Cisco UCS C22 M3 High-Density Rack Server (Large Form Factor Hard Disk Drive Model)

OVERVIEW

The Cisco® UCS C22 M3 large-form factor (LFF) drive Rack Server combines economics and a density-optimized feature set from entry level enterprise to SMB with applications such as scale out, virtualization, IT and web infrastructure, VPN servers, file/print servers, and appliances.

Building on the success of the Cisco UCS C-Series Servers, the Cisco UCS C22 M3 server and the Cisco 1225 VIC further extend the capabilities of the Cisco UCS portfolio in a 1RU form factor with the addition of the Intel® Xeon® processor E5-2400 series processor family CPUs, which delivers the best combination of performance and efficiency gains. In addition, the Cisco UCS C22 M3 server offers 12 DIMM slots, up to eight disk drives, 2 PCIe slots and two 1 Gigabit Ethernet LAN-on-motherboard (LOM) ports that provide both price/performance in a compact form factor.

DETAILED VIEWS

Chassis Front View

Figure 1 shows the Cisco UCS C22 M3 High-Density LFF Rack Server.

Figure 1   Chassis Front View
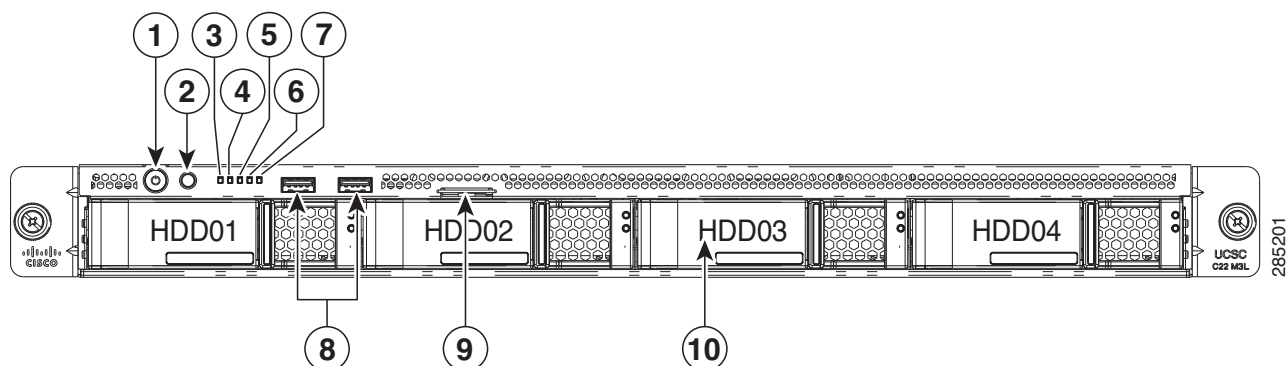
1	Power button/power status LED	6	Power supply status LED
2	Identification button/LED	7	Network link activity LED
3	System status LED	8	USB 2.0 ports (two)
4	Fan status LED	9	Pull-out asset tag
5	Temperature status LED	10	Drives (up to four hot-swappable 3.5-inch drives)

Chassis Rear View

Figure 2 shows the external features of the rear panel.

Figure 2   Chassis Rear View
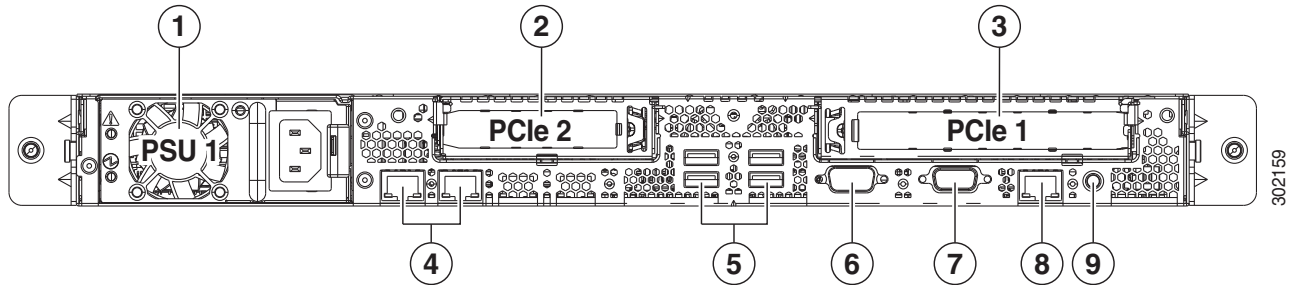
1	Power supply	6	Serial port (DB-9 connector)
2	Slot 2: Low-profile PCIe slot on riser 2 PCIe Gen 3 slot, x8, half-height, half-length	7	VGA video port (DB-15 connector)
3	Slot 1: Standard-profile PCIe slot on riser 1 PCIe Gen 3 slot, x16, full-height, half-length	8	10/100/1000 Base-T Ethernet dedicated management port
4	Dual 1-Gb Base-T Ethernet ports (two)	9	Rear Identification button/LED
5	USB 2.0 ports (four)	—	—

BASE SERVER STANDARD CAPABILITIES and FEATURES

Table 1 lists the capabilities and features of the base server. Details about how to configure the server for a particular feature or capability (for example, number of processors, disk drives, or amount of memory) are provided in *CONFIGURING the SERVER, page 8*.

Table 1 Capabilities and Features

Capability/Feature	Description
Chassis	Single rack unit (1RU) chassis
CPU	One or two Intel® Xeon E5-2400 series processor family CPUs
Chipset	Intel C600 chipset
Memory	12 DIMM slots
NIC	Embedded dual-port Intel I350 PCIe-based Gigabit Ethernet controller
Expansion slots	Two riser cards with one PCIe card slot in each riser ■ Riser 1 (controlled by CPU 1) • Slot 1: PCIe Gen 3 slot, x16 extended connector (Cisco CNIC), half-length, full-height, with NCSI[1] and Cisco CNIC[2] support. The Cisco 1225 virtual interface card requires an NCSI slot. ■ Riser 2 (controlled by CPU 2) • Slot 2: PCIe Gen 3 slot, x8 connector, half-length, half-height, no NCSI support
Internal storage devices	■ Up to four 3.5-inch SAS+SATA hot-swappable hard disk drives (HDDs) ■ One connector on the motherboard that can accommodate a USB 2.0 drive. You can order an 8 GB drive for this connector and use it as a hypervisor or license dongle. The 8 GB USB drive comes blank. Or, you can order a 16 GB drive that comes with preloaded drivers and utilities.
Video	The Emulex Pilot 3 Integrated Baseboard Management Controller provides video: ■ Matrox G200e video controller ■ Integrated 2D graphics core with hardware acceleration ■ Supports all display resolutions up to 1920 x 1200 x 16 bpp resolution at 60 Hz ■ 24-bit color depth for all resolutions less than 1600x1200 ■ 256 MB video memory

Capability/Feature	Description

Storage controller	The following RAID options are available:
	
	■ Embedded RAID (3 Gbps) (this implementation of RAID does not consume a PCIe slot).
	
	    • Embedded SATA-only RAID controller, supporting up to four SATA-only drives (RAID 0, 1, 10)
	
	    • ROM1 RAID upgrade, supporting up to four SAS+SATA drives (RAID 0, 1, 10).
	
	    • ROM15 RAID upgrade, supporting up to four SAS+SATA drives (RAID 0, 1, 5, 10).
	
	■ Plug-in RAID controller cards (these cards consume PCIe slots)
	
	    • LSI MegaRAID SAS 9265CV-8i RAID 8-port PCIe plug-in RAID controller card, supporting RAID 0, 1, 5, 6, 10, 50, and 60 and up to eight internal SAS+SATA drives (limited to four drives in this server). Includes a 1 GB Transportable Memory Module (TMM) data cache and chassis-mounted (remote) supercap for data cache power backup.
	
	    • LSI MegaRAID 9240-8i RAID 8-port PCIe plug-in RAID controller card, supporting RAID 0, 1, 5, 10, and 50 and up to eight internal SAS+SATA drives (limited to four drives in this server).
	
	    • LSI MegaRAID 9220-4i RAID 4-port PCIe plug-in RAID controller supporting RAID 0, 1, and 10 and up to four internal SAS+SATA drives.

Interfaces	■ Rear panel
	
	    • One DB9 serial port connector
	
	    • Four USB 2.0 port connectors
	
	    • One DB15 VGA connector
	
	    • One 10/100/1000 Ethernet management port
	
	    • Two 1 GbE Ethernet LOM ports
	
	■ Front panel
	
	    • Two USB 2.0 ports

Front Panel	■ A front panel controller provides status indications and control buttons
Power subsystem	One 450 W power supply or one 650 W power supply, depending on server configuration and loading. Prior to making a power supply selection, the UCS Power Calculator should be run to determine the right size power supply for your server configuration. A fully configured C22 M3 server may require the 650 W power supply. The UCS Power Calculator can be found at the following link: https://express.salire.com/Go/Cisco/Cisco-UCS-Power-Calculator.aspx
Fans	Chassis: ■ Five fans for front-to-rear cooling. N + 1 redundant. Power supply: ■ The power supply is equipped with a fan.

Capability/Feature	Description
Integrated management processor	Cisco Integrated Management Controller (CIMC).
	Depending on your CIMC settings, the CIMC can be accessed through the 1-Gb Ethernet dedicated management port, the 1-Gb Ethernet LOM ports, or a Cisco 1225 virtual interface card.

Notes . . .

1. NCSI = network communications services interface protocol. The slot stays active when the server is in standby power state.
2. CNIC = Cisco network interface card.

CONFIGURING the SERVER

Follow these steps to configure the Cisco UCS C22 M3 High-Density LFF Rack Server:

STEP 1   VERIFY SERVER SKU

Verify the product ID (PID) of the server as shown in *Table 2*.

Table 2   PID of the C22 M3 High-Density LFF Rack Base Server

Product ID (PID)	Description
UCSC-C22-M3L	UCS C22 M3 LFF with rail kit, without PSU, CPU, memory, HDD, or PCIe cards

The Cisco C22 M3 server:

■   Includes a rail kit

■   Does not include power supply, CPU, memory, hard disk drives (HDDs), or plug-in PCIe cards.

> **NOTE:** Use the steps on the following pages to configure the server with the components that you want to include.

STEP 2   SELECT CPU(s)

The standard CPU features are:

■ Intel Xeon E5-2400 series processor family CPUs

■ Intel C600 chipset

■ Cache size of 10, 15, or 20 MB

Select CPUs

The available CPUs are listed in *Table 3*.

Table 3   Available Intel CPUs: Xeon E5-24xx Family

Product ID (PID)	Intel Number	Clock Freq (GHz)	Power (W)	Cache Size (MB)	Cores	QPI	Highest DDR3 DIMM Clock Support (MHz)[1]
UCS-CPU-E5-2470	E5-2470	2.30	95	20	8	8.0	1600
UCS-CPU-E5-2450	E5-2450	2.10	95	20	8	8.0	1600
UCS-CPU-E5-2440	E5-2440	2.40	95	15	6	7.2	1333
UCS-CPU-E5-2430	E5-2430	2.20	95	15	6	7.2	1333
UCS-CPU-E5-2430L	E5-2430L	2.00	60	15	6	7.2	1333
UCS-CPU-E5-2420	E5-2420	1.90	95	15	6	7.2	1333
UCS-CPU-E5-2407	E5-2407	2.20	80	10	4	6.4	1066
UCS-CPU-E5-2403	E5-2403	1.80	80	10	4	6.4	1066

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) 1-CPU configurations:

■ Select any one CPU listed in *Table 3*.

(2) 2-CPU Configurations:

■ Select two identical CPUs from any one of the rows of *Table 3 on page 10*.

Caveats

■ You can select either one CPU or two identical CPUs.

■ If you select one CPU, only one PCIe slot (the full-height slot on riser 1) is available for use.

■ For optimal performance, select DIMMs with the highest clock speed for a given processor (see *Table 3 on page 10*). 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: 1333 or 1600 MHz
    - Ranks per DIMM: 1 or 2
    - Operational voltage: dual voltage capable (1.5 V or 1.35 V)
    - Registered ECC DDR3 DIMMS (RDIMMS)
- Memory is organized with three memory channels per CPU, with up to two DIMMs per channel, as shown in *Figure 3*.

Figure 3   C22 M3 LFF Memory Organization
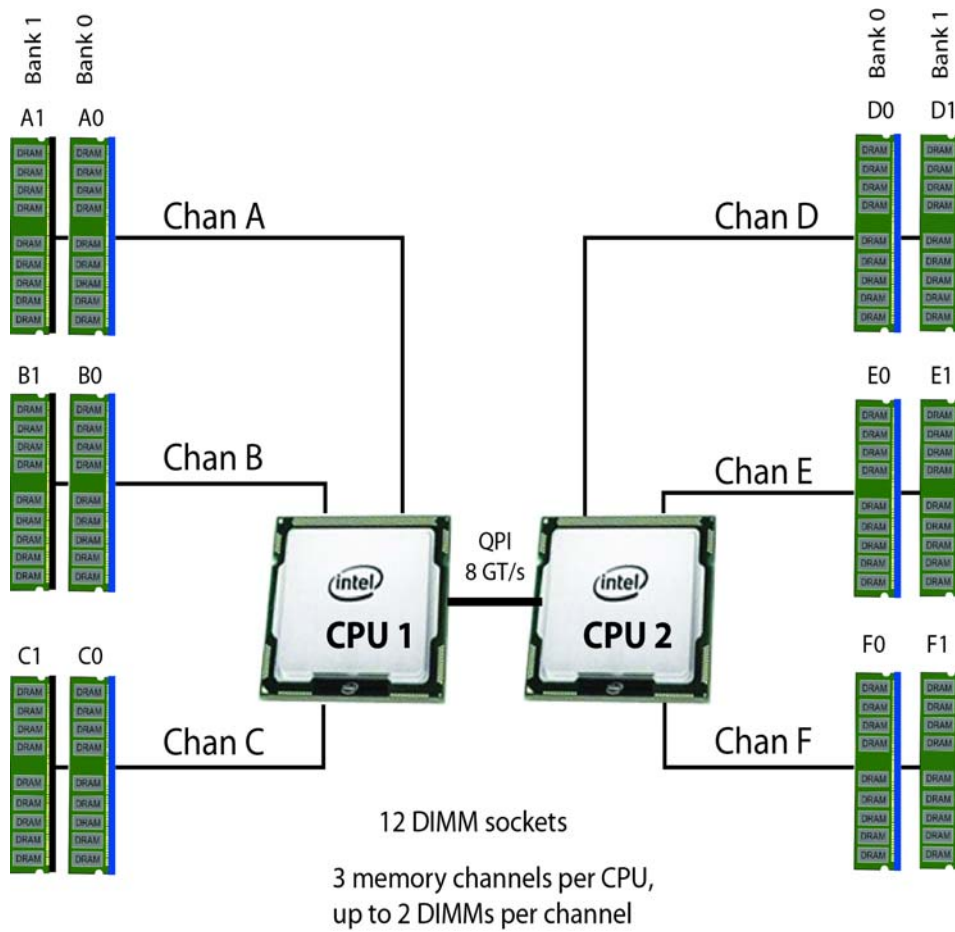
Select DIMMs

Select the memory configuration. The available memory DIMMs are listed in *Table 4*.

> NOTE: When memory mirroring is enabled, the memory subsystem simultaneously writes identical data to two channels. If a memory read from one of the channels returns incorrect data due to an uncorrectable memory error, the system automatically retrieves the data from the other channel. A transient or soft error in one channel does not affect the mirrored data, and operation continues unless there is a simultaneous error in exactly the same location on a DIMM and its mirrored DIMM. Memory mirroring reduces the amount of memory available to the operating system by 50% because only one of the two populated channels provides data.

Table 4   Available DDR3 DIMMs

Product ID (PID)	PID Description	Voltage	Ranks /DIMM
DIMM Options			
UCS-MR-1X041RY-A	4 GB DDR3-1600-MHz RDIMM/PC3-12800/1R/x4/1.35v/35nm	1.35 V	1
UCS-MR-1X082RX-A	8 GB DDR3-1333-MHz RDIMM/PC3-10600/2R/x4/1.35v/35nm	1.35 V	2
UCS-MR-1X082RY-A	8 GB DDR3-1600-MHz RDIMM/PC3-12800/2R/x4/1.35v/35nm	1.35 V	2
UCS-MR-1X162RY-A	16 GB DDR3-1600-MHz RDIMM/PC3-12800/2R/x4/1.35v/35nm	1.35 V	2
UCS-MU-1X042RE-A	4 GB DDR3-1333-MHz ECC UDIMM/PC3-10600/1R/x4/1.35v/35nm	1.35 V	1
UCS-ML-1X324RY-A	32GB DDR3-1600-MHz LR DIMM/PC3-10600/quad rank/x4/1.35v	1.35 V	4
Memory Mirroring Option			
N01-MMIRROR	Memory mirroring option		

Approved Configurations

(1) **1-CPU configuration without memory mirroring:**

■ Select from 1 to 6 DIMMs. Refer to *Memory Population Rules, page 49*, for more detailed information.

(2) **1-CPU configuration with memory mirroring:**

■ Select either 2 or 4 DIMMs. The DIMMs will be placed by the factory as shown in the following table:

Number of DIMMs	DIMM Placement in Channels (Channel A is not used with memory mirroring)
2	1 DIMM in Channel B, 1 DIMM in Channel C
4	2 DIMMs in Channel B, 2 DIMMs in Channel C

■ Select the memory mirroring option (N01-MMIRROR) as shown in *Table 4 on page 13*.

(1) **2-CPU configuration without memory mirroring:**

■ Select from 1 to 6 DIMMs per CPU (2 to 12 DIMMs total). Refer to *Memory Population Rules, page 49*, for more detailed information.

(2) **2-CPU configuration with memory mirroring:**

■ Select 2 or 4 DIMMs per CPU (4 or 8 DIMMs total). The DIMMs will be placed by the factory as shown in the following table:

Number of DIMMs per CPU	DIMM Placement (Channels A and D are not used with memory mirroring)	
2	CPU 1: 1 DIMM in Channel B 1 DIMM in Channel C	CPU 2: 1 DIMM in Channel E 1 DIMM in channel F
4	CPU 1: 2 DIMMs in Channel B 2 DIMMs in Channel C	CPU 2: 2 DIMMs in Channel E 2 DIMMs in Channel F

■ Select the memory mirroring option (N01-MMIRROR) as shown in *Table 4 on page 13*.

> **NOTE:** System performance is optimized when the DIMM size and quantity are equal for both CPUs.

Caveats

- Do not mix 1333 MHz and 1600 MHz DIMMs

- Do not mix DIMM types (RDIMM, LRDIMM, or UDIMM) or sizes

- Do not select more than two different types of DIMMs (only two PID types allowed)

- For 2-CPU configurations, install a minimum of 2 DIMMs (one per CPU).

- If you use different sizes of DIMMs, the quantity of each size of DIMM must be even (2, 4, or 6). For example, 4 UCS-MR-1X082RY-A DIMMs and 6 UCS-MR-1X162RY-A DIMMs. Also, the sum of all PIDs must adhere to the maximum quantity rule of 12 DIMMs for 2-CPU systems.

- By default, all DIMMs run at 1.35 V, which yields 1333-MHz memory speeds. To run the memory DIMMS at 1600 MHz, you need to go into the BIOS or set the policy with UCSM (service profile) to run in Performance Mode. This forces the DIMMs to operate at 1.5 V and yields 1600-MHz speeds, provided:

  — The DIMMs are 1600-MHz devices

  — The CPUs chosen support 1600-MHz operation

  For more information regarding memory, see *CPUs and DIMMs, page 47*.

STEP 4   SELECT RAID CONFIGURATION

NOTE: If you do not select a plug-in PCIe RAID card or one of the embedded RAID upgrade options, you will have an embedded SATA-only RAID controller that supports up to four SATA-only drives (RAID 0, 1, 10)

NOTE: When creating a RAID volume, follow these guidelines:

- Use the same capacity for each drive in the volume
- Use either all SAS drives or all SATA drives
- Use either all HDDs or all SSDs

NOTE: The number of RAID groups (virtual drives) supported per controller is as follows (note however, that this server can have a maximum of only four internal physical drives):

- LSI MegaRAID SAS 9265CV-8i RAID controller card = 64
- LSI MegaRAID 9240-8i RAID controller card = 16
- LSI MegaRAID 9220-4i RAID controller card = 16

The RAID controller choices are:

(1) Embedded RAID (on motherboard)

NOTE: Embedded RAID is not available with VMWare.

NOTE: The RAID configuration options listed in *Table 6 on page 17* are not available if you choose embedded RAID (in this case, you must configure RAID yourself using separate software).

(2) Plug-in PCIe RAID controller cards

Cisco can provide factory-configured RAID systems depending on the RAID controller chosen and the number of drives ordered. Factory-configured RAID options are listed with each RAID card description.

RAID levels 50 and 60 are supported, although they are not available as factory-configured RAID options.

Select RAID Options

Select one RAID controller (either embedded RAID in *Table 5* or hardware RAID using a plug-in RAID controller and an appropriate RAID configuration option in *Table 6 on page 17*).

Table 5   Available Embedded RAID (LSI MegaSR) Options

Product ID (PID)	PID Description
Embedded RAID	
UCSC-RAID-ROM1	Software RAID (LSI MegaSR), supporting up to four SAS+SATA drives. SAS and SATA drives can be mixed. This option supports RAID 0, 1, and 10, and operates at 3 Gb/s. Operating systems supported are Windows and Linux only (no VMware support).
UCSC-RAID-ROM15	Software RAID (LSI MegaSR), supporting up to four SAS+SATA drives. SAS and SATA drives can be mixed. This option supports RAID 0, 1, 5, and 10, and operates at 3 Gb/s. Operating systems supported are Windows and Linux only (no VMware support).

Table 6   Available Hardware RAID Options

Product ID (PID)	PID Description
RAID Controllers **Note that plug-in PCIe RAID controllers are installed by default in slot 1 for 1-CPU systems and slot 2 for 2-CPU systems**	
UCS-RAID-9265CV	LSI MegaRAID 9265CV-8i (with supercap power backup) ■ Supports up to four internal SAS+SATA drives. SAS and SATA drives can be mixed. ■ Includes a 1 GB Transportable Memory Module (TMM) cache and chassis-mount (remote) supercap power module for data cache backup ■ RAID levels supported: RAID 0, 1, 5, 6, 10, 50, 60 (see the RAID Configuration Options section later in this table)
UCSC-RAID-9240-8I	LSI MegaRAID 9240-8i ■ Supports up to four internal SAS+SATA drives. SAS and SATA drives can be mixed. ■ RAID levels supported: RAID 0, 1, 5, 10, 50 (see the RAID Configuration Options section later in this table)
UCSC-RAID-9220-4i	LSI MegaRAID 9220-4i ■ Supports up to four internal SAS+SATA drives. SAS and SATA drives can be mixed. ■ RAID levels supported: RAID 0, 1, 10 (see the RAID Configuration Options section later in this table)
RAID Configuration Options (not available for embedded RAID)	
R2XX-RAID0	Factory preconfigured RAID striping option Enable RAID 0 Setting. Requires a minimum of one hard drive.

Table 6   Available Hardware RAID Options *(continued)*

Product ID (PID)	PID Description
R2XX-RAID1	Factory preconfigured RAID mirroring option Enable RAID 1 Setting. Requires exactly two drives with the same size, speed, capacity.
R2XX-RAID5	Factory preconfigured RAID option Enable RAID 5 Setting. Requires a minimum of three drives of the same size, speed, capacity.
R2XX-RAID6	Factory preconfigured RAID option Enable RAID 6 Setting. Requires a minimum of four drives of the same size, speed, capacity.
R2XX-RAID10	Factory preconfigured RAID option Enable RAID 10 Setting. Requires an even number of drives (minimum of four drives) of the same size, speed, capacity.

NOTE: Although RAID levels 50 and 60 are not orderable from the factory, they are supported for selected controllers as shown in *Table 5*.

Approved Configurations

(1) 1-CPU Configurations

Select an embedded RAID option from *Table 5 on page 17* or one PCIe plug-in RAID controller from *Table 6 on page 17*. You may also select an appropriate optional RAID configuration listed in *Table 6 on page 17*.

> **NOTE:** In 1-CPU configurations, PCIe slot 1 is the default slot supported for an internal drive RAID controller. PCIe slot 2 is not supported for 1-CPU systems.

> **NOTE:** If you do not select a plug-in PCIe RAID card or one of the embedded RAID upgrade options from *Table 5 on page 17*, you will have an embedded SATA-only RAID controller that supports up to four SATA-only drives (RAID 0, 1, 10) and slot 1 can be used for a plug-in PCIe card (see *Table 8 on page 23*)

(2) 2-CPU Configurations

Select an embedded RAID option from *Table 5 on page 17*, or one PCIe plug-in RAID controller from *Table 6 on page 17*. You may also select an appropriate optional RAID configuration listed in *Table 6 on page 17*.

> **NOTE:** In 2-CPU configurations, PCIe slot 2 is the default slot supported for an internal drive RAID controller. PCIe slot 1 can be used for a PCIe expansion card (including the VIC card). You can change the default card slot for a RAID controller to slot 1 by going into the BIOS and reconfiguring the option ROM (OPROM) settings. Keep in mind, however, that if you use slot 1 for a RAID controller, you will not be able to install a VIC card, which can be installed only in slot 1.

> **NOTE:** If you do not select a plug-in PCIe RAID card, or one of the embedded RAID upgrade options from *Table 5 on page 17*, you will have an embedded SATA-only RAID controller that supports up to four SATA-only drives (RAID 0, 1, 10) and slots 1 and 2 can be used for PCIe cards (see *Table 8 on page 23*).

Caveats

■ In 1-CPU configurations, there is only one full-height PCIe slot available (located on riser 1). Slot 2 is not supported in 1-CPU systems.

— If you choose embedded RAID, you can select one optional PCIe card from *Table 8 on page 23* to be installed in slot 1.

— If you choose a plug-in RAID controller from *Table 5 on page 17*, it will be installed in slot 1 by default and you will not be able to select any optional PCIe card from *Table 8 on page 23*.

- — Note that only a single Cisco 1225 Virtual Interface Card (VIC) card is supported and it must be installed in the full-length, full-height PCIe slot (slot 1) on riser 1, which is the only slot that supports NCSI. So take this into account when populating RAID controller cards. You can have either a PCIe RAID controller or a VIC card in slot 1.

    - — Slot 2 is not supported in 1-CPU systems.

- ■ In 2-CPU configurations, there are two PCIe slots available (one full-height slot, slot 1, and one half-height slot, slot 2).

    - — If you choose embedded RAID, you can select up to two optional PCIe cards from *Table 8 on page 23* to be installed in slots 1 and 2.

    - — If you choose a plug-in RAID controller from *Table 5 on page 17*, it will be installed in slot 2 by default and you will be able to select one additional optional PCIe card from *Table 8 on page 23* to be installed in slot 1.

- ■ The optional plug-in PCIe RAID controller cards are all half-height. If you choose one of these cards in a 2-CPU configuration, only the full-height PCIe card slot will be available for an additional optional PCIe card.

- ■ Note that only a single Cisco 1225 Virtual Interface Card (VIC) card is supported and it must be installed in the full-length, full-height PCIe slot (slot 1) on riser 1, which is the only slot that supports NCSI. So take this into account when populating RAID controller cards.

- ■ You can choose only one type of RAID controller, either embedded RAID or a PCIe plug-in controller. If you choose embedded RAID, slot 1 in a 1-CPU system and slots 1 and 2 in a 2-CPU system are available for adding optional PCIe cards.

- ■ For plug-in RAID controller cards, you can choose an optional RAID configuration (RAID 0, 1, 5, 6, or 10), which is preconfigured at the factory. The RAID level you choose must be an available RAID choice for the controller selected. RAID levels 50 and 60 are supported, depending on the RAID controller selected, although they are not available as configuration options.

> **NOTE:** For more important information regarding RAID support, see *RAID Summary, page 53* and *RAID Option ROM (OPROM) Settings, page 54*.

STEP 5   SELECT HARD DISK DRIVES (HDDs)

The standard disk drive features are:

- 3.5-inch large form factor
- Hot-pluggable
- Sled-mounted

Select Drives

The available drives are listed in *Table 7*.

Table 7   Available Hot-Pluggable Sled-Mounted HDDs

Product ID (PID)	PID Description	Drive Type	Capacity
HDDs			
UCS-HDD3TI2F214	3 TB SAS 7.2K RPM 3.5 inch HDD	SAS	3 TB
UCS-HDD2TI2F213	2 TB SAS 7.2K RPM 3.5 inch HDD	SAS	2 TB
UCS-HDD1TI2F212	1 TB SAS 7.2K RPM 3.5 inch HDD	SAS	1 TB
UCS-HDD500GI1F211	500 GB SATA 7.2K RPM 3.5 inch HDD	SATA	500 GB
UCS-HD4T7KS3-E	4 TB SAS 7.2K RPM 3.5 inch HDD	SAS	4 TB

NOTE: When creating a RAID volume, follow these guidelines:
- Use the same capacity for each drive in the volume
- Use either all SAS drives or all SATA drives
- Use either all HDDs or all SSDs

NOTE: The number of RAID groups (virtual drives) supported per controller is as follows:
- LSI MegaRAID SAS 9265CV-8i RAID controller card = 64
- LSI MegaRAID 9240-8i RAID controller card = 16
- LSI MegaRAID 9220-4i RAID controller card = 16

Approved Configurations

(1) **Embedded RAID (LSI MegaSR)**

■ Select up to four SAS+SATA drives (note that no factory-configured RAID option listed in *Table 6 on page 17* can be chosen for software RAID). You can mix SAS and SATA drives.

(2) **LSI MegaRAID 9265CV-8i (with data cache and supercap), LSI MegaRAID 9240-8i, and LSI MegaRAID 9220-4i**

■ Select up to four SAS+SATA drives listed in *Table 7 on page 21*. You can mix SAS and SATA drives.

Caveats

■ You can mix SATA and SAS drives

■ If you select one or more HDDs, you must either use the embedded SATA-only controller (for up to four SATA drives), or select either a PCIe RAID controller from *Table 6 on page 17* or an embedded RAID option from *Table 5 on page 17*.

— If you select one or more SAS HDDs, you must select a PCIe RAID controller.

■ If you do not select a plug-in PCIe RAID card or one of the embedded RAID upgrade options, you will have an embedded SATA-only RAID controller that supports up to four SATA-only drives (RAID 0, 1, 10

STEP 6 SELECT PCIe OPTION CARD(s)

The standard PCIe card offerings are:

- Converged Network Adapters (CNAs)
- Network Interface Cards (NICs)
- Host Bus Adapters (HBAs)

Select PCIe Option Cards

The available PCIe option cards are listed in *Table 8*.

Table 8   Available PCIe Option Cards

Product ID (PID)	PID Description	Card Height
Converged Network Adapters (CNAs)		
UCSC-PCIE-CSC-02	Cisco VIC 1225 Dual Port 10Gb SFP+ CNA	Half
UCSC-PCIE-C10T-02	Cisco VIC 1225T Dual Port 10GBaseT CNA	Half
UCSC-PCIE-QSFP[1]	Qlogic QLE8242-CU dual-port 10 GbE FCoE CNA	Half
UCSC-PCIE-ESFP	Emulex OCe11102-FX dual-port 10 GbE FCoE CNA	Half
Network Interface Cards (NICs)		
N2XX-ABPCI01-M3	Broadcom 5709 Dual-Port Ethernet PCIe Adapter w/TOE for M3 Servers	Half
N2XX-ABPCI03-M3	Broadcom 5709 Quad Port 10/100/1Gb NIC w/TOE iSCSI for M3 Servers	Half
UCSC-PCIE-BTG	Broadcom 57712 Dual Port 10GbE 10G-BaseT w/TOE	Half
N2XX-AIPCI01	Intel 10GbE 2-Port Niantec Controller with Copper SFP+ Cable	Half
UCSC-PCIE-IRJ45	Intel Quad Port GbE controller (this is a quad-port i350 controller)	Half
UCSC-PCIE-ITG	Intel X540 Dual Port 10GBase-T Adapter	Half
UCSC-PCIE-BSFP	Broadcom NetXtreme II 57712 Dual Port 10 Gigabit Ethernet PCIe Adapter Card with SFP+	Half
UCSC-PCIE-B3SFP	BROADCOM 57810 10Gb AFEX SFP+	Half
Host Bus Adapters (HBAs)		
N2XX-AEPCI03	Emulex LPe 11002, 4Gb Fibre Channel PCIe Dual Channel HBA	Half
N2XX-AEPCI05	Emulex LPe 12002, 8Gb dual port Fibre Channel HBA	Half
N2XX-AQPCI03	Qlogic QLE2462, 4Gb dual port Fibre Channel HBA	Half
N2XX-AQPCI05	Qlogic QLE2562, 8Gb dual port Fibre Channel HBA	Half

Notes . . .

1. The "QSFP" in UCSC-PCIE-QSFP stands for QLogic SFP (QSFP is not to be confused with 40 GbE QSFP)

Approved Configurations

(1) **No RAID controller plug-in card**

■ If you did not choose a plug-in RAID controller card (for example, you selected embedded RAID (LSI MegaSR) or no RAID controller at all), you can select up to one PCIe option card listed in *Table 8 on page 23* for 1-CPU configurations or up to two cards for 2-CPU configurations.

(2) **One RAID controller plug-in card**

■ If you selected a plug-in PCIe RAID controller, you cannot select any additional PCIe cards for 1-CPU configurations; however, you can select one additional optional PCIe card for 2-CPU configurations.

> **NOTE:** If a plug-in RAID controller card is installed, any optional PCIe card you select will be installed in the full-height slot. RAID controllers are always installed in the half-height slot when possible (unless you change the OPROM setting to enable the full-height slot, slot 1) for RAID.

Caveats

■ Only a single Cisco 1225 Virtual Interface Card (VIC) card is supported and it must be installed in the full-height slot of riser 1, which is the only slot that supports NCSI.

■ All PCIe cards will fit in either riser 1 or riser 2, except the VIC card, which must be installed in the full-height slot of riser 1. The Cisco 1225 VIC card must be plugged into slot 1, which supports NCSI.

■ Additional considerations for the Cisco 1225 VIC card:

— Supports 10G SFP+ optical and copper twinax connections

— The server supports installation of only one Cisco VIC 1225 card and it is supported only in PCIe slot 1. Slot 1 can operate while the server is in standby power mode.

— Requires that the server has CIMC firmware version 1.4(6) or later installed. There is a heartbeat LED on the top of the card that indicates when firmware is active.

— To use this card for UCS integration (Cisco UCS Manager mode) with Cisco UCS Manager 2.1(0) or later, the minimum card-firmware and uboot image level is 2.1(0.306).

■ To help ensure that your operating system is compatible with the card you have selected, check the Hardware Compatibility List at this URL:

http://www.cisco.com/en/US/products/ps10477/prod_technical_reference_list.html

STEP 7   ORDER OPTIONAL NETWORK CARD ACCESSORIES

Copper twinax cables and SFP optical modules may be ordered to support the two-port network cards that are available with the server.

Choose Optional Twinax Cables

Table 9 lists the copper twinax cables available for the PCIe cards. You can choose cable lengths of 1, 3, 5, 7, or 10 meters. The two longer cables (7 and 10 meters) are active, which means that they contain active components within the SFP+ housing to improve signal quality.

Table 9   Available Twinax Cables

Product ID (PID)	PID Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable (1 M)
SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable (3 M)
SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable (5 M)
SFP-H10GB-ACU7M	10GBASE-CU SFP+ Cable (7 M)
SFP-H10GB-ACU10M	10GBASE-CU SFP+ Cable (10 M)

Approved Configurations

(1) Choose Up to Two Twinax Cables for Each Network Card Ordered

■ You may choose one or two twinax cables for each network card ordered. The cables can be different lengths; however, you would normally order two cables of equal lengths to connect to the primary and redundant network switching equipment.

Caveats

The twinax cables listed in *Table 9* can be ordered only for the following PCIe cards:

— UCSC-PCIE-CSC-02 (Cisco VIC 1225 Dual Port 10Gb SFP+ CNA)

— UCS-PCIE-BSFP (Broadcom 57712)

— N2XX-AEPCI01 (Emulex OCe10102-F)

— N2XX-AIPCI01 (Intel Dual Port Ethernet X520)

Choose Optional SFP Modules

Optical Cisco SFP+ modules are listed in *Table 10*.

Table 10 Available SFP Modules

Product ID (PID)	PID Description
SFP-10G-SR	10GBASE-SR SFP+ Module 850 nm, multimode, SR, 3.3V, LC connector, with Digital Optical Monitoring
DS-SFP-FC8G-SW	8 Gbit SFP+ Module 850 nm, multimode, SR, 3.3V, LC connector, with Digital Optical Monitoring

Approved Configurations

(1) **Choose Up to Two SFP+ Modules for Each Network Card Ordered**

■ You may choose one or two SFP+ optical modules cables for each network card ordered. You would normally order two modules for connecting to the primary and redundant network switching equipment. With the SFP+ optical modules, you can use common fiber optic cables, widely available.

See *Figure 4 on page 27* for typical SFP+ and twinax connections to the network cards.

Caveats

The SFP-10G-SR optical module listed in *Table 10* should be ordered only for the following PCIe cards, as they do not come by default with any optical modules:

— UCSC-PCIE-CSC-02 (Cisco VIC 1225 Dual Port 10Gb SFP+ CNA)

— UCSC-PCIE-BSFP (Broadcom 57712)

— N2XX-ABPCI02 (Broadcom 57711)

— N2XX-AEPCI01 (Emulex OCe10102-F)

The DS-SFP-FC8G-SW optical module listed in *Table 10* should be ordered only for the following PCIe cards, as they do not come by default with any optical modules:

— N2XX-AEPCI05 (Emulex LPe 12002, 8Gb dual-port Fibre Channel HBA)

Figure 4   Network Card Connections
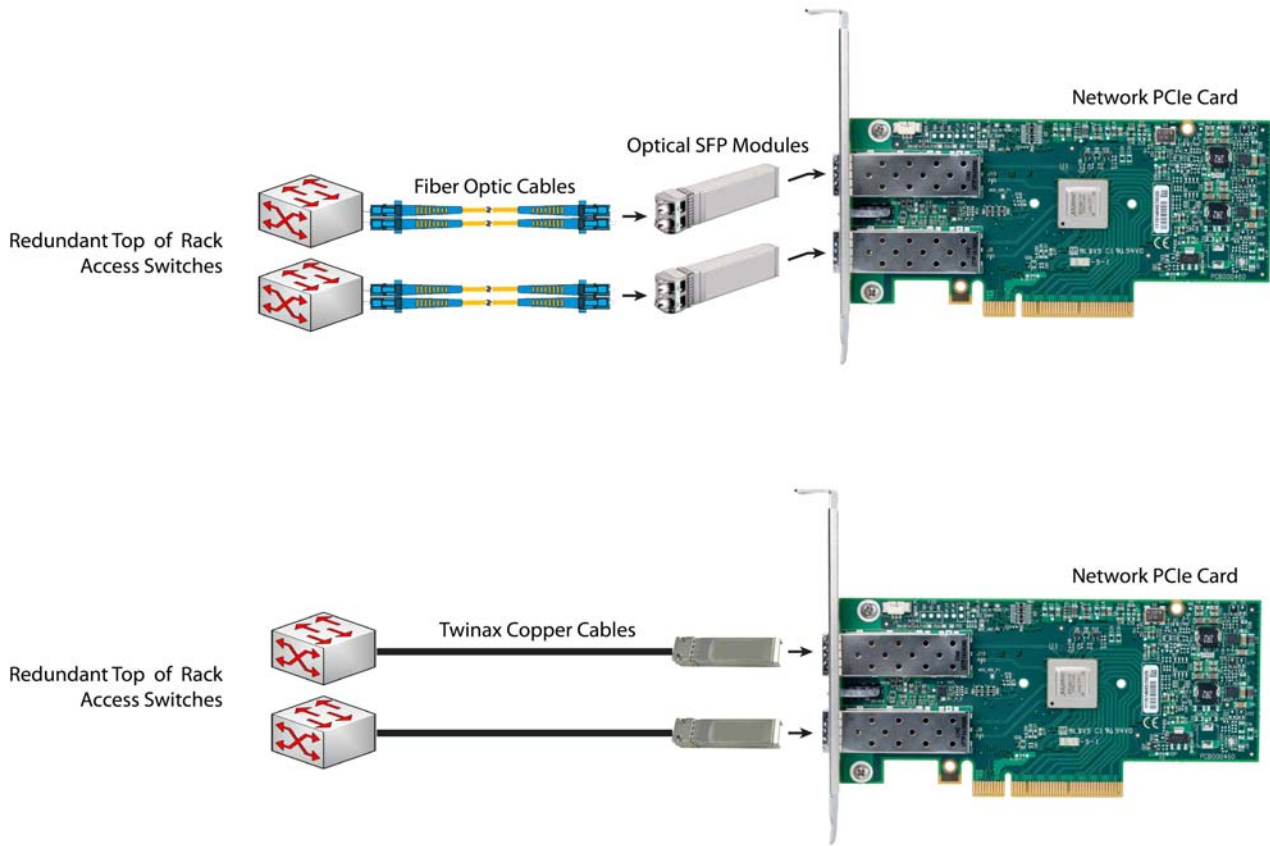
STEP 8   SELECT AC POWER CORD(s)

Using *Table 11*, select the appropriate AC power cords. You can select a minimum of no power cords and a maximum of two. If you select the option R2XX-DMYMPWRCORD, no power cord is shipped with the server.

Table 11 Available Power Cords
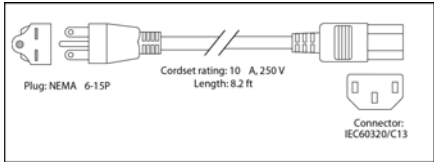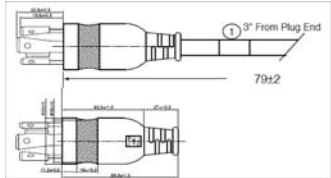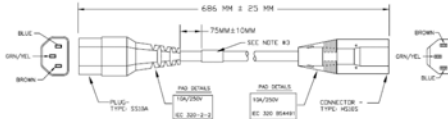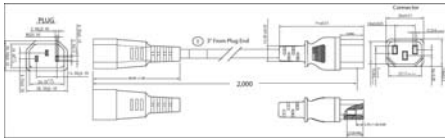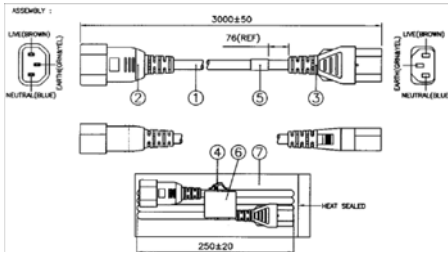
Product ID (PID)	PID Description	Images
R2XX-DMYMPWRCORD	No power cord (dummy PID to allow for a no power cord option)	Not applicable
CAB-N5K6A-NA	Power Cord, 200/240V 6A, North America	
CAB-AC-L620-C13	AC Power Cord, NEMA L6-20 - C13, 2M/6.5ft	
CAB-C13-CBN	CABASY,WIRE,JUMPER CORD, 27" L, C13/C14, 10A/250V	
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
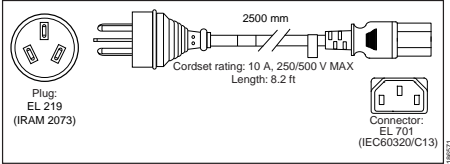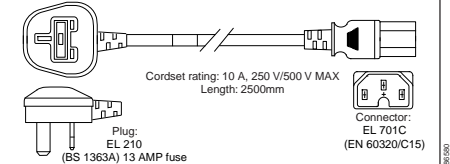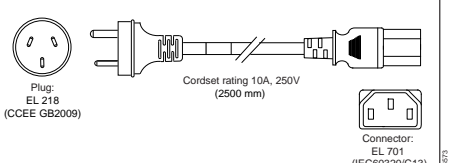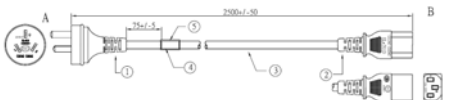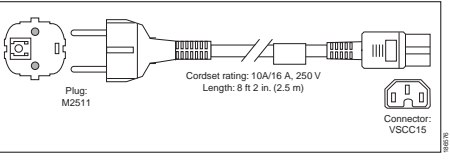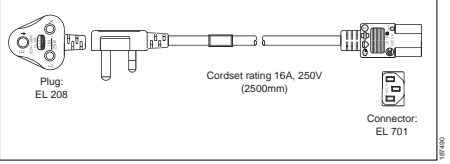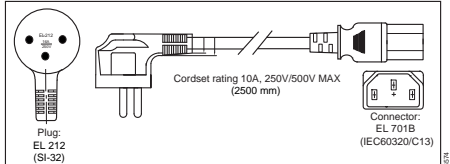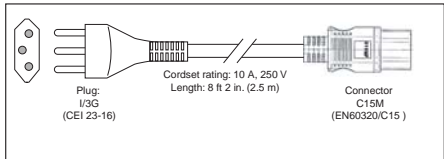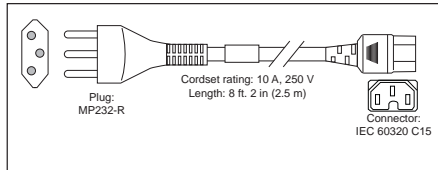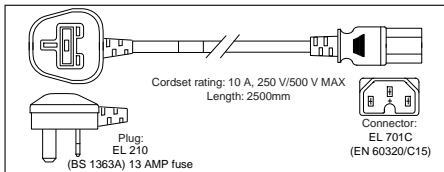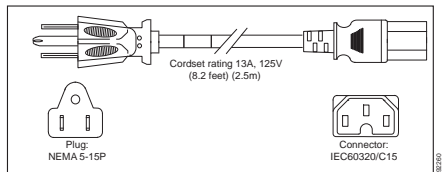
Product ID (PID)	PID Description	Images
SFS-250V-10A-AR	Power Cord, SFS, 250V, 10A, Argentina	
CAB-9K10A-AU	Power Cord, 250VAC 10A 3112 Plug, Australia	
SFS-250V-10A-CN	Power Cord, SFS, 250V, 10A, China	
CAB-250V-10A-CN	AC Power Cord - 250V, 10A - PRC	
CAB-9K10A-EU	Power Cord, 250VAC 10A CEE 7/7 Plug, EU	
SFS-250V-10A-ID	Power Cord, SFS, 250V, 10A, India	
SFS-250V-10A-IS	Power Cord, SFS, 250V, 10A, Israel	

Table 11 Available Power Cords

Product ID (PID)	PID Description	Images
CAB-9K10A-IT	Power Cord, 250VAC 10A CEI 23-16/VII Plug, Italy	
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-JPN-3PIN	Power Cord 3PIN, Japan	Image not available

Cisco UCS C22 M3 High-Density LFF Rack Server

STEP 9   ORDER POWER SUPPLY

The C22 M3 server accommodates one power supply. A lightly loaded server can operate from one 450 W power supply. A fully loaded server might need to be powered with a 650 W power supply (see *Table 12*).

Prior to making a power supply selection, the UCS Power Calculator should be run to determine the right size power supply for your server configuration. A fully configured C22 M3 server may require the 650 W power supply. The UCS Power Calculator can be found at the following link:

https://express.salire.com/Go/Cisco/Cisco-UCS-Power-Calculator.aspx

Table 12   Power Supply PIDs

Product ID (PID)	PID Description
UCSC-PSU-450W	450 W power supply
UCSC-PSU-650W	650 W power supply

STEP 10 ORDER OPTIONAL REVERSIBLE CABLE MANAGEMENT ARM

The reversible cable management arm mounts on either the right or left slide rails at the rear of the server 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-CMA1	Cable Management Arm for C22 rack servers

NOTE: If you order and install a cable management arm, you will need the longest power cable available.

For more information about the cable management arm, see the *Cisco UCS C22 M3 Installation and Service Guide* at this URL:

http://www.cisco.com/en/US/docs/unified_computing/ucs/c/hw/C22/install/C22.pdf

STEP 11 ORDER A TRUSTED PLATFORM MODULE

Trusted Platform Module (TPM) is a computer chip (microcontroller) that can securely store artifacts used to authenticate the platform (server). 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-TPM1-001	Trusted Platform Module

STEP 12 ORDER OPTIONAL USB 2.0 DRIVES

You may order one optional USB 2.0 drive. One socket on the motherboard can accommodate either the 8 GB drive or the 16 GB drive.

The 8 GB drive (if ordered) is blank and comes installed on the motherboard. It can be used for a hypervisor or a license dongle. The 16 GB drive (if ordered) contains preloaded drivers and utilities and comes installed on the motherboard.

The USB drive ordering information is listed in *Table 15*.

Table 15   USB 2.0 Drive

Product ID (PID)	PID Description
UCS-USBFLSHA-8GB	8 GB Flash USB Drive for C22/C24
UCS-USBFLSHA-16GB	16 GB Flash USB Drive for C22/C24, preloaded with UCS SCU/HUU bootable images and driver ISO file

See *Figure 5 on page 46* for the location of the internal USB connector.

STEP 13 SELECT OPERATING SYSTEM

Several operating systems are available from which to choose. Select one of the operating systems shown in *Table 16*.

Table 16   Operating Systems

PID Description	Product ID (PID)
SUSE Linux Enterprise Server	
SLES-1A	SLES/1yr subscription/svcs required/0 media
SLES-3A	SLES/3yr subscription/svcs required/0 media
Red Hat Enterprise Linux	
RHEL-2S-1G-1A	RHEL/2 Socket/1 Guest/1Yr Svcs Required
RHEL-2S-1G-3A	RHEL/2 Socket/1 Guest/3Yr Svcs Required
RHEL-2S-4G-1A	RHEL/2 Socket/4 Guest/1Yr Svcs Required
RHEL-2S-4G-3A	RHEL/2 Socket/4 Guest/3Yr Svcs Required
RHEL-2S-UG-1A	RHEL/2 Socket/U Guest/1Yr Svcs Required
RHEL-2S-UG-3A	RHEL/2 Socket/U Guest/3Yr Svcs Required
RHEL Add-Ons	
RHEL-HA-2S-1A	RHEL Option/High-Availability/2 Socket/1Yr Svcs Required
RHEL-RS-2S-1A	RHEL Option/Resilient w/Ha /2 Socket/1 Yr Svcs Required
RHEL-SFS-2S-1A	RHEL Option/Scalable File System/2 Socket/1 Yr Svcs Required
RHEL-HA-2S-3A	RHEL Option/High-Availability/2 Socket/3Yr Svcs Required
RHEL-RS-2S-3A	RHEL Option/Resilient Storage w/ HA /2 Socket/3 Yr Svcs Reqd
RHEL-SFS-2S-3A	RHEL Option/Scalable File System/2 Socket/3 Yr Svcs Required
Windows Server	
MSWS-08R2-STHV	Windows Svr 2008 ST media R2 ST (1-4CPU, 5CAL)
MSWS-08R2-ENHV	Windows Svr 2008 EN media R2 EN (1-8CPU, 25CAL)
MSWS-08R2-DCHV2S	Windows Svr 2008 R2-2 CPU-Data Center
MSWS-08R2-DCHV4S	Windows Svr 2008 R2-4 CPU-Data Center

Table 16   Operating Systems *(continued)*

PID Description	Product ID (PID)
VMWare Server	
VMW-VS5-STD-1A	VMware vSphere 5 Standard for 1 Processor, 1 Year, Support Rqd
VMW-VS5-STD-2A	VMware vSphere 5 Standard for 1 Processor, 2 Year, Support Rqd
VMW-VS5-STD-3A	VMware vSphere 5 Standard for 1 Processor, 3 Year, Support Rqd
VMW-VS5-STD-4A	VMware vSphere 5 Standard for 1 Processor, 4 Year, Support Rqd
VMW-VS5-STD-5A	VMware vSphere 5 Standard for 1 Processor, 5 Year, Support Rqd
VMW-VS5-ENT-1A	VMware vSphere 5 Enterprise for 1 Processor, 1 Year Support
VMW-VS5-ENT-2A	VMware vSphere 5 Enterprise for 1 CPU, 2 Yr Support
VMW-VS5-ENT-3A	VMware vSphere 5 Enterprise for 1 CPU, 3 Yr Support
VMW-VS5-ENT-4A	VMware vSphere 5 Enterprise for 1 Processor, 4 Year Support
VMW-VS5-ENT-5A	VMware vSphere 5 Enterprise for 1 CPU, 5 Yr Support
VMW-VS5-ENTP-1A	VMware vSphere 5 Enterprise Plus for 1 Processor, 1 Year, Support Rqd
VMW-VS5-ENTP-2A	VMware vSphere 5 Enterprise Plus for 1 CPU, 2 Yr Support
VMW-VS5-ENTP-3A	VMware vSphere 5 Enterprise Plus for 1 Processor, 3 Year, Support Rqd
VMW-VS5-ENTP-4A	VMware vSphere 5 Enterprise Plus for 1 Processor, 4 Year Support
VMW-VS5-ENTP-5A	VMware vSphere 5 Enterprise Plus for 1 Processor, 5 Year, Support Rqd

STEP 14 SELECT OPERATING SYSTEM MEDIA KIT

Select the optional operating system media listed in *Table 17*.

Table 17   OS Media

Product ID (PID)	PID Description
RHEL-6	RHEL 6 Recovery Media Only (Multilingual)
SLES-11	SLES 11 media only (multilingual)
MSWS-08R2-STHV-RM	Windows Svr 2008 R2 ST (1-4CPU, 5CAL), Media
MSWS-08R2-ENHV-RM	Windows Svr 2008 R2 EN (1-8CPU, 25CAL), Media
MSWS-08R2-DCHV-RM	Windows Svr 2008 R2 DC (1-8CPU, 25CAL), Media

STEP 15 SELECT OPTIONAL VALUE-ADDED SOFTWARE

You can select from a variety of value-added software listed in *Table 18*.

Table 18   Value Added Software

Product ID (PID)	PID Description
BMC-SE-4C	BMC BladeLogic Standard Edition, 4 Cores, Support Required
BMC-SE-6C	BMC BladeLogic Standard Edition, 6 Cores, Support Required
BMC-SE-8C	BMC BladeLogic Standard Edition, 8 Cores, Support Required
BMC-SE-10C	BMC BladeLogic Standard Edition, 10 Cores, Support Required
BMC-AE-4C	BladeLogic Advanced Edition, 4 Cores, Support Required
BMC-AE-6C	BMC BladeLogic Advanced Edition, 6 Cores, Support Required
BMC-AE-8C	BMC BladeLogic Advanced Edition, 8 Cores, Support Required
BMC-AE-10C	BMC BladeLogic Advanced Edition, 10 Cores, Support Required
BMC-002	BMC BladeLogic CM, Physical Server
BMC-012	BMC BPPM Per Server
VMW-VC5-STD-1A	VMware vCenter 5 Standard for 1 Processor, 1 Year, Support Rqd
VMW-VC5-STD-2A	VMware vCenter 5 Standard for 1 Processor, 2 Year, Support Rqd
VMW-VC5-STD-3A	VMware vCenter 5 Standard for 1 Processor, 3 Year, Support Rqd
VMW-VC5-STD-4A	VMware vCenter 5 Standard for 1 Processor, 4 Year, Support Rqd
VMW-VC5-STD-5A	VMware vCenter 5 Standard for 1 Processor, 5 Year, Support Rqd

STEP 16 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.

SMARTnet for UCS

For support of the entire Unified Computing System, Cisco offers the Cisco SMARTnet 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 UCS blade servers, there is Smart Call Home, which provides proactive, embedded diagnostics and real-time alerts. For systems that include Unified Computing System Manager, the support service includes downloads of UCSM upgrades. The Cisco SMARTnet 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 19*.

Table 19   Cisco SMARTnet for UCS Service

Product ID (PID)	On Site?	Description
CON-PREM-C22M3L	Yes	ONSITE 24X7X2 UCS C22 M3 Server - LFF
CON-OSP-C22M3L	Yes	ONSITE 24X7X4 UCS C22 M3 Server - LFF
CON-OSE-C22M3L	Yes	ONSITE 8X5X4 UCS C22 M3 Server - LFF
CON-OS-C22M3L	Yes	ONSITE 8X5XNBD UCS C22 M3 Server - LFF
CON-S2P-C22M3L	No	SMARTNET 24X7X2 UCS C22 M3 Server - LFF
CON-SNTP-C22M3L	No	SMARTNET 24X7X4 UCS C22 M3 Server - LFF
CON-SNTE-C22M3L	No	SMARTNET 8X5X4 UCS C22 M3 Server - LFF
CON-SNT-C22M3L	No	SMARTNET 8X5XNBD UCS C22 M3 Server - LFF

SMARTnet for UCS Hardware Only Service

For faster parts replacement than is provided with the standard Cisco Unified Computing System warranty, Cisco offers the Cisco SMARTnet for UCS Hardware Only Service. You can choose from two levels of advanced onsite parts replacement coverage in as little as four hours. SMARTnet for UCS Hardware Only Service provides remote access any time to Cisco support professionals who can determine if a return materials authorization (RMA) is required. You can choose a service listed in *Table 20*.

Table 20   SMARTnet for UCS Hardware Only Service

Product ID (PID)	Service Level GSP	On Site?	Description
CON-UCW7-C22M3L	UCW7	Yes	UC PLUS 24X7X4OS UCS C22 M3 Server - LFF
CON-UCW5-C22M3L	UCW5	Yes	UC PLUS 8X5XNBDOS UCS C22 M3 Server - LFF

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, but requires additional specializations and requirements. For additional information, see the following URL:

www.cisco.com/go/partnerucssupport

The two Partner Unified Computing Support Options include:

■ Partner Support Service for UCS

■ Partner Support Service for UCS Hardware Only

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 21*.

Table 21   Partner Support Service for UCS

Product ID (PID)	Service Level GSP	On Site?	Description
CON-PSJ1-C22M3L	PSJ1	No	UCS SUPP PSS 8X5XNBD UCS C22 M3 Server - LFF
CON-PSJ2-C22M3L	PSJ2	No	UCS SUPP PSS 8X5X4 UCS C22 M3 Server - LFF
CON-PSJ3-C22M3L	PSJ3	No	UCS SUPP PSS 24X7X4 UCS C22 M3 Server - LFF
CON-PSJ4-C22M3L	PSJ4	No	UCS SUPP PSS 24X7X2 UCS C22 M3 Server - LFF

Partner Support Service for UCS Hardware Only provides customers with replacement parts in as little as two hours. See *Table 22*.

Table 22   Partner Support Service for UCS (Hardware Only)

Product ID (PID)	Service Level GSP	On Site?	Description
CON-PSW2-C22M3L	PSW2	No	UCS W PL PSS 8X5X4 UCS C22 M3 Server - LFF
CON-PSW3-C22M3L	PSW3	No	UCS W PL PSS 24X7X4 UCS C22 M3 Server - LFF
CON-PSW4-C22M3L	PSW4	No	UCS W PL PSS 24X7X2 UCS C22 M3 Server - LFF

Unified Computing Combined Support Service

Combined Services makes it easier to purchase and manage required services under one contract. SMARTnet 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 23*.

Table 23   UCS Computing Combined Support Service

Product ID (PID)	Service Level GSP	On Site?	Description
CON-NCF2-C22M3L	NCF2	No	CMB SPT SVC 24X7X2 UCS C22 M3 Server - LFF
CON-NCF2P-C22M3L	NCF2P	Yes	CMB SPT SVC 24X7X2OS UCS C22 M3 Server - LFF
CON-NCF4P-C22M3L	NCF4P	Yes	CMB SPT SVC 24X7X4OS UCS C22 M3 Server - LFF
CON-NCF4S-C22M3L	NCF4S	Yes	CMB SPT SVC 8X5X4OS UCS C22 M3 Server - LFF
CON-NCFCS-C22M3L	NCFCS	Yes	CMB SPT SVC 8X5XNBDOS UCS C22 M3 Server - LFF
CON-NCFE-C22M3L	NCFE	No	CMB SPT SVC 8X5X4 UCS C22 M3 Server - LFF
CON-NCFP-C22M3L	NCFP	No	CMB SPT SVC 24X7X4 UCS C22 M3 Server - LFF
CON-NCFT-C22M3L	NCFT	No	CMB SPT SVC 8X5XNBD UCS C22 M3 Server - LFF

Unified Computing Drive Retention Service

With the Cisco Unified Computing Drive Retention (UCDR) 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 24*.

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

Table 24 Drive Retention Service Options

Service Description	Service Program Name	Service Level GSP	Service Level	Product ID (PID)
SMARTnet for UCS Service with Drive Retention	UCS DR	UCSD7	24x7x4 Onsite	CON-UCSD7-C22M3L
		UCSD7	8x5xNBD Onsite	CON-UCSD5-C22M3L

Table 24 Drive Retention Service Options *(continued)*

Service Description	Service Program Name	Service Level GSP	Service Level	Product ID (PID)
SMARTnet for UCS HW ONLY+Drive Retention	UCS HW+DR	UCWD7	24x7x4 Onsite	CON-UCWD7-C22M3L
		UCWD5	8x5xNBD Onsite	CON-UCWD5-C22M3L

For more service and support information, see the following URL:

http://www.cisco.com/en/US/services/ps2961/ps10312/Unified_Computing_Services_Overview.pdf

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 R42610 rack is available from Cisco for the C-Series servers, including the C22 M3 LFF server. This rack is a standard 19-inch rack and can be ordered with a variety of options, as listed in *Table 25*. Racks are shipped separately from the C22 M3 LFF server.

Table 25   Racks and Rack Options

Product ID (PID)	PID Description
RACK-UCS[1]	Cisco R42610 expansion rack, no side panels
RACK-UCS2[1]	Cisco R42610 standard rack, w/side panels
RACK-BLANK-001	Filler panels (qty 12), 1U, plastic, toolless
RACK-CBLMGT-001	Cable mgt D rings (qty 10), metal
RACK-CBLMGT-011	Cable mgt straps (qty 10), Velcro
RACK-FASTEN-001	Mounting screws (qty 100), M6
RACK-FASTEN-002	Cage nuts (qty 50), M6
RACK-JOIN-001	Rack joining kit

Notes . . .

1. Use these same base PIDs to order spare racks (available only as next-day replacements).

For more information about the R42610 rack, see *RACKS, page 55*.

OPTIONAL STEP - ORDER PDU

An optional power distribution unit (PDU) is available from Cisco for the C-Series rack servers, including theC22 M3 server. This PDU is available in a zero rack unit (RU) style (see *Table 25*).

Table 26   PDU Options

Product ID (PID)	PID Description
RP208-30-2P-U-2	Zero RU PDU

For more information about the PDU, see *PDUs, page 57*.

SUPPLEMENTAL MATERIAL

CHASSIS

An internal view of the C22 M3 chassis with the top cover removed is shown in *Figure 5*.

Figure 5   C22 M3 LFF With Top Cover Off
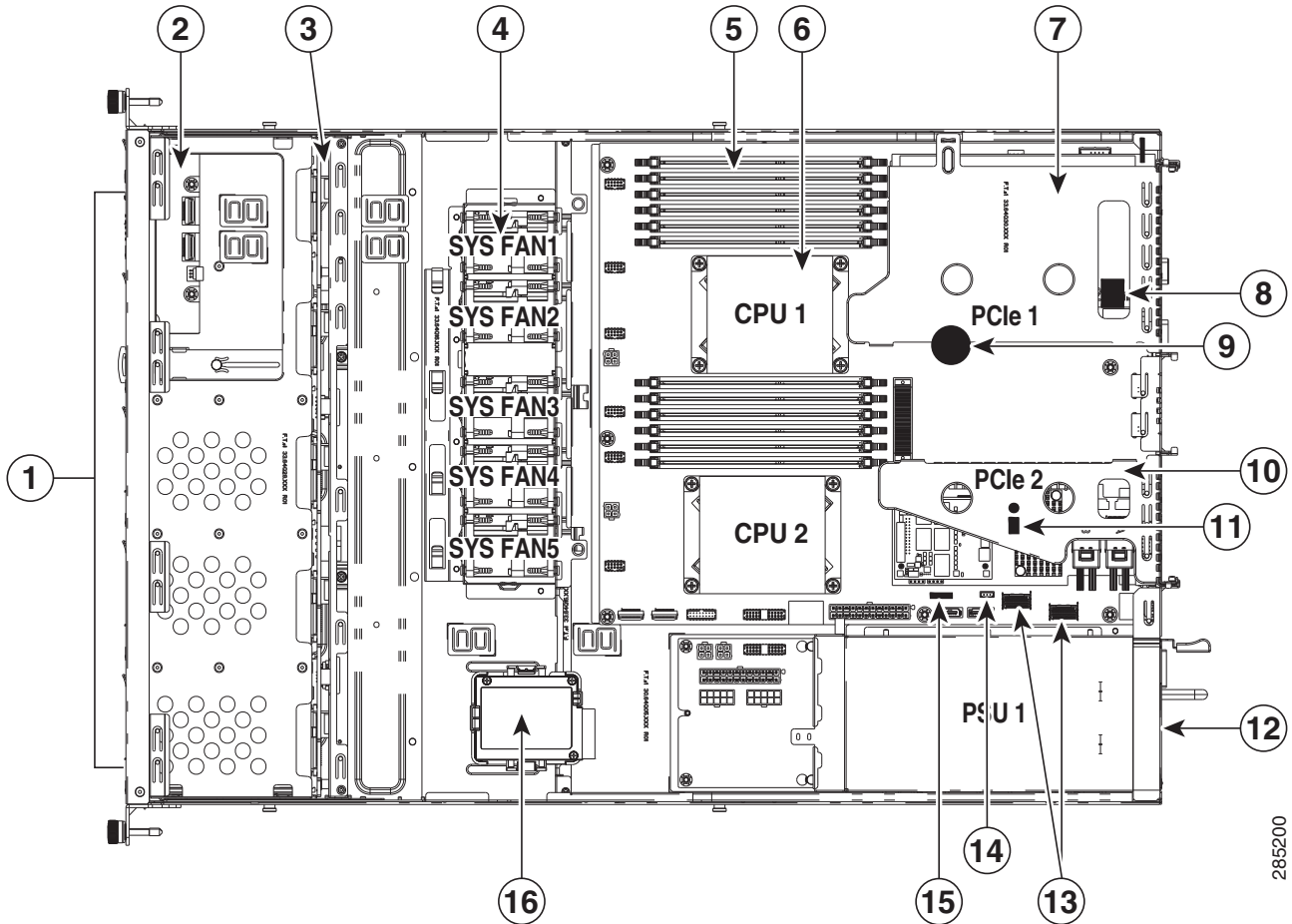
1	Drives (hot-swappable, accessed through front panel)	9	RTC battery on motherboard
2	Front panel operations board	10	PCIe riser 2 (PCIe slot 2)
3	Drive backplane	11	Trusted platform module socket on motherboard (not visible under PCIe riser 2)
4	Cooling fans (five)	12	Power supply (accessed through rear panel)

5	DIMM slots on motherboard (12)	13	Integrated SAS RAID connectors on motherboard (left to right, SCU_Port 0, SCU_Port 1)
6	CPU and heatsinks (2)	14	Software RAID 5 key header on motherboard
7	PCIe riser 1 (PCIe slot 1)	15	RAID SCU option ROM header on motherboard
8	Internal USB 2.0 port (on motherboard under PCIe riser 1)	16	Mounting point for supercap power module (RAID backup unit)

CPUs and DIMMs

Physical Layout

Each CPU has three DIMM channels:

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

Each DIMM channel has two banks: Bank 0 and Bank 1. The blue-colored DIMM banks are for Bank 0 and the black-colored are for Bank 1.

As an example, DIMM slots A0, B0, and C0 belong to Bank 0, while A1, B1, and C1 belong to Bank 1.

Figure 6 shows how banks and channels are physically laid out on the motherboard. The DIMM slots on the top (channels A, B, and C) are associated with CPU 1, while the DIMM slots on the bottom (channels D, E, and F) are associated with CPU 2. Bank 0 slots (blue) are populated before Bank 1 slots (black).

Figure 6   Physical Layout of CPU DIMM Channels and Banks
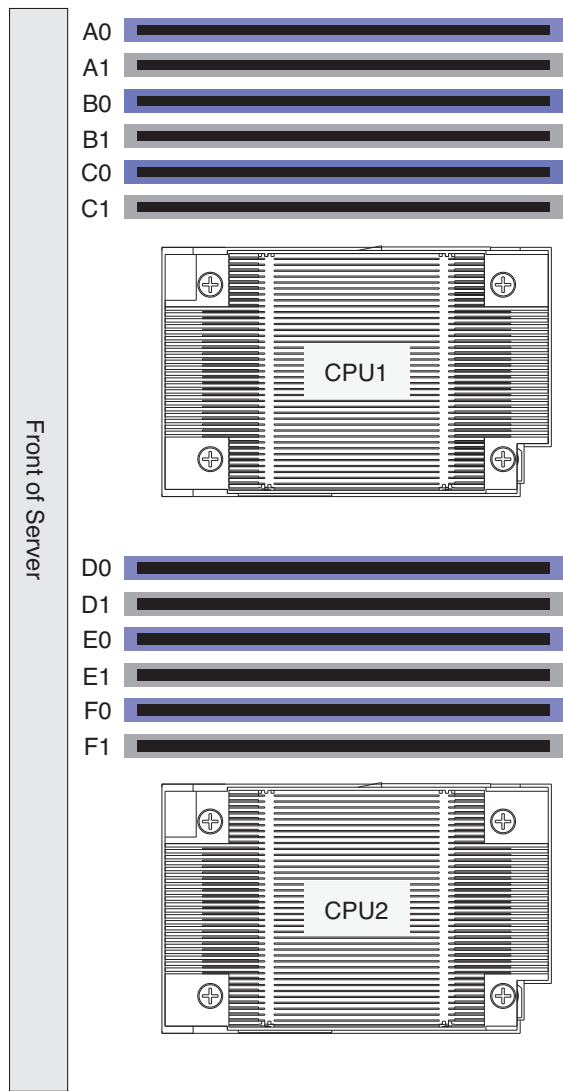
Memory Population Rules

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

- Each channel has two DIMM slots (for example, channel A = slots A0 and A1).

    — Each channel can operate with one or two DIMMs installed.

    — If a channel has only one DIMM, populate slot 0 first (the blue slot).

- When both CPUs are installed, populate the DIMM slots of each CPU identically.

    — Fill blue slots in the channels first: A0, D0, B0, E0, C0, F0

    — Fill black slots in the channels second: A1, D1, B1, E1, C1, F1

- Any DIMM installed in a DIMM socket for which the CPU is absent is not recognized.

- For optimum performance, populate at least one DIMM per memory channel per CPU.

- When populating DIMM slots, multiples of 6 DIMMs are best for achieving optimum performance, since there are 3 memory channels per CPU socket and 2 CPUs must be populated.

- At 1 DPC and 2 DPC, 1600-MHz DIMMS will run at 1600 MHz (provided the CPU supports 1600 MHz DIMMs) and 1333-MHz DIMMs will run at 1333 MHz.

- When mixing DIMMs, the following rules need to be followed:

    — When mixing DIMMs of different densities (sizes), populate DIMMs with the highest density first. For example, if you have to mix 16 GB with 8 GB DIMMs, populate 16 GB DIMMs in blue slots (or bank 0) and then 8 GB in black slots (or bank 1).

    — When mixing DIMMs with different ranks, populate DIMMs with the higher rank first. For example, populate 16 GB 2R or 8 GB 2R before 4 GB 1R DIMMs.

    — DIMMs of different sizes (4 GB, 8 GB, 16 GB) can be mixed across different channels. Total memory size in a single channel should be the same. For example, if you are mixing 4 GB and 8 GB DIMMs to achieve total 72 GB (6x8 GB + 6x4 GB) for a server, then populate blue slots with 8 GB DIMMs and black slots with 4 GB DIMMs and total memory size should be 12 GB across all 3 channels for both CPUs.

    — When mixing DIMMs, all the DIMMs in the server must be the same speed.

Recommended Memory Population

This section explains the recommended DIMM population order rules for the C22 M3 server.

■ All DIMMs must be DDR3 DIMMs.

■ Mixing of Registered and Unbuffered DIMMs is not allowed per platform.

■ Do not mix 1333-MHz DIMMs with 1600-MHz DIMMs.

Follow *Table 27* when populating DIMMs in the server.

Table 27 Recommended DIMM Population

Total Memory Size	CPU 1		CPU 2		Total DIMMs in System
	Blue Slots Bank 0 (A0, B0, C0)	Black Slots Bank 1 (A1, B1, C1)	Blue Slots Bank 0 (D0, E0, F0)	Black Slots Bank 1 (D1, E1, F1)	
48 GB[1]	3 x 4 GB	3 x 4 GB	3 x 4 GB	3 x 4 GB	12
	3 x 8 GB	—	3 x 8 GB	—	6
72 GB	3 x 8 GB	3 x 4 GB	3 x 8 GB	3 x 4 GB	12
96 GB[2]	3 x 8 GB	3 x 8 GB	3 x 8 GB	3 x 8 GB	12
	3 x 16 GB	—	3 x 16 GB	—	6
120 GB	3 x 16 GB	3 x 4 GB	3 x 16 GB	3 x 4 GB	12
144 GB	3 x 16 GB	3 x 8 GB	3 x 16 GB	3 x 8 GB	12
192 GB	3 x 16 GB	3 x 16 GB	3 x 16 GB	3 x 16 GB	12

Notes . . .

1. For 48 GB, there are two possible sweet spot configurations:

   6 x 8 GB occupies 1 DPC, so there is a possibility of increasing total memory size in the system (beyond 48 GB) by going to 2 DPC while still maintaining memory speed at 1600 MHz.

   If there is no plan to increase total memory size in the system (beyond 48 GB), then 12 x 4GB is more price effective at this time.

2. For 96 GB, there are two possible optimal configurations:

   6 x 16GB occupies 1 DPC, so there is a possibility of increasing total memory size in the system (beyond 96 GB) by going to 2 DPC while maintaining the maximum memory speed at 1600 MHz.

   12 x 8GB gives the peak performance for this configuration and is recommended if there is no plan of increasing the total memory in the future.

Supported DIMM Populations

The supported DIMM populations are listed in *Table 28*.

Table 28 Supported DIMM Configurations

CPU 1 DIMMs	# CPU 1 DIMMs	CPU 1 Capacity	CPU 2 DIMMs	# CPU 2 DIMMs	CPU 2 Capacity	Total DIMMs for both CPUs	Total Capacity for 2 CPUs
1 x 4 GB	1	4 GB	1 x 4 GB	1	4 GB	2	8 GB
2 x 4 GB	2	8 GB	2 x 4 GB	2	8 GB	4	16 GB
1 x 8 GB	1	8 GB	1 x 8 GB	1	8 GB	2	16 GB
3 x 4 GB	3	12 GB	3 x 4 GB	3	12 GB	6	24 GB
4 x 4 GB	4	16 GB	4 x 4 GB	4	16 GB	8	32 GB
2 x 8 GB	2	16 GB	2 x 8 GB	2	16 GB	4	32 GB
1 x 16 GB	1	16 GB	1 x 16 GB	1	16 GB	2	32 GB
5 x 4 GB	5	20 GB	5 x 4 GB	5	20 GB	10	40 GB
6 x 4 GB	6	24GB	6 x 4 GB	6	24GB	12	48 GB
3 x 8 GB	3	24 GB	3 x 8 GB	3	24 GB	6	48 GB
4 x 8 GB	4	32 GB	4 x 8 GB	4	32 GB	8	64 GB
2 x 16 GB	2	32 GB	2 x 16 GB	2	32 GB	4	64 GB
3 x 8 GB + 3 x 4 GB[1]	6	36 GB	3 x 8 GB + 3 x 4 GB[2]	6	36 GB	12	72 GB
5 x 8 GB	5	40 GB	5 x 8 GB	5	40 GB	10	80 GB
6 x 8 GB	6	48 GB	6 x 8 GB	6	48 GB	12	96 GB
3 x 16 GB	3	48 GB	3 x 16 GB	3	48 GB	6	96 GB
3 x 16 GB + 3 x 4 GB[3]	6	60 GB	3 x 16 GB + 3 x 4 GB[4]	6	60 GB	12	120 GB
4 x 16 GB	4	64 GB	4 x 16 GB	4	64 GB	8	128 GB
3 x 8 GB + 3 x 16 GB[5]	6	72 GB	3 x 8 GB + 3 x 16 GB[6]	6	72 GB	12	144 GB
5 x 16 GB	5	80 GB	5 x 16 GB	5	80 GB	10	160 GB
6 x 16 GB	6	96 GB	6 x 16 GB	6	96 GB	12	192 GB

Notes . . .
1. UCS-MR-1X082RY-A + UCS-MR-1X041RY-A
2. UCS-MR-1X082RY-A + UCS-MR-1X041RY-A
3. UCS-MR-1X162RY-A + UCS-MR-1X041RY-A
4. UCS-MR-1X162RY-A + UCS-MR-1X041RY-A
5. UCS-MR-1X082RY-A + UCS-MR-1X162RY-A
6. UCS-MR-1X082RY-A + UCS-MR-1X162RY-A

Low-Voltage DIMM Considerations

The C22 M3 server can be ordered with low-voltage (1.35 V) DIMMs only. Note the following considerations:

- Low-voltage DIMMs within the server must have the identical manufacturer, type, speed, and size.

- Low-voltage DIMMs and standard-voltage DIMMs can be mixed in the same server. Note that this causes the system BIOS to default to standard-voltage operation (Performance Mode). That is, the server cannot operate in Power Saving Mode unless all DIMMs are low-voltage DIMMs.

- CPUs that have a maximum memory frequency less than 1333 MHz support low-voltage DIMMs operating in Power Saving Mode only, and do not support Performance Mode.

RAID Summary

■ ROM1 and ROM15 embedded RAID upgrade options each support up to 4 drives.

■ The LSI MegaRAID SAS 9265CV-8i, 9240-8i, and 9220-4i RAID controller cards each support up to 4 drives

> **NOTE:** If you *do not* select a plug-in PCIe RAID card or one of the embedded RAID upgrade options (ROM1 or ROM15), you will have an embedded SATA-only RAID controller that supports up to four SATA-only drives (RAID 0, 1, 10).

See *Table 29* for a summary of the supported RAID configuration options.

Table 29 Supported RAID Configurations[1]

Server	# CPUs	Embedded RAID	Internal PCIe RAID #1[2]	Internal PCIe RAID #2[3]	# Drives Supported	PCIe Slots[4]	
						1	2
C22 M3 LFF	1	Not allowed	Installed slot 1 (default)[5]	Not allowed	4 internal	O	U
	1	Enabled	Not allowed	Not allowed	4 internal	A	U
C22 M3 LFF	2	Not allowed	Installed slot 2 (default)	Not allowed	4 internal	A	O
	2	Enabled	Not allowed	Not allowed	4 internal	A	A

Notes . . .

1. You cannot mix RAID types. You can use either embedded RAID or PCIe RAID, but only one at a time.

2. If you want to boot from a device other than the 9265CV-8i, 9240-8i, or 9220-4i MegaRAID PCIe cards, you can leave the cards installed. Just disable the OPROM for their slots, and the system will boot even with the cards installed.

3. This server does not support dual RAID controllers.

4. A = available slot, O = occupied slot, U = unsupported slot (slot 2 is not supported in 1-CPU systems)

5. The OPROM is enabled for the default PCIe RAID controller slots. If you want to enable a different slot, you must go into the BIOS and enable the OPROM for the desired slot and disable the OPROM for the default PCIe slot (see *Figure 7 on page 54*).

RAID Option ROM (OPROM) Settings

The server contains an Option ROM (OPROM) for the PCIe slots. The server has a finite amount of option ROM with which it can boot up devices. Go into the BIOS and disable the OPROM on the PCIe slots not used for booting so that resources are available for the slots that are used for booting. An example OPROM BIOS screen is shown in *Figure 7*.

Figure 7   Example BIOS Screen for OPROM

```
        Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
           Advanced

    ▶ PCIe Link Speed Configuration                        Configure PCIe Link Speed for
                                                           PCIe Root Ports
      LOM OptionROM Configuration
      ─────────────────────────

      LOM Port 0 Legacy OptionROM          [Disabled]
      LOM Port 1 Legacy OptionROM          [Disabled]

      PCIe Slots OptionROM Configuration
      ──────────────────────────────

      All PCIe Slots OptionROM             [Enabled]

      PCIe SlotID:1 OptionROM              [Enabled]
      PCIe SlotID:2 OptionROM              [Enabled]

      PCIe Slots Inventory
      ────────────────────
                                            →←     Select Screen
      SlotID:1  LSI 9265CV-8i MegaRAID SAS HBA      ↑↓     Select Item
                                            Enter  Select Field
                                            +/-    Change Value
                                            F1     General Help
                                            F9     BIOS Defaults
                                            F10    Save & Exit
                                            ESC    Exit



        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

RACKS

The Cisco R42610 rack (see *Figure 8*) 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 30*.

Table 30 Cisco R42610 Rack Specifications

Parameter	Standard Rack	Expansion Rack
Dimensions (H x W x D)	78.74 x 24 x 43.38 in. (2000 x 610 x 1102 mm)	78.74 x 23.58 x 43.38 in. (2000 x 599 x 1102 mm)
Dimensions (H x W x D) with packaging	89 x 33 x 47 in. (2261 x 838 x 1194 mm)	89 x 33 x 47 in. (2261 x 838 x 1194 mm)
Distance from front mounting rail to rear mounting rail	29.2 in (741 mm)	29.2 in (741 mm)
Weight	299.83 lb (136 kg)	231. 49 lb (105 kg)
Weight with packaging	354 lb (161 kg)	284 lb (129 kg)
Side panels included	Yes	No
Equipment mounting capacity	42RU	42RU
Static load capacity	2100 lb (954 kg)	2100 lb (954 kg)
Dynamic load capacity	Not applicable	Not applicable

NOTE: The AC input connector is an IEC 320 C-14 15 A/250 VAC power inlet.

Figure 8   Cisco R42610 Rack

Front view - door closed   Front view - door open   Front view - door removed

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 24 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) PDU. See *Figure 9*).

**Figure 9**   **Zero Rack Unit PDU (PID = RP208-30-2P-U-2)**
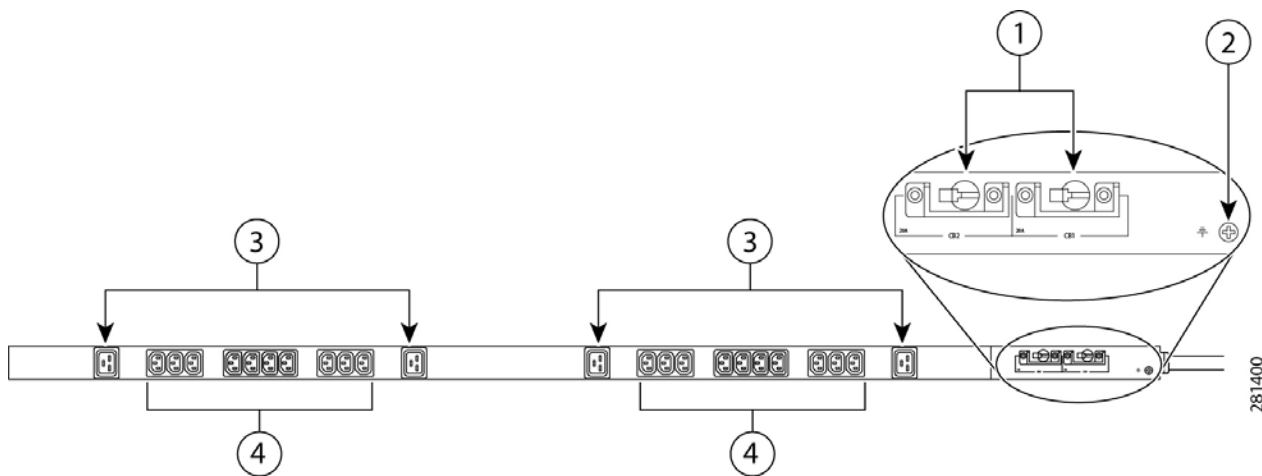
1	Breakers	3	C13 plugs
2	Ground connection	4	C19 plugs

Cisco RP Series PDU models provide two 20-ampere (A) circuit breakers for groups of receptacles. The effects of a tripped circuit are limited to a receptacle group. Simply press a button to reset that circuit.

Motherboard USB Port

The C22 M3 LFF motherboard has one general-purpose USB socket as shown in *Figure 10*.

Figure 10   Motherboard USB Port
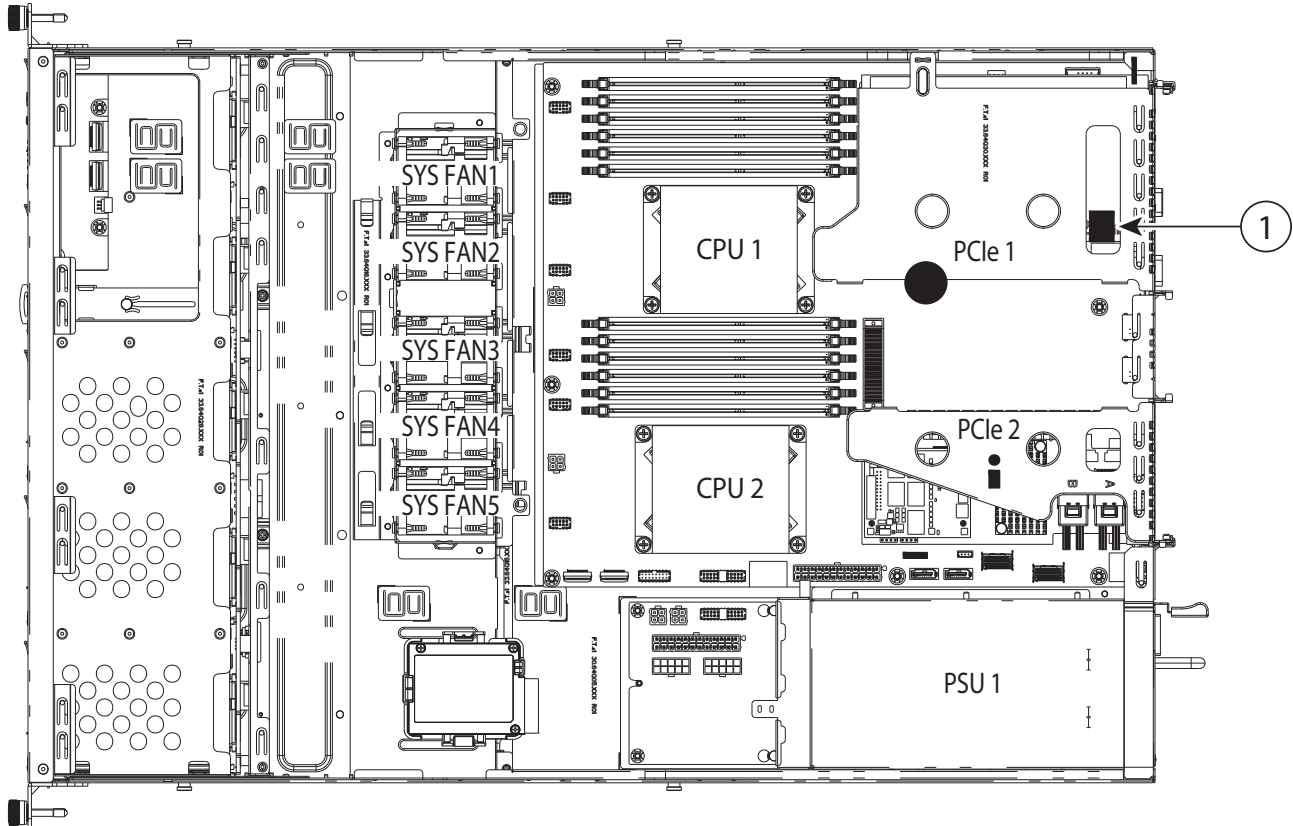
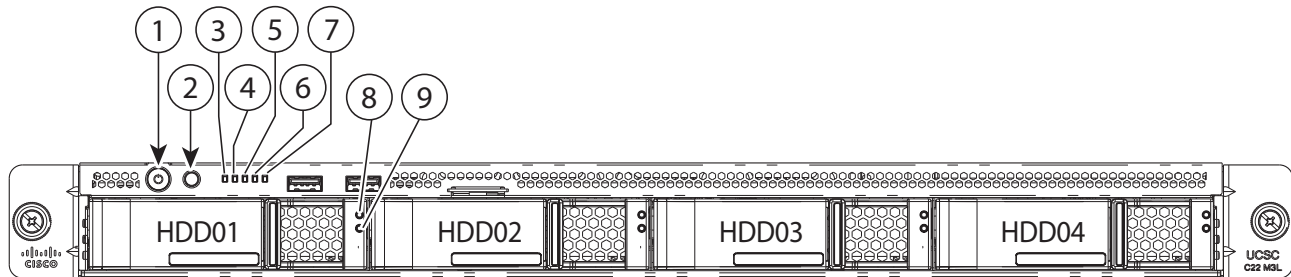| 1	Internal USB 2.0 port (on motherboard under PCIe riser 1)	—	—

LED Indicators

The server contains LED indicators on the front and rear panels. Their functions are described in the following sections.

Front Panel

Figure 11 shows the front panel LEDs.

Figure 11   Front Panel LEDs

1	Power button/Power status LED	6	Power supply status LED
2	Identification button/LED	7	Network link activity LED
3	System status LED	8	Hard drive fault LED
4	Fan status LED	9	Hard drive activity LED
5	Temperature status LED	—	—

See *Table 31* for the functions of the front panel LEDs.

Table 31 Front Panel LEDs

LED	LED State	Meaning
Power (LED is integrated into power button)	Off	Server power is off
	On (amber)	Server power is soft off (power is supplied only to the CIMC and some motherboard functions)
	On (green)	Card power is on
Unit ID (LED is integrated into unit ID button)	Off	Unit ID not active
	On (blue)	Unit ID is activated

Table 31 Front Panel LEDs *(continued)*

| LED	LED State	Meaning
System Status	Off	Undefined
	On (green)	Server is in normal operating condition
	On (amber)	Server is in a degraded operational state. For example: ■ Power supply redundancy is lost. ■ CPUs are mismatched. ■ At least one CPU is faulty. ■ At least one DIMM is faulty. ■ At least one drive in a RAID configuration failed.
	Blinking (amber)	Server is in a critical fault state. For example: ■ Boot failed. ■ Fatal CPU and/or bus error is detected. ■ Server is in over-temperature condition
Fan Status	Off	Undefined
	On (green)	Fans are operating and no error condition has been detected
	On (amber)	Fans are in a degraded operational state, indicating that one of the fans has a fault.
	Blinking (amber)	Critical fault state, indicating that two or more fans have a fault.
Temperature Status	Off	Undefined
	On (green)	System is operating at normal temperature and no error conditions have been detected.
	On (amber)	One or more temperature sensors exceeded a warning threshold.
	Blinking (amber)	One or more temperature sensors exceeded a critical threshold
Power Supply Status	Off	Undefined
	On (green)	AC power supplies are operating and no error condition has been detected.
	On (amber)	One or more power supplies are in a degraded operational state.
	Blinking (amber)	One or more power supplies are in a critical fault state.
Network Link Status	Off	Undefined
	On (green)	Link pulses detected on any of the LOM ports, but no activity.

Table 31 Front Panel LEDs *(continued)*

LED	LED State	Meaning
	Blinking (green)	Activity on any of the LOM ports
Hard Drive Fault	Off	The hard drive is operating properly
	On (amber)	The hard drive has failed
	Blinking (amber)	The hard drive is rebuilding
Hard Drive Activity	Off	There is no hard drive in the hard drive sled (no access, no fault)
	On (green)	The hard drive is ready
	Blinking (green)	The hard drive is reading or writing data

Rear Panel

Figure 12 shows the rear panel LEDs.

Figure 12   Front Panel LEDs
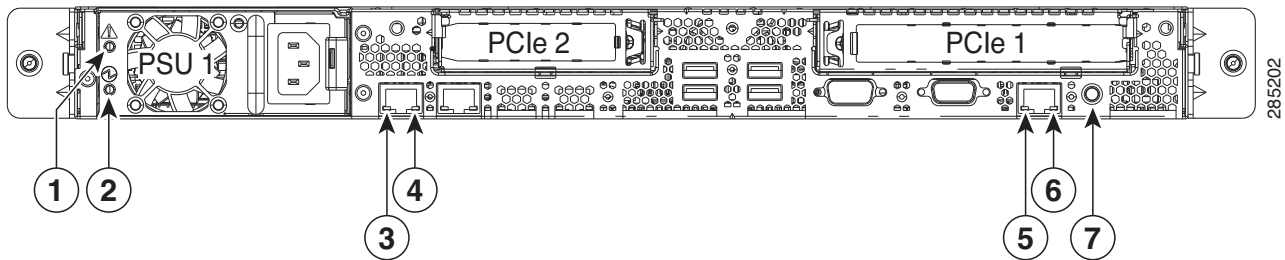
1	Power supply fault LED	5	10/100/1000 Ethernet dedicated management link status LED
2	Power supply AC OK LED	6	10/100/1000 Ethernet dedicated management link speed LED
3	1-Gb Ethernet link speed LED	7	Rear Identification button/LED
4	1-Gb Ethernet link status LED	—	—

See *Table 32* for the functions of the rear panel LEDs.

Table 32 Rear Panel LEDs

LED	LED State	Meaning
Power Supply Fault	Off	The power supply is operating normally
	Blinking (amber)	An event warning threshold has been reached, but the power supply continues to operate
	On (amber)	A critical fault threshold has been reached, causing the power supply to shut down (for example, a fan failure or an over-temperature condition).
Power Supply AC	Off	There is no AC power to the power supply
	Blinking (green)	AC power OK, DC output not enabled
	On (green)	AC power OK, DC outputs OK
1GbE Link Speed	Off	Link Speed = 10 MbpS
	On (amber)	Link Speed = 100 MbpS
	On (green)	Link Speed = 1 GbpS
1GbE Link Status	Off	No Link
	On (green)	Link is active
	Blinking (green)	Traffic is present on the active link
10/100/1000 Base-T Link Status	Off	No Link
	On (green)	Link is active
	Blinking (green)	Traffic is present on the active link
10/100/1000 Base-T Link Speed	Off	Link Speed = 10 Mbps
	On (amber)	Link Speed = 100 Mbps
	On (green)	Link Speed = 1 Gbps
Unit ID (LED is integrated into unit ID button)	Off	Unit ID not active
	On (blue)	Unit ID is activated

Cisco UCS C22 M3 High-Density LFF Rack Server

TECHNICAL SPECIFICATIONS

Dimensions and Weight

Table 33 UCS C22 M3 Dimensions and Weight

Parameter	Value
Height	1.70 in (43.2 mm)
Width	16.93 in.(430 mm)
Depth	26.0 in. (660.4 mm)
Front Clearance	3 in. (76 mm)
Side Clearance	1 in. (25 mm)
Rear Clearance	9 in. (233 mm)
Weight	
Maximum (4 HDDs, 2 CPUs, 12 DIMMs, 1 power supply)	31.5 lbs (14.3 kg)
Bare (0 HDD, 0 CPU, 0 DIMM, no power supply)	23.48 lbs (10.65 kg)

Power Specifications

The general power specifications for the C22 M3 LFF server 450 W power supply are listed in *Table 34*.

Table 34 UCS C22 M3 LFF 450 W Power Supply Specifications

Description	Specification
AC input voltage	90 to 264 VAC self-ranging 100 to 120 VAC nominal 200 to 240 VAC nominal
AC input frequency	Range: 47 to 63 Hz (single phase, 50 to 60 Hz nominal)
Maximum AC input current	6 A maximum at 100 VAC 3 A maximum at 208 VAC
Maximum AC inrush current	9 A peak @ 35° C, 208 VAC
Maximum output power for the power supply	450 W
Power supply output voltage	Main power: 12 VDC Standby power: 12 VDC
Power supply efficiency	CSCI Platinum

> **NOTE:** AC input connector is an IEC 320 C-14 15A/250VAC power inlet.

The general power specifications for the C22 M3 LFF server 650 W power supply are listed in *Table 35*.

Table 35 UCS C22 M3 LFF 650 W Power Supply Specifications

Description	Specification
AC input voltage	90 to 264 VAC self-ranging, 100 to 120 VAC nominal 200 to 240 VAC nominal
AC input frequency	Range: 47 to 63 Hz (single phase, 50 to 60 Hz nominal)
Maximum AC input current	7.6 A maximum at 100 VAC 3.65 A maximum at 208 VAC
Maximum AC inrush current	11 A peak @ 35° C, 208 VAC
Maximum output power for the power supply	650 W
Power supply output voltage	Main power: 12 VDC Standby power: 12 VDC
Power supply efficiency	CSCI Platinum

> **NOTE:** AC input connector is an IEC 320 C-14 15A/250VAC power inlet.

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

https://express.salire.com/Go/Cisco/Cisco-UCS-Power-Calculator.aspx

Environmental Specifications

The power specifications for the C22 M3 server are listed in *Table 36*.

Table 36 UCS C22 M3 Environmental Specifications

Parameter	Minimum
Temperature operating	41 to 95° F (5 to 35° C) Maximum temperature is to be derated by 1 degree C for every 305 m (1000 ft.) of altitude above sea level
Temperature nonoperating	–40 to 149°F (–40 to 65°C)
Humidity (RH) nonoperating, non-condensing	10 to 90%
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)	5.9
Sound Pressure level, Measure A-weighted per ISO7779 LpAm (dBA) Operation at 73°F (23°C)	46

Compliance Requirements

The regulatory compliance requirements for C-Series servers are listed in *Table 37*.

Table 37 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

CISCO