Spec Sheet

Cisco UCS C460 M2 High-Performance Rack-Mount Server

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CONTENTS

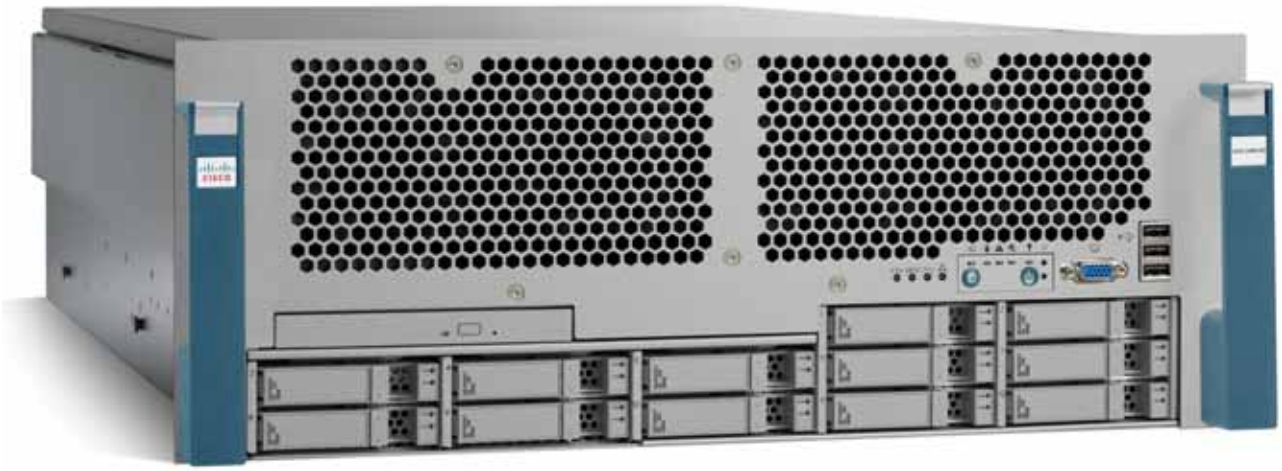
OVERVIEW

The Cisco UCS C460 M2 High-Performance Rack Server (*Figure 1*) is a four-rack-unit (4RU) server supporting the Intel® Xeon® processor E7-4800 and E7-8800 product families, with up to 2 terabytes (TB) of double-data-rate 3 (DDR3) memory in 64 slots, and up to 12 small form factor (SFF), hot-pluggable SAS and SATA disk drives.

10 PCI Express (PCIe) slots support the Cisco UCS C-Series network adapters, with an eleventh PCIe slot reserved for a hard disk drive array controller card. Additional I/O is provided by 2 Gigabit Ethernet LOM ports, 2 10-Gigabit Ethernet ports, and 2 dedicated out-of-band (OOB) management ports.

Figure 1 Cisco UCS C460 M2 High-Density Rack Server

Front View



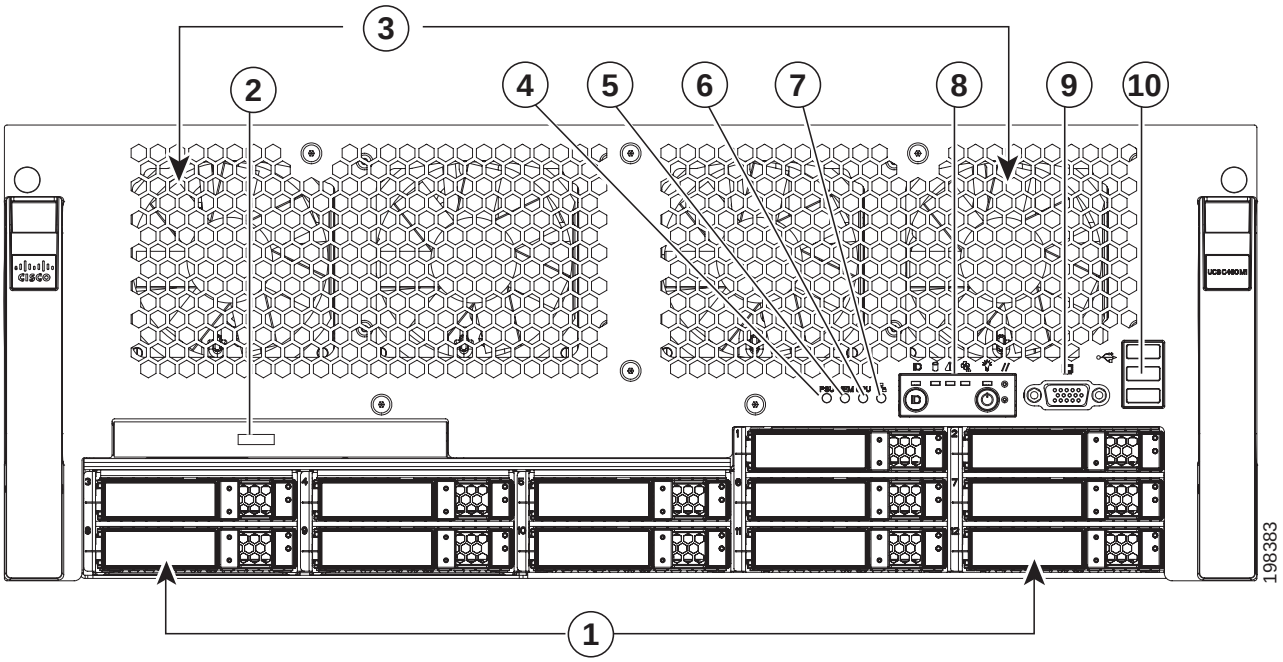
Rear View

DETAILED VIEWS

Chassis Front View

Figure 2 is a detailed front view of the Cisco UCS C460 M2 General-Purpose Rack Server.

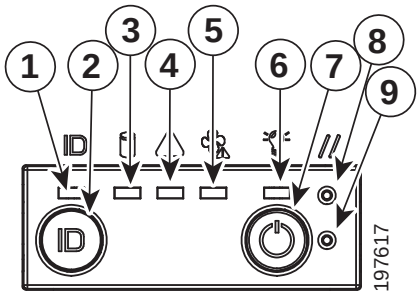
Figure 2 Chassis Front View



1	HDDs (up to 12)	**6**	CPU status LED
2	SATA DVD drive	**7**	Network activity LED
3	Fans (up to 8)	**8**	Operations panel (see *Figure 3 on page 5* for a detailed view)
4	Power supply status LED	**9**	VGA connector
5	Memory status LED	**10**	USB ports (3)

Figure 3 is a detailed view of operator panel.

Figure 3 Chassis Front View

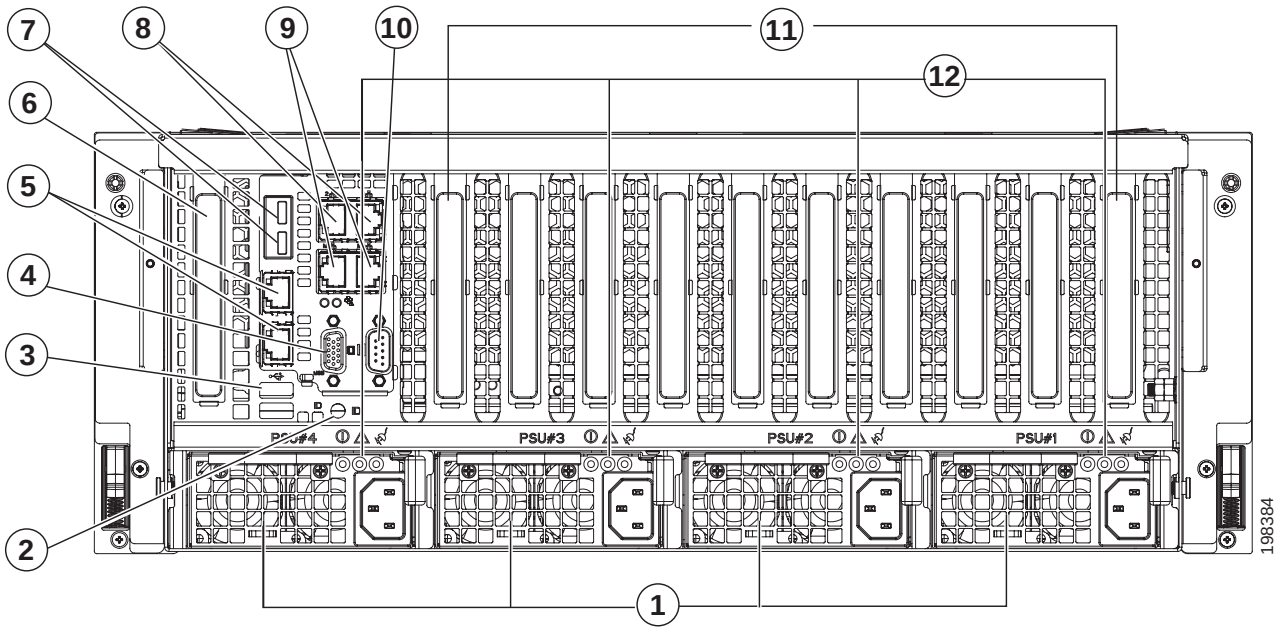


1	ID LED	**6**	Power status LED
2	ID button	**7**	Power button
3	HDD fault LED	**8**	Reset button
4	System health LED	**9**	NMI button
5	Fan fault LED		

Chassis Rear View

Figure 4 shows the external features of the rear panel.

Figure 4 Chassis Rear View



1	Power supplies (up to 4)	**7**	10G SFP+ LOM ports, two total
2	ID button	**8**	1 Gigabit LOM ports (2 total)
3	USB ports (2 total)	**9**	10/100 Management ports M1 and M2
4	VGA connector	**10**	Serial connector
5	10GBase-T LOM ports, two total	**11**	PCIe slots 1 through 10 (left to right as shown)
6	SAS riser slot	**12**	Power supply LEDs

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 on page 10*.

Table 1 Capabilities and Features

Capability/Feature	Description
Chassis	Four rack unit (4RU) chassis
CPU	Either 2 or 4 Intel® Xeon® E7-8800/4800 family processors Two-CPU configurations require 2 power supplies Four-CPU configurations require 4 power supplies
Chipset	Intel® 7500 chipset and Intel 7510 scalable memory buffer
Memory	Eight slots for memory riser boards. Each memory riser can hold up to 8 DIMMs, for a maximum DIMM population of 64 DIMMs. Maximum memory capacity is 2 TB. This is accomplished with 64 DIMMs, consisting of 32 DIMM kits (2 32 GB matched DIMMs per kit) in a 4-CPU configuration.
USB Flash drive	Optional 2 GB internal eUSB flash drives (up to 2) can be used as bootable drives
Expansion slots	There are 10 PCIe expansion slots: ■ Slots 1 and 2: Gen 2x8, 3/4 length card, x24 hot-swappable connectors ■ Slots 3 and 4: Gen 2x4, 1/2 length card, x8 connectors ■ Slot 5: Gen 2x16, 3/4 length card, x16 connector ■ Slots 6 and 7: Gen 2x8, 3/4 length card, x8 hot-swappable connectors ■ Slot 8: Gen 1x4, 3/4 length card, x8 connector ■ Slot 9: Gen 1x4, 1/2 length card, x8 connector ■ Slot 10: Gen 2x4, 1/2 length card, x8 connector  **NOTE:** CPU3 must be installed to support PCIe slots 5, 6, 7, 9, and 10. Legacy I/O devices like video cards are only supported on slots 1,2,3, 4 and 8.

Table 1 Capabilities and Features *(continued)*

Capability/Feature	Description
Storage controller	Factory-configured RAID support options: ■ RAID 0, 1, 5, 6, 10, 50, and 60 support for up to 12 SAS or SATA drives with either the optional LSI MegaRAID SAS 9260-8i controller, or ■ RAID 0 and 1 support for up to 8 SAS or SATA drives with the optional LSI MegaRAID 9240-8I RAID controller. There is a dedicated SAS riser slot in the chassis for either RAID controller card. There is also a location inside the chassis for the optional LSI RAID battery backup unit that can be used with the 9260-8i controller card.
Internal storage devices	Up to 12 SFF 2.5” SAS or SATA hard disk drives (HDDs) or solid state drives (SSDs). UCS Storage Accelerators are also available. These PCIe flash storage devices provide independent high-speed storage.
Video	The server CIMC chip includes a Matrox G200 core. The first 8 MB of memory are allocated to the video core. ■ 1280 x 1024 resolution ■ 32-bit color depth ■ 8 MB video memory
Interfaces	■ Rear panel • Two 10/100 dedicated management Ethernet ports • Two 1-Gigabit ports (10/100/1000 Mbps capable). These integrated Gigabit ports support the Wake on LAN (WoL) and TCP/IP Offload Engine (TOE) standards • Two 10-Gigabit Base-T Ethernet ports • Two 10-Gigabit SFP+ Ethernet ports • One RS232 serial connector • One 15-pin VGA connector • Two USB 2.0 connectors ■ Front panel • One 15-pin VGA connector • Three USB 2.0 connectors

Table 1 Capabilities and Features *(continued)*

Capability/Feature	Description
Power subsystem	■ Either 2 or 4 850 W power supplies ■ Power supplies are hot-swappable, rear-accessible, and redundant as 2+2 or 3+1  **NOTE:** You can use 2 power supplies with a 2-CPU configuration. In this case, 1+1 redundancy is supported only if your server's overall power consumption can be supported by a single 850W power supply during the failure and hot-swap. For more information about your server's power consumption, use the power calculator accessible at **http://www.cisco.com/assets/cdc_content_elements/flash/dataCenter/cisco_ucs_power_calculator/**
Fans	Chassis: ■ 8 fans, hot-swappable Power supply: ■ Each of the 4 power supplies is equipped with a fan.
Integrated management processor	The built-in Cisco Integrated Management Controller (CIMC) GUI or CLI interface enables you to monitor the server inventory, health, and system event logs.

CONFIGURING the SERVER

Follow these steps to configure the Cisco UCS C460 M2 High-Performance Rack Server:

STEP 1 VERIFY BASE SKU

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

Table 2 PID of the Base C460 M2 Rack Server

Product ID (PID)	Description
UCSC-BASE-M2-C460	UCS C460 M2 Rack SVR w/o CPU, Mem, HDD, PCIe

The base server:

- Includes:
  - Two 850 W power supplies (required for 2-CPU systems)
  - Blanking panels for empty drive locations (to maintain cooling air flow)
  - Cable management arm
  - Rail kit
- Does not include:
  - Third and fourth 850 W power supplies (required for 4-CPU systems)
  - CPUs
  - Four empty memory riser boards (for 2-CPU systems) or 8 empty memory riser boards (for 4-CPU systems)
  - Hard disk drives (HDDs)
  - Solid-state Drives (SSDs)
  - 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 CHOOSE CPU(S)

The standard CPU features are:

- Intel Xeon E7-8800 or E7-4800 (Westmere EX) series CPUs
- Intel 7500 chipset and Intel 7510 scalable memory buffer
- Cache size of 18, 24, or 30 MB

Choose CPUs

The available CPUs are listed in *Table 3*.

Table 3 Available CPUs: Intel Xeon Westmere E7-48xx/88xx Family

Product ID (PID)	Intel Number	Clock Freq (GHz)	Power (W)	Cache Size (MB)	Cores	QPI	Highest DDR3 DIMM Clock Support (MHz)
UCS-CPU-E78837	E7-8837	2.67	130	30	8	6.40	1066
UCS-CPU-E74870	E7-4870	2.40	130	30	10	6.40	1066
UCS-CPU-E74860	E7-4860	2.26	130	24	10	6.40	1066
UCS-CPU-E78867L	E7-8867L	2.13	105	30	10	6.40	1066
UCS-CPU-E74830	E7-4830	2.13	105	24	8	6.40	1066
UCS-CPU-E74850	E7-4850	2.00	130	24	10	6.40	1066
UCS-CPU-E74807	E7-4807	1.86	95	18	6	4.80	1066

Approved Configurations

(1) Two-CPU Configuration

- Choose two identical CPUs from *Table 3*.

(2) Four-CPU Configuration

- Choose four identical CPUs from *Table 3*.

Caveats

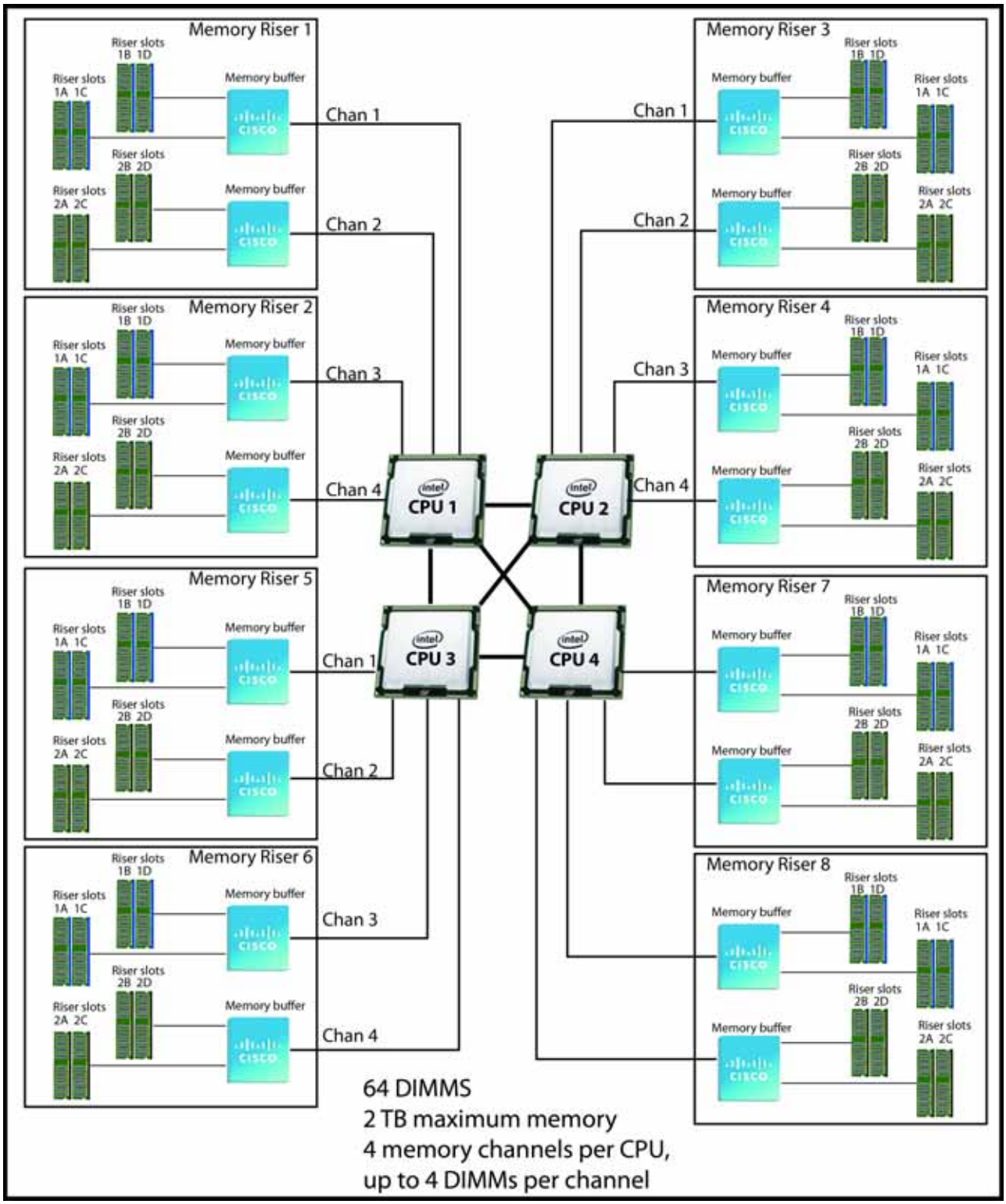
- You must select either two or four identical processors.

STEP 3 CHOOSE MEMORY

The standard memory features are:

- Plug-In Memory Riser Boards
  - Up to eight DIMMs per riser board
  - Riser boards plug vertically into the motherboard
  - Up to two riser boards per CPU (total maximum of eight per system)
- DIMMs
  - Clock speed: 1066 MHz
  - Ranks per DIMM: 1, 2, or 4
  - Operational voltage: 1.5 or 1.35 V
  - Registered
- Each CPU controls four serial memory interface (SMI) channels. Memory buffers on the memory risers convert each SMI channel into two DDR3 subchannels. There are two memory risers for each CPU. Memory is organized as two paired-DIMM kits (4 DIMMs) per memory channel, as shown in *Figure 5*.

Figure 5 C460 M2 Memory Organization



Choose Memory Riser Boards

You may choose four memory riser boards for a two-CPU system or eight memory riser boards for a four-CPU system.

Table 4 Available Memory Riser Boards

Product ID (PID)	PID Description	Max DIMMs per Riser
Riser Board Options		
UCSC-MRB-002-C460	Memory riser board for C460 M2 server only	8

Approved Configurations

(1) Two-CPU System

- Choose four memory riser boards from *Table 4*.

(1) Four-CPU System

- Choose eight memory riser boards from *Table 4*.

Caveats

- You should order enough risers with enough sockets to accommodate your maximum forseeable memory needs.

Choose DIMMs and Memory Mirroring

Select the memory configuration and whether or not you want the memory mirroring option. The available memory DIMMs and mirroring option are listed in *Table 5*.

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.

DIMMs are orderable as kits, with two DIMMs per kit. Choose the desired number of DIMMs and the memory mirroring option if desired. The available memory DIMMs are listed in *Table 5*.

Table 5 Available DDR3 DIMM Kits (2 DIMMs per Kit)

Product ID (PID)	PID Description	Voltage (V)	Ranks/ DIMM
DIMM Options			
UCS-MR-2X041RX-C	2X4GB DDR3-1333-MHz RDIMM/PC3-10600/single rank/x4/1.35v	1.5/1.35	1
UCS-MR-2X082RX-C	2X8GB DDR3-1333-MHz RDIMM/PC3-10600/dual rank/x2/1.35v	1.5/1.35	2
UCS-MR-2X164RX-C	2X16GB DDR3-1333-MHz RDIMM/PC3-10600/quad rank/x4/1.35v	1.5/1.35	4
UCS-MR-2X324RX-C	2x32GB DDR3-1333-MHz RDIMM/PC3-10600/quad rank/x4/1.35v	1.5/1.35	4
Memory Mirroring Option			
N01-MMIRROR	Memory mirroring option		

Approved Configurations

(1) Minimum Configuration without memory mirroring

- One memory riser with at least one matched DIMM pair. The memory riser must be installed in a slot controlled by either CPU1 or CPU2. All four CPUs can run from a single DIMM pair.

(2) Maximum Configuration without memory mirroring

- Eight memory risers with at least one matched DIMM pair per riser (16 DIMMs total) and up to four matched DIMM pairs per riser (64 DIMMs total).

(3) Minimum Configuration with memory mirroring

- One memory riser with at least two matched DIMM pairs.

(4) Maximum Configuration with memory mirroring

- Eight memory risers with at least two matched DIMM pairs per riser (16 DIMMs total) and up to four matched DIMM pairs per riser (64 DIMMs total).

NOTE: There are three memory mirroring modes:

1 Intra-socket mirroring

2 Inter-socket cross-memory-controller mirroring

3 Inter-socket complete master-slave mirroring

Mirroring mode can be configured using the UCS Manager BIOS Policy RAS Memory tab

Caveats

- Each CPU controls four DDR3 channels.
- The minimum DIMM configuration is at least one matched DIMM pair installed in a memory riser on either CPU1 or CPU2. All four CPUs can run from a single DIMM pair.
- DIMMs are required to be populated in pairs. DIMMs for this server are available as two-DIMM kits.
- The DIMMs in any given pair must be identical.
- Any DIMM installed in a memory riser corresponding to an empty CPU slot becomes inaccessible.
- For optimal performance, distribute DIMMs evenly across all installed CPUs and memory buffers.
- DIMMs within a channel are populated starting with the DIMMs farthest from the memory buffer in a fill-farthest approach.
- Matched pairs of risers on paired DDR3 channels must have identical DIMM configurations.

For more information about memory, see *CPUs and DIMMs on page 49*.

STEP 4 CHOOSE HARD DISK DRIVEs or SOLID STATE DRIVEs

The standard disk drive features are:

- 2.5-inch small form factor
- Hot-pluggable
- Sled-mounted

Choose Drives

The available drives are listed in *Table 6*.

Table 6 Available Hot-Pluggable Sled-Mounted HDDs and SSDs

Product ID (PID)	PID Description	Drive Type	Capacity
HDDs			
A03-D146GC2	146 GB SAS 15K RPM SFF HDD	SAS	146 GB
A03-D300GA2	300 GB 6 Gb SAS 10K RPM SFF HDD	SAS	300 GB
UCS-HDD300GI2F105	300 GB 6 Gb SAS 15K RPM SFF HDD	SAS	300 GB
A03-D500GC3	500 GB 6 Gb SATA 7.2K RPM SFF	SATA	500 GB
A03-D600GA2	600 GB 6 Gb SAS 10K RPM SFF HDD	SAS	600 GB
UCS-HDD900GI2F106	900 GB 6Gb SAS 10K RPM SFF HDD	SAS	900 GB
A03-D1TBSATA	1 TB SATA 7.2K RPM SFF HDD	SATA	1 TB
SSDs			
UCS-SD100G0KA2-E	100 GB SATA 2.5 inch Enterprise Performance SSD	SATA	100 GB
UCS-SD100G0KA2-G	100 GB 2.5 inch Enterprise Value SSD	SATA	100 GB
UCS-SD200G0KA2-E	200 GB 2.5 SATA Enterprise performance SSD	SATA	200 GB
UCS-SD300G0KA2-E	300 GB 2.5 SATA Enterprise performance SSD	SATA	300 GB
UCS-SD400G0KA2-G	400 GB 2.5 Enterprise Value SSD	SATA	400 GB

Approved Configurations

(1) LSI MegaRAID SAS 9260-8i RAID controller (battery backup is optional)

- Select up to 12 SAS or SATA drives listed in *Table 6* (you can mix SAS/SATA drives, but not HDD/SSD drives). This configuration supports RAID 0, 1, 5, 6, and 10.

(2) LSI MegaRAID SAS 9240-8i RAID controller (no battery backup)

- Select up to 8 SAS or SATA drives listed in *Table 6* (you can mix SAS/SATA drives, but not HDD/SSD drives). This configuration supports RAID 0and 1.

Caveats

- SSDs and HDDs should not be mixed in the same RAID volume.

STEP 5 CHOOSE RAID CONFIGURATION

The C460 M2 server accommodates either an LSI MegaRAID SAS 9260-8i or LSI MegaRAID SAS 9240-8i RAID controller. The C460 M2 contains a drive bay housing up to 12 HDDs or SSDs.

Cisco can provide factory-configured RAID 0, 1, 5, 6, and 10 systems depending on the RAID implementation chosen, the RAID controller chosen, and the number of drives ordered. Factory-configured RAID options are listed at the end of *Table 7*. Note that RAID levels 50 and 60 are supported on the 9260-8i, but are not factory configurable.

Choose RAID Options

Choose one RAID controller, one RAID configuration option, and, if desired, the battery backup option listed in *Table 7*.

Table 7 Available RAID Options

Product ID (PID)	PID Description
RAID Controllers	
RC460-PL001	LSI MegaRAID SAS 9260-8i (RAID 0, 1, 5, 6, 10, 50, 60 supported) ■ Plugs into the dedicated SAS riser on the rear of the server on the left (see *Figure 4 on page 6*). ■ Supports from 1 to 12 internal SAS or SATA drives ■ Battery backup (R2XX-LBBU2) is required (see the RAID Battery Backup section later in this table) ■ Factory-configured RAID options: RAID 0, 1, 5, 6, 10 (see the RAID PIDs section in this table)
RC460-PL002	LSI MegaRAID SAS 9240-8i (RAID 0 and 1) ■ Plugs into the dedicated SAS riser on the rear of the server on the left (see *Figure 4 on page 6*). ■ Supports from 1 to 8 internal SAS or SATA drives ■ Battery backup option not available ■ Factory-configured RAID options: RAID 0 and 1 (see the RAID PIDs section in this table)
RAID Battery Backup Option	
R2XX-LBBU2	Battery Backup (for LSI MegaRAID SAS 9260-8i controller only)
RAID Configuration	
R2XX-RAID0	Factory pre-configured RAID striping option Enable RAID 0 Setting. Requires a minimum of 1 hard drive.
R2XX-RAID1	Factory pre-configured RAID mirroring option Enable RAID 1 Setting. Requires exactly 2 drives, with same size, speed, capacity.

Table 7 Available RAID Options *(continued)*

Product ID (PID)	PID Description
R2XX-RAID5	Factory pre-configured RAID option Enable RAID 5 Setting. Requires minimum 3 drives of same size, speed, capacity.
R2XX-RAID6	Factory pre-configured RAID option Enable RAID 6 Setting. Requires minimum 4 drives of same size, speed, capacity.
R2XX-RAID10	Factory pre-configured RAID option Enable RAID 10 Setting. Requires an even number of drives (minimum 4 drives) of same size, speed, capacity.

.

NOTE: No RAID option can be chosen if you have one of the following configurations:

- A mix of SAS and SATA drives
- No drives

Approved Configurations

(1) One RAID Controller Card

- Choose either the RC460-PL001 LSI MegaRAID SAS 9260-8i RAID controller or the RC460-PL002 LSI MegaRAID SAS 9240-8i RAID controller listed in *Table 7*. You will be able to control from 1 to 12 drives with the 9260-8i RAID controller and from 1 to 8 drives with the 9240-8i RAID controller.

Caveats

- The RAID controller card is preinstalled in a dedicated SAS riser slot in the rear of the server. See *Figure 4 on page 6*.
- You can choose an optional RAID configuration (RAID 0, 1, 5, 6, or 10), which is pre-configured at the factory. If you do not choose a RAID configuration, the disks will be configured as a JBOD.

STEP 6 CHOOSE PCIe OPTION CARD(S)

The standard PCIe card offerings are:

- Converged Network Adapters (CNA)
- Network Interface Cards (NICs)
- Host Bus Adapters (HBAs)
- UCS Storage Accelerators

Choose 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 (CNA)		
N2XX-AEPCI01	Emulex OneConnect OCe10102-F CNA 2-port 10Gbps	Half
UCSC-PCIE-BSFP	Broadcom 57712 Dual Port 10Gb SFP+ w/TOE iSCSI	Half
UCSC-PCIE-BTG	Broadcom 57712 Dual Port 10GBASE-T w/TOE iSCSI	Half
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	Qlogic QLE8242-CU Dual Port 10 GbE FCoE CNA	Half
Network Interface Cards (NICs)		
N2XX-ABPCI03-M3	Broadcom 5709 Quad Port 1Gb w/TOE iSCSI for M3 Servers	Half
N2XX-AIPCI01	Intel Dual Port 10 GbE Ethernet X520 Server Adapter	Half
Host Bus Adapters (HBAs)		
N2XX-AEPCI03	Emulex LPe 11002 Dual Port 4Gb Fibre Channel HBA	Half
N2XX-AEPCI05	Emulex LPe 12002 Dual Port 8Gb Fibre Channel HBA	Half
N2XX-AQPCI03	Qlogic QLE2462 Dual Port 4Gb Fibre Channel HBA	Half
N2XX-AQPCI05	Qlogic QLE2562 Dual Port 8Gb Fibre Channel HBA	Half

Table 8 Available PCIe Option Cards *(continued)*

Product ID (PID)	PID Description	Card Height
UCS Storage Accelerators		
UCSC-F-FIO-3000M	Cisco UCS 3.0 TB MLC Fusion ioDrive2 for C-Series Servers	Full
UCSC-F-FIO-1205M	Cisco UCS 1205 GB MLC Fusion ioDrive2 for C-Series Servers	Half
UCSC-F-FIO-785M	Cisco UCS 785 GB MLC Fusion ioDrive2 for C-Series Servers	Half
UCSC-F-FIO-365M	Cisco UCS 365GB MLC Fusion ioDrive2 for C-Series Servers	Half
Computing Processor Accessory Kit		
UCSC-GPU-N01-C460	Accessory Kit for NVIDIA Tesla C2050 GPU[1] includes power cable, panels)	N/A

Notes . . .

1. The NVIDIA Tesla card itself can be ordered from a certified NVIDIA Tesla reseller partner or distributor listed at the following link: **http://www.nvidia.com/object/tesla_wtb.html#3**. Note that the C2050 is a full-height PCIe x16 dual-slot form factor card and consumes 238 watts (max). It can be installed only in PCIe slot 5.

Approved Configurations

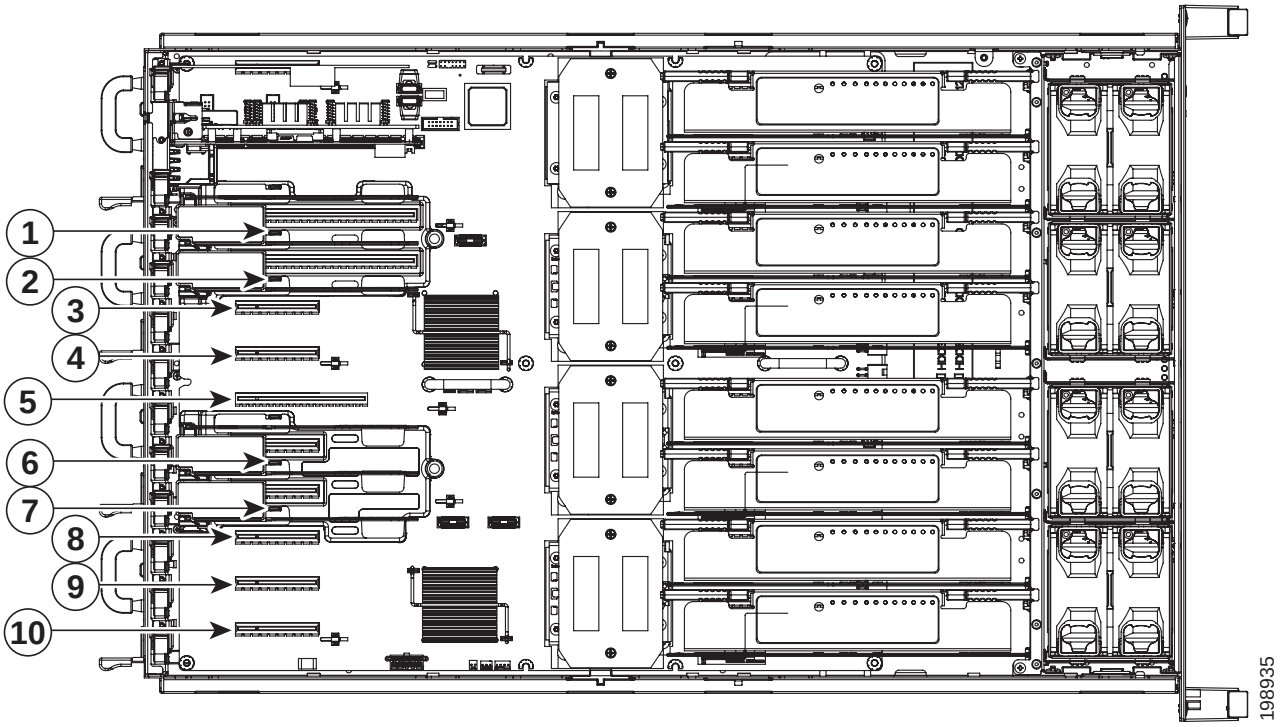
(1) Select up to 10 PCIe Cards

- Use *Table 9* as a guide for adding PCIe cards. See *Figure 6* for the slot locations.

Table 9 PCIe Expansion Slot Numbering

Slot Number	Slot Characteristics
1 and 2	PCIe Gen 2x8, 3/4 length card, x24 hot-swappable connectors
3 and 4	PCIe Gen 2x4, 1/2 length card, x8 connectors
5	PCIe Gen 2x16, 3/4 length card, x16 connector
6 and 7	PCIe Gen 2x8, 3/4 length card, x8 hot-swappable connectors
8	PCIe Gen 1x4, 3/4 length card, x8 connector
9	PCIe Gen 1x4, 1/2 length card, x8 connector
10	PCIe Gen 2x4, 1/2 length card, x8 connector

Figure 6 PCIe Slot Locations



Caveats

- CPU3 must be installed to support PCIe slots 5, 6, 7, 9, and 10.
- Legacy I/O devices such as video cards are only supported on slots 1, 2, 3, 4 and 8.
- The Cisco Card NIC mode is currently supported only with a Cisco 1225 VIC (UCSC-PCIE-CSC-02) that is installed in PCIe slot 1.
- The C460 server accommodates the Cisco 1225 Virtual Interface card, which is supported only in slots 1 and 2.
  - Only one Cisco 1225 VIC can be used for both UCSM management and data traffic in the C460 M2 server
  - The Cisco 1225 VIC in slot 1 handles management and data traffic.
  - If a second Cisco 1225 VIC is installed in slot 2, it will be used for data traffic only. This is due to the standby power supplied only to slot 1.
- All PCIe slots are standard-height and require a standard-height mounting bracket on the PCIe card.
- Additional considerations for the Cisco 1225 VIC card:
  - Supports 10G SFP+ optical and copper twinax connections
  - To use the Cisco Card NIC mode, this card must be installed 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 cards you have selected, please 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

Copper twinax cables are listed in *Table 10*. 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 10 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 10* can be ordered only for the following PCIe cards:

- UCS-PCIE-BSFP (Broadcom 57712)
- N2XX-AEPCI01 (Emulex OCe10102-F)
- N2XX-AIPCI01 (Intel Dual Port Ethernet X520)
- N2XX-AQPCI01 (Qlogic QLE 8152-CNA)
- UCSC-PCIE-CSC-02 (Cisco VIC 1225 Dual Port 10Gb SFP+ CNA)

Choose Optional SFP Modules

Optical Cisco SFP+ modules are listed in *Table 11*.

Table 11 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 7 on page 28* for typical SFP+ and twinax connections to the network cards.

Caveats

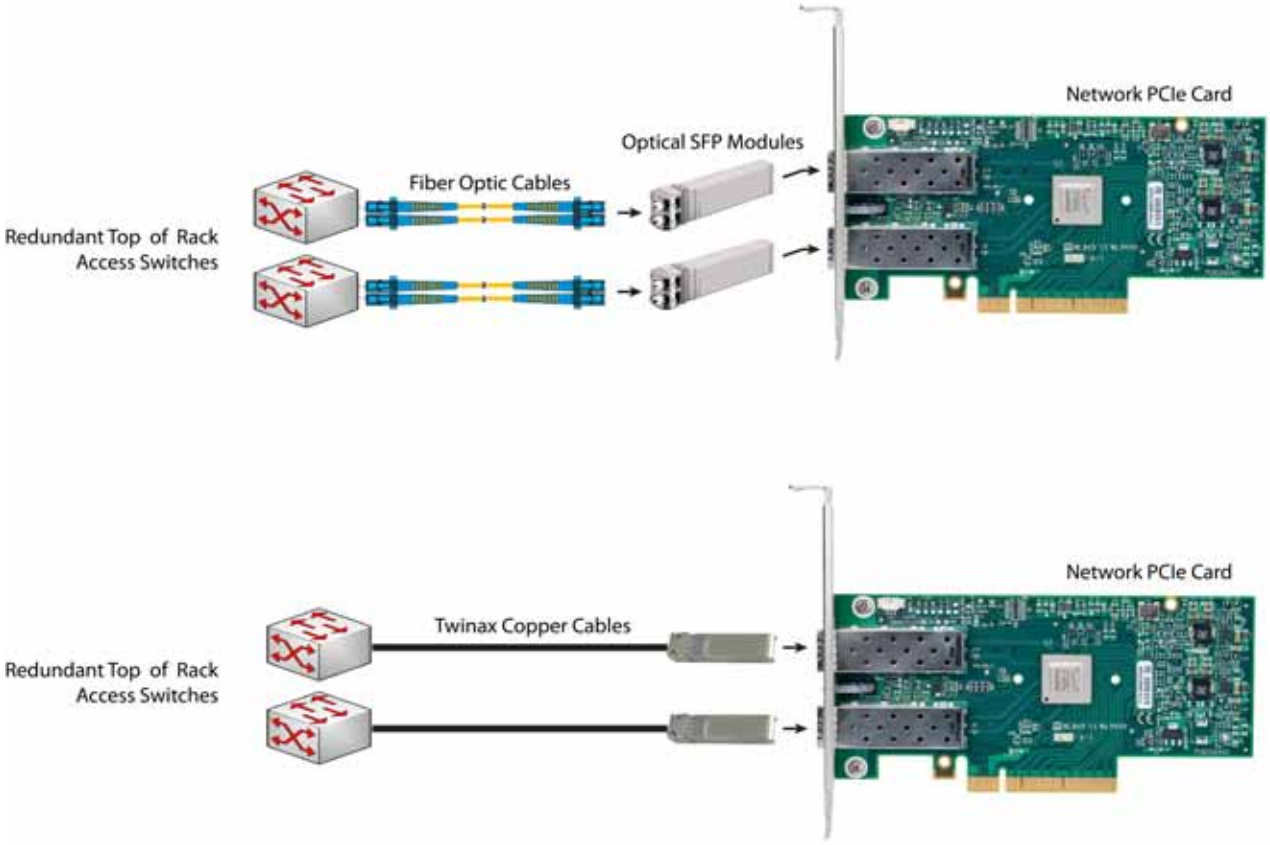
The SFP-10G-SR optical module listed in *Table 11* should be ordered only for the following PCIe cards, as they do not come by default with any optical modules:

- UCSC-PCIE-BSFP (Broadcom 57712)
- N2XX-AEPCI01 (Emulex OCe10102-F)
- UCSC-PCIE-CSC-02 (Cisco VIC 1225 Dual Port 10Gb SFP+ CNA)

The DS-SFP-FC8G-SW optical module listed in *Table 11* 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 Dual Port 8Gb Fibre Channel HBA)

Figure 7 Network Card Connections



STEP 8 ORDER POWER SUPPLIES

If you ordered a 2-CPU system, the base server comes with two power supplies, which is adequate to power the server. If you ordered a 4-CPU system, you must order two additional power supplies, listed in *Table 15*.

Table 12 Power Supplies

Product ID (PID)	PID Description
RC460-PSU2-850W	850W POWER SUPPLY UNIT FOR C-SERIES C460

STEP 9 SELECT AC POWER CORD(s)

Select the appropriate AC power cords listed in *Table 13*. You may select a minimum of no power cords and a maximum of two power cords. If you select the option R2XX-DMYMPWRCORD, no power cord is shipped with the server.

Table 13 Available Power Cords

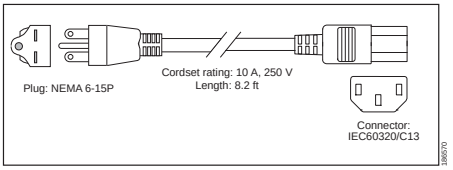
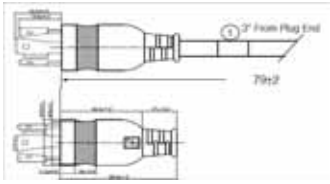
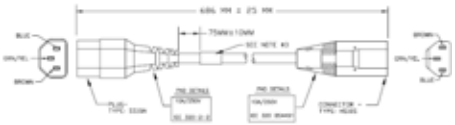
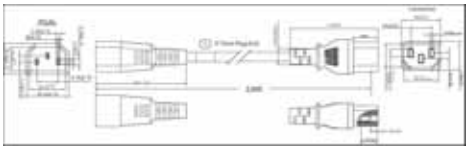
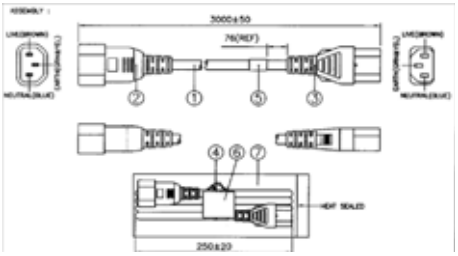
Product ID (PID)	PID Description	Images
R2XX-DMYMPWRCORD	No power cord (dummy PID to allow for a no power cord option)	Not applicable
CAB-N5K6A-NA	Power Cord, 200/240V 6A, North America	
CAB-AC-L620-C13	AC Power Cord, NEMA L6-20 - C13, 2M/6.5ft	
CAB-C13-CBN	CABASY,WIRE,JUMPER CORD, 27" L, C13/C14, 10A/250V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

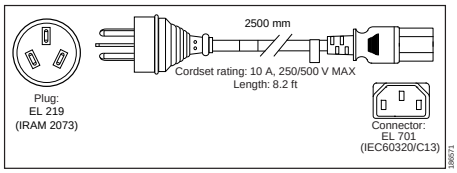
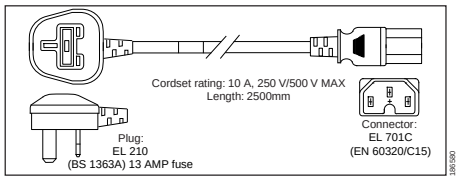
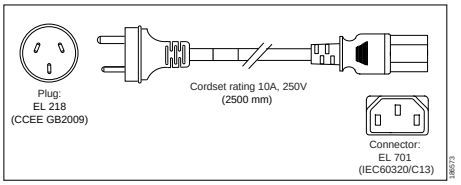
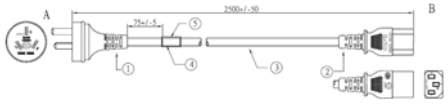
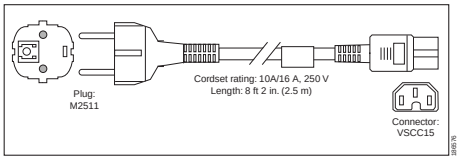
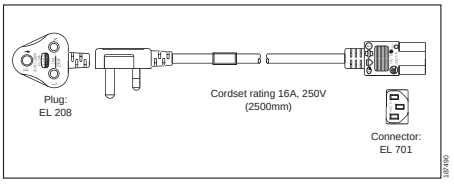
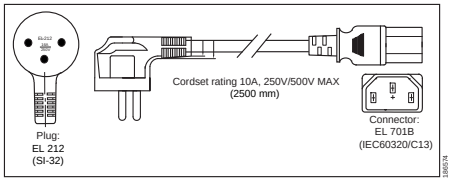
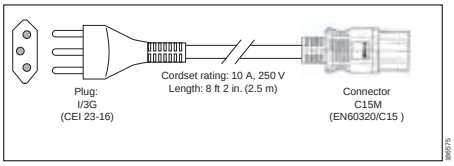
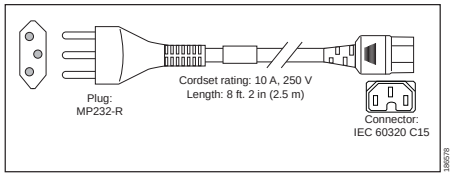
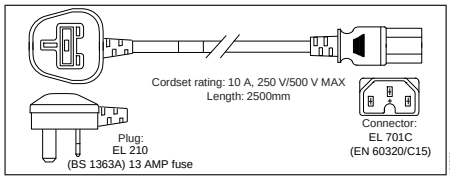
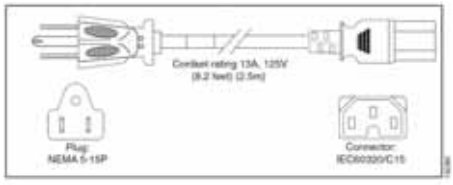
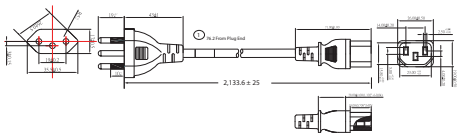
Product ID (PID)	PID Description	Images
SFS-250V-10A-AR	Power Cord, SFS, 250V, 10A, Argentina	
CAB-9K10A-AU	Power Cord, 250VAC 10A 3112 Plug, Australia	
SFS-250V-10A-CN	Power Cord, SFS, 250V, 10A, China	
CAB-250V-10A-CN	AC Power Cord - 250V, 10A - PRC	
CAB-9K10A-EU	Power Cord, 250VAC 10A CEE 7/7 Plug,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

Table 13 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-250V-10A-BR	Power Cord - 250V, 10A - Brazil	
CAB-JPN-3PIN	Power Cord 3PIN, Japan	Image not available

STEP 10 ORDER OPTIONAL SLIDE RAIL KIT

Two different optional slide rail kits can be ordered:

- Tool-less slide rail kit (RC460-SLDRAIL)
- Short slide rail kit (RC460-SLDRAIL-S), where space is at a premium and a cable management arm is not needed

You can order one of the slide rail kits listed in *Table 14*.

Table 14 Slide Rail Kits

Product ID (PID)	PID Description
RC460-SLDRAIL	Slide rail kit for the UCS C460 rack server
RC460-SLDRAIL-S	Short slide rail kit for C460, no CMA

STEP 11 ORDER OPTIONAL CABLE MANAGEMENT ARM

A cable management arm is available for the tool-less slide rail kit (PID RC460-SLDRAIL). The cable management arm attaches to the left and right slide rails at the rear of the server and is used for cable management. You can order the cable management arm listed in *Table 15*.

Table 15 Cable Management Arm

Product ID (PID)	PID Description
RC460-CBLARM	Cable Management Arm for C460

STEP 12 ORDER OPTIONAL INTERNAL FLASH eUSB DRIVE

One or two optional 2 GB eUSB drives may be ordered and used as a boot drive. The eUSB drives plug into vertical USB slots on the motherboard. You can order the eUSB boot drive listed in *Table 16*.

Table 16 Available USB Drive

Product ID (PID)	PID Description	Drive Type	Capacity
RC460-EUSB	2 GB eUSB Drive	USB	2 GB

Approved Configurations

- Select one or two eUSB drives from *Table 16*.

Caveats

None

STEP 13 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 17*.

Table 17 Trusted Platform Module

Product ID (PID)	PID Description
UCSC-TPM-001-C460	Trusted Platform Module

STEP 14 CHOOSE OPERATING SYSTEM AND VALUE-ADDED SOFTWARE

Several operating systems and value-added software programs are available. Select as desired from *Table 18*.

Table 18 OSs and Value-Added Software (for 4-CPU servers)

PID Description	Product ID (PID)
Microsoft 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-12-ST2S	Windows Server 2012 Standard (2 CPU/2 VMs)
MSWS-12-DC2S	Windows Server 2012 Datacenter (2 CPU/Unlimited VMs)
MSWS-12-ST2S-NS	Windows Server 2012 Standard (2 CPU/2 VMs) No Cisco SVC
MSWS-12-DC2S-NS	Windows Server 2012 Datacenter (2 CPU/Unlim VM) No Cisco Svc
SUSE Linux Enterprise Server	
SLES-1A	SLES/1yr subscription/svcs required/0 media
SLES-3A	SLES/3yr subscription/svcs required/0 media
UCS-SLES-TERMS	Acceptance of Terms, Standalone SLES License for UCS Servers
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-4S-1G-1A	RHEL/4 Socket/1 Guest/1Yr Svcs Required
RHEL-4S-1G-3A	RHEL/4 Socket/1 Guest/3Yr Svcs Required
RHEL-4S-4G-1A	RHEL/4 Socket/4 Guest/1Yr Svcs Required
RHEL-4S-4G-3A	RHEL/4 Socket/4 Guest/3Yr Svcs Required
RHEL-4S-UG-1A	RHEL/4 Socket/U Guest/1Yr Svcs Required
RHEL-4S-UG-3A	RHEL/4 Socket/U Guest/3Yr Svcs Required
RHEL-HA-2S-1A	RHEL Option/High-Availability/2 Socket/1Yr Svcs Required
RHEL-HA-2S-3A	RHEL Option/High-Availability/2 Socket/3Yr Svcs Required

Table 18 OSs and Value-Added Software (for 4-CPU servers) *(continued)*

PID Description	Product ID (PID)
RHEL-HA-4S-1A	RHEL Option/High-Availability/4 Socket/1Yr Svcs Required
RHEL-HA-4S-3A	RHEL Option/High-Availability/4 Socket/3Yr Svcs Required
RHEL-RS-2S-1A	RHEL Option/Resilient Storage w/HA /2 Socket/1 Yr Svcs Reqd
RHEL-RS-2S-3A	RHEL Option/Resilient Storage w/HA /2 Socket/3 Yr Svcs Reqd
RHEL-RS-4S-1A	RHEL Option/Resilient Storage w/HA /4 Socket/1 Yr Svcs Reqd
RHEL-RS-4S-3A	RHEL Option/Resilient Storage w/HA /4 Socket/3 Yr Svcs Reqd
RHEL-SFS-2S-1A	RHEL Option/Scalable File System/2 Socket/1 Yr Svcs Required
RHEL-SFS-2S-3A	RHEL Option/Scalable File System/2 Socket/1 Yr Svcs Required
RHEL-SFS-4S-1A	RHEL Option/Scalable File System/4 Socket/1 Yr Svcs Required
RHEL-SFS-4S-3A	RHEL Option/Scalable File System/4 Socket/3 Yr Svcs Required
BMC	
BMC-002	BMC BladeLogic CM, Physical Server
BMC-012	BMC BPPM Per Server
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	BMC 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 Standard Edition, 10 Cores, Support Required
UCS-BMC-TERMS	Acceptance of Terms, Standalone BMC License for UCS Servers
VMWare 5	
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 Rqd
VMW-VS5-ENT-2A	VMware vSphere 5 Enterprise for 1 CPU, 2 Yr Support Rqd
VMW-VS5-ENT-3A	VMware vSphere 5 Enterprise for 1 CPU, 3 Yr Support Rqd
VMW-VS5-ENT-4A	VMware vSphere 5 Enterprise for 1 Processor, 4 Year Support Rqd

Table 18 OSs and Value-Added Software (for 4-CPU servers) *(continued)*

PID Description	Product ID (PID)
VMW-VS5-ENT-5A	VMware vSphere 5 Enterprise for 1 CPU, 5 Yr Support Rqd
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 Rqd
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 Rqd
VMW-VS5-ENTP-5A	VMware vSphere 5 Enterprise Plus for 1 Processor, 5 Year Support Rqd
VMW-VC5-STD-1A	VMware vCenter 5 Server Standard, 1 yr support required
VMW-VC5-STD-2A	VMware vCenter 5 Server Standard, 2 yr support required
VMW-VC5-STD-3A	VMware vCenter 5 Server Standard, 3 yr support required
VMW-VC5-STD-4A	VMware vCenter 5 Server Standard, 4 yr support required
VMW-VC5-STD-5A	VMware vCenter 5 Server Standard, 5 yr support required
UCS-VMW-TERMS	Acceptance of Terms, Standalone VMW License for UCS Servers

STEP 15 CHOOSE OPERATING SYSTEM MEDIA KIT

Choose the optional operating system media listed in *Table 19*.

Table 19 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-08RS-ENHV-RM	Windows Svr 2008 R2 EN (1-8CPU, 25CAL), Media
MSWS-08R2-DCHV-RM	Windows Svr 2008 R2 DC (1-8CPU, 25CAL), Media
MSWS-12-ST2S-RM	Windows Server 2012 Standard (2 CPU/2 VMs) Recovery Media
MSWS-12-DC2S-RM	Windows Server 2012 Datacenter (2 CPU/Unlimited VM) Rec Media

STEP 16 CHOOSE 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 20*.

Table 20 Cisco SMARTnet for UCS Service

Product ID (PID)	On Site?	Description
CON-PREM-C460M2	Yes	ONSITE 24X7X2 C460 M2 Rack Server
CON-OSP-C460M2	Yes	ONSITE 24X7X4 C460 M2 Rack Server
CON-OSE-C460M2	Yes	ONSITE 8X5X4 C460 M2 Rack Server
CON-OS-C460M2	Yes	ONSITE 8X5XNBD C460 M2 Rack Server
CON-S2P-C460M2	No	SMARTNET 24X7X2 C460 M2 Rack Server
CON-SNTP-C460M2	No	SMARTNET 24X7X4 C460 M2 Rack Server
CON-SNTE-C460M2	No	SMARTNET 8X5X4 C460 M2 Rack Server
CON-SNT-C460M2	No	SMARTNET 8X5XNBD C460 M2 Rack Server

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 21*.

Table 21 SMARTnet for UCS Hardware Only Service

Product ID (PID)	Service Level GSP	On Site?	Description
CON-UCW7-C460M2	UCW7	Yes	UC PLUS 24X7X4OS C460 M2 Rack Server
CON-UCW5-C460M2	UCW5	Yes	UC PLUS 8X5XNBDOS C460 M2 Rack Server

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 22*.

Table 22 Partner Support Service for UCS

Product ID (PID)	Service Level GSP	On Site?	Description
CON-PSJ1-C460M2	PSJ1	No	UCS SUPP PSS 8X5XNBD C460 M2 Rack Server
CON-PSJ2-C460M2	PSJ2	No	UCS SUPP PSS 8X5X4 C460 M2 Rack Server
CON-PSJ3-C460M2	PSJ3	No	UCS SUPP PSS 24X7X4 C460 M2 Rack Server
CON-PSJ4-C460M2	PSJ4	No	UCS SUPP PSS 24X7X2 C460 M2 Rack Server

Partner Support Service for UCS Hardware Only provides customers with replacement parts in as little as two hours. See *Table 23*.

Table 23 Partner Support Service for UCS (Hardware Only)

Product ID (PID)	Service Level GSP	On Site?	Description
CON-PSW2-C460M2	PSW2	No	UCS W PL PSS 8X5X4 C460 M2 Rack Server
CON-PSW3-C460M2	PSW3	No	UCS W PL PSS 24X7X4 C460 M2 Rack Server
CON-PSW4-C460M2	PSW4	No	UCS W PL PSS 24X7X2 C460 M2 Rack Server

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 24*.

Table 24 UCS Computing Combined Support Service

Product ID (PID)	Service Level GSP	On Site?	Description
CON-NCF2-C460M2	NCF2	No	CMB SPT SVC 24X7X2 C460 M2 Rack Server
CON-NCF2P-C460M2	NCF2P	Yes	CMB SPT SVC 24X7X2OS C460 M2 Rack Server
CON-NCF4P-C460M2	NCF4P	Yes	CMB SPT SVC 24X7X4OS C460 M2 Rack Server
CON-NCF4S-C460M2	NCF4S	Yes	CMB SPT SVC 8X5X4OS C460 M2 Rack Server
CON-NCFCS-C460M2	NCFCS	Yes	CMB SPT SVC 8X5XNBDOS C460 M2 Rack Server
CON-NCFE-C460M2	NCFE	No	CMB SPT SVC 8X5X4 C460 M2 Rack Server
CON-NCFP-C460M2	NCFP	No	CMB SPT SVC 24X7X4 C460 M2 Rack Server
CON-NCFT-C460M2	NCFT	No	CMB SPT SVC 8X5XNBD C460 M2 Rack Server

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 25*.

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

Table 25 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-C460M2
		UCSD7	8x5xNBD Onsite	CON-UCSD5-C460M2
SMARTnet for UCS HW ONLY+Drive Retention	UCS HW+DR	UCWD7	24x7x4 Onsite	CON-UCWD7-C460M2
		UCWD5	8x5xNBD Onsite	CON-UCWD5-C460M2

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 RACKS

The optional R42610 rack is available from Cisco for the C-Series servers, including the C460 M2 server. This rack is a standard 19-inch rack and can be ordered with a variety of options, as listed in *Table 26*. Racks are shipped separately from the C460 M2 server.

Table 26 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 on page 51*.

OPTIONAL STEP - ORDER PDU

An optional power distribution unit (PDU) is available from Cisco for the C-Series rack servers, including theC460 M2 server. This PDU is available in a zero rack unit (RU) style (see *Table 27*).

Table 27 PDU Options

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

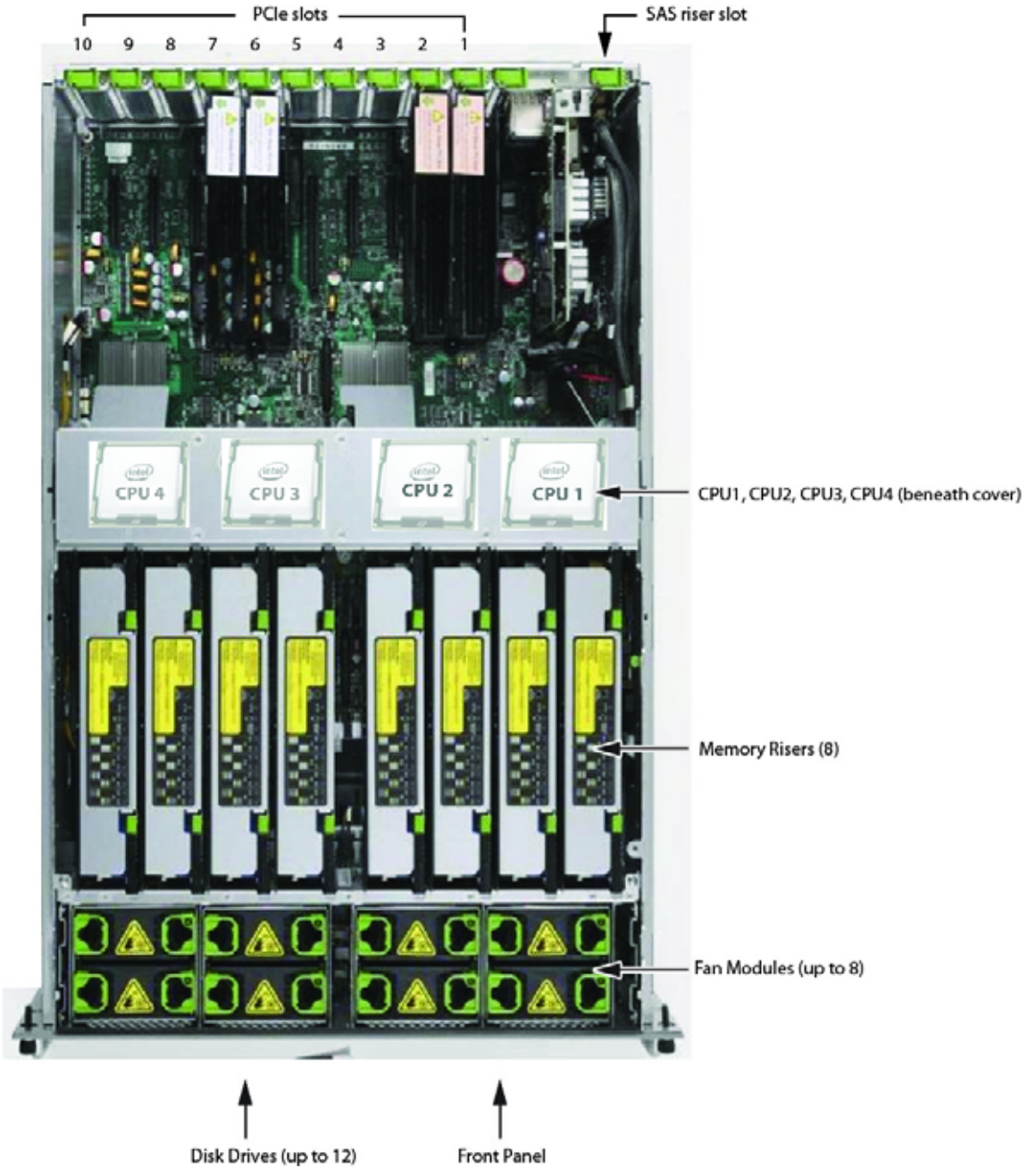
For more information about the PDU, see *PDUs on page 53*.

SUPPLEMENTAL MATERIAL

CHASSIS

An internal view of the C460 M2 chassis with the top cover removed is shown in *Figure 8*.

Figure 8 C460 M2 With Top Cover Removed



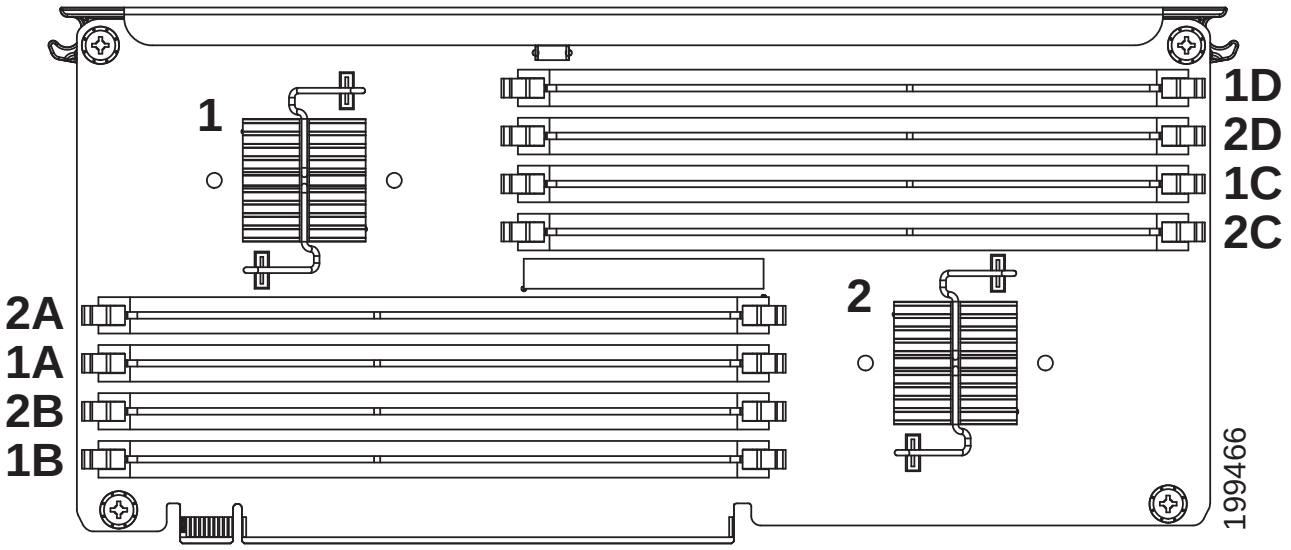
CPUs and DIMMs

Physical Layout

Each CPU controls four serial memory interface (SMI) channels (see *Figure 5 on page 14*). There is one memory riser for every two channels. There are therefore two memory risers per CPU. Each CPU channel drives a memory buffer on a riser card, and each memory buffer converts a CPU SMI into two DDR3 subchannels that each read and write two DIMM pairs on a memory riser.

The physical layout of a memory riser is shown in *Figure 9*.

Figure 9 Memory Riser Physical Layout



1	Memory buffer #1	**2**	Memory buffer #2

In *Figure 9*, the buffers and channels are:

- Buffer 1, subchannel 1: slots 1B and 1D
- Buffer 1, subchannel 2: slots 1A and 1C
- Buffer 2, subchannel 1: slots 2B and 2D
- Buffer 2, subchannel 2: slots 2A and 2C

Memory Population Rules

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

- The minimum configuration for the server is at least one matched DIMM pair installed in a memory riser on either CPU1 or CPU2 All four CPUs can run from a single DIMM pair.
- DIMMs are required to be populated in pairs. DIMMs for this server are configured as two-DIMM kits.

- The DIMMs in any given pair must be identical.
- Any DIMM installed in a memory riser corresponding to an empty CPU slot becomes inaccessible.
- For optimal performance, distribute DIMMs evenly across all installed CPUs and memory buffers.
- DIMMs within a subchannel are populated starting with the DIMMs farthest from the memory buffer in a fill-farthest approach.
- For example, the order that you should populate the four channels on a memory riser is as follows (see also *Figure 9 on page 49*):
  - 1.Slots 1B and 1D (buffer 1, subchannel 1)
  - 2.Slots 1A and 1C (buffer 1, subchannel 2)
  - 3.Slots 2B and 2D (buffer 2, subchannel 1)
  - 4.Slots 2A and 2C (buffer 2, subchannel 2

RACKS

The Cisco R42610 rack (see *Figure 10*) 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 28*.

Table 28 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 10 Cisco R42610 Rack

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

PDUs

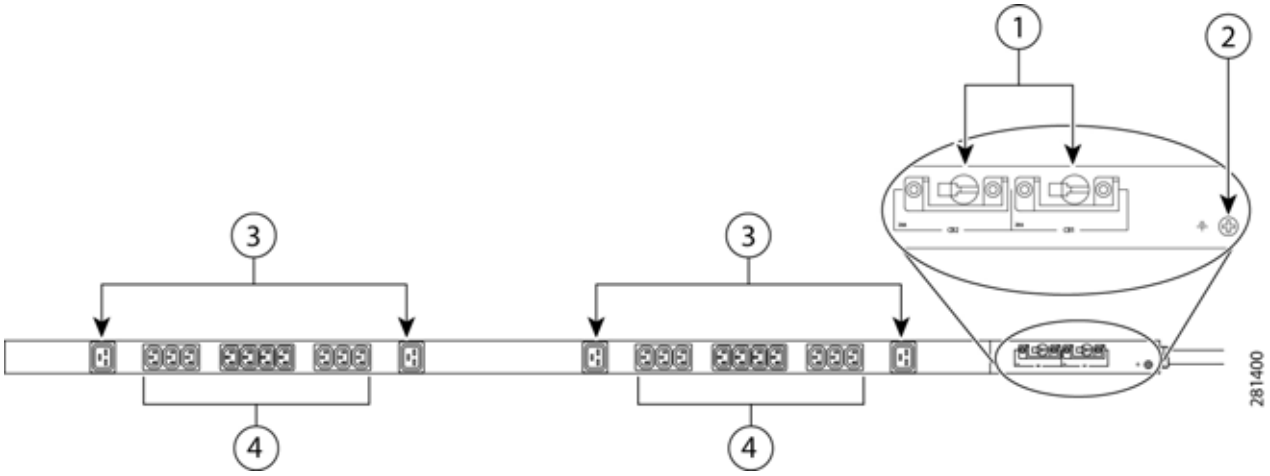
Cisco RP Series Power Distribution Units (PDUs) offer power distribution with branch circuit protection.

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 11*).

Figure 11 Zero Rack Unit PDU (PID = RP208-30-2P-U-2)



1	Breakers	**3**	C19 plugs
2	Ground connection	**4**	C13 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.

TECHNICAL SPECIFICATIONS

Dimensions and Weight

Table 29 UCS C460 M2 Dimensions and Weight[1]

Parameter	Value
Height	6.8 in. (174 mm)
Width	16.7 in.(424 mm)
Depth	27.7 in. (704 mm)
Front Clearance	3 in. (7.62 cm)
Side Clearance	1 in. (25.4 mm)
Rear Clearance	6 in. (152.4 mm)
Weight (maximum configuration, including slide rail brackets and cable management arm)	110.23 lbs (50 kg)*

Notes . . .

1. The system weight given here is an estimate for a fully configured system and will vary depending on the number of peripheral devices and power supplies.

Power Specifications

The general power specifications for the C460 M2 server are listed in *Table 30*.

Table 30 UCS C460 M2 Power Specifications

Description	Specification
AC input voltage	100 to 127 VAC nominal (Range: 90 to 264 VAC)
AC input frequency	50 to 60 Hz nominal (Range: 47 to 63 Hz)
Maximum AC input current	9 A at 100 VAC
Maximum AC inrush current	30 A peak sub-cycle duration
Maximum output power for each power supply	850 W
Power supply output voltage	Main power: 12 VDC Standby Power: 5 VDC
Power supply efficiency	92% Peak, complies with 80Plus Gold Standard

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

Environmental Specifications

The power specifications for the C460 M2 server are listed in *Table 31*.

Table 31 UCS C460 M2 Environmental Specifications

Parameter	Minimum
Temperature operating	10°C to 35°C (50°F to 95°F)
Temperature nonoperating	-40°C to 70°C (-40°F to 158°F)
Altitude	-30 m to 1500 m (-100 ft to 5000 ft)
Humidity nonoperating	95%, noncondensing at temperatures of 25ºC (77ºF) to 30ºC (86ºF)

Compliance Requirements

The regulatory compliance requirements for C-Series servers are listed in *Table 32*.

Table 32 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

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