Cisco HyperFlex Systems HX Data Platform Pre-Install Checklist

Preinstallation Checklist for Cisco HX Data Platform

Cisco HyperFlex Systems Documentation Roadmap

For a complete list of all Cisco HyperFlex Systems documentation, see Cisco HyperFlex Systems Documentation Roadmap.

Contact Information

Customer Account Team and Contact Information

Name	Title	E-mail	Phone
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Equipment Shipping Address

Company Name	
Attention Name/Dept	
Street Address #1	
Street Address #2	
City, State, and Zip	
Data Center Floor and Room #	

Office Address (if different than shipping address)

Company Name	
Attention Name/Dept	
Street Address #1	
Street Address #2	
City, State, and Zip	

Software Requirements

The software requirements include verification that you are using compatible versions of Cisco HyperFlex Systems (HX) components and VMware vSphere components.

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.

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

- For new deployments, verify that Cisco UCS Manager 3.1(2b) or later is installed. Contact Contacting Cisco TAC for guidance.

- 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.

HyperFlex Release	HX Data Platform Installer	HX Data Platform	UCS FI Firmware
2.0(1a)	2.0(1a)	2.0(1a)	3.1(2b), 3.1(2c), 3.1(2f)
1.8(1e)	1.8(1e)	1.8(1e)	3.1(2b), 3.1(2c)
1.8(1c)	1.8(1c)	1.8(1c)	3.1(2b), 3.1(2c)
1.8(1b)	1.8(1b)	1.8(1b)	3.1(2b)
1.8(1a)	1.8(1a)	1.8(1a)	3.1(2b)
1.7.3	1.7.3	1.7.3	2.2(7c)
1.7.1	1.7.1-14835	1.7	2.2(7c)
1.7.1	1.7.1	1.7	2.2(6f)

Supported VMware vSphere Versions and Editions

Each HyperFlex release is compatible with specific versions of vSphere, VMware vCenter, and VMware ESXi.

- Verify that all HX servers have a compatible version of vSphere preinstalled.

• Verify that the vCenter version is the same or later than the ESXi version.

• Verify that you have a vCenter administrator account with root-level privileges and the associated password.

Note

• You cannot preinstall the vSphere Standard, Essentials Plus, and ROBO editions on HX servers.

• vSphere version 5.5 U3 supports only HX240c or HXAF240c HX servers.

• If you have the ESXi 5.5 U3b version, we recommend an ESXi upgrade. Contact Contacting Cisco TAC for additional information.

• 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).

HyperFlex Version	vSphere Versions	vSphere Editions
2.0(1a)	6.0 U1b, 6.0 U2, 6.0 U2 Patch 3, 6.0 U2 Patch 4	Enterprise, Enterprise Plus, Standard, Essentials Plus, ROBO
1.8(1e)	6.0 U1b, 6.0 U2, 6.0 U2 Patch 3	Enterprise, Enterprise Plus, Standard, Essentials Plus, ROBO
1.8(1c)	6.0 U1b, 6.0 U2, 6.0 U2 Patch 3	Enterprise, Enterprise Plus, Standard, Essentials Plus, ROBO
1.8(1c)	5.5 U3	Enterprise, Enterprise Plus
1.8(1b)	6.0 U1b, 6.0 U2, 6.0 U2 Patch 3	Enterprise, Enterprise Plus, Standard, Essentials Plus, ROBO
1.8(1a)	6.0 U1b, 6.0 U2, 6.0 U2 Patch 3	Enterprise, Enterprise Plus, Standard, Essentials Plus, ROBO
1.7.3	6.0 U1b, 6.0 U2	Enterprise, Enterprise Plus, Standard, Essentials Plus, ROBO
1.7.3	5.5 U3	Enterprise, Enterprise Plus
1.7.1	6.0 U1b	Enterprise, Enterprise Plus, Standard, Essentials Plus, ROBO
1.7.1	5.5 U3	Enterprise, Enterprise Plus

VMware vSphere Licensing Requirements

How you purchase your vSphere license determines how your license applies to your HyperFlex system.

• **If you purchased your vSphere license with HyperFlex**

Each HyperFlex server either has the Enterprise or Enterprise Plus edition preinstalled at the factory.

- The SD cards have the OEM licenses preinstalled. If you delete or overwrite the content of the SD cards after receiving the HX servers, you also delete the factory-installed licenses from the SD cards.

- We do not provide physical PAK or license keys.

- OEM license keys is a new VMware vCenter 6.0 U1b feature. Earlier versions do not support OEM licenses.

- All factory-installed HX nodes share the same OEM license key. With vSphere OEM keys, the "Usage" count can exceed the "Capacity" value.

- When you add an HX host to vCenter through the "Add Host" wizard, in the "Assign license" section, select the OEM license.

  We obfuscate the actual vSphere OEM license key; for example, 0N085-XXXXX-XXXXX-XXXXX-10LHH

- Standard, Essentials Plus, and ROBO editions are not available preinstalled on HX servers.

- **If you did NOT purchase your vSphere license with HyperFlex**

  The HX nodes have a vSphere Foundation license preinstalled. The Foundation license supports a version of vSphere for installation but is not a Right-To-Use (RTU) vSphere license. After initial setup, you must supply your own vSphere license for a supported version of vSphere that you intend to use.

  vSphere 5.5 U3 can only license the Enterprise or Enterprise Plus editions.

- **If you purchased your vSphere license from Cisco without a HyperFlex system**

  Contact Contacting Cisco TAC to obtain a spare vSphere license at no additional cost.

Physical Requirements

Physical Server Requirements

- For a HX220c/HXAF220c Cluster:

  - Two rack units (RU) for the UCS 6248UP, 6332UP, 6332-16UP Fabric Interconnects (FI) or four RU for the UCS 6296UP FI

  - HX220c Nodes are one RU each; for example, for a three-node cluster, three RU are required; for a four-node cluster, 4 RU are required

  - If a Top-of-Rack switch is included in the install, add at least two additional RU of space for the switch.

- For a HX240c/HXAF240c Cluster:

  - Two rack units (RU) for the UCS 6248UP, 6332UP, 6332-16UP Fabric Interconnects (FI) or four RU for the UCS 6296UP FI

  - HX240c Nodes are two RU each; for example, for a three-node cluster, six RU are required; for a four-node cluster, eight RU are required

• If a Top-of-Rack switch is included in the install, add at least two additional RU of space for the switch.

Although there is no requirement for contiguous rack space, it makes installation easier.

• The system requires two C13/C14 power cords connected to a 15-amp circuit per device in the cluster. At a minimum, there are three HX nodes and two FI, and it can scale to eight HX nodes, two FI, and blade chassis.

• Up to 2 - 4x uplink connections for UCS Fabric Interconnects.

• Per best practice, each FI requires either 2x10 Gb optical connections in an existing network, or 2x10 Gb Twinax cables. Each HX node requires two Twinax cables for connectivity (10 Gb optics can be used). For deployment with 6300 series FI, use 2x40GbE uplinks per FI and connect each HX node with dual native 40GbE.

• **VIC and NIC Support:** For details, see the Cisco HyperFlex Systems—Networking Topologies document.

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Note Single FI HX deployment is not supported.

Network Requirements

Verify that your environment adheres to the following best practices:

• Must use a different subnet and VLANs for each network.

• Verify that each host directly attaches to a UCS Fabric Interconnect using an appropriate cable.

• **Do not** use VLAN 1, the default VLAN, because it can cause networking issues, especially if Disjoint Layer 2 configuration is used. Use a different VLAN.

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Important **Reserved VLAN IDs**- VLANs with IDs from 4030 to 4047 and from 4094 to 4095 are reserved in UCS. You cannot use VLANs with IDs from this range. Until Cisco UCS Manager Release 4.0(1d), VLAN ID 4093 was in the list of reserved VLANs. VLAN 4093 has been removed from the list of reserved VLANs and is available for configuration.

The VLAN IDs you specify must also be supported on the uplink switch that you are using. For example, VLAN IDs 3968 to 4095 are reserved by Nexus switches and VLAN IDs 1002 to 1005 are reserved by Catalyst switches. Before you decide the VLAN IDs for HyperFlex use, make sure that the same VLAN IDs are available on your uplink switch.

• Configure the upstream switches to accommodate non-native VLANs. Cisco HX Data Platform Installer sets the VLANs as non-native by default.

• Uplinks from the UCS Fabric Interconnects to all top of rack switch ports must configure spanning tree in **edge trunk** or **portfast edge** mode depending on the vendor and model of the switch. This extra configuration ensures that when links flap or change state, they do not transition through unnecessary spanning tree states and incur an extra delay before traffic forwarding begins. Failure to properly configure FI uplinks in **portfast edge** mode may result in network and cluster outages during failure scenarios and during infrastructure upgrades that leverage the highly available network design native to HyperFlex.

Each VMware ESXi host needs the following separate networks:

- **Management traffic network**—From the VMware vCenter, handles hypervisor (ESXi server) management and storage cluster management.

- **Data traffic network**—Handles the hypervisor and storage data traffic.

- **vMotion network**

- **VM network**

There are four vSwitches, each one carrying a different network:

- **vswitch-hx-inband-mgmt**—Used for ESXi management and storage controller management.

- **vswitch-hx-storage-data**—Used for ESXi storage data and HX Data Platform replication.

  The vswitch-hx-inband-mgmt and vswitch-hx-storage-data vSwitches further divide into two port groups with assigned static IP addresses to handle traffic between the storage cluster and ESXi host.

- **vswitch-hx-vmotion**—Used for VM and storage VMware vMotion.

  This vswitch has one port group for management, defined through VMware vSphere, which connects to all hosts in the vCenter cluster.

- **vswitch-hx-vm-network**—Used for VM data traffic.

  You can add or remove VLANs on the corresponding vNIC templates in Cisco UCS Manager and create port groups on the vswitch.

Note
- Cisco HX Data Platform Installer creates the vSwitches automatically.

- Ensure that you enable the following services in vSphere after you create the HX Storage Cluster using `post_install` script. For details on the post_install script, see Run Post-Installation Script .

  - DRS (vSphere Enterprise Plus only)

  - vMotion

  - High Availability

Required Ports

Minimum two ports are required, one for storage management network and one for storage data network. For redundancy and failover, it is highly recommended that you have four ports, 2 each for the storage management network and storage data network.

If your network is behind a firewall, in addition to the standard VMware recommended ports for ESXi and vCenter, ensure that the following firewall ports are open:

Port Number	Protocol	Direction
80	HTTP /TCP	Inbound
443	HTTPS /TCP	Inbound

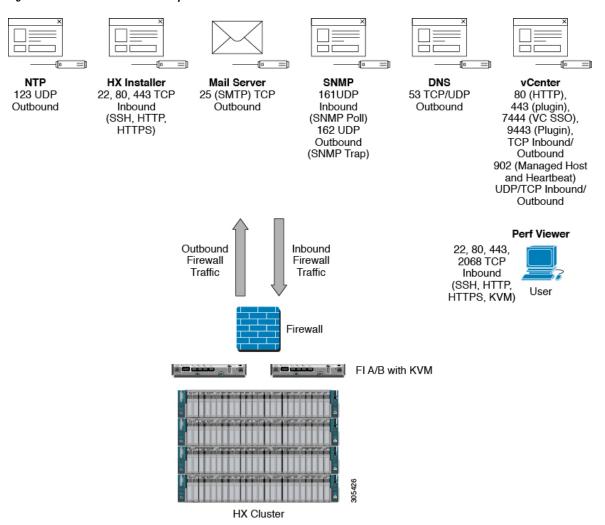| Port Number	Protocol	Direction
2068	KVM/TCP	Inbound
22	SSH /TCP	Inbound/Outbound
110 (secure POP port is TCP; 995)	POP3 /TCP	Inbound/Outbound
143 (secure IMAP port is TCP; 993)	IMAP4 /TCP	Inbound/Outbound
25	SMTP /TCP	Outbound
53 (external lookups)	DNS /TCP/UDP	Outbound
123	NTP / UDP	Outbound
161	SNMP Poll	Inbound
162	SNMP Trap	Outbound
902	UDP/TCP	Inbound/Outbound
7444 *default SSO	HTTPS/TCP	Outbound
9443	HTTPS/TCP	Inbound/Outbound
8089	TCP	Inbound

Tip If you do not have standard configurations and need different port setting, refer to Table C-5 Port Literal Values for customizing your environment.

Also refer to the diagram for further details.

NTP
123 UDP
Outbound

HX Installer
22, 80, 443 TCP
Inbound
(SSH, HTTP,
HTTPS)

Mail Server
25 (SMTP) TCP
Outbound

SNMP
161UDP
Inbound
(SNMP Poll)
162 UDP
Outbound
(SNMP Trap)

DNS
53 TCP/UDP
Outbound

vCenter
80 (HTTP),
443 (plugin),
7444 (VC SSO),
9443 (Plugin),
TCP Inbound/
Outbound
902 (Managed Host
and Heartbeat)
UDP/TCP Inbound/
Outbound

Outbound
Firewall
Traffic

Inbound
Firewall
Traffic

Perf Viewer
22, 80, 443,
2068 TCP
Inbound
(SSH, HTTP,
HTTPS, KVM)

User

Firewall

FI A/B with KVM

HX Cluster

Deployment Information

Before deploying HX Data Platform and creating a cluster, collect the following information about your system.

Cisco UCS Fabric Interconnects (FI) Information

UCS cluster name	
FI cluster IP address	
UCS FI-A IP address	
UCS FI-B IP address	
Pool for KVM IP addresses (one per HX node is required)	

Subnet mask IP address	
Default gateway IP address	
MAC pool prefix (provide two hex characters)	00:25:B5:
UCS Manager username	admin
Password	

VLAN Information

Tag the VLAN IDs to the Fabric Interconnects.

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Important   **Reserved VLAN IDs**- VLANs with IDs from 4030 to 4047 and from 4094 to 4095 are reserved in UCS. You cannot use VLANs with IDs from this range. Until Cisco UCS Manager Release 4.0(1d), VLAN ID 4093 was in the list of reserved VLANs. VLAN 4093 has been removed from the list of reserved VLANs and is available for configuration.

The VLAN IDs you specify must also be supported on the uplink switch that you are using. For example, VLAN IDs 3968 to 4095 are reserved by Nexus switches and VLAN IDs 1002 to 1005 are reserved by Catalyst switches. Before you decide the VLAN IDs for HyperFlex use, make sure that the same VLAN IDs are available on your uplink switch.

Network	VLAN ID	VLAN Name	Description
Use separate subnet and VLANs for each of the following networks:			
VLAN for VMware ESXi and Cisco HyperFlex (HX) management		Hypervisor Management Network Storage controller management network	Used for management traffic among ESXi, HX, and VMware vCenter; must be routable.
VLAN for HX storage traffic		Hypervisor Data Network Storage controller management network	Used for storage traffic and requires L2.
VLAN for VM VMware vMotion		vswitch-hx-vmotion	Used for vMotion VLAN, if applicable.
VLAN for VM network		vswitch-hx-vm-network	Used for VM/application network.

Customer Deployment Information

Deploy the HX Data Platform using an OVF installer appliance. A separate ESXi server, which is not a member of the vCenter HX Cluster, is required to host the installer appliance. The installer requires one IP address on the management network.

The installer appliance IP address must be reachable from the management subnet used by the hypervisor and the storage controller VMs. The installer appliance must run on the ESXi host or on a VM Player/VMware workstation that is **not** a part of the cluster installation. In addition, the HX Data Platform Installer VM IP address must be reachable by Cisco UCS Manager, ESXi, and vCenter IP addresses where HyperFlex hosts are added.

Installer appliance IP address	

Network IP Addresses

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Note
- Data network IPs in the range of 169.254.X.X in a network larger than /24 is not supported and should not be used.
- Data network IPs in the range of 169.254.254.0/24 must not be used.

Management Network IP Addresses (must be routable)			Data Network IP Addresses (does not have to be routable)	
Important Ensure that the Data and Management Networks are on different subnets for a successful installation.				
ESXi Hostname*	**Hypervisor Management Network**	**Storage Controller Management Network**	**Hypervisor Data Network (Not Required for Cisco Intersight)**[1]	**Storage Controller Data Network (Not Required for Cisco Intersight)**[2]
Server 1:				
Server 2:				
Server 3:				
Server 4:				
Server 5:				
	Storage Cluster Management IP address		**Storage Cluster Data IP address**	
	Subnet mask IP address		**Subnet mask IP address**	
	Default gateway IP address		**Default gateway IP address**	

[1] *Data network IPs are automatically assigned to the 169.254.X.0/24 subnet based on MAC address prefix.*
[2] *Data network IPs are automatically assigned to the 169.254.X.0/24 subnet based on MAC address prefix.*

* Verify DNS forward and reverse records are created for each host. If no DNS records exist, hosts are added to vCenter by IP address instead of FQDN.

VMware vMotion Network IP Addresses

VMware vMotion Network IP Addresses (not configured by software)
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•

VMware vMotion Network IP Addresses (not configured by software)
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•
•

Hypervisor Credentials

root username	root
root password	

VMware vCenter Configuration

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

vCenter FQDN or IP address	
vCenter admin username *username@domain*	
vCenter admin password	
vCenter data center name	
VMware vSphere compute cluster and storage cluster name	

Single Sign-On (SSO)

SSO Server URL* • This information is required only if the SSO URL is not reachable. • This is automatic for ESXi version 6.0 and later.	

* SSO Server URL can be found in vCenter at **vCenter Server** > **Manage** > **Advanced Settings**, key *config.vpxd.sso.sts.uri*.

Network Services

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Note
- At least one DNS and NTP server must 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.

- **Custom HyperFlex Controller Hostname**: If you would like to set custom host names for the HyperFlex controller VMs, make sure to pre-configure DNS servers with forward (A) and reverse (PTR) DNS records for each controller management IP before starting deployment. If a valid DNS record is not found, the installer will set the controller hostname as SpringpathController and 10 random digits/uppercase letters.

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

Connected Services

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

Contacting Cisco TAC

You can open a Cisco Technical Assistance Center (TAC) support case to reduce time addressing issues and get efficient support directly with Cisco Prime Collaboration application.

For all customers, partners, resellers, and distributors with valid Cisco service contracts, Cisco Technical Support provides around-the-clock, award-winning technical support services. The Cisco Technical Support website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies:

http://www.cisco.com/techsupport

Using the TAC Support Case Manager online tool is the fastest way to open S3 and S4 support cases. (S3 and S4 support cases consist of minimal network impairment issues and product information requests.) After you describe your situation, the TAC Support Case Manager automatically provides recommended solutions. If your issue is not resolved by using the recommended resources, TAC Support Case Manager assigns your support case to a Cisco TAC engineer. You can access the TAC Support Case Manager from this location:

https://mycase.cloudapps.cisco.com/case

For S1 or S2 support cases or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 support cases consist of production network issues, such as a severe degradation or outage.) S1 and S2 support cases have Cisco TAC engineers assigned immediately to ensure your business operations continue to run smoothly.

To open a support case by telephone, use one of the following numbers:

- Asia-Pacific: +61 2 8446 7411

- Australia: 1 800 805 227

- EMEA: +32 2 704 5555

- USA: 1 800 553 2447

For a complete list of Cisco TAC contacts for Enterprise and Service Provider products, see http://www.cisco.com/c/en/us/support/web/tsd-cisco-worldwide-contacts.html.

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