Spec Sheet

This product has been discontinued

Cisco HyperFlex HXAF220c M4 Node

CISCO SYSTEMS
170 WEST TASMAN DR
SAN JOSE, CA, 95134
WWW.CISCO.COM

PUBLICATION HISTORY

REV A.15 February 19, 2019

OVERVIEW 3
DETAILED VIEWS 4
Chassis Front View 4
Chassis Rear View 5
BASE HXAF220c M4 STANDARD CAPABILITIES and FEATURES 6
CONFIGURING the HXAF220c M4 9
STEP 1 VERIFY SKU 10
STEP 2 SELECT CPU(s) 11
STEP 3 SELECT MEMORY 13
STEP 4 SELECT DRIVE CONTROLLER 16
SAS HBA Drive Connectivity 16
STEP 5 SELECT SOLID STATE DRIVES (SSDs) 17
STEP 6 SELECT PCIe OPTION CARD(s) 19
STEP 7 ORDER POWER SUPPLIES 20
STEP 8 SELECT AC POWER CORD(s) 21
STEP 9 ORDER TOOL-LESS RAIL KIT AND OPTIONAL REVERSIBLE CABLE MANAGEMENT ARM . 24
STEP 10 ORDER A TRUSTED PLATFORM MODULE (OPTIONAL) 25
STEP 11 ORDER CISCO FLEXIBLE FLASH SD CARD MODULE 26
STEP 12 SELECT OPERATING SYSTEM AND VALUE-ADDED SOFTWARE 27
STEP 13 SELECT SERVICE and SUPPORT LEVEL 28
OPTIONAL STEP - ORDER RACK(s) 32
OPTIONAL STEP - ORDER PDU 33
SUPPLEMENTAL MATERIAL 34
Hyperconverged Systems 34
Chassis 35
Block Diagram 36
CPUs and DIMMs 37
Physical Layout 37
Memory Population Rules 38
DIMM Population Order 39
Serial Port Details 40
Upgrade and Servicing-Related Parts 41
Motherboard Lithium Battery 41
Thermal Grease (with syringe applicator) for CPU to Heatsink Seal 42
Air Baffle Replacement Kit 42
RACKS 43
PDUs 45
KVM CABLE 46
TECHNICAL SPECIFICATIONS 47
Dimensions and Weight 47
Power Specifications 48
Environmental Specifications 49
Compliance Requirements 50

OVERVIEW

Cisco HyperFlex™ Systems unlock the full potential of hyperconvergence. The systems are based on an end-to-end software-defined infrastructure, combining software-defined computing in the form of Cisco Unified Computing System (Cisco UCS) servers; software-defined storage with the powerful Cisco HX Data Platform and software-defined networking with the Cisco UCS fabric that will integrate smoothly with Cisco Application Centric Infrastructure (Cisco ACI™). Together with a single point of connectivity and hardware management, these technologies deliver a preintegrated and adaptable cluster that is ready to provide a unified pool of resources to power applications as your business needs dictate.

The Cisco HyperFlex HXAF220c M4 Node is shown in *Figure 1*.

Figure 1 Cisco HyperFlex HXAF220c M4 Node

Front View



Rear View

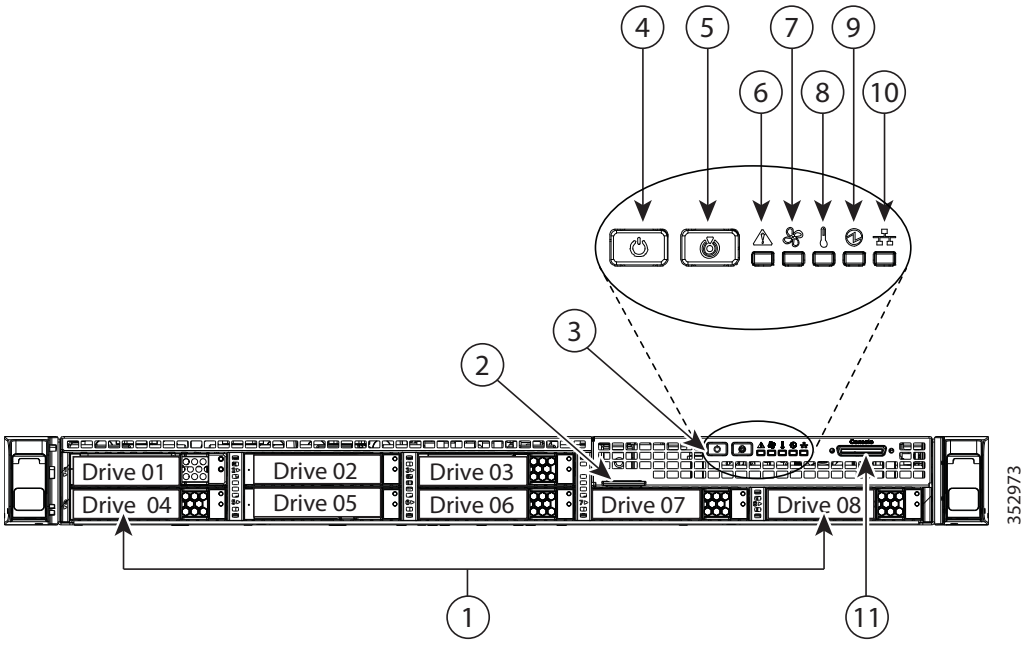


DETAILED VIEWS

Chassis Front View

Figure 2 shows the front view of the Cisco HyperFlex HXAF220c M4 Node (with front bezel removed).

Figure 2 Chassis Front View



1	Drives ■ 6 x 3.8 TB, 6 x 960 GB SATA SSDs, or up to 6 x 800 GB SAS SEDs (for data) Drives 03 through 08 ■ 1 x 800 GB SAS SSD drive, 1 x 400 GB SAS SSD drive, 1 x 800 GB SAS SED SSD, 1 x 400 GB NVMe, or 1 x 1.6TB NVMe (for caching) Drive 02 ■ 1 x 120 GB or 240 GB drive (HyperFlex system drive) Drive 01	**7**	Fan status LED
2	Pull-out asset tag	**8**	Temperature status LED
3	Operations panel buttons and LEDs	**9**	Power supply status LED
4	Power button/Power status LED	**10**	Network link activity LED
5	Unit identification button/LED	**11**	KVM connector (used with KVM cable that provides two USB 2.0, one VGA, and one serial connector)[1]
6	System status LED	**—**	—

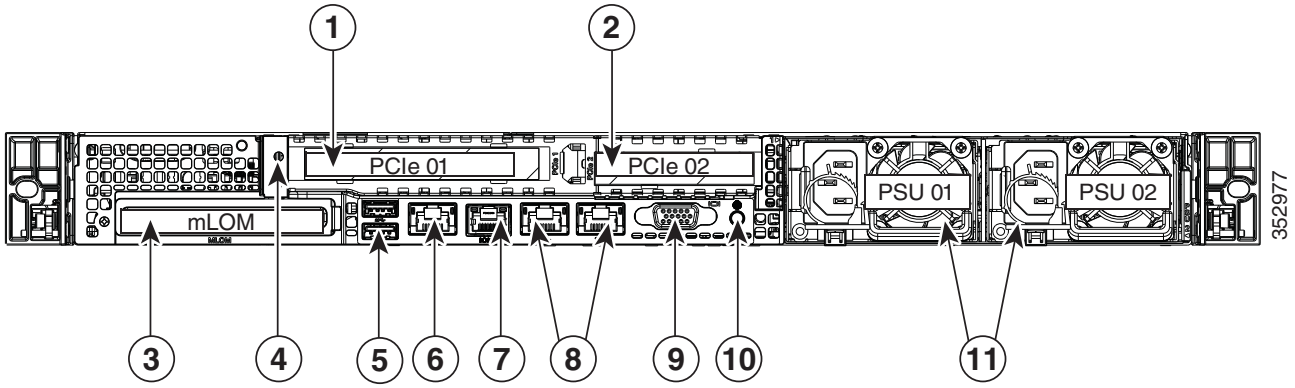
Notes . . .

1. For more information about the KVM cable connection, see **KVM CABLE, page 46**

Chassis Rear View

Figure 3 shows the external features of the rear panel.

Figure 3 Chassis Rear View



1	PCIe riser 1/slot 1	**7**	Serial port (RJ-45 connector)[1]
2	PCIe riser 2/slot 2	**8**	Two embedded (on the motherboard) Intel i350 GbE Ethernet controller ports (LAN1, LAN2)
3	Modular LAN-on-motherboard (mLOM) card slot	**9**	VGA video port (DB-15)
4	Grounding-lug hole (for DC power supplies)	**10**	Rear unit identification button/LED
5	USB 3.0 ports (two)	**11**	Power supplies (up to two, redundant as 1+1)
6	1-Gb Ethernet dedicated management port	**—**	—

Notes . . .

1. For details of the serial port pinout, see **Serial Port Details, page 40**.

BASE HXAF220c M4 STANDARD CAPABILITIES and FEATURES

Table 1 lists the capabilities and features of the base HXAF220c M4 Node. Details about how to configure the system for a particular feature or capability (for example, number of processors, disk drives, or amount of memory) are provided in **CONFIGURING the HXAF220c M4, page 9**.

Table 1 Capabilities and Features

Capability/Feature	Description
Chassis	One rack unit (1RU) chassis
CPU	Two Intel® Xeon E5-2600 v4 series processor family CPUs
Chipset	Intel® C610 series chipset
Memory	24 slots for registered ECC DIMMs (RDIMMs)
Multi-bit Error Protection	Supports multi-bit error protection.
Embedded NIC	Two embedded (on the motherboard) Intel i350 GbE ports, supporting the following: ■ Pre-Execution Boot (PXE boot) ■ iSCSI boot ■ Checksum and segmentation offload ■ NIC teaming
Expansion slots	Riser 1 (controlled by CPU 1): ■ One full-height profile, 3/4-length slot with x24 connector and x16 lane Riser 2 (controlled by CPU 2): ■ One half-height profile, half-length slot with x24 connector and x16 lane Dedicated disk controller slot (see *Figure 6 on page 35*) ■ An internal slot is reserved for use by the Cisco 12 Gbps Modular SAS HBA.
PCIe Interposer Board	A interposer board inside the chassis containing two mini-SAS HD connectors on HX allows a front-mount NVMe SFF 2.5" drives to mount in drive bays 1 or 2 (only) and connect to the PCIe bus of CPU2. This is required when NVMe Write Log drive is configured.
Internal storage devices	Drives are installed into front-panel drive bays that provide hot-pluggable access. ■ Small Form Factor (SFF) drives. • Six 3.8 TB, six 960 GB SATA SSDs, or six 800 GB SED drives (for data) • One 400GB/800GB SAS SSD or one 400GB/1.6TB NVMe SSD[1] (for caching) • One 120/240 GB SATA SSD (HyperFlex system drive)
Cisco Flexible Flash drives	The system supports two internal 64 GB Cisco Flexible Flash drives (SD cards). The SD cards are mirrored to each other and are used for booting.

Table 1 Capabilities and Features *(continued)*

Capability/Feature	Description
Video	The Cisco Integrated Management Controller (CIMC) provides video using the Matrox G200e video/graphics controller: ■ Integrated 2D graphics core with hardware acceleration ■ DDR2/3 memory interface supports up to 512 MB of addressable memory (8 MB is allocated by default to video memory) ■ Supports display resolutions up to 1920 x 1200 16bpp @ 60Hz ■ High-speed integrated 24-bit RAMDAC ■ Single lane PCI-Express host interface running at Gen 1 speed
Interfaces	■ Rear panel • One DB15 VGA connector • One RJ45 serial port connector • Two USB 3.0 port connectors • One RJ-45 10/100/1000 Ethernet management port, using Cisco Integrated Management Controller (CIMC) firmware • Two Intel i350 embedded (on the motherboard) GbE LOM ports • One flexible modular LAN on motherboard (mLOM) slot that accommodates the Cisco UCS VIC 1227 MLOM - Dual Port 10Gb SFP+ interface card or the VIC 1387 Cisco VIC 1387 Dual Port 40Gb QSFP CNA. • Two PCIe 3.0 slots ■ Front panel • One KVM console connector (supplies two USB 2.0 connectors, one VGA DB15 connector, and one serial port (RS232) RJ45 connector)
Storage controller	■ Cisco 12 Gbps Modular SAS HBA with internal SAS connectivity • This system can be configured with a maximum of 8 drives) • Plugs into a dedicated internal disk controller slot • No RAID support
WoL	The 1-Gb Base-T Ethernet LAN ports support the wake-on-LAN (WoL) standard.
Front Panel	A front panel controller provides status indications and control buttons
Modular LAN on Motherboard (mLOM) slot	The mLOM slot accommodates the following card: ■ Cisco VIC 1227 or 1387 Virtual Interface Cards
Power subsystem	Two 770 W (AC) hot swappable power supplies.
ACPI	This system supports the advanced configuration and power interface (ACPI) 4.0 standard.
Fans	Chassis: ■ Six hot-swappable fans for front-to-rear cooling

Table 1 Capabilities and Features *(continued)*

Capability/Feature	Description
Integrated management processor	Baseboard Management Controller (BMC) running Cisco Integrated Management Controller (CIMC) firmware. Depending on your CIMC settings, the CIMC can be accessed through the 1-GbE dedicated management port, the 1-GbE LOM ports, or a Cisco virtual interface card (VIC).

Notes . . .

1. This drive can be placed in the front drive bays 1 and 2 only.

CONFIGURING the HXAF220c M4

For the most part, this system comes with a fixed configuration. Use these steps to see or change the configuration of the Cisco HXAF220c M4 Node:

- STEP 1 VERIFY SKU, page 10
- STEP 2 SELECT CPU(s), page 11
- STEP 3 SELECT MEMORY, page 13
- STEP 4 SELECT DRIVE CONTROLLER, page 16
- STEP 5 SELECT SOLID STATE DRIVES (SSDs), page 17
- STEP 6 SELECT PCIe OPTION CARD(s), page 19
- STEP 7 ORDER POWER SUPPLIES, page 20
- STEP 8 SELECT AC POWER CORD(s), page 21
- STEP 9 ORDER TOOL-LESS RAIL KIT AND OPTIONAL REVERSIBLE CABLE MANAGEMENT ARM, page 24
- STEP 10 ORDER A TRUSTED PLATFORM MODULE (OPTIONAL), page 25
- STEP 11 ORDER CISCO FLEXIBLE FLASH SD CARD MODULE, page 26
- STEP 12 SELECT OPERATING SYSTEM AND VALUE-ADDED SOFTWARE, page 27
- STEP 13 SELECT SERVICE and SUPPORT LEVEL, page 28
- OPTIONAL STEP - ORDER RACK(s), page 32
- OPTIONAL STEP - ORDER PDU, page 33

STEP 1 VERIFY SKU

Verify the product ID (PID) from *Table 2*.

Table 2 PID of the HXAF220c M4 Node

Product ID (PID)	Description
HXAF220c-M4S[1]	HXAF220c M4 Node, with two CPUs, memory, six SSDs for data storage, one SSD (HyperFlex system drive), one SSD for caching, two power supplies, two SD cards, one VIC 1227 mLOM card, no PCIe cards, and no rail kit
HXAF-M4S-HXDP	This major line bundle (MLB) consists of the Server Nodes (HXAF220C-M4S and HXAF240C-M4SX) with HXDP software spare PIDs
HXAF2X0C-M4S	This major line bundle (MLB) consists of the Server Nodes (HXAF220C-M4S and HXAF240C-M4SX), Fabric Interconnects (HX-FI-6248UP and HX-FI-6296UP), and HXDP software spare PIDs.

Notes . . .

1. This product may not be purchased outside of the approved bundles (must be ordered under the MLB).

The HXAF220c M4 Node:

- Includes two power supplies, two CPUs, memory, eight solid-state drives (SSDs), VIC 1227 mLOM card, and SD cards
- Does not include rail kit or plug-in PCIe cards.



NOTE: Use the steps on the following pages to see or change the configuration of the system.

STEP 2 SELECT CPU(s)

The standard CPU features are:

- Intel Xeon E5-2600 v4 series processor family CPUs
- Intel C610 series chipset
- Cache size of up to 55 MB

Select CPUs

The available CPUs are listed in *Table 3*.

Table 3 Available Intel CPUs

Product ID (PID)	Intel Number	Clock Freq (GHz)	Power (W)	Cache Size (MB)	Cores	QPI	Highest DDR4 DIMM Clock Support (MHz)[1]
E5-2600 v4 Series Processor Family CPUs							
HX-CPU-E52699E	E5-2699 v4	2.20	145	55	22	9.6 GT/s	2400
HX-CPU-E52699AE	E5-2699A v4	2.40	145	55	22	9.6 GT/s	2400
HX-CPU-E52698E	E5-2698 v4	2.20	135	50	20	9.6 GT/s	2400
HX-CPU-E52697AE	E5-2697A v4	2.60	145	40	16	9.6 GT/s	2400
HX-CPU-E52697E	E5-2697 v4	2.30	145	45	18	9.6 GT/s	2400
HX-CPU-E52695E	E5-2695 v4	2.10	120	45	18	9.6 GT/s	2400
HX-CPU-E52690E	E5-2690 v4	2.60	135	35	14	9.6 GT/s	2400
HX-CPU-E52683E	E5-2683 v4	2.10	120	40	16	9.6 GT/s	2400
HX-CPU-E52680E	E5-2680 v4	2.40	120	35	14	9.6 GT/s	2400
HX-CPU-E52667E	E5-2667 v4	3.20	135	25	8	9.6 GT/s	2400
HX-CPU-E52660E	E5-2660 v4	2.00	105	35	14	9.6 GT/s	2400
HX-CPU-E52658E	E5-2658 v4	2.30	105	35	14	9.6 GT/s	2400
HX-CPU-E52650E	E5-2650 v4	2.20	105	30	12	9.6 GT/s	2400
HX-CPU-E52650LE	E5-2650L v4	1.70	65	35	14	9.6 GT/s	2400
HX-CPU-E52640E	E5-2640 v4	2.40	90	25	10	8.0 GT/s	2133
HX-CPU-E52630E	E5-2630 v4	2.20	85	25	10	8/0 GT/s	2133
HX-CPU-E52630LE	E5-2630L v4	1.80	55	25	8	8.0 GT/s	2133
HX-CPU-E52620E	E5-2620 v4	2.10	85	20	8	8.0 GT/s	2133
HX-CPU-E52609E	E5-2609 v4	1.70	85	20	8	6.4 GT/s	1866

Notes . . .

1. If higher or lower speed DIMMs are selected than what is shown in the table for a given CPU, the DIMMs will be clocked at the lowest common denominator of CPU clock and DIMM clock.

Approved Configurations

(1) 2-CPU Configuration:

- Select two identical CPUs from any one of the rows of *Table 3 on page 11*.

Caveats

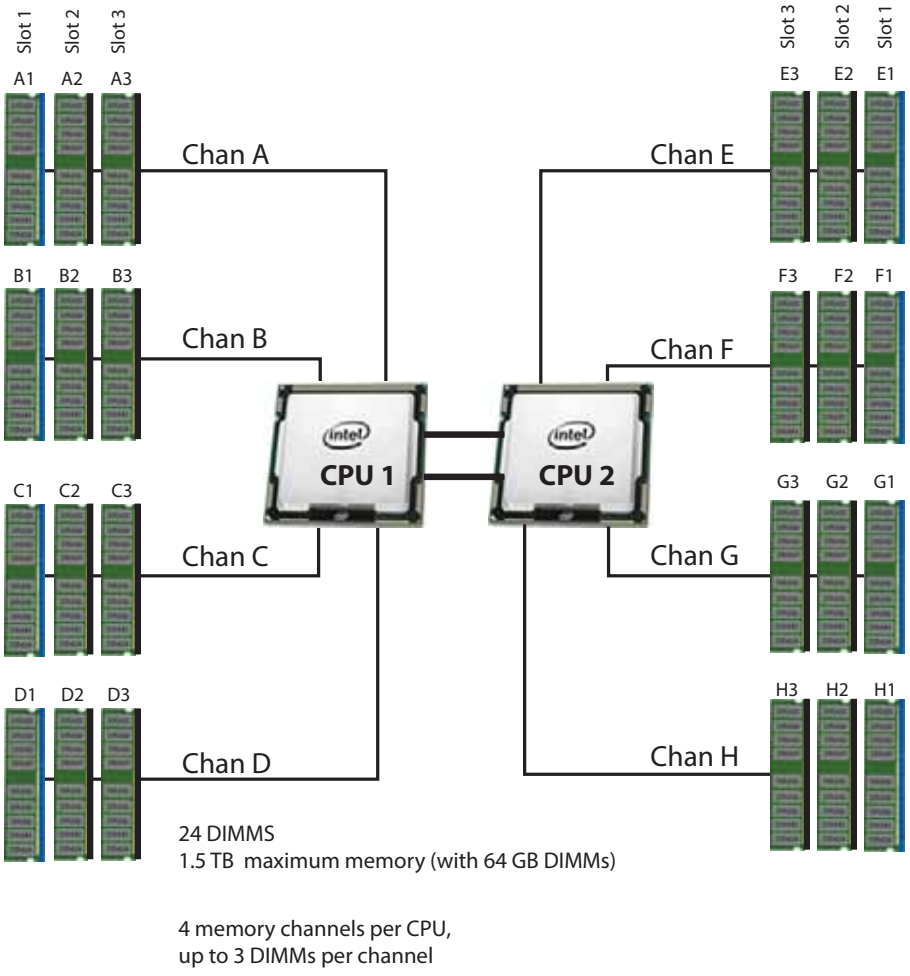
- You must select two identical processors.
- For optimal performance, select DIMMs with the highest clock speed for a given processor (see *Table 3 on page 11*). If you select DIMMs whose speeds are lower or higher than that shown in the tables, suboptimal performance will result.

STEP 3 SELECT MEMORY

The standard memory features are:

- DIMMs
  - Clock speed: 2400 and 2133 MHz
  - Ranks per DIMM: 1, 2, 4, or 8
  - Operational voltage: 1.2 V
  - Registered ECC DDR4 DIMMs (RDIMMs), load-reduced DIMMS (LR-DIMMs), or thru-silicon-via DIMMs (TSV-DIMMs).
- Memory is organized with four memory channels per CPU, with up to three DIMMs per channel, as shown in *Figure 4*.

Figure 4 HXAF220c M4 Node Memory Organization



Select DIMMs

Select the desired DIMMs from *Table 4*.

Table 4 Available DDR4 DIMMs

Product ID (PID)	PID Description	Voltage	Ranks/ DIMM
DIMM Options			
2400-MHz DIMM Options			
HX-ML-1X644RV-A	64 GB DDR4-2400-MHz LRDIMM/PC4-19200/quad rank/x4	1.2 V	4
HX-MR-1X322RV-A	32GB DDR4-2400-MHz RDIMM/PC4-19200/dual rank/x4	1.2 V	2
HX-MR-1X161RV-A	16GB DDR4-2400-MHz RDIMM/PC4-19200/single rank/x4	1.2 V	1

Approved Configurations

(1) 2-CPU configuration:

- Select either 8 or 12 identical DIMMs per CPU (16 or 24 total identical DIMMs). Refer to **Memory Population Rules, page 38**, for more detailed information.

NOTE: System performance is optimized when the DIMM type and quantity are equal for both CPUs, and when all channels are filled equally across the CPUs.

Caveats

- System speed is dependent on how many DIMMs are populated per channel and the CPU DIMM speed support. See *Table 5* and *Table 6* for details.

Table 5 DIMM Memory Speeds with Different CPUs

DIMM Speed	DPC	1866-MHz Capable CPU	2133-MHz Capable CPU
		RDIMM (DR)	RDIMM (DR)
2133 DIMM[1]	3 DPC	1600	1866 (32 GB RDIMMs and 16 GB DIMMs)
	2 DPC	1866	2133
	1 DPC	1866	2133

Notes . . .

1. 2133-MHz DIMMs are the only offered and supported DIMMs for the HXAF220c M4 Node.

Table 6 2400-MHz DIMM Memory Speeds with Different v4 CPUs

DIMM and CPU Frequencies	DPC	LRDIMM (QRx4) - 64 GB	RDIMM (2Rx4) - 32 GB	RDIMM (SRx4) - 16 GB
		1.2 V	1.2 V	1.2 V
DIMM = 2400 MHz CPU = 2400 MHz	1DPC	2400 MHz	2400 MHz	2400 MHz
	2DPC	2400 MHz	2400 MHz	2400 MHz
	3DPC	2133 MHz	1866 MHz	2133 MHz
DIMM = 2400 MHz CPU = 2133 MHz	1DPC	2133 MHz	2133 MHz	2133 MHz
	2DPC	2133 MHz	2133 MHz	2133 MHz
	3DPC	1866 MHz	1866 MHz	1866 MHz
DIMM = 2400 MHz CPU = 1866 MHz	1DPC	1866 MHz	1866 MHz	1866 MHz
	2DPC	1866 MHz	1866 MHz	1866 MHz
	3DPC	1866 MHz	1600 MHz	1600 MHz

- The HXAF220c M4 Node supports the following memory reliability, availability, and serviceability (RAS) modes:
  - Independent Channel Mode
  - Lockstep Channel Mode
- Below are the system level RAS Mode combination limitations:
  - Mixing of Independent and Lockstep channel mode is not allowed per platform.
- DIMMs for CPU 1 and CPU 2 must always be configured identically.
- Non-ECC DIMMs are not supported.
- Pairs of DIMMs (A1/B1, A2/B2, etc) MUST be the exact same (same PID, rev, DIMM loading order)
- Cisco memory from previous generation systems (DDR3) is not compatible with this system.

For more information regarding memory, see **CPUs and DIMMs, page 37**.

STEP 4 SELECT DRIVE CONTROLLER

SAS HBA Drive Connectivity

Choose the following SAS HBA for internal drive connectivity (non-RAID):

- Cisco 12 Gbps Modular SAS HBA, which plugs into a dedicated RAID controller slot.

Select Controller Options

Select the following:

- Cisco 12 Gbps Modular SAS HBA (see *Table 7*)

Table 7 Hardware Controller Options

Product ID (PID)	PID Description
Controllers for Internal Drives	
Note that the following Cisco 12Gbps Modular SAS HBA controller is factory-installed in the dedicated internal slot.	
HX-SAS12GHBA	Cisco 12 Gbps Modular SAS HBA ■ Supports up to 8 internal SAS/SATA SSDs ■ No RAID functionality. Ideal for SDS (Software Defined Storage) applications. It is also ideal for environments demanding the highest IOPs (for external SSD attach), where a RAID controller can be an I/O bottleneck.

Approved Configurations

- The Cisco 12 Gbps Modular SAS HBA supports up to 8 internal drives with non-RAID support.

STEP 5 SELECT SOLID STATE DRIVES (SSDs)

The standard disk drive features are:

- 2.5-inch small form factor
- Hot-pluggable
- Drives come mounted in sleds

NOTE:
All SED HDDs are FIPs 140-2 compliant
SED SSDs (10X endurance) are FIPS 140-2 compliant
SED SSDs (3X and 1X endurance) are not FIPS 140-2 compliant

Select Drives

NVMe SFF 2.5" drives can only be placed in front drive bays 1 and 2. The available drives are listed in *Table 8*.

Table 8 Available Hot-Pluggable Sled-Mounted SSDs

Product ID (PID)	PID Description	Drive Type	Capacity
SSD Data Drive			
HX-SD38TBKS4-EV	3.8 TB 2.5 inch Enterprise Value 6G SATA SSD	SATA	3.8 TB
HX-SD960GBKS4-EV	960 GB 2.5 inch Enterprise Value 6G SATA SSD	SATA	960 GB
SED Persistent Data Drives			
HX-SD800GBEK9	800 GB 2.5 inch Ent. Performance 12G SAS SSD (10X endurance)	SAS	800 GB
HX-SD960GBM1K9	960 GB Enterprise Value SSD (SATA) (1X FWPD, SED)	SATA	960 GB
HX-SD38TBM1K9	3.8 TB Enterprise Value SSD (SATA) (1X FWPD, SED)	SATA	3.8 TB
SAS SSD Caching Drive			
HX-SD800G12S4-EP	800 GB 2.5 inch Ent. Performance 12G SAS SSD (10X endurance)	SAS	800 GB
HX-SD400G12S4-EP	400 GB 2.5 inch Enterprise Performance 12G SAS SSD (10X endurance)	SAS	400 GB
NVMe SSD Drive			
HX-NVMEM4-H1600[1]	Cisco 2.5in U.2 1.6 TB HGST SN200 NVMe. High Endurance SSD	NVMe	1.6 TB
SED Cache/WL Drives			
HX-SD800GBEK9	800 GB 2.5 inch Ent. Performance 12G SAS SSD (10X endurance)	SAS	800 GB
SATA SSD (HyperFlex System Drive)			
HX-SD120GBKS4-EV	120 GB 2.5 inch Enterprise Value 6G SATA SSD	SATA	120 GB
HX-SD240GBKS4-EV	240 GB 2.5 inch Enterprise Value 6G SATA SSD	SATA	240 GB

Table 8 Available Hot-Pluggable Sled-Mounted SSDs *(continued)*

Product ID (PID)	PID Description	Drive Type	Capacity
NOTE: Cisco uses solid state drives (SSDs) from a number of vendors. All solid state drives (SSDs) are subject to physical write limits and have varying maximum usage limitation specifications set by the manufacturer. Cisco will not replace any solid state drives (SSDs) that have exceeded any maximum usage specifications set by Cisco or the manufacturer, as determined solely by Cisco			

Approved Configurations

(1) Cisco 12 Gbps Modular SAS HBA

- Select the following drives:
  - Six 3.8 TB SSD data drives (HX-SD38TBKS4-EV) or six 960 GB SSD data drives (HX-SD960GBKS4-EV or UCS-SD960GBE1K9). If either of these are selected, you cannot select SED drives HX-SD800GBEK9, HX-SD960GBM1K9 OR HX-SD960GBM1K9.
  - Six 800 GB 2.5 inch Enterprise Performance 12G SAS SSD (10X endurance) drives (HX-SD800GBEK9), six 3.8TB SED SSD data drive (HX-SD38TBM1K9) or six 960G SED SSD data drive (HX-SD960GBM1K9). If these are selected, all drives must be SED drives (you cannot select PIDs (HX-SD960GBKS4-EV, HX-SD38TBKS4-EV, HX-SD800G12S4-EP, HX-SD400G12S4-EP, HX-NVMEM4-H1600 or HX-PCI25-40010).
  - One 800 GB 2.5 inch Enterprise Performance SAS SSD caching drive (HX-SD800G12S4-EP), 400 GB 2.5 inch Enterprise Performance SAS SSD caching drive (HX-SD400G12S4-EP), 400GB 2.5 inch SFF PCIe/NVMe Storage Intel P3700 High Endurance (HX-PCI25-40010), or 1.6TB 2.5 inch NVMe High Performance High Endurance (HX-NVMEM4-H1600). If selected, you cannot select SED caching drive HX-SD800GBEK9.
  - One 800 GB 2.5 inch Enterprise Performance SAS SSD caching drive (HX-SD800GBEK9). If selected, all drives must be SED drives (you cannot select PIDs HX-SD960GBKS4-EV, HX-SD38TBKS4-EV, HX-SD400G12S4-EP, HX-PCI25-40010, HX-NVMEM4-H1600 or HX-SD800G12S4-EP).
  - One 120 GB (HX-SD120GBKS4-EV) or 240 GB (HX-SD240GBKS4-EV) 2.5 inch Enterprise Value SATA HyperFlex system drive.

See **SELECT DRIVE CONTROLLER, page 16** for more details.

Caveats

- You must choose up to six or 8 data SSDs, one caching SSD, and one HyperFlex system drive.

STEP 6 SELECT PCIe OPTION CARD(s)

The standard PCIe card offerings is:

- Modular LAN on Motherboard (mLOM)
- Network Interface Card (NIC)

Select PCIe Option Card

The available PCIe option card is listed in *Table 9*.

Table 9 Available PCIe Option Cards

Product ID (PID)	PID Description	Card Height
Modular LAN on Motherboard (mLOM)[1]		
HX-MLOM-CSC-02	Cisco UCS VIC1227 VIC MLOM - Dual Port 10Gb SFP+	N/A
HX-MLOM-C40Q-03	Cisco UCS VIC 1387 Dual Port 40Gb QSFP CNA MLOM	N/A
Network Interface Card (NIC)		
HX-PCIE-IRJ45	Intel i350 Quad Port 1Gb Adapter	

Notes . . .

1. The mLOM card does not plug into any of the riser 1 or riser 2 card slots; instead, it plugs into a connector inside the chassis.

Caveats

- Other considerations for the Cisco VIC cards:
  - VIC 1227 supports 10G SFP+ optical and copper twinax connections
  - VIC 1387 supports 40G SFP+ connections
  - The VIC 1227 and 1387 are supported with the following software releases: 2.0.8h and above (CIMC) and 2.2.6f (UCSM).

STEP 7 ORDER POWER SUPPLIES

The HXAF220c M4 Node accommodates two 770 W AC power supplies. The power supply PIDs are shown in *Table 10*. The link below can be used to estimate power consumption.

http://ucspowercalc.cisco.com

Table 10 Power Supply PIDs

Product ID (PID)	PID Description
UCSC-PSU1-770W	770 W power supply

Approved Configurations

- This system must have two power supplies.

STEP 8 SELECT AC POWER CORD(s)

Using *Table 11*, select the appropriate AC power cords. You must select a minimum of zero and a maximum of two identical power cords. However, If you select the option R2XX-DMYMPWRCORD, no power cord is shipped with the HXAF220c Node.

Table 11 Available Power Cords

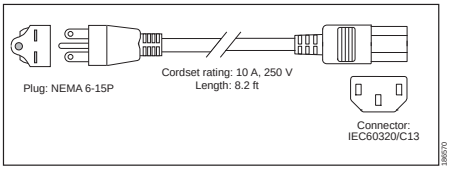
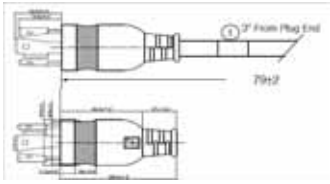
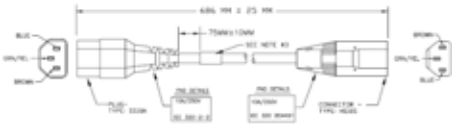
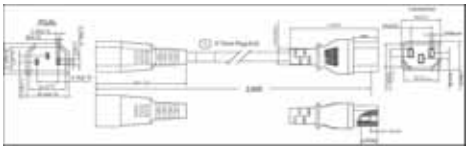
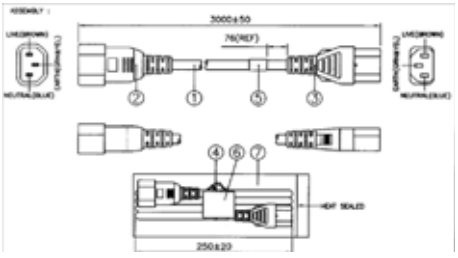
Product ID (PID)	PID Description	Images
R2XX-DMYMPWRCORD	No power cord (dummy PID to allow for a no power cord option)	Not applicable
CAB-N5K6A-NA	Power Cord, 200/240V 6A, North America	
CAB-AC-L620-C13	AC Power Cord, NEMA L6-20 - C13, 2M/6.5ft	
CAB-C13-CBN	CABASY,WIRE,JUMPER CORD, 27" L, C13/C14, 10A/250V	
CAB-C13-C14-2M	CABASY,WIRE,JUMPER CORD, PWR, 2 Meter, C13/C14,10A/250V	
CAB-C13-C14-AC	CORD,PWR,JMP,IEC60320/C14,IEC60320/C13, 3.0M	

Table 11 Available Power Cords

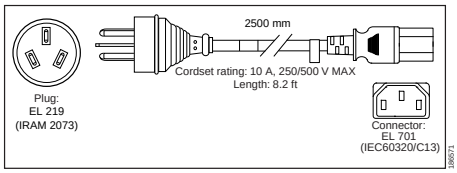
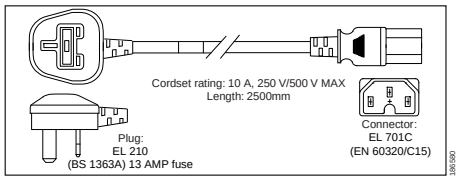
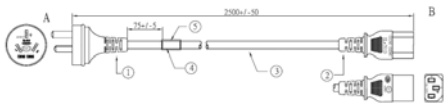
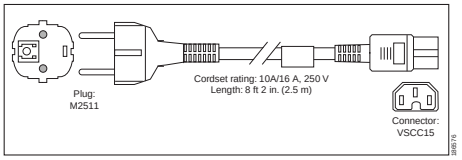
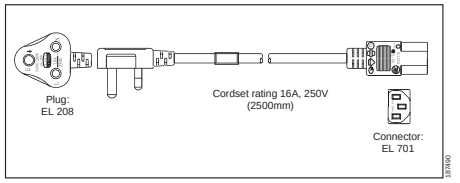
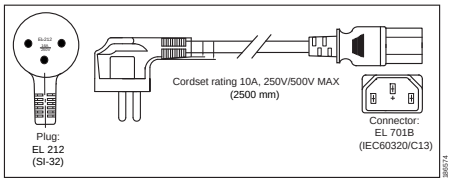
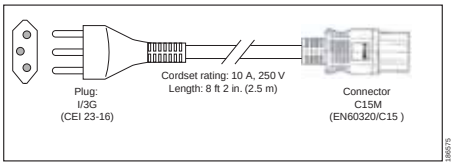
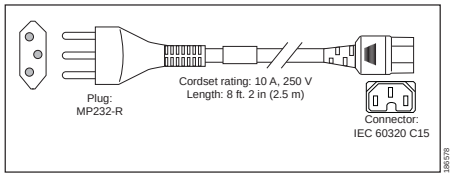
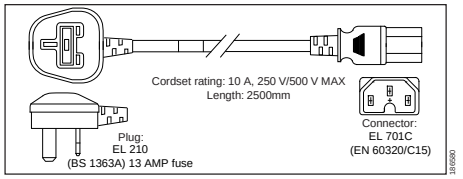
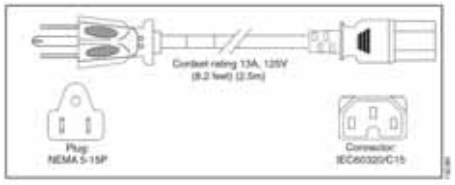
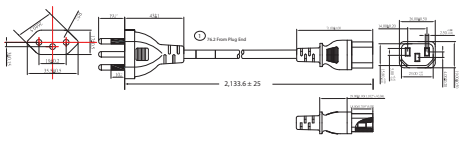
Product ID (PID)	PID Description	Images
CAB-250V-10A-AR	Power Cord, 250V, 10A, Argentina	
CAB-9K10A-AU	Power Cord, 250VAC 10A 3112 Plug, Australia	
CAB-250V-10A-CN	AC Power Cord - 250V, 10A - PRC	
CAB-9K10A-EU	Power Cord, 250VAC 10A CEE 7/7 Plug, EU	
SFS-250V-10A-ID	Power Cord, SFS, 250V, 10A, India	
SFS-250V-10A-IS	Power Cord, SFS, 250V, 10A, Israel	
CAB-9K10A-IT	Power Cord, 250VAC 10A CEI 23-16/VII Plug, Italy	

Table 11 Available Power Cords

Product ID (PID)	PID Description	Images
CAB-9K10A-SW	Power Cord, 250VAC 10A MP232 Plug, Switzerland	
CAB-9K10A-UK	Power Cord, 250VAC 10A BS1363 Plug (13 A fuse), UK	
CAB-9K12A-NA	Power Cord, 125VAC 13A NEMA 5-15 Plug, North America	
CAB-250V-10A-BR	Power Cord - 250V, 10A - Brazil	
CAB-JPN-3PIN	Power Cord 3PIN, Japan	Image not available
CAB-C13-C14-2M-JP	Power Cord C13-C14, 2M/6.5ft Japan PSE mark	Image not available

STEP 9 ORDER TOOL-LESS RAIL KIT AND OPTIONAL REVERSIBLE CABLE MANAGEMENT ARM

Select a Tool-Less Rail Kit

Select a tool-less rail kit from *Table 12*.

Table 12 Tool-Less Rail Kit Options

Product ID (PID)	PID Description
UCSC-RAILF-M4	Friction Rail Kit
UCSC-RAILB-M4	Ball Bearing Rail Kit for

Select an Optional Reversible Cable Management Arm

The reversible cable management arm mounts on either the right or left slide rails at the rear of the HXAF220c Node and is used for cable management. Use *Table 13* to order a cable management arm.

Table 13 Cable Management Arm

Product ID (PID)	PID Description
UCSC-CMAF-M4	Reversible CMA for tool-less friction and ball bearing rail kit

For more information about the tool-less rail kit and cable management arm, see the *Cisco UCS C220 M4 Installation and Service Guide* at this URL:

http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/c/hw/C220M4/install/C220M4.html



NOTE: If you plan to rackmount your UCS HXAF220c M4 Node, you must order one of the tool-less rail kits.

STEP 10 ORDER A TRUSTED PLATFORM MODULE (OPTIONAL)

Trusted Platform Module (TPM) is a computer chip (microcontroller) that can securely store artifacts used to authenticate the platform. These artifacts can include passwords, certificates, or encryption keys. A TPM can also be used to store platform measurements that help ensure that the platform remains trustworthy. Authentication (ensuring that the platform can prove that it is what it claims to be) and attestation (a process helping to prove that a platform is trustworthy and has not been breached) are necessary steps to ensure safer computing in all environments.

The TPM ordering information is listed in *Table 14*.

Table 14 Trusted Platform Module

Product ID (PID)	PID Description
UCSX-TPM2-001	Trusted Platform Module 1.2 SPI-based for UCS systems

NOTE: The TPM module used in this system conforms to TPM v1.2 and 2.0, as defined by the Trusted Computing Group (TCG). It is also SPI-based.

STEP 11 ORDER CISCO FLEXIBLE FLASH SD CARD MODULE

You must order two 64 GB or two 32 GB SD cards. The SD cards are mirrored to each other and are used for booting. See *Figure 6 on page 35* for the location of the SD cards. There are two locations, SD1 and SD2.

Table 15 Secure Digital (SD) Card

Product ID (PID)	PID Description
HX-SD-64G-S	64 GB SD Card

Caveats

- You must select two 64 GB or two 32 GB SD cards. No mixing is allowed.

STEP 12 SELECT OPERATING SYSTEM AND VALUE-ADDED SOFTWARE

Several operating systems and value-added software programs are available. Select as desired from **Table 16**.

Table 16 OSs and Value-Added Software

PID Description	Product ID (PID)
VMware[1]	
HX-VSP-STD-D	Factory Installed - VMware vSphere6 Std SW and Lic (2 CPU)
HX-VSP-STD-DL	Factory Installed - VMware vSphere6 Standard SW Download
HX-VSP-EPL-D	Factory Installed - VMware vSphere6 Ent Plus SW+Lic (2 CPU)
HX-VSP-EPL-DL	Factory Installed - VMware vSphere6 Enterprise Plus SW Dnld
HX-VSP-FND-D	Factory Installed - vSphere SW (End user to provide License)
HX-VSP-FND-DL	Factory Installed - VMware vSphere6 Foundation SW Download
HX-VSP-STD-D	Factory Installed - VMware vSphere6 Std SW and Lic (2 CPU)
HX-VSP-STD-DL	Factory Installed - VMware vSphere6 Standard SW Download
Microsoft Windows Server	
HX-MSWS-19-DC-RM	Windows Server 2019 DC (16Cores/Unlim VM) Rec Media DVD Only
HX-MSWS-19-DC16C	Windows Server 2019 Data Center (16 Cores/Unlimited VMs)
HX-MSWS-19-DCA2C	Windows Server 2019 Data Center - Additional 2 Cores
HX-MSWS-19-ST-RM	Windows Server 2019 Stan (16 Cores/2 VMs) Rec Media DVD Only
HX-MSWS-19-ST16C	Windows Server 2019 Standard (16 Cores/2 VMs)
HX-MSWS-19-STA2C	Windows Server 2019 Standard - Additional 2 Cores
Software Subscription	
HXDP-001-2YR	Cisco HyperFlex HX Data Platform SW 1 Yr Subscription
HXDP-001-4YR	Cisco HyperFlex HX Data Platform SW 3 Yr Subscription
HXDP-S001-1YR=	Cisco HyperFlex HX Data Platform SW 1 yr Subscription v2.0
HXDP-S001-2YR=	Cisco HyperFlex HX Data Platform SW 2 yr Subscription v2.0
HXDP-S001-3YR=	Cisco HyperFlex HX Data Platform SW 3 yr Subscription v2.0
HXDP-S001-4YR=	Cisco HyperFlex HX Data Platform SW 4 yr Subscription v2.0
HXDP-S001-5YR=	Cisco HyperFlex HX Data Platform SW 5 yr Subscription v2.0

Notes . . .

1. Although VMware 6.0 is installed at the factory, both VMware 5.5 and VMware 6.0 are supported.

STEP 13 SELECT SERVICE and SUPPORT LEVEL

A variety of service options are available, as described in this section.

Unified Computing Warranty, No Contract

If you have noncritical implementations and choose to have no service contract, the following coverage is supplied:

- Three-year parts coverage.
- Next business day (NBD) onsite parts replacement eight hours a day, five days a week.
- 90-day software warranty on media.
- Ongoing downloads of BIOS, drivers, and firmware updates.
- UCSM updates for systems with Unified Computing System Manager. These updates include minor enhancements and bug fixes that are designed to maintain the compliance of UCSM with published specifications, release notes, and industry standards.

Smart Net Total Care for UCS

For support of the entire Unified Computing System, Cisco offers the Cisco Smart Net Total Care for UCS Service. This service provides expert software and hardware support to help sustain performance and high availability of the unified computing environment. Access to Cisco Technical Assistance Center (TAC) is provided around the clock, from anywhere in the world.

For systems that include Unified Computing System Manager, the support service includes downloads of UCSM upgrades. The Cisco Smart Net Total Care for UCS Service includes flexible hardware replacement options, including replacement in as little as two hours. There is also access to Cisco's extensive online technical resources to help maintain optimal efficiency and uptime of the unified computing environment. You can choose a desired service listed in *Table 17*.

Table 17 Cisco Smart Net Total Care for UCS Service

Product ID (PID)	On Site?	Description
CON-PREM-HX220M4S	Yes	ONSITE 24X7X2 HXAF220c M4 SFF
CON-OSPT-HX220M4S	Yes	ONSITE Troubleshooting 24x7x4 HXAF220c M4 SFF
CON-OSP-HX220M4S	Yes	ONSITE 24X7X4 UCS HXAF220c M4 SFF
CON-OSE-HX220M4S	Yes	ONSITE 8X5X4 HXAF220c M4 SFF
CON-OS-HX220M4S	Yes	ONSITE 8X5XNBD HXAF220c M4 SFF
CON-S2P-HX220M4S	No	SMARTNET 24X7X2 HXAF220c M4 SFF
CON-SNTP-HX220M4S	No	SMARTNET 24X7X4 HXAF220c M4 SFF
CON-SNTE-HX220M4S	No	SMARTNET 8X5X4 HXAF220c M4 SFF
CON-SNT-HX220M4S	No	SMARTNET 8X5XNBD HXAF220c M4 SFF

Unified Computing Partner Support Service

Cisco Partner Support Service (PSS) is a Cisco Collaborative Services service offering that is designed for partners to deliver their own branded support and managed services to enterprise customers. Cisco PSS provides partners with access to Cisco's support infrastructure and assets to help them:

- Expand their service portfolios to support the most complex network environments
- Lower delivery costs
- Deliver services that increase customer loyalty

Partner Unified Computing Support Options enable eligible Cisco partners to develop and consistently deliver high-value technical support that capitalizes on Cisco intellectual assets. This helps partners to realize higher margins and expand their practice.

PSS is available to all Cisco PSS partners.

The Partner Unified Computing Support Option for the Cisco HXAF220c Node is:

- Partner Support Service for UCS

Partner Support Service for UCS provides hardware and software support, including triage support for third party software, backed by Cisco technical resources and level three support. See *Table 18*.

Table 18 Partner Support Service for UCS

Product ID (PID)	Service Level GSP	On Site?	Description
CON-PSJ1-HX220M4S	PSJ1	No	UCS SUPP PSS 8X5XNBD HXAF220c M4 SFF
CON-PSJ2-HX220M4S	PSJ2	No	UCS SUPP PSS 8X5X4 HXAF220c M4 SFF
CON-PSJ3-HX220M4S	PSJ3	No	UCS SUPP PSS 24X7X4 HXAF220c M4 SFF
CON-PSJ4-HX220M4S	PSJ4	No	UCS SUPP PSS 24X7X2 HXAF220c M4 SFF

Unified Computing Combined Support Service

Combined Services makes it easier to purchase and manage required services under one contract. Smart Net Total Care services for UCS help increase the availability of your vital data center infrastructure and realize the most value from your unified computing investment. The more benefits you realize from the Cisco Unified Computing System (Cisco UCS), the more important the technology becomes to your business. These services allow you to:

- Optimize the uptime, performance, and efficiency of your UCS
- Protect your vital business applications by rapidly identifying and addressing issues
- Strengthen in-house expertise through knowledge transfer and mentoring
- Improve operational efficiency by allowing UCS experts to augment your internal staff resources

- Enhance business agility by diagnosing potential issues before they affect your operations

You can choose a service listed in *Table 19*.

Table 19 UCS Computing Combined Support Service

Product ID (PID)	Service Level GSP	On Site?	Description
CON-NCF2-HX220M4S	NCF2	No	CMB SPT SVC 24X7X2 HXAF220c M4 SFF
CON-NCF2P-HX220M4S	NCF2P	Yes	CMB SPT SVC 24X7X2OS HXAF220c M4 SFF
CON-NCF4P-HX220M4S	NCF4P	Yes	CMB SPT SVC 24X7X4OS HXAF220c M4 SFF
CON-NCF4S-HX220M4S	NCF4S	Yes	CMB SPT SVC 8X5X4OS HXAF220c M4 SFF
CON-NCFCS-HX220M4S	NCFCS	Yes	CMB SPT SVC 8X5XNBDOS HXAF220c M4 SFF
CON-NCFE-HX220M4S	NCFE	No	CMB SPT SVC 8X5X4 HXAF220c M4 SFF
CON-NCFP-HX220M4S	NCFP	No	CMB SPT SVC 24X7X4 HXAF220c M4 SFF
CON-NCFT-HX220M4S	NCFT	No	CMB SPT SVC 8X5XNBD HXAF220c M4 SFF

Smart Net Total Care for UCS with Drive Retention

With the Smart Net Total Care for UCS with Drive Retention (UCSDR) Service, you can obtain a new disk drive in exchange for a faulty drive without returning the faulty drive. In exchange for a Cisco replacement drive, you provide a signed Certificate of Destruction (CoD) confirming that the drive has been removed from the system listed, is no longer in service, and has been destroyed.

Sophisticated data recovery techniques have made classified, proprietary, and confidential information vulnerable, even on malfunctioning disk drives. The UCDR service enables you to retain your drives and ensures that the sensitive data on those drives is not compromised, which reduces the risk of any potential liabilities. This service also enables you to comply with regulatory, local, and federal requirements.

If your company has a need to control confidential, classified, sensitive, or proprietary data, you might want to consider one of the Drive Retention Services listed in *Table 20 on page 31*.



NOTE: Cisco does not offer a certified drive destruction service as part of this service.

Table 20 Drive Retention Service Options

Service Description	Service Program Name	Service Level GSP	Service Level	Product ID (PID)
Smart Net Total Care for UCS with Drive Retention	UCS DR	UCSD8	24x7x2 Onsite	CON-UCSD8-HX220M4SF
		OSPTD	24x7x4 Onsite Troubleshooting	CON-OPSTD-HX220M4SF
		UCSD7	24x7x4 Onsite	CON-UCSD7-HX220M4S
		UCSD5	8x5xNBD Onsite	CON-UCSD5-HX220M4S

For a complete listing of available services for Cisco Unified Computing System, see this URL:

http://www.cisco.com/en/US/products/ps10312/serv_group_home.html

OPTIONAL STEP - ORDER RACK(s)

The optional R42612 rack is available from Cisco for the C-Series servers, including the HXAF220c M4 node. This rack is a standard 19-inch rack and can be ordered with a variety of options, as listed in *Table 21*. Racks are shipped separately from the HXAF220c M4 node

Table 21 Racks and Rack Options

Product ID (PID)	PID Description
RACK2-UCS	Cisco R42612 expansion rack, no side panels. This type of rack is used for multiple-rack deployments.
RACK2-UCS2	Cisco R42612 static (standard) rack, with side panels. This type of rack is used for single-rack and end of row deployments. Side panels are needed for racks at the ends of multiple-rack deployments. For example, when configuring a row of 5 racks, order 1 standard rack plus 4 expansion racks. Apply the side panels from the standard rack to the racks at each end of the row.
RACK-BLANK-001	Blanking panels (qty 12), 1U, plastic, toolless. Recommended to ensure proper airflow. Fill all empty RU spaces in the front of the rack. Because each blanking panel PID includes 12 panels, use the following calculation: 42RU - occupied RU = available RU. Divide available RU by 12 to determine PID order quantity.
RACK-CBLMGT-001	Cable mgt D rings (qty 10), metal. Use the D rings to bundle system cables to ensure proper airflow.
RACK-CBLMGT-003	Brush strip (qty 1), 1 U. The brush strip promotes proper airflow while allowing cables to be passed from the front to the rear of the rack.
RACK-CBLMGT-011	Cable mgt straps (qty 10), Velcro. Use the Velcro straps to bundle system cables to ensure proper airflow.
RACK-FASTEN-001	Mounting screws (qty 100), M6. The rack ships with nuts and screws, but extras may be ordered.
RACK-FASTEN-002	Cage nuts (qty 50), M6. The rack ships with nuts and screws, but extras may be ordered.
RACK2-JOIN-001	Rack joining kit. Use the kit to connect adjacent racks within a row. Order 1 unit less than the number of racks in the row.
RACK2-GRND-001	Cisco R42612 grounding kit

For more information about the R42612 rack, see **RACKS, page 43**.

OPTIONAL STEP - ORDER PDU

An optional power distribution unit (PDU) is available from Cisco for the C-Series rack servers, including the HXAF220c M4 node. This PDU is available in a zero rack unit (RU) style or horizontal PDU style (see *Table 22*).For more information about the PDU, see **PDUs, page 45**.

Table 22 Available PDUs

Product ID (PID)	Description	Plug	Country
Zero-RU PDUs			
RP208-30M1P-6-36	30 A, single-phase, vertical-mount PDU with 6 C19 and 36 C13 connectors	L6-30P	North America
RP208-30M3P-6-30	30 A, three-phase, vertical-mount PDU with 6 C19 and 30 C13 connectors	L15-30P	North America
RP208-60M3P-12-9	60 A, three-phase, vertical-mount PDU with 12 C19 and 9 C13 connectors	IEC60309 460P9	North America
RP230-32M1P-6-36	32 A, single-phase, button-mount (rear and sides) PDU with 6 C19 and 36 C13 connectors	IEC60309 332P6	International
RP230-32M3P-12-12	32 A, single-phase, button-mount (rear and sides) PDU with 12 C19 and 12 C13 connectors	IEC60309 532P6	International
Horizontal PDUs (occupy RU space)			
RP208-30M1P-4-8 (1 RU space)	30 A, single-phase, horizontal-mount PDU with 4 C19 and 8 C13 connectors	L6-30P	North America
RP208-60M3P-12 (2 RU spaces)	48 A, three-phase, horizontal-mount PDU with 12 C19 connectors	L15-30P	North America

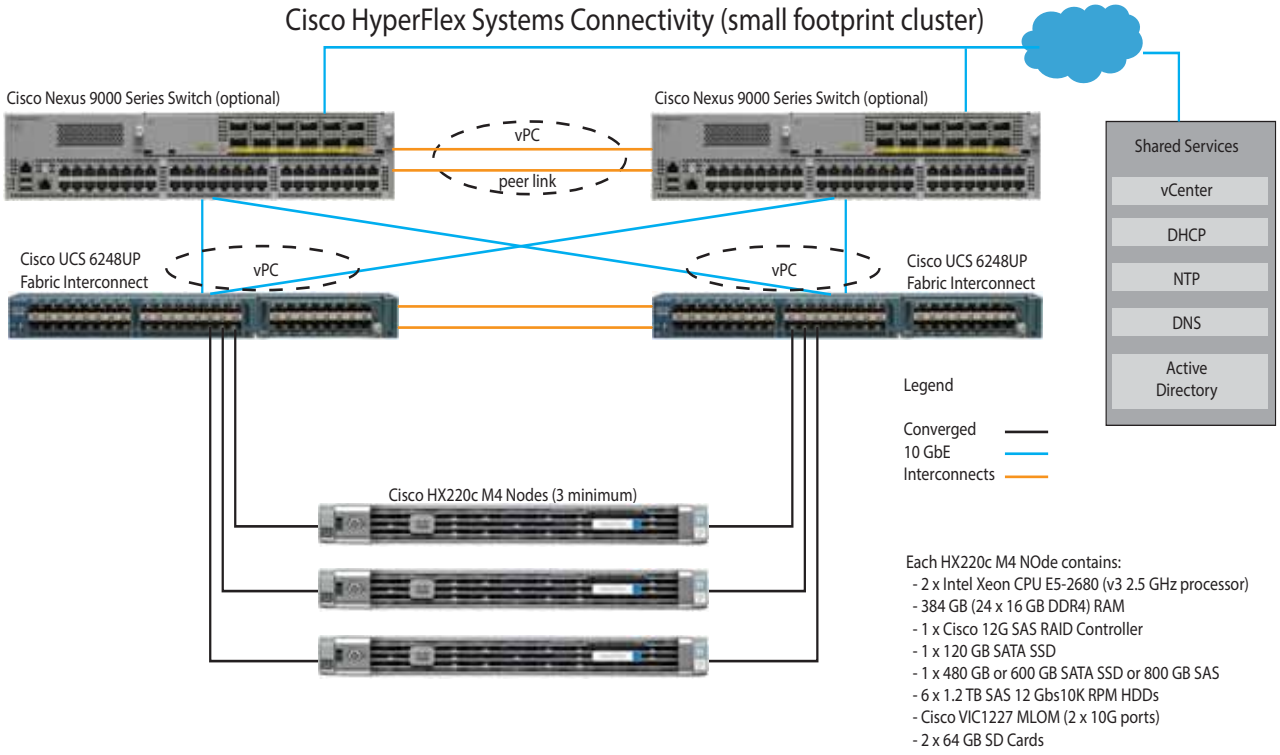
SUPPLEMENTAL MATERIAL

Hyperconverged Systems

Cisco HyperFlex Systems let you unlock the full potential of hyperconvergence and adapt IT to the needs of your workloads. The systems use an end-to-end software-defined infrastructure approach, combining software-defined computing in the form of Cisco HyperFlex HX-Series nodes; software-defined storage with the powerful Cisco HX Data Platform; and software-defined networking with the Cisco UCS fabric that will integrate smoothly with Cisco Application Centric Infrastructure (Cisco ACI). Together with a single point of connectivity and management, these technologies deliver a preintegrated and adaptable cluster with a unified pool of resources that you can quickly deploy, adapt, scale, and manage to efficiently power your applications and your business.

Figure 5 show a small footprint cluster.

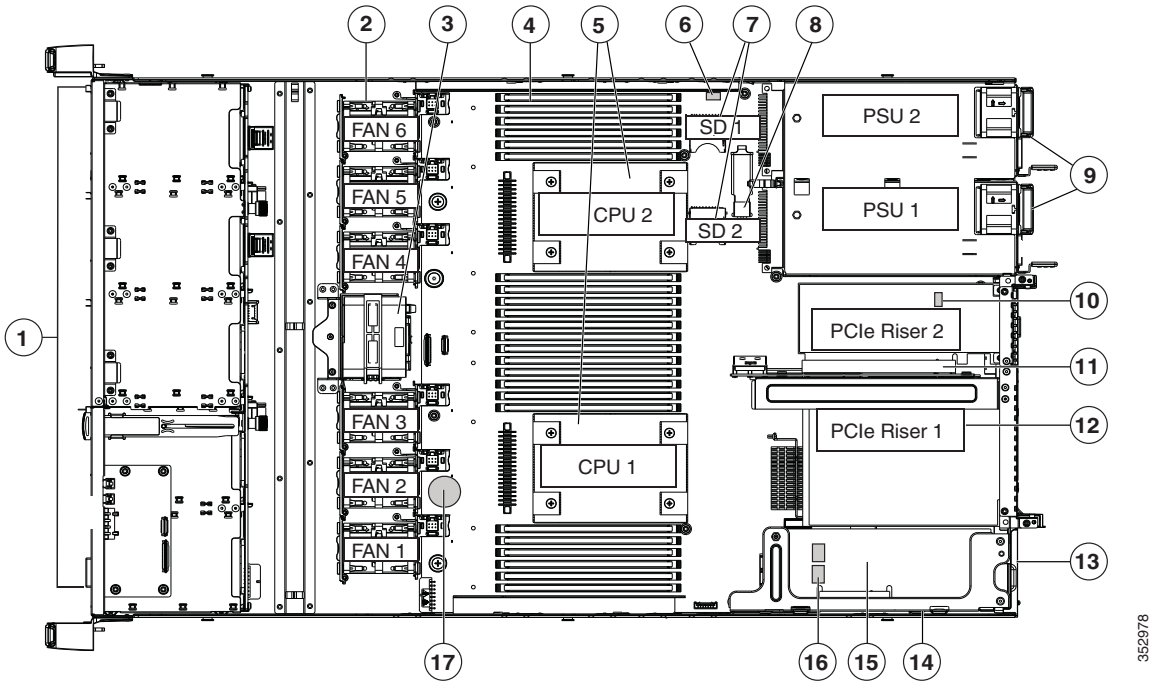
Figure 5 Small Footprint Cluster Using HXAF220c M4 Nodes



Chassis

An internal view of the HXAF220c M4 Node with the top cover removed is shown in *Figure 6*. The location of the two SD cards is marked with callout #7.

Figure 6 HXAF220c M4 Node With Top Cover Off

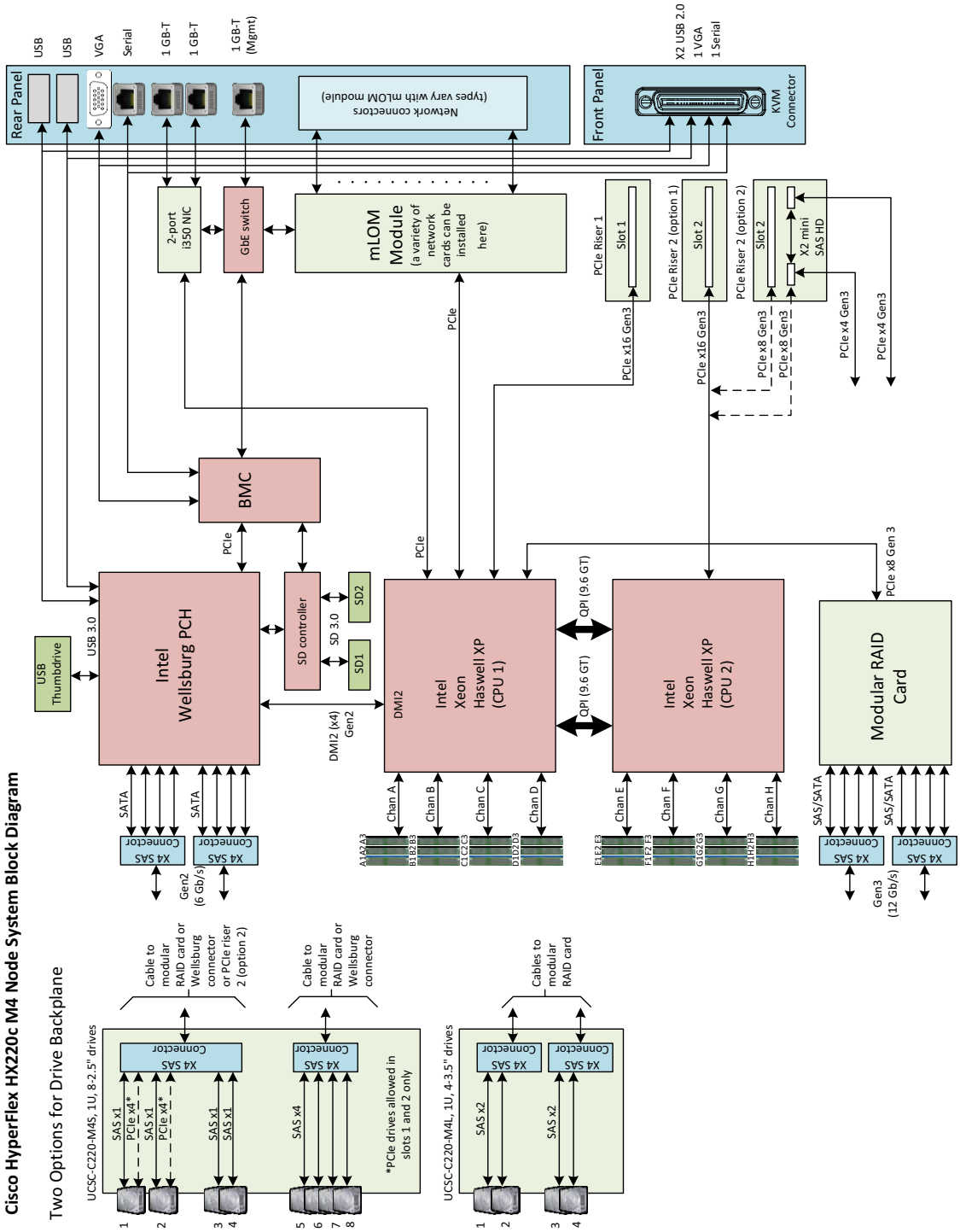


1	Drives (SAS/SATA drives are hot-swappable)	10	Trusted platform module (TPM) socket on motherboard (not visible in this view)
2	Cooling fan modules (six)	11	PCIe riser 2 (half-height PCIe slot 2)
3	SuperCap backup unit mounting location (not used in this system)	12	PCIe riser 1 (full-height PCIe slot 1)
4	DIMM sockets on motherboard (either 16 or 24 DIMMs populated)	13	Modular LOM (mLOM) connector on chassis floor
5	CPUs and heatsinks (two)	14	Cisco 12 Gbps Modular SAS HBA disk controller PCIe riser (dedicated riser with horizontal socket)
6	Embedded SATA RAID header for RAID 5 key (not used)	15	Cisco 12 Gbps Modular SAS HBA controller card
7	Cisco SD card bays on motherboard (two)	16	Embedded SATA RAID mini-SAS connectors on motherboard (not visible in this view and not used)
8	Internal USB 3.0 port on motherboard (not used)	17	RTC battery on motherboard
9	Power supplies (two, hot-swappable when redundant as 1+1)	—	—

Block Diagram

A simplified block diagram of the HXAF220c M4 Node is shown in *Figure 7*.

Figure 7 HXAF220c M4 Node Block Diagram (simplified)



CPUs and DIMMs

Physical Layout

Each CPU has four DIMM channels:

- CPU1 has channels A, B, C, and D
- CPU2 has channels E, F, G, and H

Each DIMM channel has three slots: slot 1, slot 2, and slot 3. The blue-colored DIMM slots are for slot 1, the black-colored slots for slot 2, and the white slots for slot 3.

As an example, DIMM slots A1, B1, C1, and D1 belong to slot 1, while A2, B2, C2, and D2 belong to slot 2.

Figure 8 shows how slots and channels are physically laid out on the motherboard. The DIMM slots on the right half of the motherboard (channels A, B, C, and D) are associated with CPU 1, while the DIMM slots on the left half of the motherboard (channels E, F, G, and H) are associated with CPU 2. The slot 1 (blue) DIMM slots are always located farther away from a CPU than the corresponding slot 2 (black) and slot 3 (white) slots. Slot 1 slots (blue) are populated before slot 2 slots (black) and slot 3 (white) slots.

Figure 8 Physical Layout of CPU DIMM Channels and Slots



Memory Population Rules

When considering the memory configuration of your system, you should consider the following items:

- Each channel has three DIMM slots (for example, channel A = slots A1, A2, and A3).
  - A channel can operate with one, two, or three DIMMs installed.
  - If a channel has only one DIMM, populate slot 1 first (the blue slot).
- When both CPUs are installed, populate the DIMM slots of each CPU identically.
  - Fill blue slots in the channels first: A1, E1, B1, F1, C1, G1, D1, H1
  - Fill black slots in the channels second: A2, E2, B2, F2, C2, G2, D2, H2
  - Fill black slots in the channels third: A3, E3, B3, F3, C3, G3, D3, H3
- Any DIMM installed in a DIMM socket for which the CPU is absent is not recognized.
- Observe the DIMM mixing rules shown in *Table 23*

Table 23 DIMM Rules for HXAF220c M4 Node

DIMM Parameter	DIMMs in the Same Channel	DIMM in the Same Slot[1]
DIMM Capacity RDIMM = 16, 32, or 64 GB	DIMMs in the same channel (for example, A1, A2, and A3) can have different capacities.	For best performance, DIMMs in the same slot (for example, A1, B1, C1, D1) should have the same capacity.
DIMM Speed 2133-MHz[2]	DIMMs will run at the lowest speed of the DIMMs/CPUs installed	DIMMs will run at the lowest speed of the DIMMs/CPUs installed
DIMM Type RDIMMs		
DIMMs per Channel (DPC)	**1 DPC, 2 DPC, or 3 DPC**	
	See *Table 5 on page 14* for valid RDIMM 1 DPC, 2 DPC, and 3 DPC memory configurations	

Notes . . .

1. Although you can have different DIMM capacities in the same slot, this will result in less than optimal performance. For optimal performance, all DIMMs in the same slot should be identical.
2. Only 2133-MHz DIMMs are currently available for the HXAF220c M4 node.

DIMM Population Order

Populate the DIMMs for a CPU according to *Table 24*.

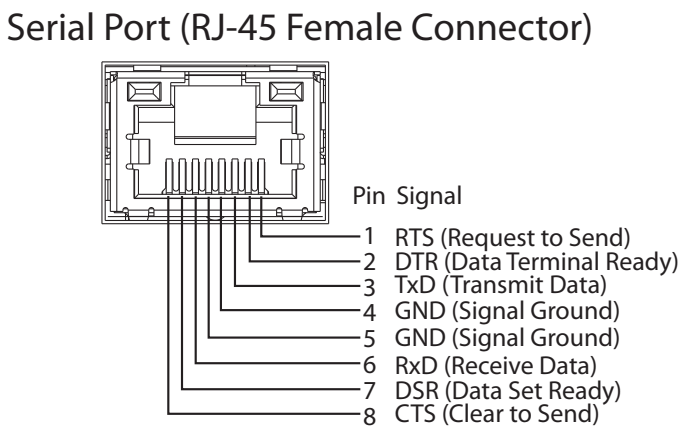
Table 24 DIMM Population Order per CPU

	Populate CPU 1 Slots	Populate CPU 2 Slots
8	A1, B1, C1, D1, A2, B2, C2, D2	E1, F1, G1, H1, E2, F2, G2, H2
12	A1, B1, C1, D1, A2, B2, C2, D2 A3, B3, C3, D3	E1, F1, G1, H1, E2, F2, G2, H2 E3, F3, G3, H3

Serial Port Details

The pinout details of the rear RJ-45 serial port connector are shown in *Figure 9*.

Figure 9 Serial Port (Female RJ-45 Connector) Pinout



Upgrade and Servicing-Related Parts

This section lists the upgrade and servicing-related parts you may need during the life of your system. Some of these parts are configured with every system, and some may be ordered when needed or may be ordered and kept on hand as spares for future use. See *Table 25*.

Table 25 Upgrade and Servicing-related Parts for UCS HXAF220c M4 Node

Spare Product ID (PID)	Description
UCSC-HS-C220M4=	Heat sink
UCS-CPU-GREASE3=	Thermal grease syringe - needed for heatsink seal
UCS-CPU-LPCVR=	CPU load plate dust cover (for unpopulated CPU sockets)
UCSX-HSCK=	UCS Processor Heat Sink Cleaning Kit For Replacement of CPU
UCSC-PCI-2A-220M4=	PCIe Riser 1&2 Assy
UCSC-PCI-2C-220M4=	PCIe Riser 3 (HBA)
UCSC-PCIF-01H=	PCIe Low Profile blanking panel
UCSC-PCIF-01F=	PCIe Full Height blanking panel
N20-BBLKD	Drive blanking panel[1]
UCSC-MLOM-BLK=	MLOM blanking panel
UCSC-RAILF-M4=	Tool-Less Friction Rail Kit
UCSC-CMAF-M4=	Reversible CMA for friction & ball bearing rail kits
UCSC-RAILB-M4=	Tool-Less Ball Bearing Rail Kit
UCSC-FAN-C220M4=	Fan Module (one)
UCSC-BAFF-C220M4=	Air Baffle, Plastic Kit
N20-BKVM=	KVM cable for console port
UCSC-PSU-BLKP1U=	Power supply blanking panel
UCS-220CBLMR8=	Set of 2 RAID cntrlr cables for 8 drive bckpln chassis[2]
UCSC-EARS-C220M4=	Rack ears kit (two ears)

Notes . . .

1. A drive blanking panel must be installed if you remove a disk drive from the system. These panels are required to maintain system temperatures at safe operating levels, and to keep dust away from system components.

Motherboard Lithium Battery

You can order a replacement motherboard battery. Installation instructions are found at this link:

http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/c/hw/C220M4/install/C220M4.html

See the section titled “Replacing the Motherboard RTC Battery.”

Thermal Grease (with syringe applicator) for CPU to Heatsink Seal

Thermal grease must be applied to the top of the CPU where it comes in contact with the heat sink (a grease syringe also ships with each CPU spare option kit). Instructions for applying thermal grease are found at:

http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/c/hw/C220M4/install/C220M4.html

See the section titled “Replacing CPUs and Heatsinks.”



CAUTION: Use only the thermal grease specified for this system (UCS-CPU-GREASE3=). This thermal grease comes in a white-tipped syringe and is to be used only in the HXAF220c M4 and HXAF240c M4 Nodes. Other systems use thermal grease in a blue-tipped syringe (UCS-CPU-GREASE=).

Thermal grease for other systems may have different thermal conductivity properties and may cause overheating if used in the HXAF220c M4 or HXAF240c M4 Nodes.

DO NOT use thermal grease available for purchase at any commercial electronics store. If these instructions are not followed, the CPU may overheat and be destroyed.



NOTE: When you purchase a spare CPU, the thermal grease with syringe applicator is included.

Air Baffle Replacement Kit

Air baffles are designed to direct airflow through the chassis to maintain the temperature at a safe operating level. These baffles must always remain installed during operation. The Air Baffle Replacement Kit includes the air baffles needed for one HXAF220c M4 Node.

RACKS

The Cisco R42612 rack (see *Figure 10 on page 44*) is certified for Cisco UCS installation at customer sites and is suitable for the following equipment:

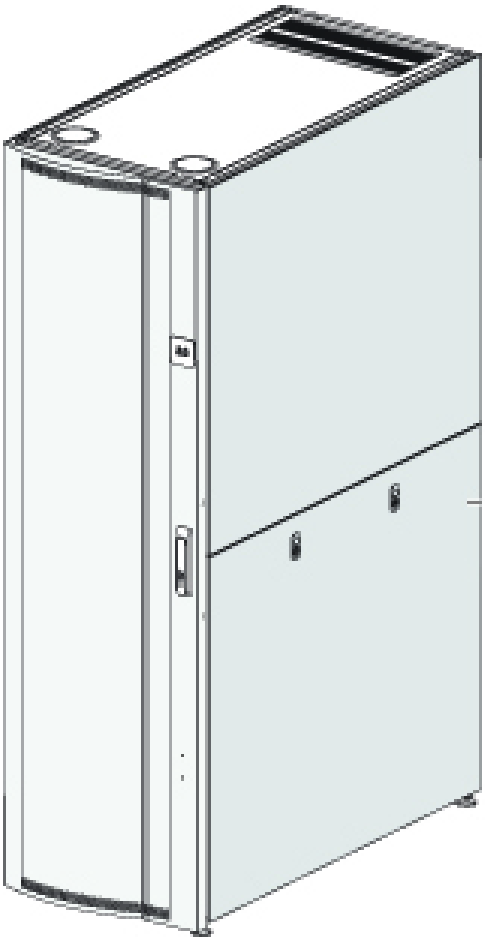
- Cisco UCS B-Series servers and fabric interconnects
- Cisco UCS C-Series and select Nexus switches

The rack is compatible with hardware designed for EIA-standard 19-inch racks. Rack specifications are listed in *Table 26*.

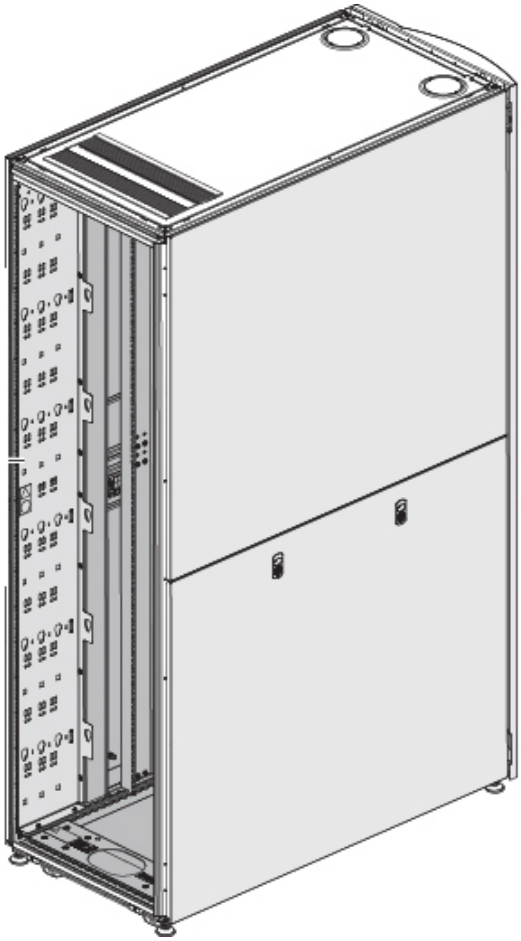
Table 26 R42612 Specifications

Cisco R42612 Rack	Standard (Static with side panels)	Expansion (Static without Side Panels)
Dimensions (H x W x D)	79.25 x 23.50 x 49.84 in. (2013 x 597 x 1266 mm)	79.25 x 23.50 x 49.84 in. (2013 x 597 x 1266 mm)
Dimensions (H x W x D) with packaging	84.25 x 32 x 54.84 in. (2140 x 813 x 1393 mm)	84.25 x 32 x 54.84 in.(2140 x 813 x 1393 mm)
Distance from front mounting rail to rear mounting rail	29.19 in. (741.5 mm)	29.19 in. (741.5 mm)
Weight	339.51 lb (154 kg)	264.55 lb (120 kg)
Weight with packaging	410.06 lb (186 kg)	335.10 lb (152 kg)
Side panels included	Yes	No
Equipment mounting capacity	42 RU	42 RU
Static load capacity	2700 lb (1224.7 kg)	2700 lb (1224.7 kg)
Dynamic load capacity	N/A	N/A

Figure 10 Cisco R42612 Rack



Front View



Rear View

PDUs

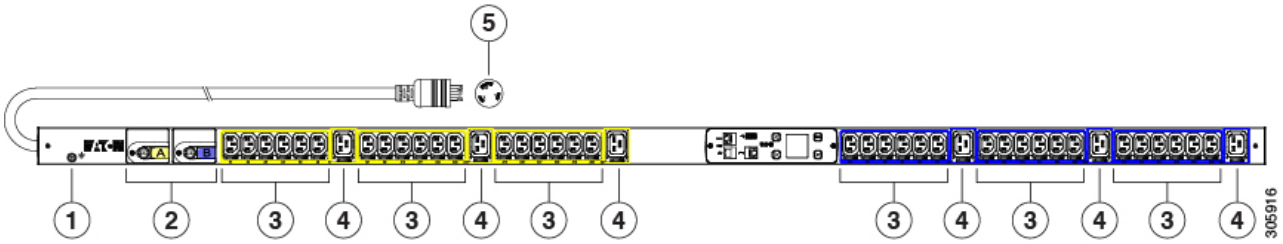
Cisco RP Series Power Distribution Units (PDUs) offer power distribution with branch circuit protection.

Cisco RP Series PDU models distribute power to up to 42 outlets. The architecture organizes power distribution, simplifies cable management, and enables you to move, add, and change rack equipment without an electrician.

With a Cisco RP Series PDU in the rack, you can replace up to two dozen input power cords with just one. The fixed input cord connects to the power source from overhead or under-floor distribution. Your IT equipment is then powered by PDU outlets in the rack using short, easy-to-manage power cords.

The C-series severs accept the zero-rack-unit (0RU) or horizontal PDU. See *Figure 11* for one example of a zero rack unit PDU.

Figure 11 RP208-30M1P-6-36 PDU



1 = Ground

2 = 20 A circuit breakers

3 = IEC 60320 C13 outlets

4 = EC 60320 C19 outlets

5 = NEMA L6-30P plug

KVM CABLE

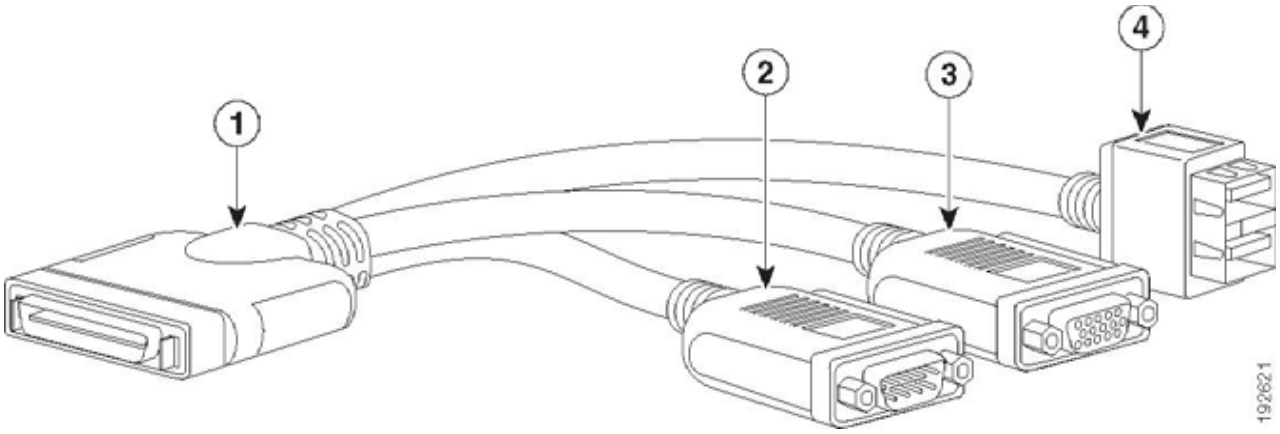
The KVM cable provides a connection into the system, providing a DB9 serial connector, a VGA connector for a monitor, and dual USB ports for a keyboard and mouse. With this cable, you can create a direct connection to the operating system and the BIOS running on the system.

The KVM cable ordering information is listed in *Table 27*.

Table 27 KVM Cable

Product ID (PID)	PID Description
N20-BKVM=	KVM cable for console port

Figure 12 KVM Cable



1	Connector (to front panel)	**3**	VGA connector (for a monitor)
2	DB-9 serial connector	**4**	Two-port USB connector (for a mouse and keyboard)

TECHNICAL SPECIFICATIONS

Dimensions and Weight

Table 28 HXAF220c M4 Node Dimensions and Weight

Parameter	Value
Height	1.7 in. (4.32 cm)
Width	16.89 in. (43.0 cm) including handles: 18.98 in. (48.2 cm)
Depth	29.8 in. (75.6 cm) including handles: 30.98 in. (78.7 cm)
Front Clearance	3 in. (76 mm)
Side Clearance	1 in. (25 mm)
Rear Clearance	6 in. (152 mm)
Weight[1]	
Maximum (8 drives, two 2 CPUs, 24 DIMMs, two power supplies)	37.9 lbs (17.2 kg)

Notes . . .

1. Weight includes inner rail, which is attached to the system. Weight does not include outer rail, which is attached to the rack.

Power Specifications

The general power specifications for the HXAF220c M4 Node 770 W (AC) power supply are listed in *Table 29*.

Table 29 HXAF220c M4 Node 770 W (AC) Power Supply Specifications

Description	Specification
AC input voltage	100—240 VAC (nominal input voltage range) 90—264 VAC (min/max input voltage range)
AC input frequency	47 to 63 Hz (single phase)
Maximum AC input current	9.5 Amps maximum at 100 VAC 4.5 Amps maximum at 208 VAC
Maximum Input VA	915 at 230 VAC
Maximum output power for each power supply	770 W on 12 VDC main 36 W on 12 VDC standby
Maximum AC inrush current	15 A (subcycle duration)
Power supply output voltage	12 VDC ± 5%
Power supply efficiency	Climate Savers Platinum Efficiency (80Plus Platinum Certified)
Form factor	RSP2
Input connector	IEC320 C14

For configuration-specific power specifications, use the Cisco UCS Power Calculator at this URL:

http://ucspowercalc.cisco.com

Environmental Specifications

The power specifications for the HXAF220c M4 Node are listed in *Table 30*.

Table 30 HXAF220c M4 Node Environmental Specifications

Parameter	Minimum
Temperature operating	41 to 95° F (5 to 35° C) derate the maximum temperature by 1°C per every 1000 ft. (305 m) of altitude above sea level
Temperature nonoperating	–40 to 149°F (–40 to 65° C)
Humidity (RH) operating	10 to 90%, non-condensing at 82° F (28° C)
Humidity (RH) nonoperating	5 to 93% at 82° F (28° C)
Altitude operating	0 to 3,000 m (0 to 10,000 ft.)
Altitude nonoperating	0 to 12,192 m (0 to 40,000 ft.)
Sound Power level, Measure A-weighted per ISO7779 LWAd (Bels) Operation at 73°F (23°C)	5.4
Sound Pressure level, Measure A-weighted per ISO7779 LpAm (dBA) Operation at 73°F (23°C)	37

Compliance Requirements

The regulatory compliance requirements for C-Series systems are listed in *Table 31*.

Table 31 UCS C-Series Regulatory Compliance Requirements

Parameter	Description
Regulatory Compliance	Products should comply with CE Markings per directives 2004/108/EC and 2006/95/EC
Safety	UL 60950-1 Second Edition CAN/CSA-C22.2 No. 60950-1 Second Edition EN 60950-1 Second Edition IEC 60950-1 Second Edition AS/NZS 60950-1 GB4943 2001
EMC - Emissions	47CFR Part 15 (CFR 47) Class A AS/NZS CISPR22 Class A CISPR22 Class A EN55022 Class A ICES003 Class A VCCI Class A EN61000-3-2 EN61000-3-3 KN22 Class A CNS13438 Class A
EMC - Immunity	EN55024 CISPR24 EN300386 KN24

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at **www.cisco.com/go/offices.**

Cisco and the Cisco Logo are trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and other countries. A listing of Cisco's trademarks can be found at www.cisco.com/go/trademarks. Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1005R)