Cisco UCS C480 M5 High-Performance Rack-Mount Server

CONTENTS

OVERVIEW

The Cisco UCS C480 M5 High-Performance Rack Server (*Figure 1*) is a four-rack-unit (4RU) server supporting the 2nd Generation Intel® Xeon® processor scalable family CPUs.

The C480 M5 has the following features:

- 2nd Generation Intel® Xeon® Scalable Processors.
- 2933-MHz GB DDR4 memory DIMMs.
- 128 GB, 256 GB, and 512 GB Intel® Optane™ Persistent Memory Modules (PMEMs).
- Up to 18 TB of memory is available if the memory slots are populated as follows:
  - 24 x 256 GB DDR4 DIMMs
  - 24 x 512 GB PMEMs
- Up to 12 TB is possible using only 48 x 256 GB DDR4 RDIMMs.

12 PCI Express (PCIe) expansion slots support Cisco UCS C-Series network adapters storage controllers, and up to 10 GPUs, with additional I/O provided by two 10GBase-T LOM ports and one 1GbE dedicated out-of-band (OOB) management port. A separate PCIe slot is reserved inside the chassis for a RAID controller card.

Figure 1   Cisco UCS C480 M5 High-Density Rack Server.
 Front View

Rear View

DETAILED VIEWS

Chassis Front View

Figure 2 is a detailed front view of the Cisco UCS C480 M5 Rack Server.

Figure 2   **Chassis Front View**

1	Power button/LED	8	Drive bay module 1 (drive bays 1 - 8)
			■ Bays 3, 4, 5, 6 support SAS/SATA drives only
			■ Bays 1, 2, 7, 8 support SAS/SATA or NVMe drives
2	Identification button/LED	9	Drive bay module 2 (drive bays 9 - 16)
			■ Bays 11, 12, 13, 14 support SAS/SATA drives only
			■ Bays 9, 10, 15, 16 support SAS/SATA or NVMe drives
3	System status LED	10	Drive bay module 3, supports either:
			■ Optional DVD drive module, or
			■ Drive bays 17 - 24 (shown)
			— Bays 19, 20, 21, 22 support SAS/SATA drives only
			— Bays 17, 18, 23, 24 support SAS/SATA or NVMe drives

4	Fan status LED	11	KVM console connector (used with a KVM cable that provides two USBs, one VGA, and one serial connector)[1]
5	Temperature status LED	12	Pull-out asset tag
6	Power supply status LED	13	CPU module bay 1 The system must have at least one CPU module in bay 1 to boot. It must also have either a CPU module or a blank filler module in bay 2.
7	Network link activity LED	14	CPU module bay 2 If no CPU module is present in bay 2, there must be a blank filler module in bay 2 for the system to boot.

Notes:

1. For more details on the KVM connector, see *KVM CABLE on page 77*.

Chassis Rear View

Figure 3 shows the external features of the rear panel.

Figure 3   Chassis Rear View
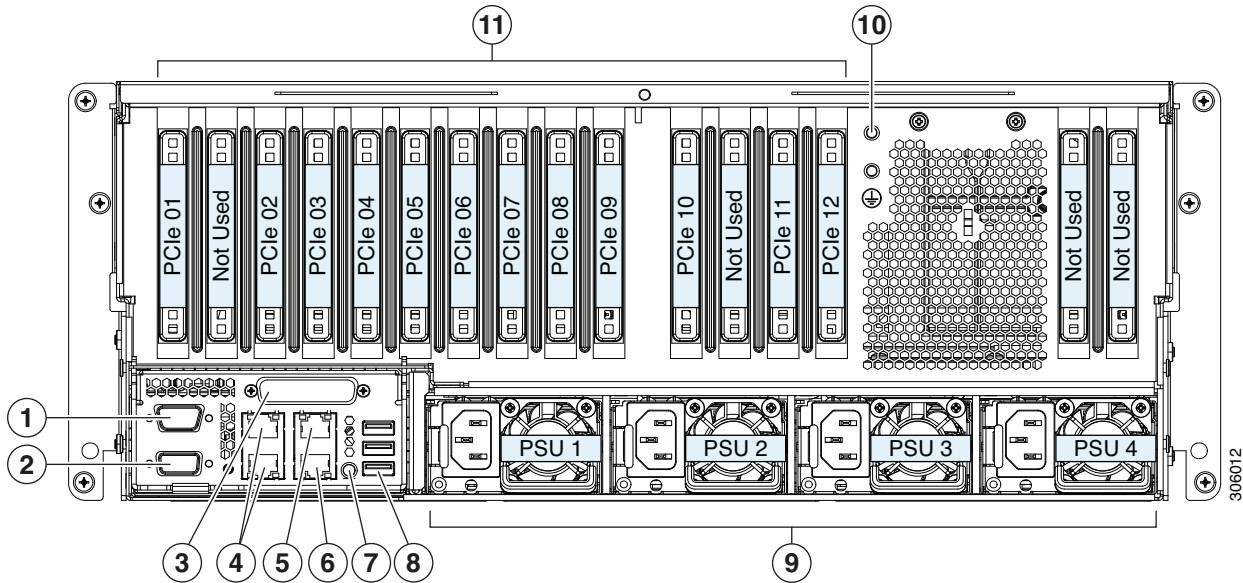
1	Serial port (DB-9 connector)	7	Rear identification LED
2	VGA video port (DB-15 connector)	8	USB 3.0 ports (three)
3	Not used at this time	9	Power supplies 1–4 (hot-swappable, redundant as 2+2, or n+1 as 3+1)
4	10 Gb Ethernet ports (LAN1 upper, LAN2 lower)	10	Screw holes for dual-hole grounding lug
5	10/100/1000 Ethernet dedicated management port M1	11	PCIe slots 1 – 12
6	Not used at this time	-	-

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 11*.

> **NOTE:** The C480 M5 blade server requires UCS Manager (UCSM) to operate as part of the UCS system as follows:
>
> ■ With Intel® Xeon® Scalable processor family CPUs, the server requires UCSM 3.2(2) or later
>
> ■ With 2nd Generation Intel® Xeon® Scalable processor family CPUs, the server requires UCSM 4.0(4).

Table 1   Capabilities and Features

Capability/Feature	Description
Chassis	Four rack unit (4RU) chassis.
CPU	Two or four 2nd Generation Intel® Xeon® scalable family CPUs.
Chipset	Intel C621 series chipset.
Memory	Two CPU modules, each consisting of two CPUs and 24 DIMM slots, plug into the midplane from the front of the chassis, for a total of up to 48 DIMM slots for the chassis with support for registered ECC DIMMs (RDIMMs), load-reduced DIMMs (LRDIMMs), through silicon via (TSV) DIMMs and support for Intel® Optane™ Persistent Memory (PMEMs)
Mullti-bit error protection	This server supports multi-bit error protection
Expansion slots	There are 12 full-height full-length PCIe expansion slots: ■ Slot 1: CPU**1** controlled, Gen-3 x16, FL, FH, GPU, NCSI, VIC primary ■ Slot 2: CPU**1** controlled, Gen-3 x16, FL, FH, GPU, NCSI, VIC secondary ■ Slot 3: CPU**3** controlled, Gen-3 x8, FL, FH, GPU, NCSI, VIC ■ Slot 4: CPU**3** controlled, Gen-3 x16, FL, FH, GPU, NCSI, VIC ■ Slot 5: CPU**2** controlled, Gen-3 x8, FL, FH, GPU, NCSI, VIC ■ Slot 6: CPU**3** controlled, Gen-3 x16, FL, FH, GPU, NCSI, VIC ■ Slot 7: CPU**4** controlled, Gen-3 x8, FL, FH, GPU, NCSI, VIC ■ Slot 8: CPU**2** controlled, Gen-3 x16, FL, FH, GPU, NCSI, VIC ■ Slot 9: CPU**2** controlled, Gen-3 x8, FL, FH, GPU ■ Slot 10: CPU**2** controlled, Gen-3 x16, FL, FH, GPU ■ Slot 11: CPU**4** controlled, Gen-3 x8, FL, FH ■ Slot 12: CPU**4** controlled, Gen-3 x8, FL, FH

Table 1   Capabilities and Features *(continued)*

Capability/Feature	Description
	NOTE: Specific slots are supported by specific CPUs. The CPU installation options are either: ■ CPU1 and CPU2 (CPU module in bay 1), or ■ CPU1, CPU2, CPU3, and CPU4 (CPU modules in bays 1 and 2). See *CHOOSE PCIe OPTION CARD(S) on page 33* for more details on which slots are supported by each CPU.

Storage controller	For front-loading drives:
	
	 ■ UCSC-RAID-M5HD is an internally mounted Cisco 12G Modular RAID controller with a 4GB cache with a supercap cache backup (UCSC-SCAP-M5). It is used for controlling the SAS/SATA drives in the front drive bays. It cannot control NVMe drives in the front drive bays.
	
	 ■ NVMe drives in the front drive bays are controlled directly from the PCIe interfaces on the CPUs.
	
	 For top-loading auxiliary module drives:
	
	 ■ UCSC-SAS9460-8i Cisco 12G 9460-8i RAID controller is a PCI controller with a 2GB cache and supercap cache.
	
	 ■ Ordering the UCSC-SAS9460-8i requires the Auxilary drive module as the SuperCap is required. The SuperCap requires the diffuser and in turn the diffuser requires the Auxilary drive module.
	
	 External drives:
	
	 ■ Cisco 12G 9400-8e SAS HBA
	   • Supports external JBOD attach
	   • Plugs into an appropriate riser slot
	   • No RAID support

RAID backup	The system supports up to two supercap power modules (SCPMs): ■ Front-loading drive bay controller (UCSC-RAID-M5H)—the SCPM mounting bracket is on the chassis wall near the front RAID controller socket. ■ Auxiliary drive module controller (UCSC-SAS9460-8i)—the SCPM mounting bracket is on the auxiliary drive module.
DVD drive option	Front-loading drive bay 3 can optionally be replaced with a DVD drive module.

Table 1   Capabilities and Features *(continued)*

Capability/Feature	Description

Internal storage devices	The server can hold up to 32 2.5-inch drives:
	
	 ■ Front drive bays are divided across three removable drive bay modules. Each drive bay module has 8 drive bays for a total of 24 front-loading drive bays.
	
	   • All 24 front drive bays support SAS/SATA drives.
	
	   • Each of the three drive bay modules has four bays that support NVMe SSDs as well as SAS/SATA drives, for a total of 12 bays that support NVMe SSDs.
	
	 ■ One auxiliary top (rear) drive bay supports a a total of 8 top-loading drive bays. See *CHOOSE DRIVE MODULES and DRIVES (OPTIONAL) on page 24* for details.
	
	 SAS and SATA drives are hot-swappable[1]; PCIe drives are hot-pluggable[2]

Internal removable media	■ A mini-storage module connector on the motherboard supports either:
	
	   • An SD card module with two SD card slots. Mixing different capacity (32, 64, or 128 GB) SD cards is not supported, or
	
	   • An M.2 module with two SATA M.2 SSD slots. Mixing different capacity (240 or 960 GB) M.2 modules is not supported.
	
	 NOTE: SD cards and M.2 SSDs cannot be mixed. See details for RAID functionality in the *ORDER SECURE DIGITAL CARDS or M.2 DEVICES (OPTIONAL)* section.
	
	 ■ One USB 2.0 port on the chassis motherboard.

ACPI	This server supports the advanced configuration and power interface (ACPI) 4.0 standard.
Video	■ Resolution up to 1600 x1200, 16 bpp at 60 Hz. Up to 256 MB of video memory.

Interfaces	■ Rear panel
	
	   • One 10/100/1000 dedicated management Ethernet port
	
	   • Two 10 Base-T Gbps Ethernet ports
	
	   • One RS-232 serial port (DB-9 connector)
	
	   • One VGA video port (DB-15 connector)
	
	   • Three USB 3.0 connectors
	
	 ■ Front panel
	
	   • One KVM connector (used with the included KVM cable, which provides two USB, one VGA, and one serial connector)

Table 1   Capabilities and Features *(continued)*

Capability/Feature	Description
Power subsystem	■ Power supplies are hot-swappable and rear-accessible. They default to redundant as 2+2 (or 1+1 for servers with only two power supplies), but may be changed to 3+1 via the Cisco Integrated Management Controller. Set Chassis->Sensors->Power Supply->Redundancy Policy to N+1. The recommendation is to connect PSU-1 and -2 to one feed and PSU-3 and -4 to another in the case of N+N. ■ 1600 W AC power supply For more information about your server's power consumption, use the power calculator accessible at http://ucspowercalc.cisco.com
Fans	Chassis: ■ 4 fans modules with 2 fans each, hot-swappable Power supply: ■ Each power supply is equipped with a fan.
Baseboard management	Cisco Integrated Management Controller (Cisco IMC) firmware. Depending on your settings, the Cisco IMC can be accessed through the 10/100/1000 dedicated management ports, the 10 GBase-T LOM ports, or a Cisco virtual interface card.
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.

Notes:

1. Hot-swappable = No preconditioning of the component is required before removal while the server is powered on.
2. Hot-pluggable = The component must be shut down in the operating system before removal while the server is powered on.

CONFIGURING the SERVER

Follow these steps to configure the Cisco UCS C480 M5 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 C480 M5 Rack Server

Product ID (PID)	Description
UCSC-C480-M5	UCS C480 M5 standard base chassis w/o CPU, mem, HDD, PCIe, PSU

The base server:

- Includes:

    — Blanking panels for empty drive locations (to maintain cooling air flow)

    — Rail kit

- Does not include:

    — CPUs

    — DIMMs

    — Intel® Optane™ Persistent Memory (PMEMs)

    — Power supplies

    — 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:

■ 2nd Generation Intel® Xeon® scalable processor family CPUs.

■ Intel C621 series chipset

■ Up to 28 cores per processor, for a total of up to 112 cores per server

> **NOTE:**
>
> The CPUs designated as Ix2xx are 2nd Generation Intel® Xeon® scalable processor family CPUs.

Select one or two CPU Modules and two CPUs per module

Product ID (PID)	Description
UCSC-C480-CM	UCS C480 M5 CPU Module w/o CPU, mem

The available CPUs are listed in *Table 3*.

Table 3 Available Intel CPUs

Product ID (PID)	Clock Freq (GHz)	Power (W)	Cache Size (MB)	Cores	UPI[1] Links (GT/s)	Highest DDR4 DIMM Clock Support (MHz)[2]	Workload/ Processor Type
Cisco Recommended Processors[3] (2nd Generation Intel® Xeon® Processors)							
UCS-CPU-I8276	2.2	165	38.50	28	3 x 10.4	2933	Oracle, SAP
UCS-CPU-I8260	2.4	165	35.75	24	3 x 10.4	2933	Microsoft Azure Stack
UCS-CPU-I6262V	1.9	135	33.00	24	3 x 10.4	2400	Virtual Server infrastructure or VSI
UCS-CPU-I6248	2.5	150	27.50	20	3 x 10.4	2933	VDI, Oracle, SQL, Microsoft Azure Stack
UCS-CPU-I6238	2.1	140	30.25	22	3 x 10.4	2933	SAP
UCS-CPU-I6234	3.3	130	24.75	8	3 x 10.4	2933	Oracle, SAP
UCS-CPU-I6230	2.1	125	27.50	20	3 x 10.4	2933	Big Data, Virtualization
UCS-CPU-I5220	2.2	125	24.75	18	2 x 10.4	2666	HCI
UCS-CPU-I5218	2.3	125	22.00	16	2 x 10.4	2666	Virtualization, Microsoft Azure Stack, Splunk, Data Protection
8000 Series Processor							
UCS-CPU-I8280L	2.7	205	38.50	28	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I8280	2.7	205	38.50	28	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I8276L	2.2	165	38.50	28	3 x 10.4	2933	2nd Gen Intel® Xeon®

Table 3   Available Intel CPUs *(continued)*

Product ID (PID)	Clock Freq (GHz)	Power (W)	Cache Size (MB)	Cores	UPI[1] Links (GT/s)	Highest DDR4 DIMM Clock Support (MHz)[2]	Workload/ Processor Type
UCS-CPU-I8276	2.2	165	38.50	28	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I8270	2.7	205	35.75	26	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I8268	2.9	205	35.75	24	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I8260Y	2.4	165	35.75	24/20 /16	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I8260L	2.3	165	35.75	24	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I8260	2.4	165	35.75	24	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I8253	2.2	125	33.00	16	3 x 10.4	2933	2nd Gen Intel® Xeon®
6000 Series Processor							
UCS-CPU-I6262V	1.9	135	33.00	24	3 x 10.4	2400	2nd Gen Intel® Xeon®
UCS-CPU-I6254	3.1	200	24.75	18	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6252N	2.3	150	35.75	24	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6252	2.1	150	35.75	24	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6248	2.5	150	27.50	20	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6246	3.3	165	24.75	12	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6244	3.6	150	24.75	8	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6242	2.8	150	22.00	16	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6240Y	2.6	150	24.75	18/14 /8	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6240L	2.6	150	24.75	18	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6240	2.6	150	24.75	18	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6238L	2.1	140	30.25	22	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6238	2.1	140	30.25	22	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6234	3.3	130	24.75	8	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6230	2.1	125	27.50	20	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6226	2.7	125	19.25	12	3 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I6222V	1.8	115	27.50	20	3 x 10.4	2400	2nd Gen Intel® Xeon®
5000 Series Processor							
UCS-CPU-I5222	3.8	105	16.50	4	2 x 10.4	2933	2nd Gen Intel® Xeon®
UCS-CPU-I5220	2.2	125	24.75	18	2 x 10.4	2666	2nd Gen Intel® Xeon®
UCS-CPU-I5220S	2.6	125	19.25	18	2 x 10.4	2666	2nd Gen Intel® Xeon®
UCS-CPU-I5218	2.3	125	22.00	16	2 x 10.4	2666	2nd Gen Intel® Xeon®
UCS-CPU-I5217	3.0	85	11.00	8	2 x 10.4	2666	2nd Gen Intel® Xeon®
UCS-CPU-I5215L	2.5	85	13.75	10	2 x 10.4	2666	2nd Gen Intel® Xeon®
UCS-CPU-I5215	2.5	85	13.75	10	2 x 10.4	2666	2nd Gen Intel® Xeon®

Notes:

1. UPI = Ultra Path Interconnect.
2. 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.
3. For details on memory support for processor classes and CPU modes, see *Memory Support for CPU Classes and CPU Modes on page 75*.
4. For 2nd Generation Intel® Xeon® Scalable Processor, UCSM 4.0(4b) software release is required.

Approved Configurations

(1) Two-CPU Configuration

■ Choose two identical CPUs from any one of the rows of *Table 3 on page 13*. CPUs 1 and 2 will be populated. In this case, you must also choose one CPU module (UCSC-C480-CM).

(2) Four-CPU Configuration

■ Choose four identical CPUs from any one of the rows of *Table 3 on page 13*. CPUs 1, 2, 3, and 4 will be populated. In this case, you must also choose two CPU modules (UCSC-C480-CM).

Caveats

— You must select one or two CPU modules with two identical processors per CPU module.

— For 2-CPU systems (one CPU module), only 24 DIMM slots are functional

 • 2 DIMMs per channel

 • The CPU module has channels A - F for CPU1 and G - M for CPU2)

— For 4-CPU systems (two CPU modules), all 48 DIMM slots are functional

 • 2 DIMMs per channel

 • CPU module 1 has channels A - F for CPU1 and G - M for CPU2

 • CPU module 2 has channels A - F for CPU3 and G - M for CPU4.

NOTE: See *CHOOSE MEMORY on page 16* for details on the compatibility of CPUs and DIMM speeds.

STEP 3   CHOOSE MEMORY

The available memory for the C480 M5 is as follows:

- Clock speed: 2933MHz

- Ranks per DIMM: 1, 2, 4, or 8

- Operational voltage: 1.2 V

- Registered ECC DDR4 DIMMS (RDIMMs), Load-reduced DIMMs (LRDIMMs), through-silicon via DIMMs (TSV DIMMs), or Intel® Optane™ Persistent Memory (PMEMs).

- New purchases with 2nd Generation Intel Scalable CPUs need to be configured with 2933-MHz DIMMs.

Memory is organized with six memory channels per CPU, with up to two DIMMs per channel, as shown in *Figure 4*.

Figure 4   C480 M5 Memory Organization
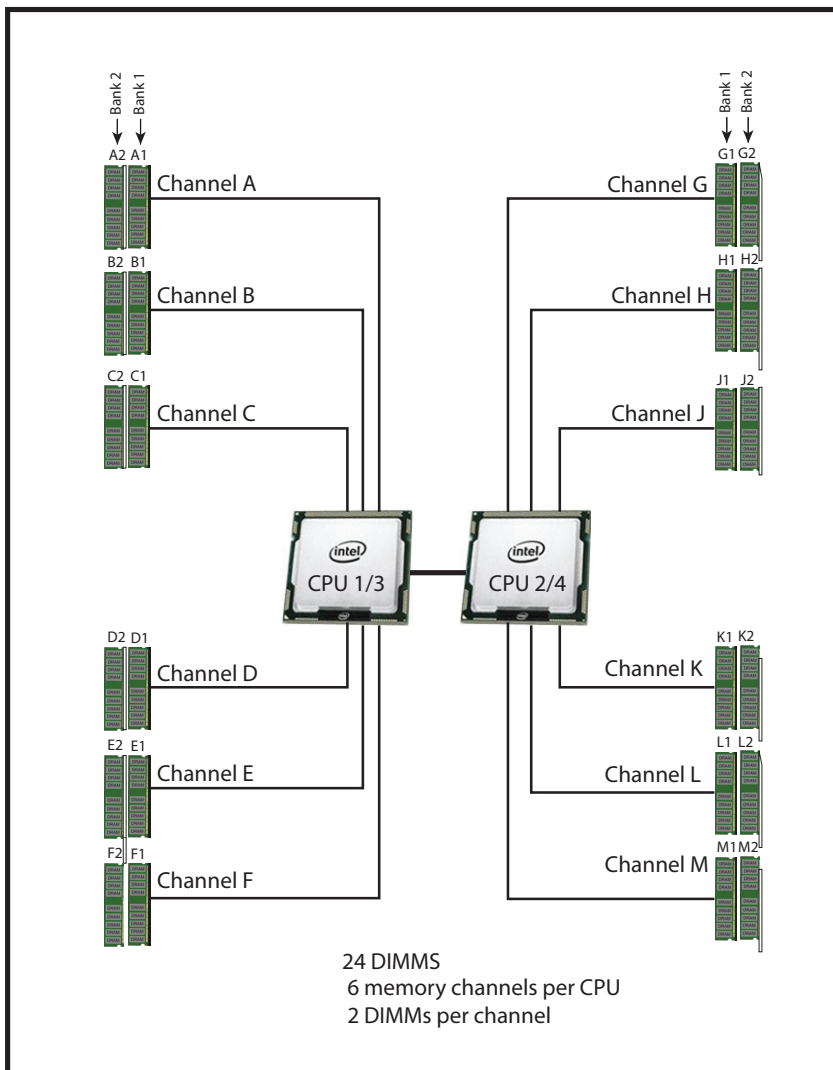
Select DIMMs and Memory Mirroring

Select the memory configuration and whether or not you want the memory mirroring option. The supported memory DIMMs and the mirroring option are listed in *Table 4*.

Table 4 Available DDR4 DIMMs

Product ID (PID)	PID Description	Voltage	Ranks /DIMM
2933-MHz DIMMs			
UCS-ML-256G8RT-H	256 GB DDR4-2933-MHz LRDIMM/8Rx4/1.2v	1.2 V	8
UCS-ML-128G4RT-H	128 GB DDR4-2933-MHz LRDIMM/4Rx4 (16Gb) 1.2v	1.2 V	4
UCS-ML-X64G4RT-H	64 GB DDR4-2933-MHz LRDIMM/4Rx4 (8Gb) 1.2v	1.2 V	4
UCS-MR-X64G2RT-H	64 GB DDR4-2933-MHz RDIMM/2Rx4 (16Gb) 1.2v	1.2 V	2
UCS-MR-X32G2RT-H	32GB DDR4-2933-MHz RDIMM/2Rx4 (8Gb) 1.2v	1.2 V	2
UCS-MR-X16G1RT-H	16 GB DDR4-2933-MHz RDIMM/1Rx4 (8Gb) 1.2v	1.2 V	1
Intel® Optane™ Persistent Memory Product			
UCS-MP-128GS-A0	Intel® Optane™ Persistent Memory, 128GB, 2666MHz		
UCS-MP-256GS-A0	Intel® Optane™ Persistent Memory, 256GB, 2666MHz		
UCS-MP-512GS-A0	Intel® Optane™ Persistent Memory, 512GB, 2666MHz		
Intel® Optane™ Persistent Memory Product Operational Modes			
UCS-DCPMM-AD	App Direct Mode		
UCS-DCPMM-MM	Memory Mode		
Memory Mirroring Option			
N01-MMIRROR	Memory mirroring option		

> **NOTE:**
>
> ■ Based on the Intel tech spec, the below DIMMs be used with the 1st Generation Intel® Xeon® scalable processor family CPUs and the 2nd Generation Intel® Xeon® scalable processor family CPUs
>
> UCS-MR-X16G1RT-H
> UCS-MR-X32G2RT-H
> UCS-ML-X64G4RT-H
>
> ■ Based on the Intel tech spec, the below DIMMs can be used only with 2nd Generation Intel® Xeon® scalable processor family CPUs, not with Intel® Xeon® scalable processor family CPUs.
>
> UCS-ML-256G8RT-H
> UCS-ML-128G4RT-H
> UCS-MR-X64G2RT-H

DIMM Memory Mirroring

When memory mirroring is enabled, the memory subsystem simultaneously writes identical data to two adjacent 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.

CPU Configuration Without Memory Mirroring

Select from 4, 6, 8, or 12 DIMMs per CPU (DIMMs for all four CPUs must be configured identically). The DIMMs will be placed in each CPU module by the factory as shown in the following tables.

#DIMMs	CPU 1/3 DIMM Placement in Channels (for identically ranked DIMMs)
4	(A1, B1); (D1, E1)
6	(A1, B1, C1); (D1, E1, F1)
8	(A1, A2, B1, B2); (D1, D2, E1, E2)
12	(A1, A2, B1, B2, C1, C2); (D1, D2, E1, E2, F1, F2)

#DIMMs	CPU 2/4 DIMM Placement in Channels (for identically ranked DIMMs)
4	(G1, H1); (K1, L1)
6	(G1, H1, J1); (K1, L1, M1)
8	(G1, G2, H1, H2); (K1, K2, L1, L2)
12	(G1, G2, H1, H2, J1, J2); (K1, K2, L1, L2, M1, M2)

CPU Configuration With Memory Mirroring

Select from 4, 6, 8, or 12 DIMMs per CPU (DIMMs for all four CPUs must be configured identically). In addition, the memory mirroring option (N01-MMIRROR) as shown in *Table 4 on page 17* must be selected.

The DIMMs will be placed by the factory as shown in the following tables.

#DIMMs	CPU 1/3 DIMM Placement in Channels (for identical ranked DIMMs)	CPU 2/4 DIMM Placement in Channels (for identical ranked DIMMs)
	CPU 1	CPU 2
8	(A1,B1); (D1,E1)	(G1, H1); (K1, L1)
12	(A1, B1, C1); (D1, E1, F1)	(G1, H1, J1); (K1, L1, M1)
16	(A1, A2, B1, B2); (D1, D2, E1, E2)	(G1, G2, H1, H2); (K1, K2, L1, L2)
24	(A1, A2, B1, B2, C1, C2); (D1, D2, E1, E2, F1, F2)	(G1, G2, H1, H2, J1, J2); (K1, K2, L1, L2, M1, M2)

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

System Speeds

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

Table 5 2666-MHz DIMM Memory Speeds with Different Intel® Xeon® Scalable Processors

DIMM and CPU Frequencies (MHz)	DPC	TSV-RDIMM (8Rx4) - 128 GB (MHz)	TSV-RDIMM (4Rx4) - 64 GB (MHz)	LRDIMM (4Rx4) - 64 GB (MHz)	RDIMM (2Rx4) - 32 GB (MHz)	LRDIMM (2Rx4) - 32 GB (MHz)
		1.2 V	1.2 V	1.2 V	1.2 V	1.2 V
DIMM = 2666 CPU = 2666	1DPC	2666	2666	2666	2666	2666
	2DPC	2666	2666	2666	2666	2666
DIMM = 2666 CPU = 2400	1DPC	2400	2400	2400	2400	2400
	2DPC	2400	2400	2400	2400	2400
DIMM = 2666 CPU = 2133	1DPC	2133	2133	2133	2133	2133
	2DPC	2133	2133	2133	2133	2133

Table 6 2933-MHz DIMM Memory Speeds with Different 2ⁿᵈ Generation Intel®Xeon® Scalable Processors

DIMM and CPU Frequencies (MHz)	DPC	LRDIMM (4Rx4)- 128 GB (MHz)	LRDIMM (4Rx4) - 64 GB (MHz)	RDIMM (2Rx4) - 64 GB (MHz)	RDIMM (2Rx4) - 32 GB (MHz)
		1.2 V	1.2 V	1.2 V	1.2 V
DIMM = 2933 CPU = 2933	1DPC	2933	2933	2933	2933
	2DPC	2933	2933	2933	2933
DIMM = 2933 CPU = 2666	1DPC	2666	2666	2666	2666
	2DPC	2666	2666	2666	2666
DIMM = 2933 CPU = 2400	1DPC	2400	2400	2400	2400
	2DPC	2400	2400	2400	2400
DIMM = 2933 CPU = 2133	1DPC	2133	2133	2133	2133
	2DPC	2133	2133	2133	2133

Memory Configurations and Modes

DIMM Guidelines

- System speed is dependent on the CPU DIMM speed support. Refer to *Table 4 on page 17* for DIMM Speeds
- The C480 M5 server supports four different memory reliability, availability, and serviceability (RAS) modes:
    - Independent Channel Mode
    - Mirrored Channel Mode
    - Lockstep Channel Mode
    - Rank Sparing Mode

> **NOTE:** Mixing of Non-Mirrored and Mirrored mode is not allowed.

- Do not mix RDIMMs, LRDIMMs, and TSV-RDIMMs.
- Single-rank DIMMs can be mixed with dual-rank DIMMs in the same channel
- For best performance, observe the following:
    - DIMMs with different timing parameters can be installed on different slots within the same channel, but only timings that support the slowest DIMM will be applied to all. As a consequence, faster DIMMs will be operated at timings supported by the slowest DIMM populated.

- When one DIMM is used, it must be populated in DIMM slot 1 (farthest away from the CPU) of a given channel.

- When single or dual rank DIMMs are populated for 2DPC, always populate the higher number rank DIMM first (starting from the farthest slot). For a 2DPC example, first populate with dual rank DIMMs in the DIMM slot 1. Then single-rank DIMMs in the DIMM 2 slot.

■ DIMMs for all four CPUs must always be configured identically.

■ Cisco memory from previous generation servers (DDR3 and DDR4) is not compatible with UCS C480 M5 server.

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

■ Memory can be configured in any number of DIMMs as pairs, though for optimal performance, refer to the C480 Memory Guide at Cisco.com.

PMEM Guidelines

■ PMEMs require second generation Intel Xeon Scalable Family processors. First generation Xeon Scalable processors do not support PMEMs.

■ All installed PMEMs must be the same size. Mixing PMEMs of different capacities is not supported.

■ The use of 1Rx8 DIMMs with PMEMs is not supported.

■ PMEMs and DIMMs must be populated as shown in *Table 7* (6 DIMMs per CPU with 2, 4, or 6 PMEMs per CPU, as shown).

Table 7   2nd Generation Intel® Xeon® Scalable Processor DIMM and PMEM[1] Physical Configurations (quad socket)

DIMM to PMEM Count	CPU 1/3											
	iMC1						iMC0					
	Channel 2		Channel 1		Channel 0		Channel 2		Channel 1		Channel 0	
	F2	F1	E2	E1	D2	D1	C2	C1	B2	B1	A2	A1
6 to 2		DIMM		DIMM	PMEM	DIMM		DIMM		DIMM	PMEM	DIMM
6 to 4		DIMM	PMEM	DIMM	PMEM	DIMM		DIMM	PMEM	DIMM	PMEM	DIMM
6 to 6	PMEM	DIMM	PMEM	DIMM	PMEM	DIMM	PMEM	DIMM	PMEM	DIMM	PMEM	DIMM
DIMM to PMEM Count	CPU 2/4											
	iMC1						iMC0					
	Channel 2		Channel 1		Channel 0		Channel 2		Channel 1		Channel 0	
	M2	M1	L2	L1	K2	K1	J2	J1	H2	H1	G2	G1
6 to 2		DIMM		DIMM	PMEM	DIMM		DIMM		DIMM	PMEM	DIMM
6 to 4		DIMM	PMEM	DIMM	PMEM	DIMM		DIMM	PMEM	DIMM	PMEM	DIMM
6 to 6	PMEM	DIMM	PMEM	DIMM	PMEM	DIMM	PMEM	DIMM	PMEM	DIMM	PMEM	DIMM

Notes:

1. All systems must be fully populated with four CPUs when using PMEMs at this time.

■ Two CPUs must be installed in each CPU module when using PMEMs.

■ For Memory Mode, install a minimum 2 PMEMs and 6 DIMMs per CPU

■ For App Direct Mode, install a minimum 2 PMEMs and 6 DIMMs per CPU

■ When either Memory Mode or Mixed Mode is used, the ratio of DIMM capacity to PMEM capacity per CPU must be between 1:2 and 1:16, and the recommended ratio is 1:6 for the best performance. For example, 6x 16GB DIMMs + 2x 256GB PMEMs is a ratio of 1:5.33 (96GB:512GB). In Mixed Mode, the ratio is between memory and only the volatile portion of the PMEMs. This ratio requirement does not apply to App Direct mode. See *Table 8* for PMEM memory modes.

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Table 8   Intel® Optane™ Persistent Memory Modes

Intel® Persistent Memory Modes	
App Direct Mode:	PMEM operates as a solid-state disk storage device. Data is saved and is non-volatile. Both PMEM and DIMM capacity counts towards CPU tiering (both PMEM and DIMM capacities count towards the CPU capacity limit)
Memory Mode:[1]	PMEM operates as a 100% memory module. Data is volatile and DRAM acts as a cache for PMEMs. Only PMEM capacity counts towards CPU tiering (only the PMEM capacity counts towards the CPU capacity limit). This is the factory default mode.
Mix Mode:	DRAM as cache. Only PMEM capacity counts towards CPU tiering (only the PMEM capacity counts towards the CPU capacity limit).

Notes:

1. For Memory Mode, the Intel-recommended DIMM to PMEM capacity ratio in the same CPU socket is from 1:2 to 1:16.

■ For each memory channel with both a PMEM and a DIMM installed, the PMEM is installed in channel slot 2 (closest) and the DIMM is installed in channel slot 1.

■ To maximize performance, balance all memory channels

■ In configurations with PMEMs installed, memory mirroring is supported, with two restrictions:

■ Mirroring is only enabled on the DIMMs installed in the server; The PMEMs themselves do not support mirroring.

■ Only App Direct mode is supported. Memory mirroring cannot be enabled when PMEMs are in Memory Mode or Mixed Mode.

■ Memory sparing is not supported with PMEMs installed

For detailed Intel PMEM configurations, refer to the following link:

https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/c/hw/C480M5/install/C480M5/C480M5_chapter_011.html?bookSearch=true#concept_b1k_mbt_tgb

For detailed DIMM/PMEM informations, refer to

Cisco UCS C480 M5 Memory Guide

STEP 4   CHOOSE DRIVE MODULES and DRIVES (OPTIONAL)

Choose Drive Modules

You can choose the following drive modules:

- Up to three UCSC-C480-8HDD drive modules. Each drive module is a front-mounting drive cage that accommodates 8 drives as follows:

    — Up to 8 SAS/SATA HDDs or SSDs per module, or

    — Up to 4 SAS/SATA HDDs or SSDs and up to 4 NVMe drives per drive module (NVMe drives are restricted to the first two and last two slots) per module

- Up to three UCSC-C480-8NVME drive modules. Each drive module is a front-mounting drive cage accommodating up to 8 drives each as follows:

    — The NVMe drive modules can only be ordered in a quantity of 3. The NVMe drive modules can only support NVMe drives; HDD drives are not allowed. Up to 24 NVMe drives can be used with NVMe drive modules.

    — By contrast, 3 HDD drive modules (see first main bullet) can hold up to 3x8 HDD drives, 3x4 NVMe drives (in the designated 2 leftmost and 2 rightmost cage slots only), or any combination of 24. The only restriction is that NVMe drives must ONLY be in designated slots. Otherwise an HDD drive can be used in any slot.

- Auxiliary Drive Module for 8 drives. This is a top (rear) mounting drive cage that accommodates 8 drives as follows:

    — If front facing cages are UCSC-C480-8HDD, up to 8 SAS/SATA HDDs or SSDs

    — If front facing cages are UCSC-C480-8NVME, up to 8 NVMe drives

    — NVMe drives cannot be mixed with HDD or SSD in the auxiliary drive module

    — Add an auxiliary drive module after the front facing drive slots are filled

- C480 M5 requires 2 CPU modules (supporting total of 4 CPUs) if any NVMe drives are to be used in HDD or NVMe drive modules.

The available drive modules are listed in *Table 9*.

Table 9   Available Drive Modules and Cable

Product ID (PID)	PID Description
Drive Modules	
UCSC-C480-8HDD	UCS C480 M5 Drive Module for 8x HDD (standard cage front facing)
UCSC-C480-8NVME	UCS C480 M5 Drive Module for 8x NVMe drives (front facing cage)
UCSC-C480-8AUX	UCS C480 M5 Auxiliary Drive Module for 8x rear drives
Drive Cable	
CBL-AUX-NVME-M5	UCS C480 M5 AUX Drive NVME Cable
CBL-AUX-SAS-M5	UCS C480 M5 AUX Drive SAS Cable

Approved Configurations

- For the UCSC-C480-8HDD drive module, the NVMe drives are restricted to the first two and last two slots per module.

- The UCSC-C480-8NVME drive module requires two CPU modules (4 CPUs total).

- At initial release, no NVMe drives are allowed in the system if the auxiliary drive cage is used with SAS/SATA drives.

- Field upgrade of a system with UCSC-C480-8HDD to use UCSC-C480-8NVME instead (or vice versa) is not currently supported.

Choose HDDS and SSDs

The standard hard disk drive (HDD) and solid-state drive (SSD) features are:

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

The available drives are listed in *Table 10*, *Table 12 on page 33*, and *Table 13 on page 35*.

Table 10 Supported Drives

Product ID (PID)	PID Description	Drive Type	Capacity
HDDs			
HDDs (15K RPM)			
UCS-HD300G15K12N	300 GB 12G SAS 15K RPM SFF HDD	SAS	300 GB
UCS-HD600G15K12N	600 GB 12G SAS 15K RPM SFF HDD	SAS	600 GB
UCS-HD900G15K12N	900 GB 12G SAS 15K RPM SFF HDD	SAS	900 GB
HDDs (10K RPM)			
UCS-HD300G10K12N	300 GB 12G SAS 10K RPM SFF HDD	SAS	300 GB
UCS-HD600G10K12N	600 GB 12G SAS 10K RPM SFF HDD	SAS	600 GB
UCS-HD12TB10K12N	1.2 TB 12G SAS 10K RPM SFF HDD	SAS	1.2 TB
UCS-HD18TB10K4KN	1.8 TB 12G SAS 10K RPM SFF HDD (4K)	SAS	1.8 TB
UCS-HD24TB10K4KN	2.4 TB 12G SAS 10K RPM SFF HDD (4K)	SAS	2.4 TB
HDDs (7K RPM)			
UCS-HD1T7K12N	1.0 TB 12G SAS 7.2K RPM SFF HDD	SAS	1.0 TB
UCS-HD2T7K12N	2.0 TB 12G SAS 7.2K RPM SFF HDD	SAS	2.0 TB

Table 10 Supported Drives

Product ID (PID)	PID Description	Drive Type	Capacity
SAS/SATA SSDs			
Enterprise Performance SSDs (High endurance, supports up to 10X or 3X DWPD (drive writes per day))			
SAS SSDs			
UCS-SD800G123X-EP	800 GB 2.5 inch Enterprise performance 12G SAS SSD(3X endurance)	SAS	800 GB
UCS-SD16H123X-EP	1.6 TB 2.5 inch Enterprise performance 12G SAS SSD(3X endurance)	SAS	1.6 TB
SATA SSDs			
UCS-SD480G63X-EP	480 GB 2.5in Enterprise performance 6G SATA SSD(3X endurance) (IntelS4600/S4610)	SATA	480 GB
UCS-SD960G63X-EP	960 GB 2.5in Enterprise performance 6G SATA SSD(3X endurance) (IntelS4600/S4610)	SATA	960 GB
UCS-SD19T63X-EP	1.9 TB 2.5in Enterprise performance 6G SATA SSD(3X endurance) (IntelS4600/S4610)	SATA	1.9 TB
UCS-SD19TM3X-EP	1.9 TB 2.5in Enterprise performance 6GSATA SSD(3X endurance)	SATA	1.9 TB
UCS-SD480GM3X-EP	480 GB 2.5in Enterprise Performance 6GSATA SSD(3X endurance)	SATA	480 GB
UCS-SD960GM3X-EP	960 GB 2.5in Enterprise performance 6GSATA SSD(3X endurance)	SATA	960 GB
Enterprise Value SSDs (Low endurance, supports up to 1X DWPD (drive writes per day))			
SAS SSDs			
UCS-SD480G121X-EV	480 GB 2.5 inch Enterprise Value 12G SAS SSD (Toshiba PM4)	SAS	480 GB
UCS-SD960GK1X-EV	960GB 2.5 inch Enterprise Value 12G SAS SSD	SAS	960 GB
UCS-SD19TK1X-EV	1.9TB 2.5 inch Enterprise Value 12G SAS SSD	SAS	1.9 TB
UCS-SD38TK1X-EV	3.8TB 2.5 inch Enterprise Value 12G SAS SSD	SAS	3.8 TB
UCS-SD76TK1X-EV	7.6TB 2.5 inch Enterprise Value 12G SAS SSD	SAS	7.6 TB
UCS-SD15TK1X-EV	15.3TB 2.5 inch Enterprise Value 12G SAS SSD	SAS	15.3 TB
SATA SSDs			
UCS-SD150G61X-EV	150 GB 2.5 inch Enterprise Value 6G SATA SSD (Intel S3520)	SATA	150 GB
UCS-SD480G61X-EV	480 GB 2.5 inch Enterprise Value 6G SATA SSD (Intel S3520)	SATA	480 GB
UCS-SD960G61X-EV	960 GB 2.5 inch Enterprise Value 6G SATA SSD (Samsung PM863A/PM883)	SATA	960 GB
UCS-SD19T61X-EV	1.9 TB 2.5 inch Enterprise Value 6G SATA SSD (Samsung PM863A/PM883)	SATA	1.9 TB
UCS-SD38T61X-EV	3.8 TB 2.5 inch Enterprise Value 6G SATA SSD (Samsung PM863A/PM883)	SATA	3.8 TB
UCS-SD120GM1X-EV	120 GB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	120 GB
UCS-SD240GM1X-EV	240 GB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	240 GB
UCS-SD480GM1X-EV	480 GB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	480 GB
UCS-SD960GM1X-EV	960 GB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	960 GB

Table 10 Supported Drives

Product ID (PID)	PID Description	Drive Type	Capacity
UCS-SD16TM1X-EV	1.6 TB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	1.6 TB
UCS-SD19TM1X-EV	1.9 TB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	1.9 TB
UCS-SD38TM1X-EV	3.8 TB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	3.8 TB
UCS-SD76T61X-EV	7.6TB 2.5 inch Enterprise Value 6G SATA SSD (Samsung 883)	SATA	7.6 TB
UCS-SD76TM1X-EV	7.6 TB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	7.6 TB
UCS-SD480G6I1X-EV	480 GB 2.5 inch Enterprise Value 6G SATA SSD (Intel S4500/S4150)	SATA	480 GB
UCS-SD960G6I1X-EV	960 GB 2.5 inch Enterprise Value 6G SATA SSD (Intel S4500/S4150)	SATA	960 GB
UCS-SD38T6I1X-EV	3.8 TB 2.5 inch Enterprise Value 6G SATA SSD (Intel S4500/S4150)	SATA	3.8 TB
Self-Encrypted Drives (SED)			
UCS-HD24T10NK9	2.4 TB 12G SAS 10K RPM SFF HDD (4K) SED	SAS	2.4 TB
UCS-HD18T10NK9	1.8TB 12G SAS 10K RPM SFF HDD (4K format, SED)	SAS	1.8 TB
UCS-HD12T10NK9	1.2TB 12G SAS 10K RPM SFF HDD (SED)	SAS	1.2 TB
UCS-HD600G15NK9	600GB 12G SAS 15K RPM SFF HDD (SED)	SAS	600 GB
UCS-SD960GBM2NK9	960GB Enterprise value SATA SSD (1X, SED)	SATA	960 GB
UCS-SD38TBEM2NK9	3.8TB Enterprise value SATA SSD (1X, SED)	SATA	3.8 TB
UCS-SD76TBEM2NK9	7.6TB Enterprise value SATA SSD (1X, SED)	SATA	7.6 TB
UCS-SD800GBKNK9	800GB Enterprise Performance SAS SSD (3X FWPD, SED)	SAS	800 GB
UCS-SD960GBKNK9	960GB Enterprise Value SAS SSD (1X FWPD, SED)	SAS	960 GB
UCS-SD38TBKNK9	3.8TB Enterprise Value SAS SSD (1X FWPD, SED)	SAS	3.8 TB
UCS-SD16TBKNK9	1.6TB Enterprise performance SAS SSD (3X FWPD, SED)	SAS	1.6 TB
PCIe/NVMe			
UCSC-NVMEHW-H800	U.2 800 GB HGST SN200 NVMe High Perf. High Endurance (HGST)	NVMe	800 GB
UCSC-NVMEHW-H1600	U.2 1.6 TB HGST SN200 NVMe High Perf. High Endurance (HGST)	NVMe	1.6 TB
UCSC-NVMEHW-H6400	U.2 6.4 TB HGST SN200 NVMe High Perf. High Endurance (HGST)	NVMe	6.4 TB
UCSC-NVMEHW-H7680	U.2 7.7 TB HGST SN200 NVMe High Perf. Value Endurance (HGST)	NVMe	7.7 TB
UCSC-NVME2H-I2TBV	Cisco 2.5" U.2 2.0TB Intel P4510 NVMe High Perf. Value Enduranc	NVMe	2.0 TB
UCSC-NVMEHW-I8000	Cisco 2.5" U.2 8TB Intel P4510 NVMe High Perf. Value Endurance	NVMe	8.0 TB
UCSC-NVME2H-I1000	Cisco 2.5" U.2 1.0TB Intel P4510 NVMe High Perf.Value Endur	NVMe	1.0 TB
UCSC-NVME2H-I1600	Cisco 2.5" U.2 1.6TB Intel P4610 NVMe High Perf.High Endurance	NVMe	1.6 TB
UCSC-NVME2H-I3200	Cisco 2.5" U.2 3.2TB Intel P4610 NVMe High Perf. High Endurance	NVMe	3.2 TB
UCSC-NVME2H-I4000	Cisco 2.5" U.2 4.0TB Intel P4510 NVMe High Perf. Value Endu	NVMe	4.0 T**B**
UCS-NVMEM6-W1600	1.6TB 2.5in U.2 WD SN840 NVMe Extreme Perf. High Endurance	NVMe	1.6 TB
UCS-NVMEM6-W3200	3.2TB 2.5in U.2 WD SN840 NVMe Extreme Perf. High Endurance	NVMe	3.2 TB

Table 10 Supported Drives

Product ID (PID)	PID Description	Drive Type	Capacity
UCS-NVMEM6-W6400	6.4TB 2.5in U.2 WD SN840 NVMe Extreme Perf. High Endurance	NVMe	6.4 TB
UCS-NVMEM6-W7680	7.6TB 2.5in U.2 WD SN840 NVMe Extreme Perf. Value Endurance	NVMe	7.6 TB
UCS-NVMEM6-W15300	15.3TB 2.5in U.2 WD SN840 NVMe Extreme Perf. High Endurance	NVMe	15.3 TB

NOTE:

■ Intel and HGST NVMe drives may NOT be mixed anywhere in a C480 M5.

■ Cisco uses solid state drives from a number of vendors. All solid state drives are subject to physical write limits and have varying maximum usage limitation specifications set by the manufacturer. Cisco will not replace any solid state drives that have exceeded any maximum usage specifications set by Cisco or the manufacturer, as determined solely by Cisco.

Approved Configurations

Many configurations are possible. Some will be shown here.

(1) Three Drive Modules for 8x HDD

■ Option 1: Fill all three drive modules with all SAS/SATA HDDs or SSDs for a total of 24 drives

■ Option 2: Fill one drive module with all SAS/SATA HDDs or SSDs and the other two with four SAS/SATA HDDs/SSDs and four NVMe drives. You will then have 16 SAS/SATA drives and 8 NVMe drives.

■ Option 3: Fill two drive modules with all SAS/SATA drives and the remaining drive module with four SAS/SATA drives and four NVMe drives. You will then have 20 SAS/SATA drives and four NVMe drives.

■ Option 4: Fill each drive module with four SAS/SATA drives and four NVMe drives. You will then have 12 SAS/SATA drives and 12 NVMe drives.

NOTE:

1. All these options require a UCSC-RAID-M5HD RAID controller

2. Supports RAID 0, 1, 5, 6, 10, 50, 60, and JBOD mode. Supports running mixed RAID and JBOD mode.

3. For all self-encrypting drives (SED), standalone Management (CIMC/UCSM) is supported for configuring and managing local keys.

4. SEDs are managed with local key management only. Third-party key management will be supported (KMIP compliant).

Caveats

— You can mix SAS/SATA drives. You can also mix HDD and SSD drives, as long as all the HDDs are in the same RAID volume and all the SSDs are in the same RAID volume.

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

— You can mix SAS/SATA and NVMe drives in the front facing HDD drive module.

(2) Three Drive Modules for 8x NVME

■ Option 1: Fill all three drive modules with NVMe drives for a total of 24 drives. SSDs or HDDs cannot be placed in this module.

(3) Auxiliary Drive Module for 8x Rear Drives
You can install 8 drives in the top rear module with either of the front-facing drive cage options

■ Option 1: Fill the module with up to 8 SAS/SATA drives. This option is available when UCSC-C480-8HDD selected for front-facing cages and there are no NVMe drives anywhere in the server.

> **NOTE:** PCIe slot 11 must be populated with a UCSC-SAS9460-8i Cisco 12G 9460-8i RAID controller with a 2GB cache to control SAS/SATA drives in the auxiliary drive module.

■ Option 2: Fill the module with up to 8 NVMe drives. This option available when UCSC-C480-NVME selected for front-facing cages.

> **NOTE:** PCIe slot 10 must be populated with a UCSC-NVME-SC PCIe NVMe Switch Module to control NVMe drives in the auxiliary drive module.

STEP 5 CHOOSE RAID CONFIGURATION

The C480 M5 server accommodates any one of the following RAID controllers for internal drives:

- Cisco 12G Modular RAID controller with 4GB cache
- Cisco 12G 9460-8i Raid controller with 2GB cache

The C480 M5 server accommodates the following HBA for external drives:

- Cisco 9400-8E 12G SAS HBA (supports JBOD only)

The C480 M5 chassis contains three front drive modules, each housing up to 8 HDD/SSD drives or up to 4 HDD/SSD and up to 4 NVMe drives (24 front facing drives total).

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 11*. Note that RAID levels 50 and 60 are supported on the Cisco 12G SAS Modular 12-port RAID controller, but are not factory configurable.

SSDs and HDDs require a RAID controller.

Choose Drive RAID Controller

Choose one internal RAID controller with a desired RAID configuration option from *Table 11* and, if desired, one external drive RAID controller.

> **NOTE:** NVMe drives in the front drive bays are controlled directly from the PCIe interfaces on the CPUs. NVMe drives in the auxiliary drive bay are controlled with the UCSC-NVME-SC PCIe NVMe Switch Module.

Table 11 Available Internal Drive RAID Options

Product ID (PID)	PID Description
RAID Controllers for Internal Drives	
UCSC-RAID-M5HD	Cisco 12G Modular RAID controller with 4GB cache (RAID 0, 1, 5, 6, 10, 50, 60 supported) ■ Plugs into a dedicated PCIe slot on the server motherboard (see *Figure 6 on page 71*). ■ Supports from 1 to 24 internal SAS or SATA drives. ■ Must be ordered with a UCSC-SCAP-M5 supercap cache backup. ■ Factory-configured RAID options: RAID 0, 1, 5, 6, 10 (see the RAID PIDs section in this table). ■ This RAID controller supports only SAS/SATA drives in the front-facing HDD card cages.

Table 11 Available Internal Drive RAID Options *(continued)*

Product ID (PID)	PID Description
UCSC-SAS9460-8i	Cisco 12G 9460-8i Raid controller with 2 GB cache (RAID 0, 1, 5, 10, 50 supported)
	■ Plugs into PCIe slot 11 to control up to 8 SAS/SATA in the rear auxiliary drive module
	■ Used only when front facing drive cages are UCSC-C480-8HDD
	■ Supports up to 8 SAS or SATA drives
	■ Factory-configured RAID options: RAID 0, 1, 5, 10 (see the RAID PIDs section in this table)
	■ This controller is only required for the top loading eight drives when they are SAS/SATA. Not used if this is an all NVMe system and top-loading drives are NVMe
SAS HBA for External JBOD Attach	
UCSC-9400-8E	Cisco 9400-8E 12G SAS HBA for external JBOD attach
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.
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

■ For Cisco SAS 9400-8e 12G SAS HBA external drive enclosure support, see the enclosure section of the compatibility list at the following link: **https://www.broadcom.com/support/storage/interop-compatibiliy/**

Customers should contact their storage vendor for technical support related to external JBOD enclosures.

Approved Configurations

(1) One RAID controller card for drive module for 8x HDD SAS/SATA drives

■ Choose the UCSC-RAID-M5HD Cisco 12G Modular RAID controller with 4GB cache if you have SAS/SATA drives mounted in any drive module for 8x HDD.

(2) One RAID controller card for rear top facing auxiliary card cage SAS/SATA drives

■ Choose the UCSC-SAS9460-8i Cisco 12G 9460-8i RAID controller with 2 GB cache if you have SAS/SATA drives mounted in the auxiliary drive module. This RAID controller mounts in PCIe slot 11 in a four CPU configuration. This RAID controller mounts in PCIe slot 10 in a two CPU configuration.

> **NOTE:** NVMe drives in either of the front facing cage options are controlled directly from the PCIe interfaces on the CPUs. For NVMe drives in the auxiliary drive bay, use the UCSC-NVME-SC PCIe NVMe Switch Module.

(3) External drive control

■ The Cisco 12G 9400-8e SAS HBA controls external drives and can be installed simultaneously with the Cisco 12G SAS Modular RAID controller card (UCSC-RAID-M5) or Cisco 12 Gbps Modular SAS HBA(UCSC-SAS-M5). A maximum of two Cisco 9400-8e 12G SAS HBAs can be installed.

Caveats

— You can choose an optional RAID configuration for the internal drive SAS/SATA RAID controller (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 (CNAs)
- Network Interface Cards (NICs)
- Accelerators/Smart (NICs)
- Host Bus Adapters (HBAs)
- UCS NVMe/PCIe Add in Cards

Choose PCIe Option Cards

The available PCIe option cards are listed in *Table 12*.

Table 12 Available PCIe Option Cards

Product ID (PID)	PID Description	Form Factor	Electrical Slot
Converged Network Adapters (CNAs)			
UCSC-PCIE-C100-04	Cisco UCS VIC 1495 Dual Port 40/100G QSFP28 CNA PCIe Spare	HHHL	x 16
UCSC-PCIE-C40Q-03	Cisco UCS VIC 1385 Dual Port 40Gb QSFP+ CNA w/RDMA	HHHL	x 16
UCSC-PCIE-C25Q-04	Cisco UCS VIC 1455 Quad Port 10/25G SFP28 CNA PCIE	HHHL	x 16
Network Interface Cards (NICs)			
1 Gb NICs			
UCSC-PCIE-IRJ45	Intel i350 Quad Port 1GBase-T NIC	HHHL	x 8
10 Gb NICs			
N2XX-AIPCI01	Intel X520 Dual Port 10Gb SFP+ NIC	HHHL	x 8
UCSC-PCIE-ID10GC	Intel X550-T2 Dual Port 10GBase-T NIC	HHHL	x 8
UCSC-PCIE-ID10GF	Intel X710-DA2 Dual Port 10Gb SFP+ NIC	HHHL	x 8
UCSC-PCIE-IQ10GF	Intel X710 Quad Port 10Gb SFP+ NIC	HHHL	x 8
UCSC-PCIE-IQ10GC	Intel X710 Quad Port 10GBase-T NIC	HHHL	x 8
25 Gb NICs			
UCSC-PCIE-QD25GF	Qlogic QL41212H Dual Port 25Gb NIC	HHHL	x 8
UCSC-PCIE-ID25GF	Intel XXV710 Dual Port 25Gb SFP28 NIC	HHHL	x 8
UCSC-P-M4D25GF	Mellanox MCX4121A-ACAT dual port 10/25G SFP28 NIC	HHHL	x 8
UCSC-P-M5D25GF	Mellanox CX-5 EN MCX512A-ACAT 2x25/10GbE SFP PCIe NIC	HHHL	x 8
40 Gb NICs			
UCSC-PCIE-QD40GF	Qlogic QL45412H Dual Port 40Gb NIC	HHHL	x 16
UCSC-PCIE-ID40GF	Intel XL710 Dual Port 40Gb QSFP+ NIC	HHHL	x 8
100 Gb NICs			

Table 12 Available PCIe Option Cards *(continued)*

Product ID (PID)	PID Description	Form Factor	Electrical Slot
UCSC-PCIE-QS100GF	Qlogic QLE45611HLCU single port 100G NIC	HHHL	x 16
UCSC-P-M5D100GF	Mellanox CX-5 MCX516A-CDAT 2x100GbE QSFP PCIe NIC	HHHL	x 16
UCSC-P-M5S100GF	Mellanox CX-5 MCX515A-CCAT 1x100GbE QSFP PCIe NIC	HHHL	x 16
PCIe - Accelerators/SmartNICs			
UCSC-P-IQAT8970	Cisco-Intel 8970 QAT Offload PCIe Adapter		x 16
Host Bus Adapters (HBAs)			
UCSC-PCIE-QD16GF	Qlogic QLE2692 Dual Port 16G Fibre Channel HBA	HHHL	x 8
UCSC-PCIE-BD16GF	Emulex LPe31002 Dual Port 16G Fibre Channel HBA	HHHL	x 8
UCSC-PCIE-QD32GF	Qlogic QLE2742 Dual Port 32G Fibre Channel HBA	HHHL	x 8
UCSC-PCIE-BS32GF	Emulex LPe32000-M2 Single Port 32G Fibre Channel HBA	HHHL	x 8
UCSC-PCIE-BD32GF	Emulex LPe32002-M2 Dual Port 32G Fibre Channel HBA	HHHL	x 8
UCS NVMe/PCIe Add in Cards			
UCSC-F-H16003	Cisco AIC 1.6TB HGST SN250 NVMe Extreme Performance High Endurance	HHHL	x 8
UCSC-NVME-H32003	Cisco AIC 3.2TB HGST SN260 NVMe Extreme Performance High Endurance	HHHL	x 8
UCSC-NVME-H64003	Cisco AIC 6.4TB HGST SN260 NVMe Extreme Performance High Endurance	HHHL	x 8
UCSC-NVME-H38401	Cisco AIC 3.8TB HGST SN260 NVMe Extreme Performance High Endurance	HHHL	x 8
UCSC-NVME-H76801	Cisco AIC 7.7TB HGST SN260 NVMe Extreme Performance Value Endurance	HHHL	x 8
UCS NVMe/PCIe Add in Cards			
UCSC-NVME-SC	PCIE NVME Switch Module - plugs into PCIe slot 10 when NVMe drives are used on the auxiliary drive module.	HHHL	x 8

Notes:

1. Qlogic/Emulex HBAs ship with FC optics installed in the HBA.

Approved Configurations

(1) Select up to 12 PCIe Cards (restricted to 6 cards for 2-CPU systems)

- ■ Use Table 13 as a guide for adding PCIe cards. See *Figure 5* for the slot locations.

Table 13 PCIe Expansion Slot Numbering

Slot Number	Slot Characteristics
1	CPU1 controlled, PCIe Gen 3, x16 lanes, FL, FH card, x24 connector, GPU, NCSI, VIC pri
2	CPU1 controlled, PCIe Gen 3, x16 lanes, FL, FH card, x24 connector, GPU, NCSI, VIC sec
3	CPU3 controlled, PCIe Gen 3, x8 lanes, FL, FH card, x24 connector, GPU, NCSI, VIC
4	CPU3 controlled, PCIe Gen 3, x16 lanes, FL, FH card, x24 connector, GPU, NCSI, VIC
5	CPU2 controlled, PCIe Gen 3, x8 lanes, FL, FH card, x24 connector, GPU, NCSI, VIC
6	CPU3 controlled, PCIe Gen 3, x16 lanes, FL, FH card, x24 connector, GPU, NCSI, VIC
7	CPU4 controlled, PCIe Gen 3, x8 lanes, FL, FH card, x24 connector, GPU, NCSI, VIC
8	CPU2 controlled, PCIe Gen 3, x16 lanes, FL, FH card, x24 connector, GPU, NCSI, VIC
9	CPU2 controlled, PCIe Gen 3, x8 lanes, FL, FH card, x24 connector, GPU
10	CPU2 controlled, PCIe Gen 3, x16 lanes, FL, FH card, x24 connector, GPU
11	CPU4 controlled, PCIe Gen 3, x8 lanes, FL, FH card, x24 connector
12	CPU4 controlled, PCIe Gen 3, x8 lanes, FL[1], FH card, x24 connector

Notes:

1. This slot cannot be used when the auxiliary drive module is installed because of lack of clearance

Figure 5   PCIe Slot Locations
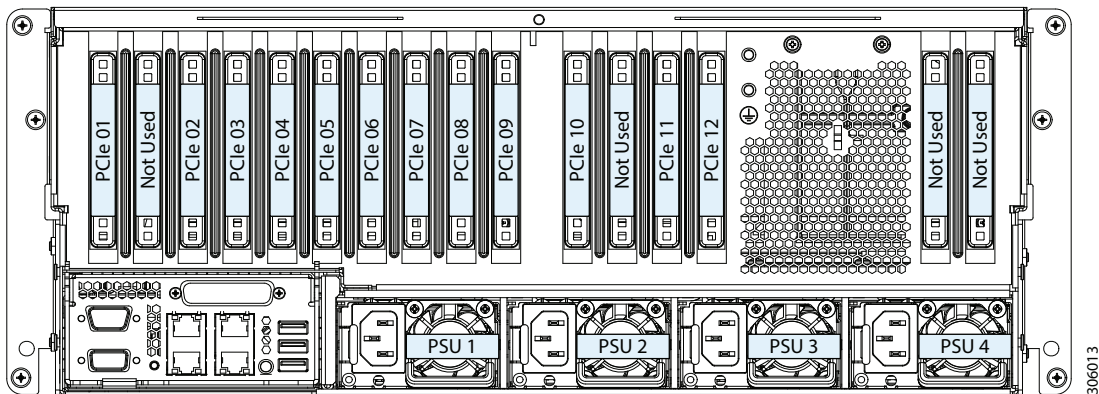
Caveats

- C480M5-8HDD – Disk slots 1, 2, and 18 not VMD/VROC capable
- C480M5-8NVME – Disk slots 7, 8, and 23 not VMD/VROC capable
- CPU1 and CPU2 must be installed to support PCIe slots 1, 2, 5, 8, 9, 10
- CPU3 and CPU4 must be installed to support PCIe slots 3, 4, 6, 11, 12.
- The Cisco Card NIC mode is currently supported only with a Cisco VIC card that is installed in PCIe slot 1, 2, 3, 4, 5, 6, 7, 8
- The C480 M5 server accommodates a Cisco Virtual Interface card, which is supported primarily in slot 1.

    — Only one Cisco 1385 VIC can be used for both UCSM management and data traffic in the C480 M5 server

    — The Cisco 1385 VIC in slot 1 handles management and data traffic.

    — If a second Cisco 1385 VIC is installed in slot 2, 3, 4, 5, 6, 7 or 8 it will be used for data traffic only.

    — Only two VICs total are supported in UCSM mode

    The following combinations of VICs are supported:

    - Max 8 x 1385, **or**
    - Max 8 x 1495, **or**
    - Max 4 x 1455, **or**
    - Max 2 x 1455 + max 2 x 1495 (mixed mode)

    UCSM mode: a maximum of four VICs are supported
    CIMC mode: a maximum of eight VICs are supported

- All PCIe slots are standard-height and require a standard-height mounting bracket on the PCIe card.
- Additional considerations for the Cisco 1385 VIC card:

    — Supports dual 40G SFP+ optical and copper twinax connections

    — To use the Cisco Card NIC mode, this card must be installed in PCIe slot 1, 2, 3, 4, 5, 6, 7, 8. Slot 1 or 2 can operate while the server is in standby power mode.

- 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

NOTE: Mixing 1300 and 1400 series VIC and MLOMs configurations is not supported.

PCIe Card Configuration with 2 and 4 CPU

Below tables helps in finding the right slot for the selected PCIe cards

Table 14 PCIe Card configuration with 2 CPU

PCIe Card Type	Primary Slot	Secondary Slot	Alternate Slot	Notes
Laguna Beach Plus RAID card	Midplane Slot	None		
Talledega RAID card	10	None		
PCIe Switch card	10	None		
Cisco x16 VIC (Clearlake)	1	2	8, 5	
Nvidia and AMD GPUs	2	8	10, 1	Slot 1 only if no VIC present
Other 16x PCIe I/O card	8	10	2, 1	
Other 8x PCIe I/O card	9	5	8, 2, 10, 1	
Cisco x16 VIC (Bodaga)	1	2	8	

Table 15 PCIe Card configuration with 4 CPU

PCIe Card Type	Primary Slot	Secondary Slot	Alternate Slot	Notes
Laguna Beach Plus RAID card	Midplane Slot	None		
Talledega RAID card	11	None		
PCIe Switch card	10	None		
Cisco x16 VIC (Clearlake)	1	2	8, 6, 4, 7, 5, 3	
Nvidia and AMD GPUs	2	4	6, 8, 10, 1	Slot 1 only if no VIC present
Other 16x PCIe I/O card	4	6	8, 2, 10, 1	
Other 8x PCIe I/O card	9	12	7, 5, 3, 11, 8, 6, 4, 2, 10, 1	
Cisco x16 VIC (Bodaga)	1	2	8, 6, 4	

NOTE:
- Primary Slots are first priorities
- Slot 1 only if no VIC present
- When no VIC presents in the configuration, GPU primary slot could be 1
- First VIC has the highest priority, then GPUs, then others.
- Secondary slots are for additional card of the same type, follow the order listed
- Alternate slots can be used but may be with reduced functionality

STEP 7   ORDER OPTIONAL PCIe OPTION CARD ACCESSORIES

- For list of supported optics and cables for VIC1385, VIC 1387, VIC 1440, VIC 1455, VIC 1457, VIC 1495 and VIC 1497 refer to VIC 1300 and VIC 1400 series data sheet at the following links:

  — https://www.cisco.com/c/en/us/products/collateral/interfaces-modules/unified-computing-system-adapters/datasheet-c78-741130.html

  — https://www.cisco.com/c/en/us/products/interfaces-modules/ucs-virtual-interface-card-1387/index.html

  — https://www.cisco.com/c/en/us/products/collateral/interfaces-modules/unified-computing-system-adapters/datasheet-c78-734727.html

Select

- NIC Interoperability with Cisco Cables/Optics. **(Table 16 to 19)**
- NIC Interoperability with Intel Cables/Optics. **(Table 20)**

Table 16 10G NIC Interoperability with Cables/Optics

Cisco Product ID (PID)	UCSC- PCIE-ID10GF	UCSC- PCIE-IQ10GF	UCSC-PCIE-ID10GC	UCSC-PCIE-IQ10GC	N2XX-AIPCI01
Cisco Direct Attach Cables (DAC)					
SFP-H10GB-CU1M	✓	✓			
SFP-H10GB-CU3M	✓	✓			
SFP-H10GB-CU5M	✓	✓			
SFP-H10GB-ACU7M	✓	✓			
SFP-H10GB-ACU10M	✓	✓			
SFP-10G-AOC1M	✓	✓			
SFP-10G-AOC2M	✓	✓			
SFP-10G-AOC3M	✓	✓			
SFP-10G-AOC5M	✓	✓			
SFP-10G-AOC7M	✓	✓			
SFP-10G-AOC10M	✓	✓			
UTP/RJ45				✓	
Cisco Optical Transceivers					
SFP-10G-SR	✓	✓			
SFP-10G-SR-S	✓	✓			

Table 16 10G NIC Interoperability with Cables/Optics

Cisco Product ID (PID)	UCSC- PCIE-ID10GF	UCSC- PCIE-IQ10GF	UCSC-PCIE-ID10GC	UCSC-PCIE-IQ10GC	N2XX-AIPCI01
SFP-10G-LR	✓	✓			
SFP-10G-LR-S	✓	✓			
UCS-SFP-1WSR					✓
UCS-SFP-1WLR					✓
GLC-LH-SMD		✓			
GLC-SX-MMD	✓	✓			

Table 17 25G NIC Interoperability with Cables/Optics

Cisco Product ID (PID)	UCSC-PCIE-ID25GF	UCSC-P-M5D25GF	UCSC-PCIE-QD25GF	UCSC-P-M4D25GF
Cisco Direct Attach Cables (DAC)				
SFP-H10GB-CU1M	✓	✓	✓	✓
SFP-H10GB-CU3M	✓	✓	✓	
SFP-H10GB-CU4M		✓		
SFP-H10GB-CU5M	✓	✓	✓	✓
SFP-H10GB-ACU7M	✓	✓	✓	
SFP-H10GB-ACU10M	✓	✓	✓	✓
SFP-10G-AOC1M	✓		✓	
SFP-10G-AOC2M	✓		✓	
SFP-10G-AOC3M	✓		✓	
SFP-10G-AOC5M	✓		✓	
SFP-10G-AOC7M	✓		✓	
SFP-10G-AOC10M	✓	✓	✓	
SFP-H25G-AOC10M		✓		
SFP-25G-AOC1M	✓		✓	
SFP-25G-AOC2M	✓		✓	
SFP-25G-AOC3M	✓		✓	
SFP-25G-AOC4M	✓		✓	
SFP-25G-AOC5M	✓	✓	✓	

Table 17 25G NIC Interoperability with Cables/Optics

Cisco Product ID (PID)	UCSC-PCIE-ID25GF	UCSC-P-M5D25GF	UCSC-PCIE-QD25GF	UCSC-P-M4D25GF
SFP-25G-AOC7M	✓	✓	✓	
SFP-25G-AOC10M	✓		✓	✓
QSFP-4SFP25G-CU3M	✓			
SFP-H25G-CU1M	✓	✓	✓	✓
SFP-H25G-CU2M	✓	✓	✓	
SFP-H25G-CU2.5M		✓		
SFP-H25G-CU3M	✓	✓	✓	✓
SFP-H25G-CU4M		✓		
SFP-H25G-CU5M	✓	✓		✓
Cisco Optical Transceivers				
SFP-10G-SR	✓	✓	✓	✓
SFP-10G-SR-S	✓		✓	✓
SFP-10G-LR	✓	✓	✓	✓
SFP-10G-LR-S	✓		✓	✓
SFP-25G-SR-S	✓	✓		✓
SFP-10/25G-LR-S		✓		
SFP-10/25G-CSR-S				✓

Table 18 40G NIC Interoperability with Cables/Optics

Cisco Product ID (PID)	UCSC-PCIE-QD40GF	UCSC-PCIE-ID40GF
Cisco Direct Attach Cables (DAC)		
QSFP-H40G-CU5M	✓	✓
QSFP-H40G-CU3M	✓	✓
QSFP-H40G-CU1M	✓	✓
QSFP-H40G-ACU7M	✓	✓
QSFP-H40G-AOC1M	✓	✓
QSFP-H40G-AOC2M	✓	✓
QSFP-H40G-AOC3M	✓	✓
QSFP-H40G-AOC5M	✓	✓

Table 18   40G NIC Interoperability with Cables/Optics

QSFP-H40G-AOC7M	✓	✓
QSFP-H40G-AOC10M	✓	✓
Cisco Optical Transceivers		
QSFP-40G-SR4	✓	
QSFP-40G-SR4-S	✓	✓
QSFP-40G-SR-BD		✓

Table 19   100G NIC Interoperability with Cables/Optics

Cisco Product ID (PID)	UCSC-PCIE-QS100GF	UCSC-P-M5S100GF	UCSC-P-M5D100GF
Cisco Direct Attach Cables (DAC)			
QSFP-100G-AOC5M		✓	✓
QSFP-100G-AOC7M		✓	✓
QSFP-100G-AOC10M		✓	✓
QSFP-100G-CU3M		✓	✓
QSFP-100G-CU5M		✓	✓
Cisco Optical Transceivers			
QSFP-100G-LR4-S		✓	✓
QSFP-100G-SR4-S		✓	✓
QSFP-40/100-SRBD		✓	✓

Table 20   NIC Interoperability with Intel Cables/Optics

Intel Product ID (PID)	N2XX-AIPCI01	UCSC-PCIE-ID10GF	UCSC-PCIE-IQ10GF
Intel DACs			
XDACBL1M	✓	✓	✓
XDACBL3M	✓	✓	✓
XDACBL5M	✓	✓	✓
Intel Optical Transceivers			
E10GSFPSR	✓	✓	✓

Table 20 NIC Interoperability with Intel Cables/Optics

Intel Product ID (PID)	N2XX-AIPCI01	UCSC-PCIE-ID10GF	UCSC-PCIE-IQ10GF
E10GSFPLR	✓	✓	✓

a. *: Compiled from testing conducted by Cisco TMG and Vendors.

b. Refer to the these links for additional Connectivity Options.

Intel:	Marvell/Qlogic:	Mellanox:
Product Guide	41000 series Interoperability Matrix	Firmware Release Notes
Speed White Paper	45000 series Interoperability Matrix	

STEP 8   ORDER OPTICAL DRIVE (OPTIONAL)

You can order an optional front facing optical drive (DVDRW). If you do, it displaces drive bay module 3 in the front facing drive cage.

Select Optical Drive

The available optical drive is listed in *Table 26*.

Table 21 Available Optical Drive

Product ID (PID)	PID Description
UCSC-C480-DVD	UCS C480 M5 Optional DVD drive

STEP 9 ORDER SECURE DIGITAL CARDS or M.2 DEVICES (OPTIONAL)

A mini-storage connector is provided on the motherboard. There are two choices of mini-storage modular adapters that fit in the connector on the motherboard.

1. Adapter with two SD HC sockets that accommodate up to two SDHC cards
2. Adapter with two M.2 sockets that accommodate up to two M.2 devices

SD Cards and Modular Adapter

The SDHC card ordering information is listed in *Table 22*.

Table 22 PIDs for Secure Digital High-Capacity Card(s) and Modular Adapter

Product ID (PID)	PID Description
UCS-SD-32G-S	32 GB SD Card for UCS servers
UCS-SD-64G-S	64 GB SD Card for UCS servers
UCS-SD-128G	128GB SD Card for UCS servers
UCS-MSTOR-SD[1]	Modular adapter for SD card

Notes:

1. The SD modular adapter (PID UCS-MSTOR-SD) is auto-included in CCW and is not selectable.

Supported Configurations

(1) **Select one or two Cisco secure digital cards**

■ Select up to two 32, 64, or 128 GB SD cards

(2) **Do not mix SD cards**

(3) **If you select SDHC cards, you cannot select any M.2 SATA SSD drive.**

M.2 SATA Cards and Modular Adapter

Order one or two matching M.2 SATA SSDs (see *Table 23*) along with a mini storage carrier or a boot-optimized RAID controller (see *Table 24*).

NOTE: It is recommended that M.2 SATA SSDs be used as boot-only devices.

Each mini storage carrier or boot-optimized RAID controller can accommodate up to two SATA M.2 SSDs shown in *Table 23*.

Table 23 M.2 SATA SSDs

Product ID (PID)	PID Description
UCS-M2-240GB	240 GB M.2 SATA SSD
UCS-M2-960GB	960 GB M.2 SATA SSD

Table 24 Mini Storage Carrier/Boot-Optimized RAID Controller

Product ID (PID)	PID Description
UCS-MSTOR-M2	Mini Storage Carrier for M.2 SATA (holds up to 2 M.2 SATA SSDs)
UCS-M2-HWRAID	Cisco Boot optimized M.2 RAID controller (holds up to 2 M.2 SATA SSDs)

> **NOTE:**
> - The UCS-M2-HWRAID boot-optimized RAID controller supports RAID 1 and JBOD mode
> - The UCS-M2-HWRAID controller is available only with 240 GB and 960 GB M.2 SSDs.
> - (CIMC/UCSM) is supported for configuring of volumes and monitoring of the controller and installed SATA M.2 drives
> - The minimum version of Cisco IMC and Cisco UCS Manager that support this controller is 4.0(4b) and later. The name of the controller in the software is MSTOR-RAID
> - The SATA M.2 drives can boot in UEFI mode only. Legacy boot mode is not supported
> - Hot-plug replacement is not supported. The server must be powered off.
> - The boot-optimized RAID controller is not supported when the server is used as a compute node in HyperFlex configurations

- Order either the Mini Storage carrier or the Boot-Optimized RAID controller from *Table 24*.
    - Choose the UCS-MSTOR-M2 mini storage carrier for controlling the M.2 SATA drives with no RAID control.
    - Choose the UCS-M2-HWRAID Boot-Optimized RAID controller for hardware RAID across the two internal SATA M.2 drives. The Boot-Optimized RAID controller holds up to 2 matching M.2 SATA drives.
- Order up to two matching M.2 SATA SSDs from *Table 23*.

> **NOTE:** The Boot-Optimized RAID controller supports VMWare, Windows and Linux Operating Systems

Caveats

- You cannot mix M.2 SATA SSDs with SD cards.

- Order either one or two identical M.2 SATA SSDs for the mini-storage carrier or boot-optimized RAID controller. You cannot mix M.2 SATA SSD capacities.

- When ordering two M.2 SATA drives with embedded software RAID, the maximum number of internal SATA drives supported is six. To support greater than six internal drives, a Cisco 12G Raid Controller or a Cisco 12G SAS HBA must be ordered

STEP 10 ORDER INTERNAL MICRO-SD CARD MODULE (OPTIONAL)

A blank 32 GB micro-SD card can be ordered. It serves as a dedicated local resource for utilities such as HUU. Images can be pulled from a file share (NFS/CIFS) and uploaded to the card for future use.

Table 25 32 GB Secure Digital (SD) Card (blank)

Product ID (PID)	PID Description
UCS-MSD-32G	32 GB Micro-SD Card for UCS servers

STEP 11 ORDER GPU CARDS and ACCESSORIES (OPTIONAL)

Select GPU Options

The available GPU PCIe options are listed in *Table 26*.

Table 26 Available PCIe Option Cards

Product ID (PID)	PID Description	Card Size	Maximum cards Per node
GPU PCIe Cards[1]			
UCSC-GPU-V100	NVIDIA V100 16GB	Full-Height Dual-Width	6
UCSC-GPU-V100-32	NVIDIA V100 32GB	Full-Height Dual-Width	6
UCSC-GPU-M10[2]	NVIDIA M10	Full-Height Dual Width	3
UCSC-GPU-M60	NVIDIA M60	Full-Height Dual-Width	6
UCSC-GPU-A100	TESLA A100, PASSIVE, 250W, 40GB	Full-Height Dual-Width	6
UCSC-GPU-T4-16[3]	NVIDIA T4 16GB	Low Profile Single-Width	9
GPU Individual Power Cable[4]			
UCS-P100CBL-480M5	C480M5 NVIDIA P40/P100/M60/V100/A100 Cable		
UCS-P10CBL-480M5	C480M5 NVIDIA M10 Cable		

Notes:

1. Refer to C480 GPU Card Installation for more details.
2. The maximum number of M10 GPUs is limited to 3 in a C480 M5 server.
3. T4 GPUs can be populated as follows:

If a VIC (slot 1) and an NVMe switch (slot 10) are both installed, single-width T4 GPUs can be installed in slots 2 through 9 (8 T4 GPUs total)

If a VIC (slot 1) is installed and an NVMe switch (slot 10) is not installed, single-width T4 GPUs can be installed in slots 2 through 10 (9 T4 GPUs total)

If neither a VIC or NVME switch are installed, T4 GPUs can be installed in slots 1 through 10. for the additional information related to GPU card slots, refer to *PCIe Card Configuration with 2 and 4 CPU on page 37*

4. GPU power cables are auto selected when configuring a server.

> **CAUTION:**
>
> - The maximum allowable operating temperature for the NVIDIA V100 GPU is 35º C (95º F) for 1 to 4 GPUs and 32º C (89º F) for 5 to 6 GPUs, M10, M60, P100, A100 GPUs is 35º C (95º F).
>
> - For the complete operating temperature requirement of double-wide GPUs Please refer to table 3 of the below url:
> https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/c/hw/C480M5/install/C480M5/C480M5_appendix_0110.html

---

NOTE:

- A 2-CPU configuration can have 6 GPUs (if there is no VIC in slot 1 and no NVMe switch in slot 10) and a 4-CPU configuration can have up to 10 GPUs (if there is no VIC in slot 1 and no NVME switch in slot 10). Any configuration that includes a GPU requires four 1600 W power supplies in the server.
- All GPU cards must be procured from Cisco as there is a unique SBIOS ID required by CIMC and UCSM
- GPUs cannot be mixed

Caveats

— NVIDIA M10 and M60 can support only less than 1TB of total memory in the server.

STEP 12 ORDER POWER SUPPLIES

The available power supplies are listed in *Table 27*.

Table 27 Power Supplies

Product ID (PID)	PID Description
UCSC-PSU1-1600W	Cisco UCS 1600W AC Power Supply for Rack Server

Caveats

— If any GPU is installed, four power supplies are required

STEP 13 SELECT AC POWER CORD(s)

Select the appropriate AC power cords listed in *Table 28*. 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.
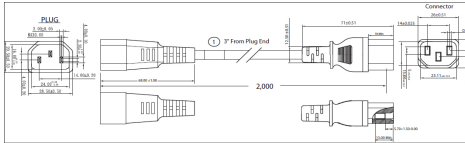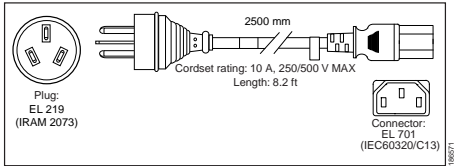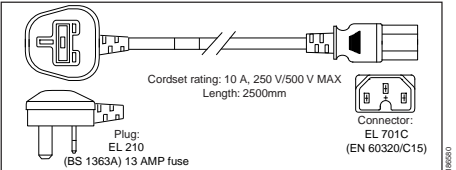
Table 28 Available Power Cords
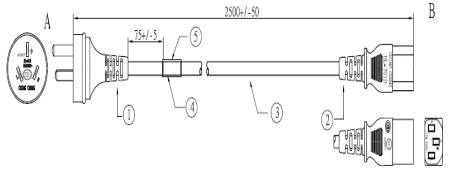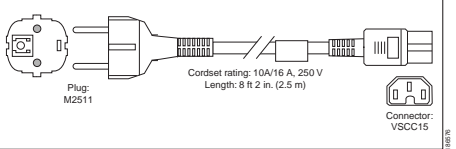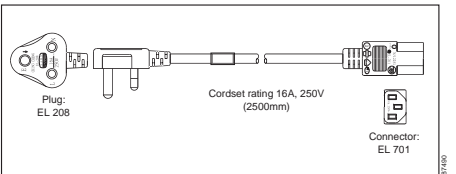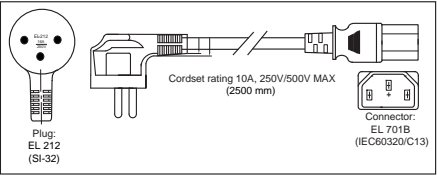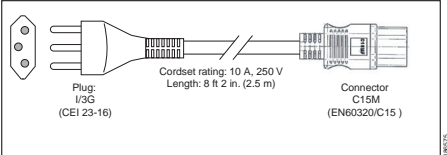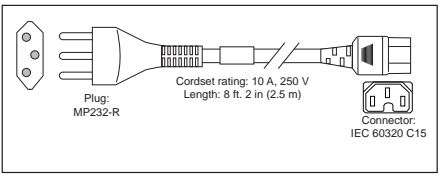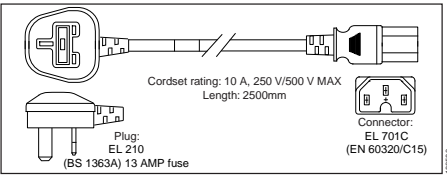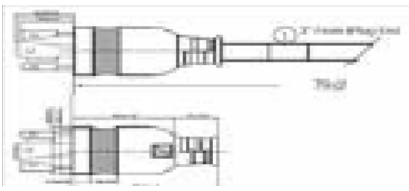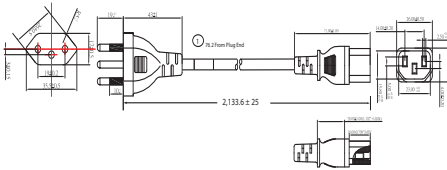
Product ID (PID)	PID Description	Images
R2XX-DMYMPWRCORD	No power cord (dummy PID to allow for a no power cord option)	Not applicable
CAB-C13-C14-2M	CABASY,WIRE,JUMPER CORD, PWR, 2 Meter, C13/C14,10A/250V	
CAB-250V-10A-AR	Power Cord, SFS, 250V, 10A, Argentina	
CAB-9K10A-AU	Power Cord, 250VAC 10A 3112 Plug, Australia	
CAB-250V-10A-CN	AC Power Cord - 250V, 10A - PRC	
CAB-9K10A-EU	Power Cord, 250VAC 10A CEE 7/7 Plug, EU	
CAB-250V-10A-ID	Power Cord, SFS, 250V, 10A, India	

Table 28 Available Power Cords

Product ID (PID)	PID Description	Images
CAB-250V-10A-IS	Power Cord, SFS, 250V, 10A, Israel	
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-AC-L620-C13	AC Power Cord, NEMA L6-20 - C13, 2M/6.5ft	
CAB-250V-10A-BR	Power Cord - 250V, 10A - Brazil	
CAB-C13-C14-IN	Power Cord Jumper,C13-C14 Connectors,1.4 Meter Length, India	Image not available
CAB-C13-C14-3M-IN	Power Cord Jumper, C13-C14 Connectors, 3 Meter Length, India	Image not available

STEP 14 ORDER OPTIONAL CABLE MANAGEMENT ARM

A cable management arm is available for the tool-less slide rail kit (PID UCSC-RAIL-4U-M5). 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 29*.

Table 29 Cable Management Arm

Product ID (PID)	PID Description
UCSC-CMA-4U-M5	Cable Management Arm for UCS C480 M5

STEP 15 ORDER USB DRIVE (OPTIONAL)

You can order up to one optional blank USB drive. The ordering information is listed in *Table 30*.

Table 30 USB Drive (blank)

Product ID (PID)	PID Description
UCS-USBFLSHB-16GB	UCS Servers 16 GB Flash USB Drive (optional)

See *Figure 6 on page 71* for the location of the USB drive socket.

STEP 16 ORDER SECURITY DEVICES (OPTIONAL)

The 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.

A safety intrusion switch gives a notification of any unauthorized mechanical access into the server

The security device ordering information listed in *Table 31*.

Table 31 Security Devices

Product ID (PID)	PID Description
UCSX-TPM2-001	Trusted Platform Module 1.2 for UCS Servers
UCSX-TPM2-002	Trusted Platform Module 2.0 for UCS servers
UCSX-TPM2-002B	Trusted Platform Module 2.0 M5 UCS Servers (FIPS 140-2 Compliant)
UCS-C480-INT-SW	UCS C480 Safety Intrusion Switch

NOTE: The module used in this server conforms to TPM v1.2 and 2.0, as defined by the Trusted Computing Group (TCG).

STEP 17 ORDER A BEZEL (OPTIONAL)

The bezel ordering information is listed in *Table 32*.

Table 32 Available Bezels

Product ID (PID)	PID Description
UCSC-BZL-EX-M5	Optional bezel for UCS C480 M5 rack server

STEP 18 SELECT MANAGEMENT CONFIGURATION (OPTIONAL)

By default, the C480 M5 server NIC mode is configured to be Shared LOM Extended. This NIC mode allows any LOM port or adapter card port to be used to access the Cisco Integrated Management Controller (CIMC). The Cisco VIC card must be installed in a slot with NCSI support.

To change the default NIC mode to Dedicated, select the UCSC-DLOM-01 PID shown in *Table 33*. In Dedicated NIC mode, the CIMC can be accessed only through the dedicated management port. See *Chassis Rear View on page 6* for the location of the management port.

To change the default NIC mode to Cisco Card Mode, select the UCSC-CCARD-01 PID shown in *Table 33*. In this mode, you can assign an IP address to the CIMC using DHCP and from there you can fully automate your deployment.

For more details on all the NIC mode settings, see

https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/c/hw/C480M5/install/C480M5/C480M5_chapter_010.html#concept_rqj_vsr_fz

Table 33   Management Configuration Ordering Information

Product ID (PID)	PID Description
UCSC-DLOM-01	Dedicated Mode BIOS setting for C-Series Servers
UCSC-CCARD-01	Cisco Card Mode BIOS setting for C-Series Servers

STEP 19 SELECT SERVER BOOT MODE (OPTIONAL)

By default, the C480 M5 server ships with UEFI as the default boot mode. To have a server shipped with the Legacy BIOS mode (which was standard on M4 and previous generation servers), select the Legacy BIOS PID

Table 34 Server Boot Mode Ordering Information

Product ID (PID)	PID Description
UCSC-LBIOS-01	Legacy Boot Mode BIOS setting for C-Series Servers

STEP 20 CHOOSE OPERATING SYSTEM AND VALUE-ADDED SOFTWARE

For more details on supported operating systems and software for this server, see the Hardware and Software Compatibility List (HCL).

Note: PIDs tagged with an asterisk (*) are Resell of an OEM Vendor's Support. They are required to be added to the associated Product License PID.

Select

- Cisco Software (*Table 35*)
- OEM Software (*Table 36*)
- Operating System (*Table 37*)

Table 35 Cisco Software

Product ID (PID)	PID Description
IMC Supervisor	
CIMC-SUP-BASE-K9	IMC Supervisor One-time Site Installation License
CIMC-SUP-B01	IMC Supervisor-Branch Mgt SW for C-Series & E-Series up to 100 Svrs
CIMC-SUP-B02	IMC Supervisor- Branch Mgt SW for C and E-Series up to 250 Svrs
CIMC-SUP-B10	IMC Supervisor- Branch Mgt SW for C and E-Series up to 1K Svrs
CIMC-SUP-B25	IMC Supervisor Branch Mgt SW for C and E-Series 25 Svrs
CIMC-SUP-A01	IMC Supervisor Adv-Branch Mgt SW for C and E-Series 100 Svrs
CIMC-SUP-A02	IMC Supervisor Adv-Branch Mgt SW for C and E-Series 250 Svrs
CIMC-SUP-A10	IMC Supervisor Adv-Branch Mgt SW for C and E-Series 1000 Svrs
CIMC-SUP-A25	IMC Supervisor Adv-Branch Mgt SW for C and E-Series 25 Svrs
EVAL-CIMC-SUP-BAS	EVAL: IMC Supervisor One-time Site Installation License
EVAL-CIMC-SUP	EVAL: IMC Supervisor-Branch Mgt SW for C/E-Series - 50 Svrs
UCS Multi-Domain Manager	
UCS-MDMGR-1S	UCS Central Per Server License
NOTE: IF you must order quantity greater than 1 of UCS-MDMGR-1S, you need to reference the UCS Central Per Server Data Sheet to order the standalone PIDs: UCS-MDMGR-LIC= or UCS-MDMGR-1DMN=	

Table 36   OEM Software

Product ID (PID)	PID Description
VMware vCenter	
VMW-VCS-STD-1A	VMware vCenter 7 Server Standard, 1 yr support require
VMW-VCS-STD-3A	VMware vCenter 7 Server Standard, 3 yr support required
VMW-VCS-STD-5A	VMware vCenter 7 Server Standard, 5 yr support required
VMW-VCS-FND-1A	VMware vCenter 7 Server Foundation (4 Host), 1 yr supp reqd
VMW-VCS-FND-3A	VMware vCenter 7 Server Foundation (4 Host), 3 yr supp reqd
VMW-VCS-FND-5A	VMware vCenter 7 Server Foundation (4 Host), 5 yr supp reqd

Table 37   Operating System

Product ID (PID)	PID Description
Microsoft Windows Server	
MSWS-19-DC16C	Windows Server 2019 Data Center (16 Cores/Unlimited VMs)
MSWS-19-DC16C-NS	Windows Server 2019 DC (16 Cores/Unlim VMs) - No Cisco SVC
MSWS-19-ST16C	Windows Server 2019 Standard (16 Cores/2 VMs)
MSWS-19-ST16C-NS	Windows Server 2019 Standard (16 Cores/2 VMs) - No Cisco SVC
Red Hat	
RHEL-2S2V-1A	Red Hat Enterprise Linux (1-2 CPU,1-2 VN); 1-Yr Support Req
RHEL-2S2V-3A	Red Hat Enterprise Linux (1-2 CPU,1-2 VN); 3-Yr Support Req
RHEL-2S2V-5A	Red Hat Enterprise Linux (1-2 CPU,1-2 VN); 5-Yr Support Req
RHEL-VDC-2SUV-1A	RHEL for Virt Datacenters (1-2 CPU, Unlim VN) 1 Yr Supp Req
RHEL-VDC-2SUV-3A	RHEL for Virt Datacenters (1-2 CPU, Unlim VN) 3 Yr Supp Req
RHEL-VDC-2SUV-5A	RHEL for Virt Datacenters (1-2 CPU, Unlim VN) 5 Yr Supp Req
Red Hat Ent Linux/ High Avail/ Res Strg/ Scal	
RHEL-2S2V-1S	Red Hat Enterprise Linux (1-2 CPU,1-2 VN); Prem 1-Yr SnS
RHEL-2S2V-3S	Red Hat Enterprise Linux (1-2 CPU,1-2 VN); Prem 3-Yr SnS
RHEL-2S-HA-1S	RHEL High Availability (1-2 CPU); Premium 1-yr SnS
RHEL-2S-HA-3S	RHEL High Availability (1-2 CPU); Premium 3-yr SnS
RHEL-2S-RS-1S	RHEL Resilent Storage (1-2 CPU); Premium 1-yr SnS

Table 37 *(continued)*Operating System

Product ID (PID)	PID Description
RHEL-2S-RS-3S	RHEL Resilent Storage (1-2 CPU); Premium 3-yr SnS
RHEL-2S-SFS-1S	RHEL Scalable File System (1-2 CPU); Premium 1-yr SnS
RHEL-2S-SFS-3S	RHEL Scalable File System (1-2 CPU); Premium 3-yr SnS
RHEL-VDC-2SUV-1S	RHEL for Virt Datacenters (1-2 CPU, Unlim VN) 1 Yr SnS Reqd
RHEL-VDC-2SUV-3S	RHEL for Virt Datacenters (1-2 CPU, Unlim VN) 3 Yr SnS Reqd
Red Hat SAP	
RHEL-SAP-2S2V-1S	RHEL for SAP Apps (1-2 CPU, 1-2 VN); Prem 1-Yr SnS Reqd
RHEL-SAP-2S2V-3S	RHEL for SAP Apps (1-2 CPU, 1-2 VN); Prem 3-Yr SnS Reqd
RHEL-SAPSP-3S	RHEL SAP Solutions Premium - License with 3 Years of SnS
RHEL-SAPSS-3S	RHEL SAP Solutions Standard - License with 3 Years of SnS
VMware	
VMW-VSP-STD-1A	VMware vSphere 7 Std (1 CPU, 32 Core) 1-yr, Support Required
VMW-VSP-STD-3A	VMware vSphere 7 Std (1 CPU, 32 Core) 3-yr, Support Required
VMW-VSP-STD-5A	VMware vSphere 7 Std (1 CPU, 32 Core) 5-yr, Support Required
VMW-VSP-EPL-3A	VMware vSphere 7 Ent Plus (1 CPU, 32 Core) 1Yr, Support Reqd
VMW-VSP-EPL-1A	VMware vSphere 7 Ent Plus (1 CPU, 32 Core) 3Yr, Support Reqd
VMW-VSP-EPL-5A	VMware vSphere 7 Ent Plus (1 CPU, 32 Core) 5Yr, Support Reqd
SUSE	
SLES-2S2V-1A	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM); 1-Yr Support Req
SLES-2SUV-1A	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM); 1-Yr Support Req
SLES-2S2V-3A	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM); 3-Yr Support Req
SLES-2SUV-3A	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM); 3-Yr Support Req
SLES-2S2V-5A	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM); 5-Yr Support Req4.0(4b)4.0(4b)
SLES-2SUV-5A	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM); 5-Yr Support Req
SLES-2S2V-1S	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM); Prio 1-Yr SnS
SLES-2SUV-1S	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM); Prio 1-Yr SnS
SLES-2S2V-3S	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM); Prio 3-Yr SnS
SLES-2SUV-3S	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM); Prio 3-Yr SnS
SLES-2S2V-5S	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM); Prio 5-Yr SnS

Table 37 *(continued)*Operating System

Product ID (PID)	PID Description
SLES-2SUV-5S	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM); Prio 5-Yr SnS
SLES-2S-HA-1S	SUSE Linux High Availability Ext (1-2 CPU); 1yr SnS
SLES-2S-HA-3S	SUSE Linux High Availability Ext (1-2 CPU); 3yr SnS
SLES-2S-HA-5S	SUSE Linux High Availability Ext (1-2 CPU); 5yr SnS
SLES-2S-GC-1S	SUSE Linux GEO Clustering for HA (1-2 CPU); 1yr Sns
SLES-2S-GC-3S	SUSE Linux GEO Clustering for HA (1-2 CPU); 3yr SnS
SLES-2S-GC-5S	SUSE Linux GEO Clustering for HA (1-2 CPU); 5yr SnS
SLES-2S-LP-1S	SUSE Linux Live Patching Add-on (1-2 CPU); 1yr SnS Required
SLES-2S-LP-3S	SUSE Linux Live Patching Add-on (1-2 CPU); 3yr SnS Required
SLES-2S-LP-1A	SUSE Linux Live Patching Add-on (1-2 CPU); 1yr Support Req
SLES-2S-LP-3A	SUSE Linux Live Patching Add-on (1-2 CPU); 3yr Support Req
SLES and SAP	
SLES-SAP-2S2V-1A	SLES for SAP Apps (1-2 CPU, 1-2 VM); 1-Yr Support Reqd
SLES-SAP-2SUV-1A	SLES for SAP Apps (1-2 CPU, Unl VM); 1-Yr Support Reqd
SLES-SAP-2S2V-3A	SLES for SAP Apps (1-2 CPU, 1-2 VM); 3-Yr Support Reqd
SLES-SAP-2SUV-3A	SLES for SAP Apps (1-2 CPU, Unl VM); 3-Yr Support Reqd
SLES-SAP-2S2V-5A	SLES for SAP Apps (1-2 CPU, 1-2 VM); 5-Yr Support Reqd
SLES-SAP-2SUV-5A	SLES for SAP Apps (1-2 CPU, Unl VM); 5-Yr Support Reqd
SLES-SAP-2S2V-1S	SLES for SAP Apps (1-2 CPU, 1-2 VM); Priority 1-Yr SnS
SLES-SAP-2SUV-1S	SLES for SAP Apps (1-2 CPU, Unl VM); Priority 1-Yr SnS
SLES-SAP-2S2V-3S	SLES for SAP Apps (1-2 CPU, 1-2 VM); Priority 3-Yr SnS
SLES-SAP-2SUV-3S	SLES for SAP Apps (1-2 CPU, Unl VM); Priority 3-Yr SnS
SLES-SAP-2S2V-5S	SLES for SAP Apps (1-2 CPU, 1-2 VM); Priority 5-Yr SnS
SLES-SAP-2SUV-5S	SLES for SAP Apps (1-2 CPU, Unl VM); Priority 5-Yr SnS

STEP 21 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) parts replacement eight hours a day, five days a week.
- 90-day software warranty on media.
- Downloads of BIOS, drivers, and firmware updates.
- UCSM updates for systems with Unified Computing System Manager. These updates include minor enhancements and bug fixes that are designed to maintain the compliance of UCSM with published specifications, release notes, and industry standards.

Smart Net Total Care (SNTC) for UCS

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

For systems that include Unified Computing System Manager, the support service includes downloads of UCSM upgrades. The Cisco Smart Net Total Care for UCS Service includes flexible hardware replacement options, including replacement in as little as two hours. There is also access to Cisco's extensive online technical resources to help maintain optimal efficiency and uptime of the unified computing environment. For more information please refer to the following url: http://www.cisco.com/c/en/us/services/technical/smart-net-total-care.html?stickynav=1

You can choose a desired service listed in *Table 38*.

Table 38 Cisco SNTC for UCS Service (PID UCSC-C480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-PREM-SCC480M5	C2P	Yes	SNTC 24X7X2OS
CON-UCSD8-SCC480M5	UCSD8	Yes	UC SUPP DR 24X7X2OS*
CON-C2PL-SCC480M5	C2PL	Yes	LL 24X7X2OS**
CON-OSP-SCC480M5	C4P	Yes	SNTC 24X7X4OS
CON-UCSD7-SCC480M5	UCSD7	Yes	UCS DR 24X7X4OS*
CON-C4PL-SCC480M5	C4PL	Yes	LL 24X7X4OS**
CON-USD7L-SCC480M5	USD7L	Yes	LLUCS HW DR 24X7X4OS***
CON-OSE-SCC480M5	C4S	Yes	SNTC 8X5X4OS
CON-UCSD6-SCC480M5	UCSD6	Yes	UC SUPP DR 8X5X4OS*

Table 38 Cisco SNTC for UCS Service (PID UCSC-C480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-SNCO-SCC480M5	SNCO	Yes	SNTC 8x7xNCDOS****
CON-OS-SCC480M5	CS	Yes	SNTC 8X5XNBDOS
CON-UCSD5-SCC480M5	UCSD5	Yes	UCS DR 8X5XNBDOS*
CON-S2P-SCC480M5	S2P	No	SNTC 24X7X2
CON-S2PL-SCC480M5	S2PL	No	LL 24X7X2**
CON-SNTP-SCC480M5	SNTP	No	SNTC 24X7X4
CON-SNTPL-SCC480M5	SNTPL	No	LL 24X7X4**
CON-SNTE-SCC480M5	SNTE	No	SNTC 8X5X4
CON-SNC-SCC480M5	SNC	No	SNTC 8x7xNCD****
CON-SNT-SCC480M5	SNT	No	SNTC 8X5XNBD
CON-SW-SCC480M5	SW	No	SNTC NO RMA

Note: For PID UCSC-C480-M5-CH, select Service SKU with C480M5CH suffix (Example: CON-PREM-C480M5CH)

*Includes Drive Retention (see *UCS Drive Retention Service on page 69*)

**Includes Local Language Support (see *Local Language Technical Support for UCS on page 70*) – Only available in China and Japan

***Includes Local Language Support and Drive Retention – Only available in China and Japan

****Available in China Only

Smart Net Total Care for Cisco UCS Onsite Troubleshooting Service

An enhanced offer over traditional Smart Net Total Care which provides onsite-troubleshooting expertise to aid in the diagnostics and isolation of hardware issue within our customers' Cisco Unified Computing System (UCS) environment. It is delivered by a Cisco Certified field engineer (FE) in collaboration with remote TAC engineer and Virtual Internet working Support Engineer (VISE). You can choose a desired service listed in *Table 39*

Table 39 SNTC for Cisco UCS Onsite Troubleshooting Service (PID UCSC-C480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-OSPT-SCC480M5	OSPT	Yes	24X7X4OS Trblshtg
CON-OSPTD-SCC480M5	OSPTD	Yes	24X7X4OS TrblshtgDR*
CON-OSPTL-SCC480M5	OSPTL	Yes	24X7X4OS TrblshtgLL**
CON-OPTLD-SCC480M5	OPTLD	Yes	24X7X4OS TrblshtgLLD***

Note: For PID UCSC-C480-M5-CH, select Service SKU with C480M5CH suffix (Example: CON-OSPT-C480M5CH)

Table 39 *(continued)*SNTC for Cisco UCS Onsite Troubleshooting Service (PID UCSC-C480-M5)

*Includes Drive Retention (see *UCS Drive Retention Service on page 69*)

**Includes Local Language Support (see *Local Language Technical Support for UCS on page 70*) – Only available in China and Japan

***Includes Local Language Support and Drive Retention – Only available in China and Japan

Solution Support for UCS

Solution Support includes both Cisco product support and solution-level support, resolving complex issues in multivendor environments, on average, 43% more quickly than product support alone. Solution Support is a critical element in data center administration, to help rapidly resolve any issue encountered, while maintaining performance, reliability, and return on investment.

This service centralizes support across your multivendor Cisco environment for both our products and solution partner products you've deployed in your ecosystem. Whether there is an issue with a Cisco or solution partner product, just call us. Our experts are the primary point of contact and own the case from first call to resolution. For more information please refer to the following url:

http://www.cisco.com/c/en/us/services/technical/solution-support.html?stickynav=1

You can choose a desired service listed in *Table 40*

Table 40 Solution Support for UCS Service (PID UCSC-C480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-SSC2P-SCC480M5	SSC2P	Yes	SOLN SUPP 24X7X2OS
CON-SSC4P-SCC480M5	SSC4P	Yes	SOLN SUPP 24X7X4OS
CON-SSC4S-SCC480M5	SSC4S	Yes	SOLN SUPP 8X5X4OS
CON-SSCS-SCC480M5	SSCS	Yes	SOLN SUPP 8X5XNBDOS
CON-SSDR7-SCC480M5	SSDR7	Yes	SSPT DR 24X7X4OS*
CON-SSDR5-SCC480M5	SSDR5	Yes	SSPT DR 8X5XNBDOS*
CON-SSS2P-SCC480M5	SSS2P	No	SOLN SUPP 24X7X2
CON-SSSNP-SCC480M5	SSSNP	No	SOLN SUPP 24X7X4
CON-SSSNE-SCC480M5	SSSNE	No	SOLN SUPP 8X5X4
CON-SSSNC-SCC480M5	SSSNC	No	SOLN SUPP NCD**
CON-SSSNT-SCC480M5	SSSNT	No	SOLN SUPP 8X5XNBD

Note: For PID UCSC-C480-M5-CH, select Service SKU with C480M5CH suffix (Example:

Table 40 Solution Support for UCS Service (PID UCSC-C480-M5)

Includes Drive Retention (see *UCS Drive Retention Service on page 69*)

**Available in China only

Smart Net Total Care for UCS Hardware Only Service

For faster parts replacement than is provided with the standard Cisco Unified Computing System warranty, Cisco offers the Cisco Smart Net Total Care for UCS Hardware Only Service. You can choose from two levels of advanced onsite parts replacement coverage in as little as four hours. Smart Net Total Care 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 desired service listed in *Table 41*

Table 41 SNTC for UCS Hardware Only Service (PID UCSC-C480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-UCW7-SCC480M5	UCW7	Yes	UCS HW 24X7X4OS
CON-UCWD7-SCC480M5	UCWD7	Yes	UCS HW+DR 24X7X4OS*
CON-UCW7L-SCC480M5	UCW7L	Yes	LL UCS 24X7X4OS**
CON-UWD7L-SCC480M5	UWD7L	Yes	LL UCS DR 24X7X4OS***
CON-UCW5-SCC480M5	UCW5	Yes	UCS HW 8X5XNBDOS
CON-UCWD5-SCC480M5	UCWD5	Yes	UCS HW+DR 8X5XNBDOS*

Note: For PID UCSC-C480-M5-CH, select Service SKU with C480M5CH suffix (Example: CON-UCW7-C480M5CH)

 *Includes Drive Retention (see *UCS Drive Retention Service on page 69*)

**Includes Local Language Support (see *Local Language Technical Support for UCS on page 70*) – Only available in China and Japan

***Includes Local Language Support and Drive Retention – Only available in China and Japan

Partner Support Service for UCS

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

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

PSS is available to all Cisco PSS partners.

The two Partner Unified Computing Support Options include:

■ Partner Support Service for UCS
■ Partner Support Service for UCS Hardware Only

PSS for UCS provides hardware and software support, including triage support for third party software, backed by Cisco technical resources and level three support. You can choose a desired service listed in *Table 42*.

Table 42 PSS for UCS (PID UCSC-C480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-PSJ8-SCC480M5	PSJ8	Yes	UCS PSS 24X7X2 OS
CON-PSJ7-SCC480M5	PSJ7	Yes	UCS PSS 24X7X4 OS
CON-PSJD7-SCC480M5	PSJD7	Yes	UCS PSS 24X7X4 DR*
CON-PSJ6-SCC480M5	PSJ6	Yes	UCS PSS 8X5X4 OS
CON-PSJD6-SCC480M5	PSJD6	Yes	UCS PSS 8X5X4 DR*
CON-PSJ4-SCC480M5	PSJ4	No	UCS SUPP PSS 24X7X2
CON-PSJ3-SCC480M5	PSJ3	No	UCS SUPP PSS 24X7X4
CON-PSJ2-SCC480M5	PSJ2	No	UCS SUPP PSS 8X5X4
CON-PSJ1-SCC480M5	PSJ1	No	UCS SUPP PSS 8X5XNBD

Note: For PID UCSC-C480-M5-CH, select Service SKU with C480M5CH suffix (Example: CON-PSJ1-C480M5CH)

*Includes Drive Retention (see *UCS Drive Retention Service on page 69*)

PSS for UCS Hardware Only

PSS for UCS Hardware Only provides customers with replacement parts in as little as two hours and provides remote access any time to Partner Support professionals who can determine if a return materials authorization (RMA) is required. You can choose a desired service listed in *Table 43*

Table 43 PSS for UCS Hardware Only (PID UCSC-C480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-PSW7-SCC480M5	PSW7	Yes	UCS W PSS 24X7X4 OS
CON-PSWD7-SCC480M5	PSWD7	Yes	UCS W PSS 24X7X4 DR*
CON-PSW6-SCC480M5	PSW6	Yes	UCS W PSS 8X5X4 OS
CON-PSWD6-SCC480M5	PSWD6	Yes	UCS W PSS 8X5X4 DR*

Table 43 PSS for UCS Hardware Only (PID UCSC-C480-M5)

CON-PSW4-SCC480M5	PSW4	No	UCS W PL PSS 24X7X2
CON-PSW3-SCC480M5	PSW3	No	UCS W PL PSS 24X7X4
CON-PSW2-SCC480M5	PSW2	No	UCS W PL PSS 8X5X4

Note: For PID UCSC-C480-M5-CH, select Service SKU with C480M5CH suffix (Example: CON-PSJ1-C480M5CH)

*Includes Drive Retention (see *UCS Drive Retention Service on page 69*)

Unified Computing Combined Support Service

Combined Services makes it easier to purchase and manage required services under one contract. SNTC 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 desired service listed in *Table 44*

Table 44 Combined Support Service for UCS (PID UCSC-C480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-NCF2P-SCC480M5	NCF2P	Yes	CMB SVC 24X7X2OS
CON-NCF4P-SCC480M5	NCF4P	Yes	CMB SVC 24X7X4OS
CON-NCF4S-SCC480M5	NCF4S	Yes	CMB SVC 8X5X4OS
CON-NCFCS-SCC480M5	NCFCS	Yes	CMB SVC 8X5XNBDOS
CON-NCF2-SCC480M5	NCF2	No	CMB SVC 24X7X2
CON-NCFP-SCC480M5	NCFP	No	CMB SVC 24X7X4
CON-NCFE-SCC480M5	NCFE	No	CMB SVC 8X5X4
CON-NCFT-SCC480M5	NCFT	No	CMB SVC 8X5XNBD
CON-NCFW-SCC480M5	NCFW	No	CMB SVC SW

Note: For PID UCSC-C480-M5-CH,select Service SKU with C480M5CH suffix (Example:CON-NCF2P-C480M5CH)

UCS Drive Retention Service

With the Cisco Unified Computing Drive Retention Service, you can obtain a new disk drive in exchange for a faulty drive without returning the faulty drive.

Sophisticated data recovery techniques have made classified, proprietary, and confidential information vulnerable, even on malfunctioning disk drives. The Drive Retention 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 the above tables (where available)

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

Local Language Technical Support for UCS

Where available, and subject to an additional fee, local language support for calls on all assigned severity levels may be available for specific product(s) – see tables above.

For a complete listing of available services for Cisco Unified Computing System, see the following URL:
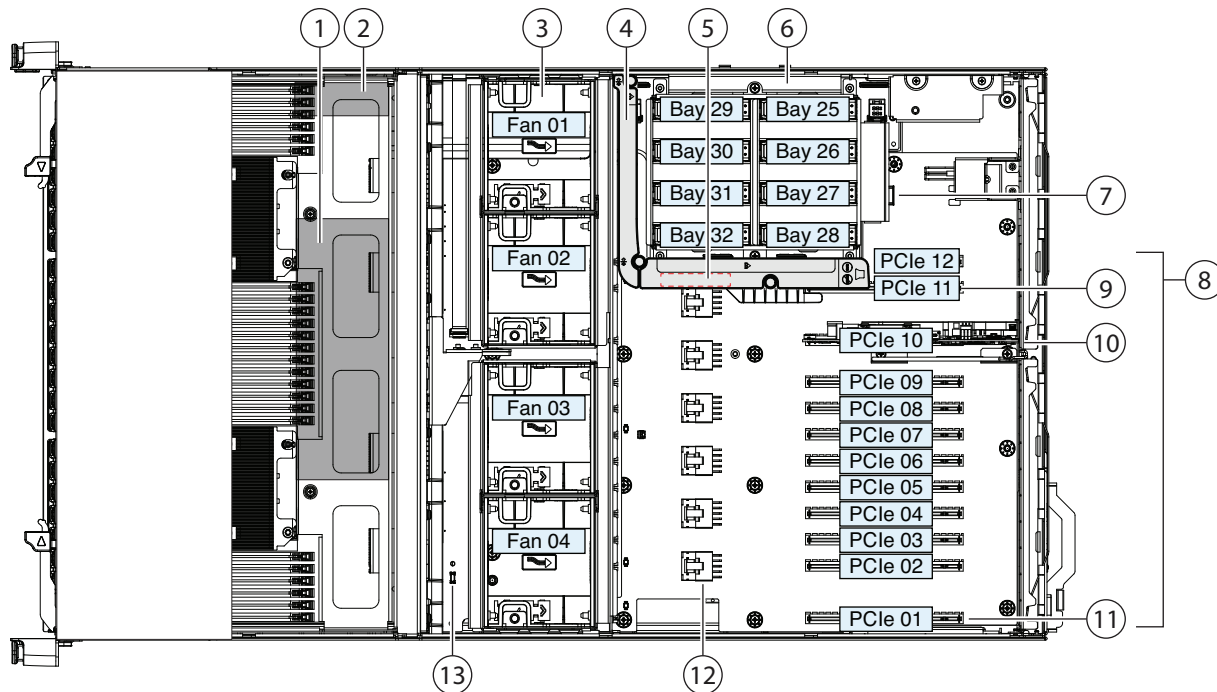
http://www.cisco.com/en/US/products/ps10312/serv_group_home.html

SUPPLEMENTAL MATERIAL

Chassis

An internal view of the C480 M5 chassis with the top cover removed is shown in *Figure 6*.

Figure 6   C480 M5 With Top Cover Removed

1	RAID controller card for front-loading drives (not visible in this view; position is near chassis floor under CPU modules)	8	PCIe slots 1 – 12 For PCIe slot specifications, see *Table 13 on page 35*
2	Supercap power module (RAID backup battery) for front RAID controller (not visible in this view; mounting bracket position is on chassis wall under CPU modules)	9	PCIe slot 11: Default slot for rear RAID controller when the rear drive module is used with SAS/SATA drives. In systems with only one CPU module, slot 11 is not supported. In this case, the rear RAID controller must be installed in slot 10 and a blanking panel must be installed in slot 11.
3	Fan modules (four modules with two fans each; hot-swappable)	10	PCIe slot 10: Required slot for NVMe switch card when the rear drive module is used with NVMe SSDs. This slot must also be used for the rear RAID controller in systems with only one CPU module.

4	Air diffuser for auxiliary rear drive module This diffuser is required only when using SAS/SATA drives in the rear drive module.	11	PCIe slot 01: Primary slot for Cisco VIC adapter card. (Secondary slot for Cisco VIC is slot 02.)
5	Position of the supercap unit (RAID backup) for the rear RAID controller. The clip for the supercap is on the inside surface of the air diffuser.	12	Power connectors for high-power GPU cards (six)
6	Auxiliary Drive Module for 8x rear drives; holds either (no mixing): ■ Up to eight 2.5-inch SAS/SATA drives, or ■ Up to eight 2.5-inch NVMe SSDs	13	Trusted platform module (TPM) on motherboard
7	Internal USB 2.0 socket on motherboard	-	-

DIMM and CPU Logical Layout

Memory is organized as shown in *Figure 7*.

Figure 7   UCS C480 M5 Memory Organization
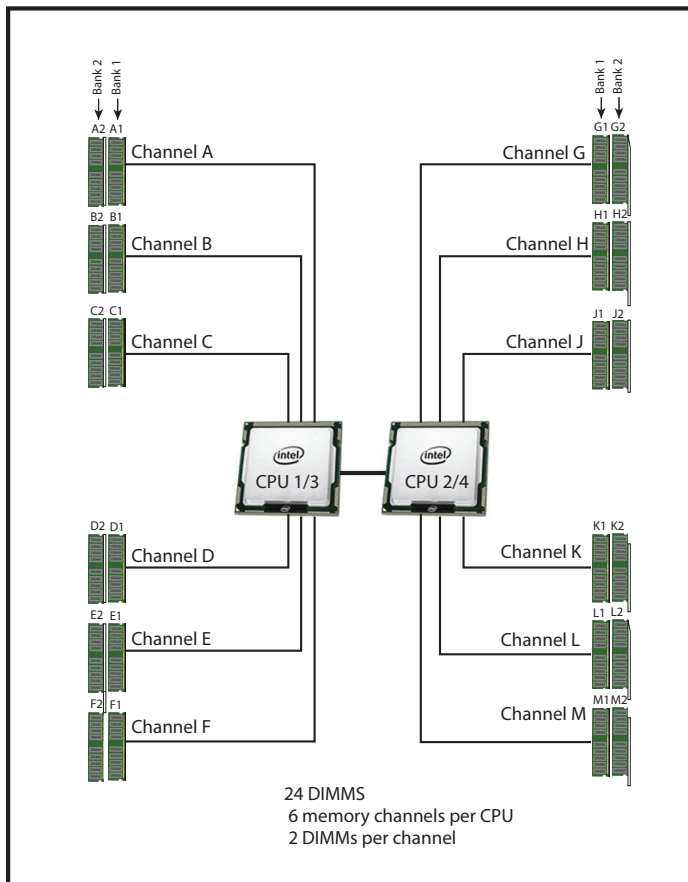
CPUs and DIMM Physical Layout

> **NOTE:** There are two plug-in CPU modules, each with two CPUs and 24 DIMMs (12 DIMMs per CPU). The bottom CPU module contains CPU1 and CPU2 and the top CPU module contains CPU3 and CPU4.

Each CPU has six DIMM channels:

- CPU1 and CPU3 have channels A, B, C, D, E, and F
- CPU2 and CPU4 have channels G, H, J, K, L, and M

Each DIMM channel has two slots: slot 1 and slot 2. The blue-colored DIMM slots are for slot 1 and the black slots for slot 2.

As an example, DIMM slots A1, B1, C1, D1, E1, and F1 belong to slot 1, while A2, B2, C2, D2, E2, and F2 belong to slot 2.

Figure 8 shows how slots and channels are physically laid out on the motherboard. The DIMM slots on the right half of the motherboard (channels A, B, C, D, E, and F) are associated with CPU 1 and CPU3, while the DIMM slots on the left half of the motherboard (channels G, H, J, K, L, and M) are associated with CPU2 and CPU4. The slot 1 (blue) DIMM slots are always located farther away from a CPU than the corresponding slot 2 (black) slots.

Figure 8   Physical Layout of CPU DIMM Channels and Slots
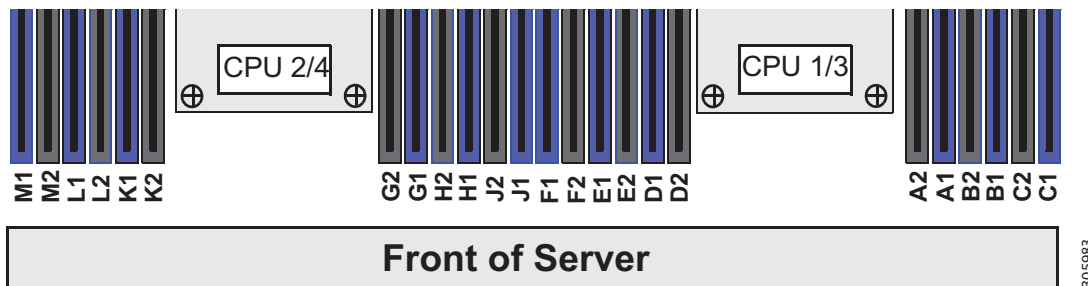
For more details, see the *"Memory Configuration Best Practices"* document, available at
https://www.cisco.com/c/dam/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/memory-guide-c220-c240-b200-m5.pdf

DIMM Population Rules

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

- Each channel has two DIMM slots (for example, channel A = slots A1 and A2).
    - A channel can operate with one or two DIMMs installed.
- Populate the DIMM slots of each CPU identically.
- Any DIMM installed in a DIMM socket for which the CPU is absent is not recognized.
- Observe the DIMM mixing rules shown in *Table 45*

Table 45 DIMM Rules for C480 M5 Servers

DIMM Parameter	DIMMs in the Same Channel	DIMM in the Same Slot[1]
DIMM Capacity RDIMM = 16, 32, or 64 GB LRDIMM = 32, 64, or 128 GB TSV-RDIMM = 64 or 128 GB	DIMMs in the same channel (for example, A1 and A2) can have different capacities.	For best performance, DIMMs in the same slot (for example, A1, B1, C1, D1, E1, F1) should have the same capacity.
	Do not mix TSV-RDIMMS with LRDIMMs nor RDIMMs	Do not mix TSV-RDIMMS with LRDIMMs nor RDIMMs
DIMM Speed 2666 MHz or 2933 MHz	DIMMs will run at the lowest speed of the CPU installed	DIMMs will run at the lowest speed of the CPU installed
DIMM Type TSV-RDIMMS, RDIMMs, or LRDIMMs	Do not mix DIMM types in a channel	Do not mix DIMM types in a slot
DIMMs per Channel (DPC)	**1 DPC or 2 DPC**	
	See *STEP 3 CHOOSE MEMORY, page 16* for valid LRDIMM and RDIMM 1 DPC and 2 DPC memory configurations	

Notes:

1. Although different DIMM capacities can exist in the same slot, this will result in less than optimal performance. For optimal performance, all DIMMs in the same slot should be identical.

For more details, see the document titled "*Cisco UCS C480 M5 Memory Guide*," available at

https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/datasheet-listing.html

Memory Support for CPU Classes and CPU Modes

For 2nd Generation Intel® Xeon® Scalable Processors:

- DIMMs and PMEMs are supported
- CPU PIDs ending in "M" support up to a limit of 2048 GB per CPU
- CPU PIDs ending in "L" support up to a limit of 4608 GB per CPU
- All other CPU PIDs support up to a limit of 1024 GB per CPU
- For the App Direct Mode, both PMEM and DIMM capacities count towards the CPU capacity limit
- For the Memory Mode and Mixed Mode only the PMEM capacity counts towards the CPU capacity limit

For Configurations Using Only DIMMs

- CPU PIDs ending in "M" support DIMM capacities up to 1536 GB per CPU (using 12 x 128 GB DIMMs) and DIMM capacities up to 2048 GB per CPU (using 8 x 256 GB DIMMs).
- CPU PIDs ending in "L" support DIMM capacities up to 1536 GB per CPU (using 12 x 128 GB DIMMs) and DIMM capacities up to 3072 GB per CPU (using 12 x 256 GB DIMMs). The 4608 GB limit cannot be reached with these capacity DIMMs.
- CPU PIDs not ending in "L" or "M" support DIMM capacities up to 1024 GB per CPU (using 8 x 128 GB DIMMs or 4 x 256 GB DIMMs).

For Configurations Using DIMMs and PMEMs in App Direct Mode

- CPU PIDs ending in "M" support capacities up to 1792 GB per CPU (using 6 x 128 GB DIMMS and 2 x 512 GB PMEMs or 4 x 256 GB PMEMs) or up to 2048 GB per CPU (using 6 x 256 GB DIMMs and 2 x 256 GB PMEMs or 6 x 256 GB DIMMs and 4 x 128 GB PMEMs)
- CPU PIDs ending in "L" support capacities up to 3840 GB per CPU (using 6 x 128 GB DIMMs and 6 x 512 GB PMEMs) or up to 4608 GB per CPU (using 6 x 256 GB DIMMs and 6 x 512 GB PMEMs)
- CPU PIDs not ending in "L" or "M" support capacities up to 1024 GB per CPU (using 6 x 128 GB DIMMs and 2 x 128 GB PMEMs).

For Configurations Using DIMMs and PMEMs in Memory or Mixed Mode

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> **NOTE:** For Memory and Mixed Modes, DIMMs are used as cache and do not factor into CPU capacity.

- CPU PIDs ending in "M" support capacities up to 2048 GB per CPU using:
  - 6 x 128 GB DIMMs as cache and 4 x 512 GB PMEMs as memory, or
  - 6x 256 GB DIMMs as cache and 4 x 512 GB PMEMs as memory
- CPU PIDs ending in "L" support capacities up to 3072 GB using:
  - 6 x 128 GB DIMMs as cache and 6 x 512 GB PMEMs as memory, or

— 6 x 256 GB DIMMs as cache and 6 x 512 GB PMEMs as memory

The allowable 4608 limit for PMEM capacity is not reached in this case.

■ CPU PIDs not ending in "L" or "M" support capacities up to 1024 GB per CPU using:

— 6 x 128 GB DIMMs as cache and 2 x 512 GB PMEMs as memory, or

— 6 x 256 GB DIMMs as cache and 2 x 512 GB PMEMs as memory

For Intel® Xeon® Scalable Processors:

■ DIMMs are supported; PMEMs are not supported

■ CPU PIDs ending in "M' support DIMM capacities up to 1536 GB per CPU (using 12 x 128 GB DIMMs).

■ All other CPU PIDs support DIMM capacities up to 768 GB per CPU (using 6 x 128 GB DIMMs or 12 x 64 GB DIMMs)

DIMM Population Order

Populate the DIMMs for a CPU according to *Table 46*.

Table 46 DIMM Population Order

	Populate CPU 1 or CPU 3 Slot		Populate CPU 2 or CPU 4 Slots	
	Blue #1 Slots	Black #2 Slots	Blue #1 Slots	Black #2 Slots
1	(A1)	-	(G1)	-
2	(A1, B1)	-	(G1, H1)	-
3	(A1, B1, C1)	-	(G1, H1, J1)	-
4	(A1, B1); (D1, E1)	-	(G1, H1); (K1, L1)	-
8	(A1, B1); (D1, E1)	(A2, B2); (D2, E2)	(G1, H1); (K1, L1)	(G2, H2); (K2, L2)
12	(A1, B1); (C1, D1); (E1, F1)	(A2, B2); (C2, D2); (E2, F2)	(G1, H1); (J1, K1); (L1, M1)	(G2, H2); (J2, K2); (L2, M2)

KVM CABLE

The KVM cable provides a connection into the server, providing a DB9 serial connector, a VGA connector for a monitor, and dual USB 2.0 ports for a keyboard and mouse. With this cable, you can create a direct connection to the operating system and the BIOS running on the server.

The KVM cable ordering information is listed in *Table 47*.

Table 47 KVM Cable

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

Figure 9   KVM Cable
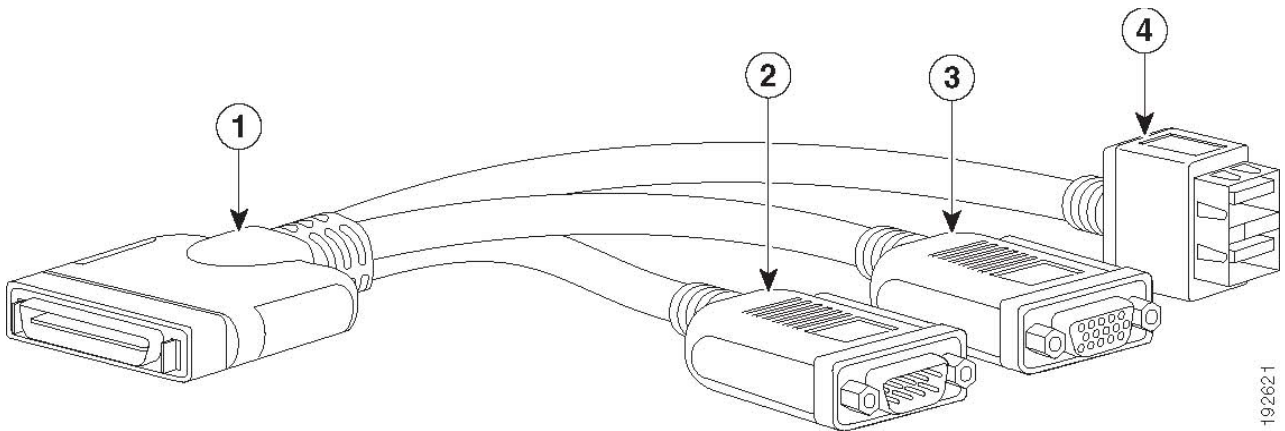
1	Connector (to server front panel)	3	VGA connector (for a monitor)
2	DB-9 serial connector	4	Two-port USB 2.0 connector (for a mouse and keyboard)

SPARE PARTS

This section lists the upgrade and service-related parts for the UCS C480 M5 server. Some of these parts are configured with every server.

Table 48 Spare Parts

Product ID (PID)	PID Description
KVM Cable	
N20-BKVM=	KVM local IO cable for UCS servers console port
CPU Accessories	
UCSC-HS-02-EX	CPU Heat Sink for UCS C480 M5 Rack Server
UCS-CPU-TIM=	Single CPU thermal interface material syringe for M5 server HS seal[1]
UCSX-HSCK=	UCS Processor Heat Sink Cleaning Kit (when replacing a CPU)[2]
UCS-CPUAT=	CPU Assembly Tool for M5 Servers
UCS-M5-CPU-CAR=	UCS M5 CPU Carrier
M.2 SATA SSD	
UCS-MSTOR-SD=	SD module (holds up to 2 SD cards)
UCS-MSTOR-M2=	M.2 module (holds up to 2 M.2 SATA drives)
UCS-M2-HWRAID =	Cisco Boot optimized M.2 RAID controller (holds up to 2 M.2 SATA SSDs)
Memory	
UCS-DIMM-BLK=	UCS DIMM Blanks[1]
UCS-ML-X64G4RT-H=	64 GB DDR4-2933-MHz LRDIMM/4Rx4 (8Gb) 1.2v
UCS-MR-X64G2RT-H=	64 GB DDR4-2933-MHz RDIMM/2Rx4 (16Gb) 1.2v
Drive Modules	
UCSC-C480-8HDD=	UCS C480 M5 Drive Module for 8x HDD (standard cage front facing)
UCSC-C480-8NVME=	UCS C480 M5 Drive Module for 8x NVMe drives (front facing cage)
UCSC-C480-8AUX=	UCS C480 M5 Auxiliary Drive Module for 8x rear drives
CBL-AUX-NVME-M5=	UCS C480 M5 AUX Drive NVME Cable
CBL-AUX-SAS-M5=	UCS C480 M5 AUX Drive SAS Cable
HDDs	
HDDs (15K RPM)	
UCS-HD300G15K12N=	300 GB 12G SAS 15K RPM SFF HDD

Table 48 Spare Parts *(continued)*

Product ID (PID)	PID Description
UCS-HD600G15K12N=	600 GB 12G SAS 15K RPM SFF HDD
UCS-HD900G15K12N=	900 GB 12G SAS 15K RPM SFF HDD
HDDs (10K RPM)	
UCS-HD300G10K12N=	300 GB 12G SAS 10K RPM SFF HDD
UCS-HD600G10K12N=	600 GB 12G SAS 10K RPM SFF HDD
UCS-HD12TB10K12N=	1.2 TB 12G SAS 10K RPM SFF HDD
UCS-HD18TB10K4KN=	1.8 TB 12G SAS 10K RPM SFF HDD (4K)
UCS-HD24TB10K4KN=	2.4 TB 12G SAS 10K RPM SFF HDD (4K)
HDDs (7K RPM)	
UCS-HD1T7K12N=	1.0 TB 12G SAS 7.2K RPM SFF HDD
UCS-HD2T7K12N=	2.0 TB 12G SAS 7.2K RPM SFF HDD
Enterprise Performance SSDs (High endurance, supports up to 10X or 3X DWPD (drive writes per day))	
SATA SSDs	
UCS-SD960G63X-EP= (spare is there)	960 GB 2.5in Enterprise performance 6G SATA SSD(3X endurance) (Intel S4600)
UCS-SD19T63X-EP=	1.9 TB 2.5in Enterprise performance 6G SATA SSD(3X endurance) (Intel S4600)
UCS-SD19TM3X-EP=	1.9TB 2.5in Enterprise performance 6GSATA SSD(3X endurance)
UCS-SD480GM3X-EP=	480GB 2.5in Enterprise Performance 6GSATA SSD(3X endurance)
UCS-SD960GM3X-EP=	960GB 2.5in Enterprise performance 6GSATA SSD(3X endurance)
SAS SSDs	
UCS-SD800G123X-EP=	800 GB 2.5 inch Enterprise performance 12G SAS SSD (3X endurance)
UCS-SD16H123X-EP=	1.6 TB 2.5 inch Enterprise performance 12G SAS SSD (3X endurance)
Enterprise Value SSDs (Low endurance, supports up to 1X DWPD (drive writes per day))	
SATA SSDs	
UCS-SD240GM1X-EV=	240 GB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)
UCS-SD480G6I1X-EV=	480 GB 2.5 inch Enterprise Value 6G SATA SSD (Intel S4500/S4150)
UCS-SD960G6I1X-EV=	960 GB 2.5 inch Enterprise Value 6G SATA SSD (Intel S4500/S4150)

Table 48 Spare Parts *(continued)*

Product ID (PID)	PID Description
UCS-SD38T6I1X-EV=	3.8 TB 2.5 inch Enterprise Value 6G SATA SSD (Intel S4500/S4150)
UCS-SD76T61X-EV=	7.6 TB 2.5 inch Enterprise Value 6G SATA SSD
SAS SSDs	
UCS-SD960GK1X-EV=	960 GB 2.5 inch Enterprise Value 12G SAS SSD
UCS-SD19TK1X-EV=	1.9 TB 2.5 inch Enterprise Value 12G SAS SSD
UCS-SD38TK1X-EV=	3.8 TB 2.5 inch Enterprise Value 12G SAS SSD
UCS-SD76TK1X-EV=	7.6 TB 2.5 inch Enterprise Value 12G SAS SSD
UCS-SD15TK1X-EV=	15.3 TB 2.5 inch Enterprise Value 12G SAS SSD
UCS-SD480G121X-EV=	480 GB 2.5 inch Enterprise Value 12G SAS SSD (Toshiba PM4)
UCS-SD960GK1X-EV=	960 GB 2.5 inch Enterprise Value 12G SAS SSD
UCS-SD19TK1X-EV=	1.9 TB 2.5 inch Enterprise Value 12G SAS SSD
Self-Encrypted Drives (SED)	
UCS-HD24T10NK9=	2.4 TB 12G SAS 10K RPM SFF HDD (4K) SED
UCS-HD18T10NK9=	1.8TB 12G SAS 10K RPM SFF HDD (4K format, SED)
UCS-HD12T10NK9=	1.2TB 12G SAS 10K RPM SFF HDD (SED)
UCS-HD600G15NK9=	600GB 12G SAS 15K RPM SFF HDD (SED)
UCS-SD960GBM2NK9=	960GB Enterprise value SATA SSD (1X, SED)
UCS-SD38TBEM2NK9=	3.8TB Enterprise value SATA SSD (1X, SED)
UCS-SD76TBEM2NK9=	7.6TB Enterprise value SATA SSD (1X, SED)
UCS-SD800GBKNK9=	800GB Enterprise Performance SAS SSD (3X FWPD, SED)
UCS-SD960GBKNK9=	960GB Enterprise Value SAS SSD (1X FWPD, SED)
UCS-SD38TBKNK9=	3.8TB Enterprise Value SAS SSD (1X FWPD, SED)
UCS-SD16TBKNK9=	1.6TB Enterprise performance SAS SSD (3X FWPD, SED)
PCIe/NVMe Drives	
UCSC-NVMEHW-H800=	U.2 800 GB HGST SN200 NVMe High Perf. High Endurance (HGST)
UCSC-NVMEHW-H1600=	U.2 1.6 TB HGST SN200 NVMe High Perf. High Endurance (HGST)
UCSC-NVMEHW-H6400=	U.2 6.4 TB HGST SN200 NVMe High Perf. High Endurance (HGST)
UCSC-NVMEHW-H7680=	U.2 7.7 TB HGST SN200 NVMe High Perf. Value Endurance (HGST)
UCSC-NVME2H-I1000=	Cisco 2.5" U.2 1.0TB Intel P4510 NVMe High Perf.Value Endur

Table 48 Spare Parts *(continued)*

Product ID (PID)	PID Description
UCSC-NVME2H-I1600=	Cisco 2.5" U.2 1.6TB Intel P4610 NVMe High Perf.High Endurance
UCSC-NVME2H-I3200=	Cisco 2.5" U.2 3.2TB Intel P4610 NVMe High Perf. High Endurance
UCSC-NVME2H-I4000=	Cisco 2.5" U.2 4.0TB Intel P4510 NVMe High Perf. Value Endu
UCS-NVMEM6-W1600=	1.6TB 2.5in U.2 WD SN840 NVMe Extreme Perf. High Endurance
UCS-NVMEM6-W3200=	3.2TB 2.5in U.2 WD SN840 NVMe Extreme Perf. High Endurance
UCS-NVMEM6-W6400=	6.4TB 2.5in U.2 WD SN840 NVMe Extreme Perf. High Endurance
UCS-NVMEM6-W7680 =	7.6TB 2.5in U.2 WD SN840 NVMe Extreme Perf. Value Endurance
UCS-NVMEM6-W15300=	15.3TB 2.5in U.2 WD SN840 NVMe Extreme Perf. High Endurance
RAID Controllers	
UCSC-RAID-M5HD=	Cisco 12G Modular RAID controller with 4GB cache (RAID 0, 1, 5, 6, 10, 50, 60 supported)
UCSC-SAS9460-8i=	Cisco 12G 9460-8i Raid controller with 2 GB cache (RAID 0, 1, 5, 10, 50 supported)
UCSC-9400-8E=	Cisco 9400-8E 12G SAS HBA for external JBOD attach
Converged Network Adapters (CNAs)	
UCSC-PCIE-C100-04=	Cisco UCS VIC 1495 Dual Port 40/100G QSFP28 CNA PCIe Spare
UCSC-PCIE-C40Q-03=	Cisco UCS VIC 1385 Dual Port 40Gb QSFP+ CNA w/RDMA
UCSC-PCIE-C25Q-04=	Cisco UCS VIC 1455 Quad Port 10/25G SFP28 CNA PCIE
Network Interface Cards (NICs)	
1 Gb NICs	
UCSC-PCIE-IRJ45=	Intel i350 Quad Port 1GBase-T NIC
10 Gb NICs	
N2XX-AIPCI01=	Intel X520 Dual Port 10Gb SFP+ NIC
UCSC-PCIE-ID10GC=	Intel X550-T2 Dual Port 10GBase-T NIC
UCSC-PCIE-ID10GF=	Intel X710-DA2 Dual Port 10Gb SFP+ NIC
UCSC-PCIE-IQ10GF=	Intel X710 Quad Port 10Gb SFP+ NIC
UCSC-PCIE-IQ10GC=	Intel X710 Quad Port 10GBase-T NIC
25 Gb NICs	
UCSC-PCIE-QD25GF=	Qlogic QL41212H Dual Port 25Gb NIC
UCSC-PCIE-ID25GF=	Intel XXV710 Dual Port 25Gb SFP28 NIC

Table 48 Spare Parts *(continued)*

Product ID (PID)	PID Description
UCSC-P-M4D25GF=	Mellanox MCX4121A-ACAT dual port 10/25G SFP28 NIC
40 Gb NICs	
UCSC-PCIE-QD40GF=	Qlogic QL45412H Dual Port 40Gb NIC
UCSC-PCIE-ID40GF=	Intel XL710 Dual Port 40Gb QSFP+ NIC
100 Gb NICs	
UCSC-PCIE-QS100GF=	Qlogic QLE45611HLCU single port 100G NIC
Host Bus Adapters (HBAs)	
UCSC-PCIE-QD16GF=	Qlogic QLE2692 Dual Port 16G Fibre Channel HBA
UCSC-PCIE-BD16GF=	Emulex LPe31002 Dual Port 16G Fibre Channel HBA
UCSC-PCIE-QD32GF=	Qlogic QLE2742 Dual Port 32G Fibre Channel HBA
UCSC-PCIE-BS32GF=	Emulex LPe32000-M2 Single Port 32G Fibre Channel HBA
UCSC-PCIE-BD32GF=	Emulex LPe32002-M2 Dual Port 32G Fibre Channel HBA
UCS NVMe/PCIe Add in Cards	
UCSC-F-H16003=	Cisco HHHL AIC 1.6TB HGST SN250 NVMe Extreme Performance High Endurance
UCSC-NVME-H32003=	Cisco HHHL AIC 3.2TB HGST SN260 NVMe Extreme Performance High Endurance
UCSC-NVME-H64003=	Cisco HHHL AIC 6.4TB HGST SN260 NVMe Extreme Performance High Endurance
UCSC-NVME-H38401=	Cisco HHHL AIC 3.8TB HGST SN260 NVMe Extreme Performance High Endurance
UCSC-NVME-H76801=	Cisco HHHL AIC 7.7TB HGST SN260 NVMeExtreme Performance Value Endurance
UCS NVMe/PCIe Switch Module	
UCSC-NVME-SC=	PCIE NVME Switch Module - plugs into PCIe slot 10 when NVMe drives are used on the auxiliary drive module.
DVD Drive	
UCSC-C480-DVD=	UCS C480 M5 Optional DVD drive
SD Cards	
UCS-SD-32G-S=	32 GB SD Card for UCS servers
UCS-SD-64G-S=	64 GB SD Card for UCS servers
UCS-SD-128G=	128GB SD Card for UCS servers

Table 48 Spare Parts *(continued)*

Product ID (PID)	PID Description
GPU PCIe Cards	
UCSC-GPU-V100=	NVIDIA V100 16GB
UCSC-GPU-V100-32=	NVIDIA V100 32GB
UCSC-GPU-P100-12G=	NVIDIA P100 12GB
UCSC-GPU-P100-16G=	NVIDIA P100 16GB
UCSC-GPU-M60=	NVIDIA M60
UCSC-GPU-A100=	TESLA A100, PASSIVE, 250W, 40GB
GPU Individual Power Cable	
UCS-P100CBL-480M5=	C480M5 NVIDIA P40/P100/M60/V100/A100 Cable
UCS-P10CBL-480M5=	C480M5 NVIDIA M10 Cable
Power Supply	
UCSC-PSU1-1600W=	Cisco UCS 1600W AC Power Supply for Rack Server
Power Cables	
CAB-C13-C14-2M=	CABASY,WIRE,JUMPER CORD, PWR, 2 Meter, C13/C14,10A/250V
CAB-250V-10A-AR=	Power Cord, SFS, 250V, 10A, Argentina
CAB-9K10A-AU=	Power Cord, 250VAC 10A 3112 Plug, Australia
CAB-250V-10A-CN=	AC Power Cord - 250V, 10A - PRC
CAB-9K10A-EU=	Power Cord, 250VAC 10A CEE 7/7 Plug, EU
CAB-250V-10A-ID=	Power Cord, SFS, 250V, 10A, India
CAB-250V-10A-IS=	Power Cord, SFS, 250V, 10A, Israel
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-AC-L620-C13=	AC Power Cord, NEMA L6-20 - C13, 2M/6.5ft
CAB-250V-10A-BR=	Power Cord - 250V, 10A - Brazil
CAB-C13-C14-IN=	Power Cord Jumper,C13-C14 Connectors,1.4 Meter Length, India
CAB-C13-C14-3M-IN=	Power Cord Jumper, C13-C14 Connectors, 3 Meter Length, India
CMA	
UCSC-CMA-4U-M5=	Cable Management Arm for UCS C480 M5

Table 48 Spare Parts *(continued)*

Product ID (PID)	PID Description
USB Drive	
UCS-USBFLSHB-16GB=	UCS Servers 16 GB Flash USB Drive (optional)
TPM	
UCSX-TPM2-001=	Trusted Platform Module 1.2 for UCS Servers
UCSX-TPM2-002=	Trusted Platform Module 2.0 for UCS servers
UCSX-TPM2-002B=	Trusted Platform Module 2.0 M5 UCS Servers (FIPS 140-2 Compliant)
UCS-C480-INT-SW=	UCS C480 Safety Intrusion Switch
Bezel	
UCSC-BZL-EX-M5=	Optional bezel for UCS C480 M5 rack server
Software/Firmware	
IMC Supervisor	
CIMC-SUP-BASE-K9=	IMC Supervisor One-time Site Installation License
CIMC-SUP-B01=	IMC Supervisor-Branch Mgt SW for C-Series & E-Series up to 100 Svrs
CIMC-SUP-B02=	IMC Supervisor- Branch Mgt SW for C & E-Series up to 250 Svrs
CIMC-SUP-B10=	IMC Supervisor- Branch Mgt SW for C & E-Series up to 1K Svrs
CIMC-SUP-B25=	IMC Supervisor Branch Mgt SW for C & E-Series 25 Svrs
CIMC-SUP-A01=	IMC Supervisor Adv-Branch Mgt SW for C & E-Series 100 Svrs
CIMC-SUP-A02=	IMC Supervisor Adv-Branch Mgt SW for C & E-Series 250 Svrs
CIMC-SUP-A10=	IMC Supervisor Adv-Branch Mgt SW for C & E-Series 1000 Svrs
CIMC-SUP-A25=	IMC Supervisor Adv-Branch Mgt SW for C & E-Series 250 Svrs
EVAL-CIMC-SUP=	EVAL: IMC Supervisor-Branch Mgt SW for C/E-Series - 50 Svrs
EVAL-CIMC-SUP-BAS=	EVAL: IMC Supervisor One-time Site Installation License
UCS Multi-Domain Manager	
UCS-MDMGR-1S=	UCS Central Per Server License **NOTE**: IF you must order quantity greater than 1 of UCS-MDMGR-1S, you need to reference the UCS Central Per Server Data Sheet to order the standalone PIDs: UCS-MDMGR-LIC= or UCS-MDMGR-1DMN=
VMware vCenter	
VMW-VCS-STD-1A=	VMware vCenter 7 Server Standard, 1 yr support required
VMW-VCS-STD-3A=	VMware vCenter 7 Server Standard, 3 yr support required

Table 48 Spare Parts *(continued)*

Product ID (PID)	PID Description
VMW-VCS-STD-5A=	VMware vCenter 7 Server Standard, 5 yr support required
VMW-VCS-FND-1A=	VMware vCenter 7 Server Foundation (3 Host), 1 yr supp reqd
VMW-VCS-FND-3A=	VMware vCenter 7 Server Foundation (3 Host), 3 yr supp reqd
VMW-VCS-FND-5A=	VMware vCenter 7 Server Foundation (3 Host), 5 yr supp reqd
Red Hat	
RHEL-2S2V-1A=	Red Hat Enterprise Linux (1-2 CPU,1-2 VN); 1-Yr Support Req
RHEL-2S2V-3A=	Red Hat Enterprise Linux (1-2 CPU,1-2 VN); 3-Yr Support Req
RHEL-2S2V-1S=	Red Hat Enterprise Linux (1-2 CPU,1-2 VN); Prem 1-Yr SnS
RHEL-2S2V-3S=	Red Hat Enterprise Linux (1-2 CPU,1-2 VN); Prem 3-Yr SnS
RHEL-2S-HA-1S=	RHEL High Availability (1-2 CPU); Premium 1-yr SnS
RHEL-2S-HA-3S=	RHEL High Availability (1-2 CPU); Premium 3-yr SnS
RHEL-2S-RS-1S=	RHEL Resilient Storage (1-2 CPU); Premium 1-yr SnS
RHEL-2S-RS-3S=	RHEL Resilient Storage (1-2 CPU); Premium 3-yr SnS
RHEL-2S-SFS-1S=	RHEL Scalable File System (1-2 CPU); Premium 1-yr SnS
RHEL-2S-SFS-3S=	RHEL Scalable File System (1-
RHEL-2S2V-5A=	Red Hat Enterprise Linux (1-2 CPU,1-2 VN); 5-Yr Support Req
RHEL-2S-HA-1A=	RHEL High Availability (1-2 CPU); 1-Yr Support Reqd
RHEL-2S-HA-3A=	RHEL High Availability (1-2 CPU); 3-Yr Support Reqd
RHEL-2S-HA-5A=	RHEL High Availability (1-2 CPU); 5-Yr Support Reqd
RHEL-2S-RS-1A=	RHEL Resilent Storage (1-2 CPU); Premium 1-yr SnS Reqd
RHEL-2S-RS-3A=	RHEL Resilent Storage (1-2 CPU); Premium 3-yr SnS Reqd
RHEL-2S-RS-5A=	RHEL Resilent Storage (1-2 CPU); Premium 5-yr SnS Reqd
RHEL-2S-SFS-1A=	RHEL Scalable File System (1-2 CPU); 1-Yr Support Reqd
RHEL-2S-SFS-3A=	RHEL Scalable File System (1-2 CPU); 1-Yr Support Reqd
RHEL-2S-SFS-5A=	RHEL Scalable File System (1-2 CPU); 1-Yr Support Reqd
Red Hat SAP	
RHEL-SAP-2S2V-1S=	RHEL for SAP Apps (1-2 CPU, 1-2 VN); Prem 1-Yr SnS Reqd
RHEL-SAP-2S2V-3S=	RHEL for SAP Apps (1-2 CPU, 1-2 VN); Prem 3-Yr SnS Reqd
RHEL-SAPSP-3S=	RHEL SAP Solutions Premium - License with 3 Years of SnS

Table 48 Spare Parts *(continued)*

Product ID (PID)	PID Description
RHEL-SAPSS-3S=	RHEL SAP Solutions Standard - License with 3 Years of SnS
VMware	
VMW-VSP-STD-1A=	VMware vSphere 7 Std (1 CPU, 32 Core) 1-yr, Support Required
VMW-VSP-STD-3A=	VMware vSphere 7 Std (1 CPU, 32 Core) 3-yr, Support Required
VMW-VSP-STD-5A=	VMware vSphere 7 Std (1 CPU, 32 Core) 5-yr, Support Required
VMW-VSP-EPL-3A=	VMware vSphere 7 Ent Plus (1 CPU, 32 Core) 1Yr, Support Reqd
VMW-VSP-EPL-1A=	VMware vSphere 7 Ent Plus (1 CPU, 32 Core) 3Yr, Support Reqd
VMW-VSP-EPL-5A=	VMware vSphere 7 Ent Plus (1 CPU, 32 Core) 5Yr, Support Reqd
SLES and SAP	
SLES-SAP-2S2V-1A=	SLES for SAP Apps (1-2 CPU, 1-2 VM); 1-Yr Support Reqd
SLES-SAP-2SUV-1A=	SLES for SAP Apps (1-2 CPU, Unl VM); 1-Yr Support Reqd
SLES-SAP-2S2V-3A=	SLES for SAP Apps (1-2 CPU, 1-2 VM); 3-Yr Support Reqd
SLES-SAP-2SUV-3A=	SLES for SAP Apps (1-2 CPU, Unl VM); 3-Yr Support Reqd
SLES-SAP-2S2V-5A=	SLES for SAP Apps (1-2 CPU, 1-2 VM); 5-Yr Support Reqd
SLES-SAP-2SUV-5A=	SLES for SAP Apps (1-2 CPU, Unl VM); 5-Yr Support Reqd
SLES-SAP-2S2V-1S=	SLES for SAP Apps (1-2 CPU, 1-2 VM); Priority 1-Yr SnS
SLES-SAP-2SUV-1S=	SLES for SAP Apps (1-2 CPU, Unl VM); Priority 1-Yr SnS
SLES-SAP-2S2V-3S=	SLES for SAP Apps (1-2 CPU, 1-2 VM); Priority 3-Yr SnS
SLES-SAP-2SUV-3S=	SLES for SAP Apps (1-2 CPU, Unl VM); Priority 3-Yr SnS
SLES-SAP-2S2V-5S=	SLES for SAP Apps (1-2 CPU, 1-2 VM); Priority 5-Yr SnS
SLES-SAP-2SUV-5S=	SLES for SAP Apps (1-2 CPU, Unl VM); Priority 5-Yr SnS
SUSE	
SLES-2S2V-1A=	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM); 1-Yr Support Req
SLES-2SUV-1A=	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM); 1-Yr Support Req
SLES-2S2V-3A=	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM); 3-Yr Support Req
SLES-2SUV-3A=	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM); 3-Yr Support Req
SLES-2S2V-5A=	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM); 5-Yr Support Req
SLES-2SUV-5A=	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM); 5-Yr Support Req
SLES-2S2V-1S=	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM); Prio 1-Yr SnS

Table 48 Spare Parts *(continued)*

Product ID (PID)	PID Description
SLES-2SUV-1S=	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM); Prio 1-Yr SnS
SLES-2S2V-3S=	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM); Prio 3-Yr SnS
SLES-2SUV-3S=	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM); Prio 3-Yr SnS
SLES-2S2V-5S=	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM); Prio 5-Yr SnS
SLES-2SUV-5S=	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM); Prio 5-Yr SnS
SLES-2S-HA-1S=	SUSE Linux High Availability Ext (1-2 CPU); 1yr SnS
SLES-2S-HA-3S=	SUSE Linux High Availability Ext (1-2 CPU); 3yr SnS
SLES-2S-HA-5S=	SUSE Linux High Availability Ext (1-2 CPU); 5yr SnS
SLES-2S-GC-1S=	SUSE Linux GEO Clustering for HA (1-2 CPU); 1yr Sns
SLES-2S-GC-3S=	SUSE Linux GEO Clustering for HA (1-2 CPU); 3yr SnS
SLES-2S-GC-5S=	SUSE Linux GEO Clustering for HA (1-2 CPU); 5yr SnS
SLES-2S-LP-1S=	SUSE Linux Live Patching Add-on (1-2 CPU); 1yr SnS Required
SLES-2S-LP-3S=	SUSE Linux Live Patching Add-on (1-2 CPU); 3yr SnS Required

Notes:

 1. This part is included with the purchase of option or spare CPU or CPU processor kits.

UPGRADING or REPLACING CPUs

> **NOTE:** Before servicing any CPU, do the following:
> - Decommission and power off the server.
> - Slide the server out from the rack.
> - Remove the top cover.

To replace an <u>existing CPU</u>, follow these steps:

(1) Have the following tools and materials available for the procedure:

- T-30 Torx driver—Supplied with replacement CPU.
- #1 flat-head screwdriver—Supplied with replacement CPU.
- CPU assembly tool—Supplied with replacement CPU. Can be ordered separately as Cisco PID UCS-CPUAT=.
- Heatsink cleaning kit—Supplied with replacement CPU. Can be ordered separately as Cisco PID UCSX-HSCK=.
- Thermal interface material (TIM)—Syringe supplied with replacement CPU. Can be ordered separately as Cisco PID UCS-CPU-TIM=.

(2) Order the appropriate replacement CPU from *Table 3 on page 13*.

(3) Carefully remove and replace the CPU and heatsink in accordance with the instructions found in "Cisco UCS C480 M5 Blade Server Installation and Service Note," found at:

https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/c/hw/C480M5/install/C480M5/C480M5_chapter_011.html#task_j5g_bzp_hz

To add a <u>new CPU</u>, follow these steps:

(1) Have the following tools and materials available for the procedure:

- T-30 Torx driver—Supplied with new CPU.
- #1 flat-head screwdriver—Supplied with new CPU
- CPU assembly tool—Supplied with new CPU.Can be ordered separately as Cisco PID UCS-CPUAT=
- Thermal interface material (TIM)—Syringe supplied with replacement CPU.Can be ordered separately as Cisco PID UCS-CPU-TIM=

(2) Order the appropriate new CPU from *Table 3 on page 13*.

(3) Order one heat sink for each new CPU. Order PID UCSB-HS-M5-F= for front CPUs and PID UCSB-HS-M5-R= for rear CPUs.

(4) Carefully install the CPU and heatsink in accordance with the instructions found in "Cisco UCS B480 M5 Blade Server Installation and Service Note," found at:

https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/c/hw/C480M5/install/C480M5/C480M5_chapter_011.html#task_j5g_bzp_hz

(5) UPGRADING or REPLACING MEMORY

> **NOTE:** Before servicing any DIMM or PMEM, do the following:
> - Decommission and power off the server.
> - Remove the top cover from the server
> - Slide the server out the front of the chassis.

To add or replace DIMMs or PMEMs, follow these steps:

(1) Order new DIMMs or PMEMs as needed from *Table 4 on page 17*.

(2) Order DIMM/PMEM blanks as needed (PID UCS-DIMM-BLK=)

(3) Open both connector latches and remove and replace the DIMM/PMEM or blank as needed.

Figure 10 Replacing Memory
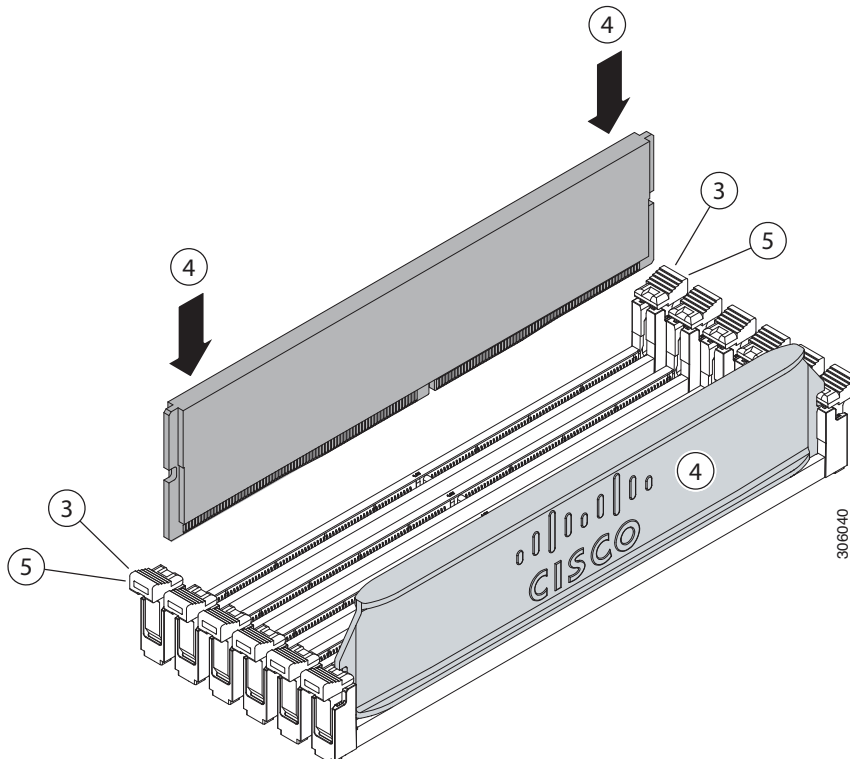
(4) Press evenly on both ends of the DIMM/PMEM until it clicks into place in its slot.

NOTE: Ensure that the notch in the DIMM/PMEM aligns with the slot. If the notch is misaligned, it is possible to damage the DIMM/PMEM, the slot, or both.

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(5) Press the connector latches inward slightly to seat them fully.

(6) Populate all slots with a DIMM, PMEM, or DIMM blank. A slot cannot be empty.

For additional details on replacing or upgrading DIMMs and PMEMs, see "Cisco UCS X480 M5 Server Installation and Service Guide," found at these links:

https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/hw/blade-servers/B480M5/B480M5_chapter_011.html#concept_a3p_vfl_kz

https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/hw/blade-servers/B480M5/B480M5_chapter_011.html#concept_qtr_4xh_zgb

DISCONTINUED EOL PRODUCTS

Below is the list of parts were previously available for this product and are no longer sold. Please refer to the EOL Bulletin Links via the *Table 49* below to determine if still supported.

Table 49 EOL Products

EOS option PID	Description	EOL bulletin link
MEMORY		
UCS-MR-X16G2RS-H	16GB DDR4-2666-MHz RDIMM/PC4-21300/dual rank/x4/1.2v	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-740780.html
CPU		
UCS-CPU-I8280M	Intel 8280M 2.7GHz/205W 28C/38.50MB 3DX DDR4 2TB 2933 MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743832.html
UCS-CPU-I8276M	Intel 8276M 2.2GHz/165W 28C/38.50MB 3DX DDR4 2TB 2933 MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743832.html
UCS-CPU-I8260M	Intel 8260M 2.4GHz/165W 24C/35.75MB 3DX DDR4 2TB 2933 MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743832.html
UCS-CPU-I6240M	Intel 6240M 2.6GHz/150W 18C/24.75MB 3DX DDR4 2TB 2933 MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743832.html
UCS-CPU-I6238M	Intel 6238M 2.1GHz/140W 22C/30.25MB 3DX DDR4 2TB 2933 MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743832.html
UCS-CPU-I5215M	Intel 5215M 2.5GHz/85W 10C/13.75MB 3DX DDR4 2TB 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743832.html
UCS-CPU-8180M	2.5 GHz 8180M/205W 28C/38.50MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-8176M	2.1 GHz 8176M/165W 28C/38.50MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-8170M	2.1 GHz 8170M/165W 26C/35.75MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-8160M	2.1 GHz 8160M/150W 24C/33MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-8180	2.5 GHz 8180/205W 28C/38.50MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-8176	2.1 GHz 8176/165W 28C/38.50MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html

Table 49 EOL Products

EOS option PID	Description	EOL bulletin link
UCS-CPU-8170	2.1 GHz 8170/165W 26C/35.75MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-8168	2.7 GHz 8168/205W 24C/33MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-8164	2.0 GHz 8164/150W 26C/35.75MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-8160T	2.1 GHz 8160/150W 24C/33MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-8160	2.1 GHz 8160/150W 24C/33MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-8158	3.0 GHz 8158/150W 12C/24.75MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-8156	3.6 GHz 8156/105W 4C/16.50MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-8153	2.0 GHz 8153/125W 16C/22MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6142M	2.6 GHz 6142M/150W 16C/22MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6140M	2.3 GHz 6140M/140W 18C/24.75MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6134M	3.2 GHz 6134M/130W 8C/24.75MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6154	3.0 GHz 6154/**200W** 18C/24.75MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6152	2.1 GHz 6152/140W 22C/30.25MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6150	2.7 GHz 6150/**165W** 18C/24.75MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6148	2.4 GHz 6148/150W 20C/27.50MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6144	3.5 GHz 6144/150W 8C/24.75MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html

Table 49 EOL Products

EOS option PID	Description	EOL bulletin link
UCS-CPU-6142	2.6 GHz 6142/150W 16C/22MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6140	2.3 GHz 6140/140W 18C/24.75MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6138T	2.0 GHz 6138T/125W 20C/27.5MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6138	2.0 GHz 6138/125W 20C/27.50MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6136	3.0 GHz 6136/150W 12C/24.75MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6134	3.2 GHz 6134/130W 8C/24.75MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6132	2.6 GHz 6132/140W 14C/19.25MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6130	2.1 GHz 6130/125W 16C/22MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6128	3.4 GHz 6128/115W 6C/19.25MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-6126	2.6 GHz 6126/125W 12C/19.25MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-5122	3.6 GHz 5122/105W 4C/16.50MB Cache/DDR4 2666MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-5120	2.2 GHz 5120/105W 14C/19.25MB Cache/DDR4 2400MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-5118	2.3 GHz 5118/105W 12C/16.50MB Cache/DDR4 2400MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-5117	2.0 GHz 5117/105W 14C/19.25MB Cache/DDR4 2400MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
UCS-CPU-5115	2.4 GHz 5115/85W 10C/13.75MB Cache/DDR4 2400MHz	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744580.html
Drives		
Enterprise Value		

Table 49 EOL Products

EOS option PID	Description	EOL bulletin link
UCS-SD240G61X-EV	240GB 2.5 inch Enterprise Value 6G SATA SSD	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-servers/eos-eol-notice-c51-742066.html
UCS-SD16T61X-EV	1.6TB 2.5 inch Enterprise Value 6G SATA SSD	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-servers/eos-eol-notice-c51-742066.html
UCS-SD240GBE1NK9	240GB Enterprise Value SSD (SATA) (1X FWPD, SED)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742509.html
UCS-SD38TBE1NK9	3.8TB Enterprise Value SATA SSD (1X FWPD, SED)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742509.html
UCS-SD38TH61X-EV	3.8TB 2.5 inch Enterprise Value 12G SAS SSD	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-seriesrack-servers/eos-eol-notice-c51-743832.html
UCS-SD19TB121X-EV	1.9 TB 2.5 inch Enterprise Value 12G SAS SSD (Toshiba PM4)	https://www.cisco.com/c/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/eos-eol-notice-c51-2451489.html
UCS-SD38TB121X-EV	3.8TB 2.5 inch Enterprise Value 12G SAS SSD	https://www.cisco.com/c/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/eos-eol-notice-c51-2451489.html
UCS-SD960G121X-EV	960GB 2.5 inch Enterprise Value 12G SAS SSD	https://www.cisco.com/c/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/eos-eol-notice-c51-2451489.html
UCS-SD960GH61X-EV	960GB 2.5 inch Enterprise Value 12G SAS SSD (SS530)	https://www.cisco.com/c/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/eos-eol-notice-c51-2451489.html
Enterprise Performance		
UCS-SD400G12TX-EP	400 GB 2.5 inch Enterprise performance 12G SAS SSD (10X endurance)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-servers/eos-eol-notice-c51-742066.html
UCS-SD400H123X-EP	400 GB 2.5 inch Enterprise performance 12G SAS SSD (3X endurance)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-servers/eos-eol-notice-c51-742066.html
UCS-SD32H123X-EP	3.2 TB 2.5 inch Enterprise performance 12G SAS SSD (3X endurance)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743832.html
UCS-SD800G12TX-EP	800 GB 2.5 inch Enterprise performance 12G SAS SSD (10X endurance)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-741644.html
UCS-SD16TB12TX-EP	1.6 TB 2.5 inch Enterprise performance 12G SAS SSD (10X endurance)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-741644.html
UCS-SD800H123X-EP	800 GB 2.5 inch Enterprise performance 12G SAS SSD (3X endurance)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743832.html
UCS-SD16T123X-EP	1.6 TB 2.5 inch Enterprise performance 12G SAS SSD (3X endurance)	https://www.cisco.com/c/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/eos-eol-notice-c51-2451489.html

Table 49 EOL Products

EOS option PID	Description	EOL bulletin link
UCS-SD400G123X-EP	400GB 2.5in Enterprise Performance 12G SAS SSD(3X endurance)	https://www.cisco.com/c/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/eos-eol-notice-c51-2451489.html
UCS-SD32T123X-EP	3.2 TB 2.5 inch Enterprise performance 12G SAS SSD (3X endurance)	https://www.cisco.com/c/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/eos-eol-notice-c51-2451489.html
NVMe		
UCSC-NVMELW-I500	500GB 2.5in U.2 Intel P4501 NVMe Med. Perf. Value Endurance	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742509.html
UCSC-NVMELW-I1000	Cisco 2.5" U.2 1TB Intel P4501 NVMe Med. Perf. Value Endur (Intel)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742509.html
UCSC-NVMEHW-I1000	Cisco 2.5" U.2 1TB Intel P4500 NVMe High Perf. Value Endurance	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742509.html
UCSC-NVMELW-I2000	Cisco 2.5" U.2 2TB Intel P4501 NVMe Perf. Value Endur (Intel)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742509.html
UCSC-NVMEHW-I1600	Cisco 2.5" U.2 1.6TB Intel P4600 NVMe High Perf. High Endurance	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742823.html
UCSC-NVMEHW-I2000	Cisco 2.5" U.2 2TB Intel P4600 NVMe High Perf. High Endurance	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742823.html
UCSC-NVMEHW-I4000	Cisco 2.5" U.2 4TB Intel P4500 NVMe High Perf. Value Endurance	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742509.html
UCSC-NVMEHW-I2TBV	2TB 2.5in U.2 Intel P4500 NVMe High Perf. Value Endurance	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742823.html
UCSC-NVMEHW-I3200	3.2TB 2.5in U.2 Intel P4600 NVMe High Perf. High Endurance	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742823.html
UCSC-NVMEHW-H3200	3.2TB 2.5in U.2 HGST SN200 NVMe High Perf. High Endurance	https://www.cisco.com/c/en/us/products/collateral/hyperconverged-infrastructure/hyperflex-hx-series/eos-eol-notice-c51-2451489.html
GPU		
UCSC-GPU-7150x2	AMD Firepro 7150x2	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742509.html
UCSC-GPU-P100-12G	NVIDIA P100 12GB	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-741579.html

Table 49 EOL Products

EOS option PID	Description	EOL bulletin link
UCSC-GPU-P100-16G	NVIDIA P100 16GB	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-741579.html
UCSC-GPU-P40	NVIDIA P40	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-744204.html
PCIe OPTION CARD		
UCSC-PCIE-Q2672	Qlogic QLE2672-CSC, 16Gb Fibre Channel HBA with SR Optics	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-741234.html
UCSC-PCIE-B3SFP	BROADCOM 57810 10Gb A-FEX SFP+	http://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-737482.html
UCSC-PCIE-CSC-02	Cisco VIC 1225 Dual Port 10Gb SFP+ CNA	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-741234.html
UCSC-PCIE-E16002	Emulex LPe16002 Dual-Port 16Gb Fibre Channel HBA w/SR Optics	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-741234.html
Microsoft Windows server		
MSWS-16-ST16C	Windows Server 2016 Standard (16 Cores/2 VMs)	https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743145.html
MSWS-16-ST24C	Windows Server 2016 Standard (24 Cores/2 VMs)	https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743145.html
MSWS-16-ST16C-NS	Windows Server 2016 Standard (16 Cores/2 VMs) - No Cisco SVC	https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743145.html
MSWS-16-ST24C-NS	Windows Server 2016 Standard (24 Cores/2 VMs) - No Cisco SVC	https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743145.html
MSWS-16-DC16C	Windows Server 2016 Data Center (16 Cores/Unlimited VMs)	https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743145.html
MSWS-16-DC24C	Windows Server 2016 Data Center (24 Cores/Unlimited VMs)	https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743145.html
MSWS-16-DC16C-NS	Windows Server 2016 DC (16 Cores/Unlim VMs) - No Cisco SVC	https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743145.html
MSWS-16-DC24C-NS	Windows Server 2016 DC (24 Cores/Unlim VMs) - No Cisco SVC	https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743145.html
OS Media		
MSWS-16-ST16C-RM	Windows Server 2016 Std (16 Cores/2 VMs) - Recovery Media	https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743145.html
MSWS-16-ST24C-RM	Windows Server 2016 Std (24 Cores/2 VMs) - Recovery Media	https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743145.html
MSWS-16-DC16C-RM	Windows Server 2016 DC (16 Cores/Unlim VMs) - Recovery Media	https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743145.html

Table 49 EOL Products

EOS option PID	Description	EOL bulletin link
MSWS-16-DC24C-RM	Windows Server 2016 DC (24 Cores/Unlim VMs) - Recovery Media	https://www.cisco.com/c/en/us/products/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743145.html

TECHNICAL SPECIFICATIONS

Dimensions and Weight

Table 50 UCS C480 M5 Dimensions and Weight[1]

Parameter	Value
Height	6.9 in. (176 mm)
Width	19.0 in.(483 mm)
Length (including front handles and power supplies)	32.7 in. (830 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)	146 lbs (66.3kg)

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

Table 51 Power Supplies

Product ID (PID)	PID Description
UCSC-PSU1-1600W	Cisco UCS 1600W AC Power Supply for Rack Server

The general power specifications for the C480 M5 server are listed in *Table 52*.

Table 52 UCS C480 M5 1600 W (AC) Power Supply Specifications

Description	Specification
AC input voltage	Voltage Range 180 - 264 VAC
AC input frequency	50 to 60 Hz nominal (range: 47 to 63 Hz)
Max AC Input current	< 9.5 A maximum at 200 VAC
Maximum Input VA	1600 VA @200 VAC

Table 52 UCS C480 M5 1600 W (AC) Power Supply Specifications

Description	Specification
Maximum output power per power supply	In the 180-265 VAC range the maximum rated output power is 1600 W, not including the standby 12V power.
Maximum inrush current	< 30A Peak at +35 degrees C (charging current for EMI-X capacitors is not considered to be inrush current)
Maximum hold up time	Greater than 12 ms with 2,200 uF of load capacitance
Power supply output voltage	12 VDC
Power supply standby voltage	12 VDC
Efficiency rating	Climate Savers Platinum Efficiency (80Plus Platinum Certified)
Form Factor	RSP2
Input connector	IEC60320 C14 type connector

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

http://ucspowercalc.cisco.com

Environmental Specifications

The power specifications for the C480 M5 server are listed in *Table 53*.

Table 53 UCS C480 M5 Environmental Specifications

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

Compliance Requirements

The regulatory compliance requirements for C-Series servers are listed in *Table 54*.

Table 54 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 UCS C480 M5 High-Performance Rack-Mount Server