@cisco.com

Advanced Networking

Management VLAN Tag: 10
 Management vSwitch: vswitch-hx-inband-mgmt
 Data VLAN Tag: 11
 Data vSwitch: vswitch-hx-storage-data

Advanced Configuration

Enable Jumbo Frames on Data Network:
 Clean up disk partitions:
 Optimize for VDI only deployment:
 vCenter Single-Sign-On Server: ex. https://<address>:7444/sts/STSService

Configuration Summary (Right Sidebar):

- Credentials:** vCenter Server: 10.64.53.54, User Name: administrator@vsphere.local, Cisco IMC User Name: eng-f155.eng.com, Admin User name: root
- IP Addresses:** Cluster Name: EDGE_CLUSTER, Management Cluster: 10.10.10.40, Management Subnet Mask: 255.0.0.0, Management Gateway: 10.10.10.1
- Server 1:** Management Cisco IMC: 10.10.10.10, Management Hypervisor: 10.10.10.20, Management Storage Controller: 10.10.10.30
- Server 2:** Management Cisco IMC: 10.10.10.11

Buttons: < Back, Start

Step 10 After deployment finishes, the **Summary Deployment** page displays a summary of the deployment details.

What to do next

Confirm HX Data Platform Plug-in installation. See [Verifying Cisco HX Data Platform Software Installation, on page 34](#)

Verifying Cisco HX Data Platform Software Installation

Step 1 Launch **vSphere**, and log in to the vCenter Server as an administrator.

Step 2 Under **vCenter Inventory Lists**, verify that **Cisco HX Data Platform** displays.

If the entry for Cisco HX Data Platform does not appear, log out of vCenter, close the browser, and log back in. In most cases, the issue is resolved by this action.

If logging out of vCenter does not fix the issue, you may have to restart the vSphere Web Client . SSH to the VCSA and run `service vsphere-client restart`. For a Windows vCenter, restart VMware VMWare vSphere Web Client in the services page in mmc.

Step 3 Ensure that your new cluster is online and registered.

Applicable for 10GE Switch Configurations

(10/25GE Only) Run Configuration Script

Use the steps below to run the configuration script and begin the initial phase for 10/25GE Edge deployment.



Note The run configuration script is a required step for the 3.5.x. release and all prior releases.

Step 1 SSH to the installer VM.

Step 2 Run the `~#hx_edge` command to start the configuration script.

Step 3 Enter **y** to continue in the interactive mode.

Step 4 Follow the on-screen prompts to complete the installation.

Step 5 Once all the inputs have been entered and confirmed, input **y** and hit enter to begin the first phase of the 10/25GE Edge deployment.

Step 6 The configuration task may take several minutes to complete. Check the summary view to view the completion status of the various tasks.

(10/25GE only) Configuring Your HyperFlex Cluster

Step 1 In your web browser, enter the IP address of the installer VM, and click **Accept** or **Continue** to bypass any SSL certificate errors.

Step 2 Verify the HyperFlex installer **Build ID** in the lower right corner of the login screen.

Step 3 Log in to Cisco HX Data Platform Installer using username **root** and password **Cisco123**.

Important Systems ship with a default password of *Cisco123* that must be changed during installation. The HyperFlex on-premise installer requires changing the root password as part of deployment. You cannot continue installation unless you specify a new password. Use the new password at this point in the configuration procedure.

Step 4 Read the End User Licensing Agreement, check **I accept the terms and conditions**, and click **Login**.

Step 5 On the **Workflow** page, click **Cluster Creation with HyperFlex Edge**.

Step 6 On the **Credentials** page, complete the following fields, and click **Continue**.

Name	Description
vCenter Credentials	
vCenter Server	FQDN or IP address of the vCenter server. You must use an account with vCenter root-level admin permissions.
User Name	Administrator username.
Admin Password	Administrator password.
CIMC Credentials	
CIMC User Name	CIMC username. By default, the user name is admin .
Password	CIMC password. By default, the password is password .
Hypervisor Credentials	
Admin User Name	Administrator username. By default, the username is root .
Admin Password	Default password is Cisco123. Important Systems ship with a default password of <i>Cisco123</i> that must be changed during installation. You cannot continue installation unless you specify a new user supplied password.

Step 7 On the **IP Addresses** page, enter the assigned addresses for each server:

Name	Description
Cisco IMC	IP Address of Cisco IMC
Hypervisor	Management IP for Hypervisor

Name	Description
Storage Controller	Management IP for Storage Controller
Cluster IP Address	Cluster management IP address
Subnet mask	Subnet mask for cluster management
Gateway	Gateway IP address for cluster management IP

Step 8

On the **Cluster Configuration** page, complete the following fields, and click **Continue**.

Note Complete all the fields using your pre-install worksheet.

Name	Description
Cisco HX Cluster	
Cluster Name	User-supplied name for the HyperFlex storage cluster.
Replication Factor	For HXDP 3.0(x) and 4.0(x), the Replication Factor must be set to 2 for HX Edge deployments. Replication factor 3 is not supported for HX Edge deployments until HXDP release 4.5.
Controller VM	
Create Admin Password	Default password is Cisco123. Important Systems ship with a default password of <i>Cisco123</i> that must be changed during installation. You cannot continue installation unless you specify a new user supplied password.
Confirm Admin Password	Confirm the Administrator password.
vCenter Configuration	
vCenter Datacenter Name	The name of the vCenter datacenter where the HyperFlex hosts were added.
vCenter Cluster Name	The name of the vCenter cluster where the HyperFlex hosts were added.
System Services	
DNS Server(s)	A comma-separated list of IP addresses for each DNS Server.
NTP Server(s)	A comma-separated list of IP addresses for each NTP Server. Important A highly reliable NTP server is required.
Time Zone	The local time zone for the controller VM.

Name	Description
Auto Support	
Enable Auto Support (Recommended)	Check to enable Auto Support. Note We highly recommend enabling Auto Support to enable sending email alerts to Cisco TAC.
Send service tickets notifications to, for example: name@company.com	Email address to receive service request notifications.

Step 9

On the **Advanced Cluster Configuration** page, complete the following fields, and click **Start**.

Name	Description
Advanced Networking	
Uplink Switch Speed	Check the radio button for 10/25GE . The MAC Address Prefix field appears. Provide the MAC Address Prefix. Note The MAC Address Prefix is used to assign unique MAC addresses to the virtual interfaces of the Cisco VIC. Ensure you select a unique range to avoid any overlap with existing network equipment.
Management VLAN Tag Data VLAN Tag	Enter the correct VLAN tags if you are using trunk ports. The VLAN tags must be different when using trunk mode. Enter 0 for both VLAN tags if you are using access ports. Note Do not enter 0 if you are using trunk ports.
Management vSwitch Data vSwitch	Do not change the auto-populated vSwitch name.
Advanced Configuration	
Enable Jumbo Frames on Data Network	Check to enable Jumbo Frames for 10/25G deployments.
Clean up disk partitions	Check to remove all existing data and partitions from every node in the HX storage cluster. For example, if this is not the first time installing the software on the cluster.
Optimize for VDi only deployment	Check to optimize VDI deployments. By default HyperFlex is performance optimized for Virtual Server Infrastructure (VSI). Check this box to tune the performance parameters for VDI deployments. This option has no affect on all-flash HX models and only needs to be enabled for hybrid HX clusters. If you are running mixed VDI and VSI workloads, do not select this option.
vCenter Single-Sign-On Server	Fill in this field only if instructed by Cisco TAC.

Review the progress for any of the cluster configuration tasks on the **Progress** page. The deployment can take anywhere between 20–45 minutes to complete.

Step 10 After deployment finishes, the **Summary Deployment** page displays a summary of the deployment details.

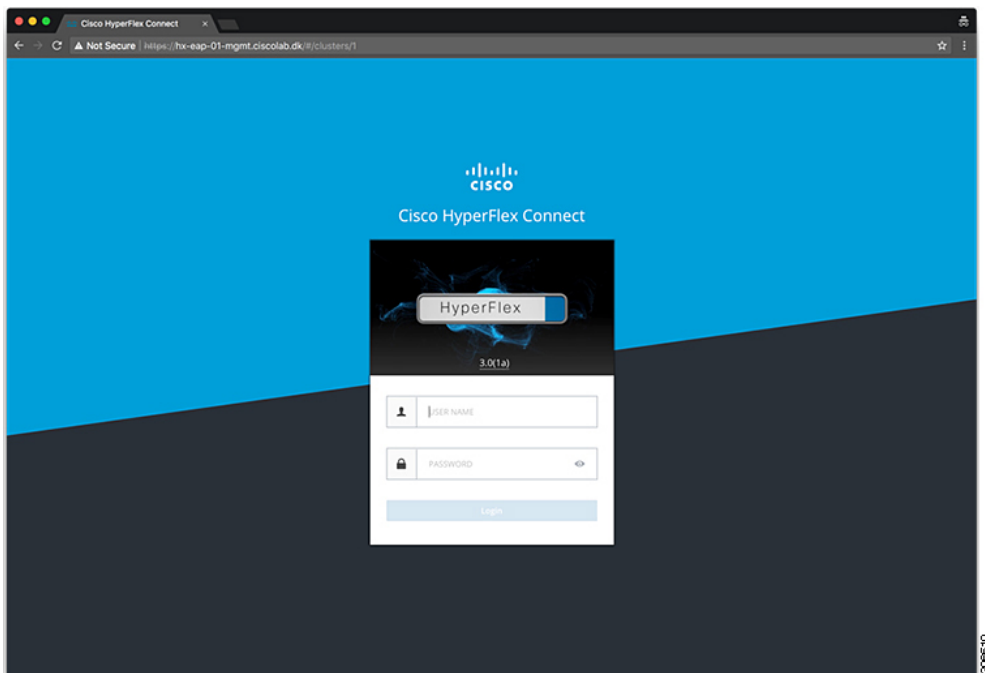
What to do next

Confirm HX Data Platform Plug-in installation.

Logging into HX Connect

Cisco HyperFlex Connect provides an HTML5 based access to HX Storage monitoring, and replication, encryption, datastore, and virtual machine tasks. This procedure provides a summary on launching and logging into HX Connect. For the detailed procedure on logging in to HX Connect, see the [Cisco HyperFlex Data Platform Administration Guide](#).

Step 1 Launch HX Connect UI from a browser of your choice from `https://Cluster_IP/` or `https://FQDN`.



Step 2 Log in with the following credentials:

- **Username**—**admin**
- **Password**—Use the password set during cluster installation.

What to do next

Run the post install script before the HyperFlex cluster is ready for production use. Depending on whether you are running in a 1GE or 10/25GE switch configuration, see:



CHAPTER 5

Post Installation Tasks

- [\(1GE Only\) Run Post Installation Script](#) , on page 41
- [\(10/25GE Only\) Run Post Installation Script](#) , on page 43
- [Configuring vMotion](#), on page 45

(1GE Only) Run Post Installation Script

Step 1 In your web browser, navigate to `http://<installer VM IP address>/mssh`, and log in using username **admin** and your password, and run `hx_post_install`.

Step 2 Press **Enter** to start post installation tasks in the web-based SSH window.

On execution of the post installation script, choose one of the following options as per the requirement:

- **1**—To run the post installation script on a newly created cluster or on an existing cluster. On selection of this option, the script runs the post installation operations on all the nodes in the cluster.
- **2**—To run the post installation script on expanded nodes or on newly added nodes after executing the expansion workflow. On selection of this option, the script fetches the list of the expanded nodes and runs the post installation operations on the expanded nodes.
- **3**—To have unique SSL certificate in the cluster. On selection of this option, the current certificate is replaced with the newly created SSL certificate. This option is not required for the cluster expansion.

Step 3 Follow the on-screen prompts to complete the installation. The `hx_post_install` script completes the following:

- License the vCenter host.
- Enable HA/DRS on the cluster per best practices.
- Suppress SSH/Shell warnings in vCenter.
- Configure vMotion per best practices.
- Add additional guest VLANs/portgroups.
- Perform HyperFlex Edge configuration check.

On successful completion of the post_install workflow, the summary of the configuration executed based on the chosen option is displayed under **Cluster Summary**.

Sample Post-Install Script is as follows:

```
admin@SpringpathController:~$ hx_post_install

Select post_install workflow-

1. New/Existing Cluster
2. Expanded Cluster (for non-edge clusters)
3. Generate Certificate

Note: Workflow No.3 is mandatory to have unique SSL certificate in the cluster. By Generating this
certificate, it will replace your current certificate. If you're performing cluster expansion, then
this option is not required.

Selection: 1
Logging in to controller HX-01-cmip.example.com
HX CVM admin password:
Getting ESX hosts from HX cluster...
vCenter URL: 192.168.202.35
Enter vCenter username (user@domain): administrator@vsphere.local
vCenter Password:
Found datacenter HX-Clusters
Found cluster HX-01

post_install to be run for the following hosts:
HX-01-esxi-01.example.com
HX-01-esxi-02.example.com
HX-01-esxi-03.example.com

Enter ESX root password:

Enter vSphere license key? (y/n) n

Enable HA/DRS on cluster? (y/n) y
Successfully completed configuring cluster HA.

Disable SSH warning? (y/n) y

Add vmotion interfaces? (y/n) y
Netmask for vMotion: 255.255.254.0
VLAN ID: (0-4096) 208
vMotion MTU is set to use jumbo frames (9000 bytes). Do you want to change to 1500 bytes? (y/n) y
vMotion IP for HX-01-esxi-01.example.com: 192.168.208.17
Adding vmotion-208 to HX-01-esxi-01.example.com
Adding vmkernel to HX-01-esxi-01.example.com
vMotion IP for HX-01-esxi-02.example.com: 192.168.208.18
Adding vmotion-208 to HX-01-esxi-02.example.com
Adding vmkernel to HX-01-esxi-02.example.com
vMotion IP for HX-01-esxi-03.example.com: 192.168.208.19
Adding vmotion-208 to HX-01-esxi-03.example.com
Adding vmkernel to HX-01-esxi-03.example.com

Add VM network VLANs? (y/n) y
Attempting to find UCSM IP
Found UCSM 10.75.61.254, logging with username admin. Org is HX-Cluster
UCSM Password:
Port Group Name to add (VLAN ID will be appended to the name): USERS
VLAN ID: (0-4096) 1219
Adding VLAN 1219 to FI
Adding VLAN 1219 to vm-network-a VNIC template
Adding USERS-1219 to HX-01-esxi-01.example.com
```



```
Adding USERS-1219 to HX-01-esxi-02.example.com
Adding USERS-1219 to HX-01-esxi-03.example.com
Add additional VM network VLANs? (y/n) n

Run health check? (y/n) y

Validating cluster health and configuration...

Cluster Summary:
Version - 3.5(2i)
Model - HXAF220C-M5SX
Health - HEALTHY
ASUP enabled - False
admin@SpringpathController:~$
```

(10/25GE Only) Run Post Installation Script

Step 1 In your web browser, navigate to `http://<installer VM IP address>/mssh`, and log in using username **admin** and your password, and run `hx_post_install`.

Step 2 Press **Enter** to start post installation tasks in the web-based SSH window.

On execution of the post installation script, choose one of the following options as per the requirement:

- **1**—To run the post installation script on a newly created cluster or on an existing cluster. On selection of this option, the script runs the post installation operations on all the nodes in the cluster.
- **2**—To run the post installation script on expanded nodes or on newly added nodes after executing the expansion workflow. On selection of this option, the script fetches the list of the expanded nodes and runs the post installation operations on the expanded nodes.
- **3**—To have unique SSL certificate in the cluster. On selection of this option, the current certificate is replaced with the newly created SSL certificate. This option is not required for the cluster expansion.

Step 3 Follow the on-screen prompts to complete the installation. The `hx_post_install` script completes the following:

- License the vCenter host.
- Enable HA/DRS on the cluster per best practices.
- Remove SSH/Shell warnings in vCenter.
- Configure vMotion per best practices.
- Add new VM portgroups
- Perform HyperFlex Edge health check.

On successful completion of the `post_install` workflow, the summary of the configuration executed based on the chosen option is displayed under **Cluster Summary**.

Sample Post-Install Script is as follows:

(10/25GE Only) Run Post Installation Script

```

admin@SpringpathController:~$ hx_post_install

Select post_install workflow-

1. New/Existing Cluster
2. Expanded Cluster (for non-edge clusters)
3. Generate Certificate

Note: Workflow No.3 is mandatory to have unique SSL certificate in the cluster. By Generating this
certificate, it will replace your current certificate. If you're performing cluster expansion, then
this option is not required.

Selection: 1
Logging in to controller HX-01-cmip.example.com
HX CVM admin password:
Getting ESX hosts from HX cluster...
vCenter URL: 192.168.202.35
Enter vCenter username (user@domain): administrator@vsphere.local
vCenter Password:
Found datacenter HX-Clusters
Found cluster HX-01

post_install to be run for the following hosts:
HX-01-esxi-01.example.com
HX-01-esxi-02.example.com
HX-01-esxi-03.example.com

Enter ESX root password:

Enter vSphere license key? (y/n) n

Enable HA/DRS on cluster? (y/n) y
Successfully completed configuring cluster HA.

Disable SSH warning? (y/n) y

Add vmotion interfaces? (y/n) y
Netmask for vMotion: 255.255.254.0
VLAN ID: (0-4096) 208
vMotion MTU is set to use jumbo frames (9000 bytes). Do you want to change to 1500 bytes? (y/n) y
vMotion IP for HX-01-esxi-01.example.com: 192.168.208.17
Adding vmotion-208 to HX-01-esxi-01.example.com
Adding vmkernel to HX-01-esxi-01.example.com
vMotion IP for HX-01-esxi-02.example.com: 192.168.208.18
Adding vmotion-208 to HX-01-esxi-02.example.com
Adding vmkernel to HX-01-esxi-02.example.com
vMotion IP for HX-01-esxi-03.example.com: 192.168.208.19
Adding vmotion-208 to HX-01-esxi-03.example.com
Adding vmkernel to HX-01-esxi-03.example.com

Add VM network VLANs? (y/n) y
Attempting to find UCSM IP
Found UCSM 10.75.61.254, logging with username admin. Org is HX-Cluster
UCSM Password:
Port Group Name to add (VLAN ID will be appended to the name): USERS
VLAN ID: (0-4096) 1219
Adding VLAN 1219 to FI
Adding VLAN 1219 to vm-network-a VNIC template
Adding USERS-1219 to HX-01-esxi-01.example.com
Adding USERS-1219 to HX-01-esxi-02.example.com
Adding USERS-1219 to HX-01-esxi-03.example.com
Add additional VM network VLANs? (y/n) n

Run health check? (y/n) y

```

```
Validating cluster health and configuration...

Cluster Summary:
Version - 3.5(2i)
Model - HXAF220C-M5SX
Health - HEALTHY
ASUP enabled - False
admin@SpringpathController:~$
```

Configuring vMotion

Configuring vMotion Automatically

The `hx_post_install` script automatically configures vMotion based on network topology.

1GE Single Switch Considerations

- Automated configuration supports only trunk ports and only configurations using a dedicated vMotion VLAN.
- If using access ports or using a shared vMotion VLAN, you have to manually configure vMotion on the existing management VMkernel port (vmk0).
- vMotion is shared on the 1GE management and VM network uplink.
- A new VMKernel port (vmk2) is created with a default 500Mbps traffic shaper to ensure vMotion doesn't fully saturate the link. This default value may be changed after running `hx_post_install`. See [Configuring Traffic Shaping Manually, on page 46](#).

1GE Dual Switch Considerations

- vMotion is configured on a dedicated 1GE uplink.
- A new VMKernel port (vmk2) is created. Failover order is auto-configured such that storage data and vMotion are separated under normal network conditions.
- No traffic shaper is required in this configuration.

10/25GE Switch Considerations

- vMotion vMotion is configured on dedicated vMotion vSwitch with dedicate active/standby vNICs.
- A new VMKernel port (vmk2) is created. Failover order is auto-configured such that storage data and vMotion are separated under normal network conditions.
- No traffic shaper is required in this configuration, although bandwidth is shared among management, vMotion, and guest VM port groups. You may apply an optional traffic shaper depending on your networking requirements.

Configuring vMotion Manually

vMotion can be configured in a number of different ways depending on environmental needs. This task covers one possible configuration and variations to this procedure are expected and permitted.

This configuration leverages a unique VLAN for vMotion that is trunked across port 1.

-
- Step 1** Launch vSphere, and log in to the vCenter Server as an administrator.
 - Step 2** From the **vCenter Inventory Lists**, click the HyperFlex host, and navigate to **Manage > Networking > Virtual Switches**.
 - Step 3** Click **Add Host Networking**.
 - Step 4** On the **Add Network Wizard: Connection Type** page, click **VMkernel**, and click **Next**.
 - Step 5** Click **Use vswitch-hx-inband-mgmt**, and click **Next**.
 - Step 6** Enter a distinctive **Network Label**, such as **vMotion**, enter the correct **VLAN ID**, check **Use this port group for vMotion**, and click **Next**.
 - Step 7** Click **Use the following IP settings**, enter a static IPv4 address and **Subnet Mask**, and click **Next**.
 - Step 8** Review the settings, and click **Finish**.
 - Step 9** Repeat this procedure for all HyperFlex hosts and compute-only hosts in the HyperFlex storage cluster.
-

Configuring Traffic Shaping Manually

For 1GE single switch deployments, it is a best practice to enable traffic shaping on the vMotion interface to prevent network congestion on shared uplinks. Failure to configure a traffic shaper could result in vMotion traffic starving management and VM guest traffic sharing the same physical 1GE port. vMotion standard switches only allow for egress traffic shaping.

-
- Step 1** Launch vSphere, and log in to the vCenter Server as an administrator.
 - Step 2** From the **vCenter Inventory Lists**, click the HyperFlex host, and navigate to **Manage > Networking > Virtual Switches**.
 - Step 3** Select the vSwitch that contains the vMotion portgroup.
 - Step 4** Click the vMotion portgroup name, and click **Edit Settings** (pencil icon).
 - Step 5** On the left menu, select **Traffic shaping**.
 - Step 6** Check the override box to enable the traffic shaper.
 - Step 7** Set the average and peak bandwidth to meet environmental needs. One possible value to use is 500,000 Kbits/sec for both, representing 50% of total bandwidth available on a 1GE uplink.
 - Step 8** Select **OK** to save settings.

Note Be careful to set average bandwidth to the desired setting. Peak bandwidth works only for bursting traffic and is quickly exhausted for vMotion operations.



APPENDIX **A**

Appendix

- [Sample Network Configuration 10GE Dual Switch, on page 47](#)
- [Sample Network Configuration 1GE Single Switch, on page 49](#)
- [Sample Network Configuration 1GE Dual Switch, on page 50](#)
- [Sample Network Configuration 10/25GE 2-Node 2-Room, on page 52](#)

Sample Network Configuration 10GE Dual Switch

10GE Dual Switch

Nexus 9000 using trunk ports

```
vlan 101
  name HX-MGMT
vlan 102
  name HX-STORAGE
vlan 103
  name HX-VMOTION
vlan 104
  name HX-GUESTVM
vlan 105
  name HX-DHCP-CIMC
...
interface Ethernet1/35
  description M5-Edge-Node1-VIC1
  switchport mode trunk
  switchport trunk native vlan 105
  switchport trunk allowed vlan 101-105
  spanning-tree port type edge trunk

interface Ethernet1/36
  description M5-Edge-Node1-VIC2
  switchport mode trunk
  switchport trunk native vlan 105
  switchport trunk allowed vlan 101-105
  spanning-tree port type edge trunk

interface Ethernet1/37
  description M5-Edge-Node2-VIC1
  switchport mode trunk
  switchport trunk native vlan 105
  switchport trunk allowed vlan 101-105
  spanning-tree port type edge trunk
```

```

interface Ethernet1/38
  description M5-Edge-Node2-VIC2
  switchport mode trunk
  switchport trunk native vlan 105
  switchport trunk allowed vlan 101-105
  spanning-tree port type edge trunk

interface Ethernet1/39
  description M5-Edge-Node3-VIC1
  switchport mode trunk
  switchport trunk native vlan 105
  switchport trunk allowed vlan 101-105
  spanning-tree port type edge trunk

interface Ethernet1/40
  description M5-Edge-Node3-VIC2
  switchport mode trunk
  switchport trunk native vlan 105
  switchport trunk allowed vlan 101-105
  spanning-tree port type edge trunk

```

Catalyst 9300 using trunk ports

```

vlan 101
  name HX-MGMT
vlan 102
  name HX-STORAGE
vlan 103
  name HX-VMOTION
vlan 104
  name HX-GUESTVM
vlan 105
  name HX-CIMC
...
interface GigabitEthernet1/0/1
  description M5-Edge-16W9-LOM1
  switchport trunk allowed vlan 101-105
  switchport mode trunk
  spanning-tree portfast trunk

interface GigabitEthernet1/0/2
  description M5-Edge-16W9-LOM2
  switchport trunk allowed vlan 101-105
  switchport mode trunk
  spanning-tree portfast trunk

interface GigabitEthernet1/0/3
  description M5-Edge-16UQ-LOM1
  switchport trunk allowed vlan 101-105
  switchport mode trunk
  spanning-tree portfast trunk

interface GigabitEthernet1/0/4
  description M5-Edge-16UQ-LOM2
  switchport trunk allowed vlan 101-105
  switchport mode trunk
  spanning-tree portfast trunk

interface GigabitEthernet1/0/5
  description M5-Edge-05G9-LOM1
  switchport trunk allowed vlan 101-105
  switchport mode trunk
  spanning-tree portfast trunk

```

```
interface GigabitEthernet1/0/6
description M5-Edge-05G9-LOM2
switchport trunk allowed vlan 101-105
switchport mode trunk
spanning-tree portfast trunk
```

Sample Network Configuration 1GE Single Switch

1GE Single Switch

Nexus 5548 using trunk ports

```
vlan 101
name HX-MGMT
vlan 102
name HX-STORAGE
vlan 103
name HX-vMOTION
vlan 104
name HX-GUESTVM
...
interface Ethernet2/11
description HX-01-Port1
switchport mode trunk
switchport trunk allowed vlan 101-104
spanning-tree port type edge trunk
speed 1000
interface Ethernet2/12
description HX-01-Port2
switchport mode trunk
switchport trunk allowed vlan 101-104
spanning-tree port type edge trunk
speed 1000
interface Ethernet2/13
description HX-02-Port1
switchport mode trunk
switchport trunk allowed vlan 101-104
spanning-tree port type edge trunk
speed 1000
interface Ethernet2/14
description HX-02-Port2
switchport mode trunk
switchport trunk allowed vlan 101-104
spanning-tree port type edge trunk
speed 1000
interface Ethernet2/15
description HX-03-Port1
switchport mode trunk
switchport trunk allowed vlan 101-104
spanning-tree port type edge trunk
speed 1000
interface Ethernet2/16
description HX-03-Port2
switchport mode trunk
switchport trunk allowed vlan 101-104
spanning-tree port type edge trunk
speed 1000
```

Catalyst 3850-48T using trunk ports

```

vlan 101
  name HX-MGMT
vlan 102
  name HX-STORAGE
vlan 103
  name HX-vMOTION
vlan 104
  name HX-GUESTVM
...
interface GigabitEthernet1/0/1
  description HX-01-Port1
  switchport trunk allowed vlan 101-104
  switchport mode trunk
  speed 1000
  spanning-tree portfast trunk
interface GigabitEthernet1/0/2
  description HX-01-Port2
  switchport trunk allowed vlan 101-104
  switchport mode trunk
  speed 1000
  spanning-tree portfast trunk
interface GigabitEthernet1/0/3
  description HX-02-Port1
  switchport trunk allowed vlan 101-104
  switchport mode trunk
  speed 1000
  spanning-tree portfast trunk
interface GigabitEthernet1/0/4
  description HX-02-Port2
  switchport trunk allowed vlan 101-104
  switchport mode trunk
  speed 1000
  spanning-tree portfast trunk
interface GigabitEthernet1/0/5
  description HX-03-Port1
  switchport trunk allowed vlan 101-104
  switchport mode trunk
  speed 1000
  spanning-tree portfast trunk
interface GigabitEthernet1/0/6
  description HX-03-Port2
  switchport trunk allowed vlan 101-104
  switchport mode trunk
  speed 1000
  spanning-tree portfast trunk

```

Sample Network Configuration 1GE Dual Switch

1GE Dual Switch

Nexus 5548 using trunk ports

This configuration uses DHCP with in-band management using native `vlan 105`. This switch connects to both 1GE LOMs and uses `dhcp relay`.

```

ip dhcp relay
...
interface Vlan105
  ip address 10.1.2.1/24

```



```
    ip dhcp relay address 10.1.1.2
    no shutdown
vlan 101
    name HX-MGMT
vlan 102
    name HX-STORAGE
vlan 103
    name HX-vmOTION
vlan 104
    name HX-GUESTVM
vlan 105
    name HX-DHCP-CIMC
...
interface Ethernet2/11
    description HX-01-Port1
    switchport mode trunk
    switchport trunk native vlan 105
    switchport trunk allowed vlan 101-105
    spanning-tree port type edge trunk
    speed 1000
interface Ethernet2/12
    description HX-01-Port2
    switchport mode trunk
    switchport trunk native vlan 105
    switchport trunk allowed vlan 101-105
    spanning-tree port type edge trunk
    speed 1000
interface Ethernet2/13
    description HX-02-Port1
    switchport mode trunk
    switchport trunk native vlan 105
    switchport trunk allowed vlan 101-105
    spanning-tree port type edge trunk
    speed 1000
interface Ethernet2/14
    description HX-02-Port2
    switchport mode trunk
    switchport trunk native vlan 105
    switchport trunk allowed vlan 101-105
    spanning-tree port type edge trunk
    speed 1000
interface Ethernet2/15
    description HX-03-Port1
    switchport mode trunk
    switchport trunk native vlan 105
    switchport trunk allowed vlan 101-105
    spanning-tree port type edge trunk
    speed 1000
interface Ethernet2/16
    description HX-03-Port2
    switchport mode trunk
    switchport trunk native vlan 105
    switchport trunk allowed vlan 101-105
    spanning-tree port type edge trunk
    speed 1000
```

Repeat the same configuration on switch #2. Eliminate the `dhcp relay` and `interface Vlan 105` commands.

Catalyst 3850-48T using trunk ports

This configuration uses statically-assigned CIMC IPs on `vlan 105`. All `vlan`s are allowed on all trunk interfaces. For security purposes, we recommend restricting the VLANs to those required for a HyperFlex deployment by adding the `switchport trunk allowed vlan` statement into all your port configurations.

```

vlan 101
  name HX-MGMT
vlan 102
  name HX-STORAGE
vlan 103
  name HX-vMOTION
vlan 104
  name HX-GUESTVM
vlan 105
  name HX-CIMC
...
interface GigabitEthernet1/0/1
  description HX-01-Port1
  switchport mode trunk
  speed 1000
  spanning-tree portfast trunk
interface GigabitEthernet1/0/2
  description HX-01-Port2
  switchport mode trunk
  speed 1000
  spanning-tree portfast trunk
interface GigabitEthernet1/0/3
  description HX-02-Port1
  switchport mode trunk
  speed 1000
  spanning-tree portfast trunk
interface GigabitEthernet1/0/4
  description HX-02-Port2
  switchport mode trunk
  speed 1000
  spanning-tree portfast trunk
interface GigabitEthernet1/0/5
  description HX-03-Port1
  switchport mode trunk
  speed 1000
  spanning-tree portfast trunk
interface GigabitEthernet1/0/6
  description HX-03-Port2
  switchport mode trunk
  speed 1000
  spanning-tree portfast trunk

```

Repeat the same configuration on switch #2.

Sample Network Configuration 10/25GE 2-Node 2-Room

10/25GE 2-Node 2-Room

Catalyst 9000 with QoS

This configuration uses quality of service to mark and prioritize HyperFlex storage traffic using the 10 or 25 Gigabit Ethernet Stacked Switches Per Room Topology

```

qos queue-softmax-multiplier 1200
qos queue-stats-frame-count
...
class-map match-all Storage_PQ
match dscp ef
class-map match-all Storage_Mark

```

```

match access-group name Storage
...
policy-map Storage_Mark
class Storage_Mark
    set dscp ef
class class-default
policy-map Storage_Queue
class Storage_PQ
    priority level 1 percent 80 //Adjust this value based on traffic mix. This guarantees
80% bandwidth for storage when needed.
    queue-buffers ratio 80
class class-default
    bandwidth remaining percent 100
    queue-buffers ratio 20
...
interface Port-channel98
switchport trunk allowed vlan 101,102,103,104,105
switchport mode trunk
!
interface GigabitEthernet1/0/3
description SERVER1-Dedicated-CIMC
switchport access vlan 145
switchport mode access
spanning-tree portfast
!
interface TenGigabitEthernet1/1/1
description SERVER1-VIC-1
switchport trunk allowed vlan 101,102,103,104,105
switchport mode trunk
spanning-tree portfast trunk
service-policy input Storage_Mark
service-policy output Storage_Queue
!
interface TenGigabitEthernet2/1/1
description SERVER1-VIC-2
switchport trunk allowed vlan 101,102,103,104,105
switchport mode trunk
spanning-tree portfast trunk
service-policy input Storage_Mark
service-policy output Storage_Queue
!
interface TenGigabitEthernet1/1/8
description cross-connect-01
switchport trunk allowed vlan 101,102,103,104,105
switchport mode trunk
channel-group 98 mode on
service-policy input Storage_Mark
service-policy output Storage_Queue
!
interface TenGigabitEthernet2/1/8
description cross-connect-02
switchport trunk allowed vlan 101,102,103,104,105
switchport mode trunk
channel-group 98 mode on
service-policy input Storage_Mark
service-policy output Storage_Queue
!
...
ip access-list extended Storage
10 permit ip 169.254.1.0 0.0.0.255 169.254.1.0 0.0.0.255

```

Repeat the same configuration on switch stack #2.

