Cisco UCS B480 M5 Blade Server

CONTENTS

OVERVIEW

Designed for demanding virtualization and database workloads, the UCS B480 M5 combines a large memory footprint with four-socket scalability, leveraging the Intel® Xeon® Scalable processor family of CPUs. The UCS B480 M5 supports 2666-MHz and 2933-MHz DDR4 memory and utilizes UCS Virtual Interface Card (VIC) technology to achieve up to 160 Gb/s aggregate I/O bandwidth, all in a dense, full-width blade form factor. The UCS B480 M5 maintains memory performance even as capacity grows and can support up to 6 TB of memory without compromise to CPU speed or core count. Up to four UCS B480 M5 Blade Servers can be installed in the UCS 5108 Blade Server Chassis.

The July 2019 update includes the following:

- 2nd Generation Intel® Xeon® Scalable Processors.

- 2933-MHz GB DDR4 memory DIMMs.

- 128 GB, 256 GB, and 512 GB Intel® Persistent Memory Modules (PMEM).

- 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

The UCS B480 M5 Blade Server is centrally managed using Cisco UCS Manager. Cisco UCSM provides a single management interface for all hardware and software.

e components of a UCS domain. Cisco UCSM manages up to 160 servers, using Single Connect Technology to consolidate network, storage, and management traffic. With Cisco UCS Central, management can be extended globally to 'of servers in multiple domains.

Figure 1   Cisco UCS B480 M5 Blade Server

DETAILED VIEWS

Blade Server Front View

Figure 2 is a detailed front view of the Cisco UCS B480 M5 Blade Server.

Figure 2   Blade Server Front View
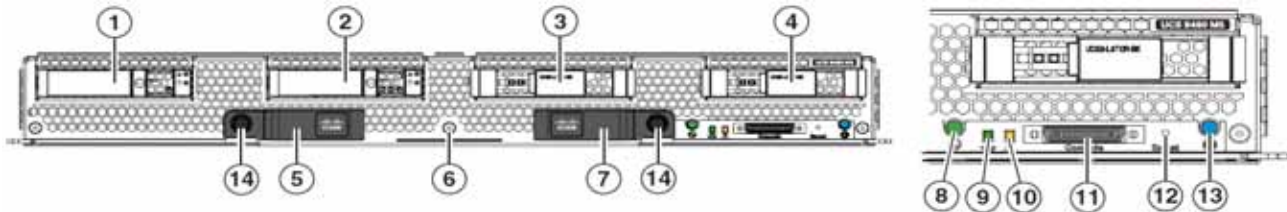
1	Drive bay 1 (populated)	8	Power button and LED
2	Drive bay 2 (populated)	9	Network link status and LED
3	Drive bay 3	10	Blade health LED
4	Drive bay 4	11	Local console connection[1]
5	Left ejector handle	12	Reset button
6	Asset pull handle (a blank asset tag is provided on which you can add your own label or sticker or you can use a marker to write your asset information on the tag)	13	Locate (identify) button and LED
7	Right ejector handle	14	Ejector thumb screw

Notes

1. For information about the KVM local I/O cable that plugs into the console connector (a cable is included with every Cisco UCS 5108 blade server chassis accessory kit), see *CHOOSE LOCAL KVM I/O CABLE* (OPTIONAL) on page 55*.

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 6*.

> NOTE: The B480 M5 blade server requires UCS Manager (UCSM) to operate as part of the UCS system.
>
> ■ The B480 M5 with the Intel® Xeon® Scalable processor family of CPUs requires UCSM 3.2(2) or later release, and with the 2nd Generation Intel Scalable Processors, UCSM 4.0(4b) is required.

Table 1   Capabilities and Features

Capability/Feature	Description
Blade server chassis	The full-width UCS B480 M5 Blade Server mounts in a Cisco UCS 5108 series blade server chassis.
CPU	Two or four Intel® Xeon® Scalable family CPUs or two or four 2nd Generation Intel® Xeon® Scalable family CPUs
Chipset	Intel C621 series chipset (Lewisburg)
Memory	48 total DIMM slots ■ Support for Advanced ECC ■ Support for registered ECC DIMMs (RDIMMs) ■ Support for load-reduced DIMMs (LRDIMMs) ■ Support for through-silicon via DIMMs (TSV DIMMs) ■ Support for Intel® Persistent Memory Modules (PMEMs)
I/O	Five configurable mezzanine slots: ■ One rear mLOM slot supports the Cisco VIC 1440 only. NOTE: The Cisco VIC 1400 Series (1440 and 1480) is compatible with 6200 and 6300 Series Fabric Interconnects as well as the 2204XP, 2208XP, 2304, and 2408XP Fabric Extenders. ■ Two rear mezzanine slots support Cisco adapters and Cisco UCS Storage Accelerator or GPUs. ■ Two front mezzanine slots support GPUs, FlexStorage RAID controllers, and the FlexStorage Passthrough module.

Table 1   Capabilities and Features *(continued)*

Capability/Feature	Description
Storage controller	■ Diskless system (no drive bays or RAID controller), or ■ Cisco FlexStorage 12G SAS RAID controller with HDD cage, providing up to 12 Gbps SAS connectivity, or ■ Cisco FlexStorage 12G SAS RAID controller with 2GB Flash-Backed Write Cache (FBWC), and HDD cage, providing up to 12 Gbps SAS connectivity, or ■ Cisco FlexStorage NVMe/Passthrough module with HDD cage
Storage devices	■ Up to four optional, front-accessible, hot-swappable 2.5-inch small form factor (SFF) SAS or SATA solid-state disks (SSDs), NVMe SFF 2.5" drives, or hard disk drives (HDDs). ■ An internal USB 3.0 port that supports the Cisco 16 GB USB. ■ An internal mini-storage slot that can accommodate one of two module options: • Module supporting up to two SD devices (32 GB, 64 GB, or 128 GB), supporting RAID 1, or • Module supporting up to two M.2 SATA Drives (240 GB or 960 GB), supporting software RAID.
Interfaces	One KVM console connector on the front panel (see *STEP 13 CHOOSE LOCAL KVM I/O CABLE* (OPTIONAL), page 55*)
Video	The Cisco Integrated Management Controller (CIMC) provides video using the Matrox G200e video/graphics controller: ■ Integrated 2D graphics core with hardware acceleration ■ 512MB total DDR4 memory, with 16MB dedicated to Matrox video memory ■ Supports display resolutions up to 1920 x 1200 16bpp @ 60Hz ■ High-speed integrated 24-bit RAMDAC ■ Single lane PCI-Express host interface running at Gen 1 speed
Power subsystem	Integrated in the Cisco UCS 5108 blade server chassis.
Fans	Integrated in the Cisco UCS 5108 blade server chassis.
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.
ACPI	Advanced Configuration and Power Interface (ACPI) 4.0 Standard supported.

Cisco UCS B480 M5 Blade Server

CONFIGURING the SERVER

Follow these steps to configure the Cisco UCS B480 M5 Blade Server:

STEP 1   CHOOSE SERVER SKU

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

Table 2   PID of the Base UCS B480 M5 Blade Server

Product ID (PID)	Description
UCSB-B480-M5	UCS B480 M5 Blade Server with no CPU, memory, HDD, SSD, or adapter cards
UCSB-B480-M5-U	UCS B480 M5 Blade Server without CPU, memory, drive bays, HDD, VIC adapter, or mezzanine adapters (UPG) (ordered standalone)
UCSB-B480-M5-CH	DISTI: UCS B480 M5 Blade Server without CPU, memory, drive bays, HDD, VIC adapter, or mezzanine adapters

The base Cisco UCS B480 M5 blade server does not include the following components. They must be selected during product ordering:

— CPUs

— DIMM memory

— Intel® Persistent Memory

— Cisco FlexStorage RAID controller with drive bays, FlexStorage Passthrough, or blank (for no local drive support)

— Disk drives

— Cisco adapters (such as the VIC 1340, VIC 1380, VIC 1440, VIC 1480 and Port Expander)

— Cisco UCS Storage Accelerators or GPUs

NOTE: Use the steps on the following pages to order servers with the configurable components that you want configured in your servers.

STEP 2   CHOOSE CPU(S)

■ Intel® Xeon® scalable processor family CPUs and 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

■ If you choose any CPU that dissipates greater than 165 W, you cannot choose GPU for the front connector due to heat concerns. (see the *CAUTION: , page 11* for the details)

NOTE:

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

Select CPUs

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]	Front GPU[3]	Workload/ Processor Type
Cisco Recommended Processors[4] (2nd Generation Intel® Xeon® Processors)								
UCS-CPU-I8276	2.2	165	38.50	28	10.4	2933	Y	Oracle, SAP
UCS-CPU-I8260	2.4	165	35.75	24	10.4	2933	Y	Microsoft Azure Stack
UCS-CPU-I6262V	1.9	135	33.00	24	10.4	2400	Y	Virtual Server Infrastructure or VSI
UCS-CPU-I6248	2.5	150	27.50	20	10.4	2933	Y	VDI, Oracle, SQL, Microsoft Azure Stack
UCS-CPU-I6238	2.1	140	30.25	22	10.4	2933	Y	SAP
UCS-CPU-I6234	3.3	130	24.75	8	10.4	2933	Y	Oracle, SAP
UCS-CPU-I6230	2.1	125	27.50	20	10.4	2933	Y	Big Data, Virtualization
UCS-CPU-I5220	2.2	125	24.75	18	10.4	2666	Y	HCI
UCS-CPU-I5218	2.3	125	22.00	16	10.4	2666	Y	Virtualization, Microsoft Azure Stack, Splunk, Data Protection
8000 Series Processor								
UCS-CPU-I8280L	2.7	205	38.50	28	10.4	2933	N	2nd Gen Intel® Xeon®
UCS-CPU-I8280	2.7	205	38.50	28	10.4	2933	N	2nd Gen Intel® Xeon®
UCS-CPU-I8276L	2.2	165	38.50	28	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I8276	2.2	165	38.50	28	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I8270	2.7	205	35.75	26	10.4	2933	N	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]	Front GPU[3]	Workload/ Processor Type
UCS-CPU-I8268	2.9	205	35.75	24	10.4	2933	N	2nd Gen Intel® Xeon®
UCS-CPU-I8260Y	2.4	165	35.75	24/20/16	10.4	2933	N	2nd Gen Intel® Xeon®
UCS-CPU-I8260L	2.3	165	35.75	24	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I8260	2.4	165	35.75	24	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I8253	2.2	125	22.00	16	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-8180M	2.5	205	38.50	28	10.4	2666	N	Intel® Xeon®
UCS-CPU-8176M	2.1	165	38.50	28	10.4	2666	Y	Intel® Xeon®
UCS-CPU-8170M	2.1	165	35.75	26	10.4	2666	Y	Intel® Xeon®
UCS-CPU-8160M	2.1	150	33.00	24	10.4	2666	Y	Intel® Xeon®
UCS-CPU-8180	2.5	205	38.50	28	10.4	2666	N	Intel® Xeon®
UCS-CPU-8176	2.1	165	38.50	28	10.4	2666	Y	Intel® Xeon®
UCS-CPU-8170	2.1	165	35.75	26	10.4	2666	Y	Intel® Xeon®
UCS-CPU-8168	2.7	205	33.00	24	10.4	2666	N	Intel® Xeon®
UCS-CPU-8164	2.0	150	35.75	26	10.4	2666	Y	Intel® Xeon®
UCS-CPU-8160	2.1	150	33.00	24	10.4	2666	Y	Intel® Xeon®
UCS-CPU-8158	3.0	150	24.75	12	10.4	2666	Y	Intel® Xeon®
UCS-CPU-8156	3.6	105	16.50	4	10.4	2666	Y	Intel® Xeon®
UCS-CPU-8153	2.0	125	22.00	16	10.4	2666	Y	Intel® Xeon®
6000 Series Processor								
UCS-CPU-I6262V	1.9	135	33	24	10.4	2400	Y	2nd Gen Intel® Xeon®
UCS-CPU-I6254	3.1	200	24.75	18	10.4	2933	N	2nd Gen Intel® Xeon®
UCS-CPU-I6252	2.1	150	35.75	24	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I6248	2.5	150	27.50	20	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I6246	3.3	165	24.75	12	10.4	2933	N	2nd Gen Intel® Xeon®
UCS-CPU-I6244	3.6	150	24.75	8	10.4	2933	N	2nd Gen Intel® Xeon®
UCS-CPU-I6242	2.8	150	22.00	16	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I6240Y	2.6	150	24.75	18/14/8	10.4	2933	N	2nd Gen Intel® Xeon®
UCS-CPU-I6240M	2.6	150	24.75	18	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I6240L	2.6	150	24.75	18	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I6240	2.6	150	24.75	18	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I6238M	2.1	140	30.25	22	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I6238L	2.1	140	30.25	22	10.4	2933	Y	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]	Front GPU[3]	Workload/ Processor Type
UCS-CPU-I6238	2.1	140	30.25	22	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I6234	3.3	130	24.75	8	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I6230N	2.3	125	27.5	20	10.4	2933	N	2nd Gen Intel® Xeon®
UCS-CPU-I6230	2.1	125	27.50	20	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I6226	2.7	125	19.25	12	10.4	2933	Y	2nd Gen Intel® Xeon®
UCS-CPU-I6222V	1.8	115	27.5	20	10.4	2400	Y	2nd Gen Intel® Xeon®
UCS-CPU-6142M	2.6	150	22.00	16	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6140M	2.3	140	24.75	18	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6134M	3.2	130	24.75	8	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6154	3.0	200	24.75	18	10.4	2666	N	Intel® Xeon®
UCS-CPU-6152	2.1	140	30.25	22	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6150	2.7	165	24.75	18	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6148	2.4	150	27.50	20	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6146	3.2	165	24.75	12	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6144	3.5	150	24.75	8	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6142	2.6	150	22.00	16	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6140	2.3	140	24.75	18	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6138	2.0	125	27.50	20	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6136	3.0	150	24.75	12	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6134	3.2	130	24.75	8	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6132	2.6	140	19.25	14	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6130	2.1	125	22.00	16	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6128	3.4	115	19.25	6	10.4	2666	Y	Intel® Xeon®
UCS-CPU-6126	2.6	125	19.25	12	10.4	2666	Y	Intel® Xeon®
5000 Series Processor								
UCS-CPU-I5222	3.8	125	16.50	4	10.4	2933	N	2nd Gen Intel® Xeon®
UCS-CPU-I5220S	2.6	125	19.25	18	10.4	2666	Y	2nd Gen Intel® Xeon®
UCS-CPU-I5220	2.2	125	24.75	18	10.4	2666	Y	2nd Gen Intel® Xeon®
UCS-CPU-I5218B	2.3	125	22	16	10.4	2666	Y	2nd Gen Intel® Xeon®
UCS-CPU-I5218	2.3	125	22.00	16	10.4	2666	Y	2nd Gen Intel® Xeon®
UCS-CPU-I5217	3.0	115	11.00	8	10.4	2666	Y	2nd Gen Intel® Xeon®
UCS-CPU-I5215M	2.5	85	13.75	10	10.4	2666	Y	2nd Gen Intel® Xeon®
UCS-CPU-I5215L	2.5	85	13.75	10	10.4	2666	Y	2nd Gen Intel® Xeon®
UCS-CPU-I5215	2.5	85	13.75	10	10.4	2666	Y	2nd Gen Intel® Xeon®
UCS-CPU-5122	3.6	105	16.50	4	10.4	2666	Y	Intel® Xeon®
UCS-CPU-5120	2.2	105	19.25	14	10.4	2400	Y	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]	Front GPU[3]	Workload/ Processor Type
UCS-CPU-5118	2.3	105	16.50	12	10.4	2400	Y	Intel® Xeon®
UCS-CPU-5117	2.0	105	19.25	14	10.4	2400	Y	Intel® Xeon®
UCS-CPU-5115	2.4	85	13.75	10	10.4	2400	Y	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. System performance may be reduced for greater than 165 W total dissipation power (TDP) processors if operating with a fan fault or above 32°C (89.6°F) system air inlet temperature, depending upon the application load. No front GPU is allowed when using CPUs that dissipate greater than 165 W.

4. For details on memory support for processor classes and CPU modes, see *Memory Support for CPU Classes and CPU Modes on page 62*.

CAUTION: In *Table 4*, systems configured with the processors shown must adhere to the ambient inlet temperature thresholds specified. If not, a fan fault or executing workloads with extensive use of heavy instructions sets such as Intel® Advanced Vector Extensions 512 (Intel® AVX-512) may assert thermal and/or performance faults with an associated event recorded in the System Event Log (SEL). *Table 4* lists ambient temperature limitations below 35° C (95° F) and configuration restrictions to ensure proper cooling and avoid excessive processor throttling, which may impact system performance.

Table 4   Ambient Temperature and Configuration Restrictions

Processor Thermal Design Power (TDP)	CPU PID	Blade Slot	Ambient Temperature Limitation	Configuration Restriction
Any Y or N SKUs	UCS-CPU-I8260Y UCS-CPU-I6240Y UCS-CPU-I6230N	Any	32ºC (90º F)	Front Mezzanine GPU
200 W or 205 W	UCS-CPU-I8280L UCS-CPU-I8280 UCS-CPU-I8270 UCS-CPU-I8268 UCS-CPU-8180M UCS-CPU-8180 UCS-CPU-8168 UCS-CPU-I6254 UCS-CPU-6154	Any		
Frequency Optimized 150/165/125 W	UCS-CPU-I6246 UCS-CPU-I6244 UCS-CPU-I5222	Any		

Supported Configurations

(1) Two-CPU Configuration

■ Choose two identical CPUs from any one of the rows of *Table 3 on page 8*. CPU1 and CPU2 will be populated.

(2) Four-CPU Configuration

■ Choose four identical CPUs from any one of the rows of *Table 3 on page 8*. CPU1, CPU2, CPU3, and CPU4 will be populated.

Notes

■ For 2-CPU systems, 24 DIMM slots are functional. When 2 CPUs are installed, rear mezzanine connectors 1 (slot 2) and 2 (slot 3) are not active.

■ For 2-CPU systems, only 24 DIMM slots are functional (channels A - F for CPU1 and G - N for CPU2).

■ See *Table 11 on page 27* for supported adapter combinations in 2-CPU systems.

■ For 4-CPU systems, all 48 DIMM slots are functional (channels A - F for CPU1, G - M for CPU2, N - T for CPU3, and U - Z for CPU4).

NOTE: See *CHOOSE MEMORY on page 14* for details on the compatibility of CPUs and DIMM speeds.

STEP 3   CHOOSE MEMORY

The standard memory features are:

■ Clock speed: 2666 MHz or 2933 MHz depending on CPU type

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NOTE: The compatibility of Intel® Xeon® scalable processor family CPUs and 2nd Generation Intel® Xeon® Scalable CPUs with different DIMM memory speeds and production servers is as shown below:

CPU Family	DIMM Speed (MHz)	Configuration
Intel Scalable CPUs	2666	2666 MHz DIMMs are supported for all production servers
	2933	2933 MHz DIMMs are not supported for new production servers
2nd Gen Intel Scalable CPUs	2666	2666 MHz DIMMs are only supported when upgrading from Intel Scalable CPUs to 2nd Gen Intel Scalable CPUs
	2933	2933 MHz is the only DIMM speed supported for new production servers

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■ Ranks per DIMM: 1, 2, 4, or 8

■ DIMM operational voltage: 1.2 V

■ Registered ECC DDR4 DIMMS (RDIMMs), Load-reduced DIMMs (LRDIMMs), through-silicon via DIMMs (TSV DIMMs), or Intel® Persistent Memory Modules (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 3*.

Figure 3   B480 M5 Memory Organization
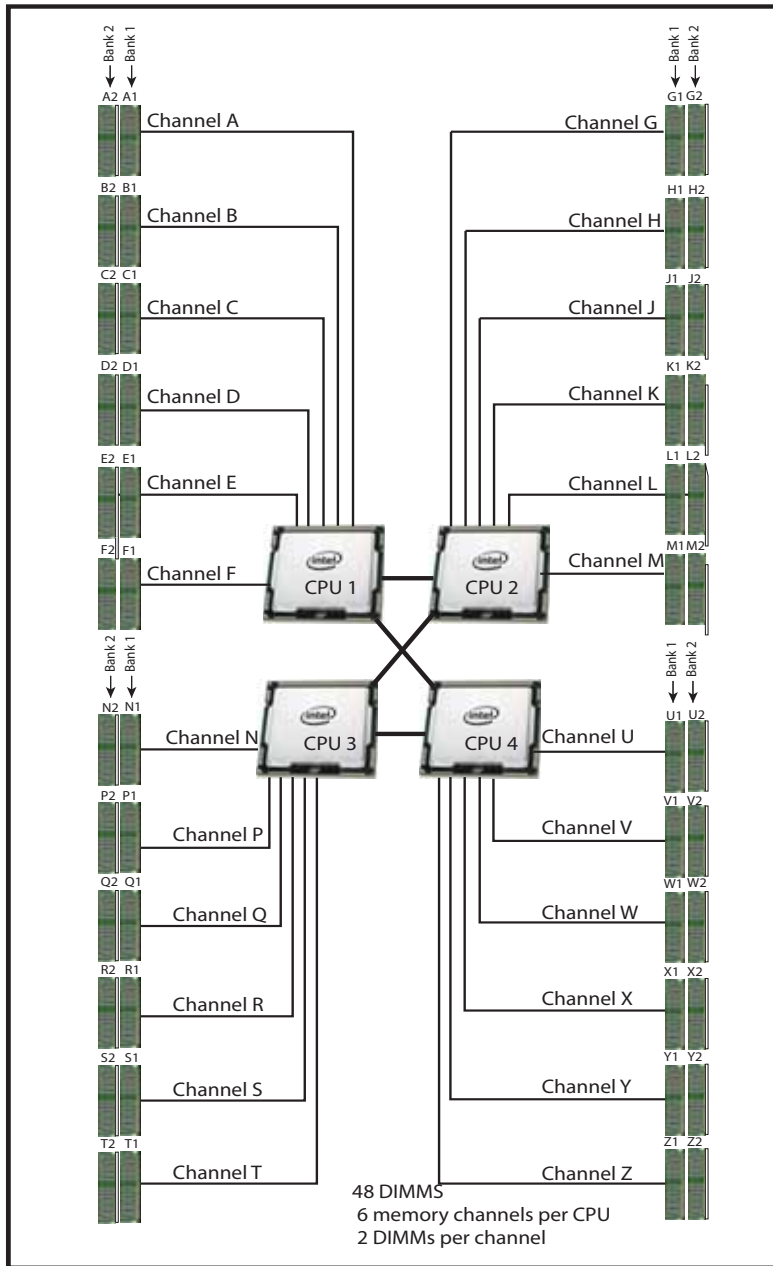
Select DIMMs and Memory Mirroring

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 5*.

Table 5   Available DDR4 DIMMs

Product ID (PID)	PID Description	Voltage	Ranks /DIMM
2666-MHz DIMMs			
UCS-MR-128G8RS-H	128 GB DDR4-2666-MHz TSV-RDIMM/8R/x4	1.2 V	8
UCS-MR-X64G4RS-H	64 GB DDR4-2666-MHz TSV-RDIMM/4R/x4	1.2 V	4
UCS-ML-X64G4RS-H	64 GB DDR4-2666-MHz LRDIMM/4R/x4	1.2 V	4
UCS-MR-X32G2RS-H	32 GB DDR4-2666-MHz RDIMM/2R/x4	1.2 V	2
UCS-ML-X32G2RS-H	32 GB DDR4-2666-MHz LRDIMM/2R/x4	1.2 V	2
UCS-MR-X16G1RS-H	16 GB DDR4-2666-MHz RDIMM/1R/x4	1.2 V	1
2933-MHz DIMMs			
UCS-ML-256G8RT-H[1]	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® Persistent Memory Product			
UCS-MP-128GS-A0	Intel® Persistent Memory, 128GB, 2666MHz		
UCS-MP-256GS-A0	Intel® Persistent Memory, 256GB, 2666MHz		
UCS-MP-512GS-A0	Intel® Persistent Memory, 512GB, 2666MHz		
Intel® Persistent Memory Product Operational Modes			
UCS-DCPMM-AD	App Direct Mode		
UCS-DCPMM-MM	Memory Mode		
Memory Mirroring Option			
N01-MMIRROR	Memory mirroring option		

Notes

1. The UCS-ML-256G8RT-H LRDIMM can be used only with 2nd Generation Intel® Xeon® scalable processor family CPUs, not with Intel® Xeon® scalable processor family CPUs.

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 by the factory as shown in the following tables.

#DIMMs	CPU 1 DIMM Placement in Channels (for identically ranked DIMMs)	
1	A1	
2	(A1, B1)	
3	(A1, B1, C1)	
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 DIMM Placement in Channels (for identically ranked DIMMs)	
1	G1	
2	(G1, H1)	
3	(G1, H1, J1)	
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)	

#DIMMs	CPU 3 DIMM Placement in Channels (for identically ranked DIMMs)	
1	N1	
2	(N1, P1)	
3	(N1, P1, Q1)	
4	(N1, P1); (R1, S1)	
6	(N1, P1, Q1); (R1, S1, T1)	
8	(N1, N2, P1, P2); (R1, R2, S1, S2)	
12	(N1, N2, P1, P2, Q1, Q2); (R1, R2, S1, S2, T1, T2)	

#DIMMs	CPU 4 DIMM Placement in Channels (for identically ranked DIMMs)	
1	U1	
2	(U1, V1)	
3	(U1, V1, W1)	
4	(U1, V1); (X1, Y1)	
6	(U1, V1, W1); (X1, Y1, Z1)	
8	(U1, U2, V1, V2); (Y1, Y2, Z1, Z2)	
12	(U1, U2, V1, V2, W1, W2); (X1, X2, Y1, Y2, Z1, Z2)	

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 5 on page 16* must be selected.

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

#DIMMs	CPU 1 DIMM Placement in Channels (for identical ranked DIMMs)	CPU 2 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)

#DIMMs	CPU 3 DIMM Placement in Channels (for identical ranked DIMMs)	CPU 4 DIMM Placement in Channels (for identical ranked DIMMs)
	CPU 3	CPU 4
8	(N1,P1); (R1,S1)	(U1, V1); (X1, Y1)
12	(N1, P1, Q1); (R1, S1, T1)	(U1, V1, W1); (X1, Y1, Z1)
16	(N1, N2, P1, P2); (R1, R2, S1, S2)	(U1, U2, V1, V2); (X1, X2, Y1, Y2)
24	(N1, N2, P1, P2, Q1, Q2); (R1, R2, S1, S2, T1, T2)	(U1, U2, V1, V2, W1, W2); (X1, X2, Y1, Y2, Z1, Z2)

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.

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System Speeds

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

Table 6   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 7   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 5 on page 16* for DIMM Speeds
- The B480 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 B480 M5 Blade.

> **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 B480 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 8* (6 DIMMs per CPU with 2, 4, or 6 PMEMs per CPU, as shown).

Table 8   2nd Generation Intel® Xeon® Scalable Processor DIMM and PMEM Physical Configurations (quad socket)

DIMM to PMEM Count	CPU 1											
	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											
	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
DIMM to PMEM Count	CPU 3											
	iMC1						iMC0					
	Channel 2		Channel 1		Channel 0		Channel 2		Channel 1		Channel 0	
	T2	T1	S2	S1	R2	R1	Q2	Q1	P2	P1	N2	N1
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

Table 8   2nd Generation Intel® Xeon® Scalable Processor DIMM and PMEM Physical Configurations (quad socket)

DIMM to PMEM Count	CPU 4											
	iMC1						iMC0					
	Channel 2		Channel 1		Channel 0		Channel 2		Channel 1		Channel 0	
	Z2	Z1	Y2	Y1	X2	X	W2	W1	V2	V1	U2	U1
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

- Either two or four CPUs may be installed 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 1:16 and 1:4, and the recommended ratio is 1:4 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 9 for PMEM memory modes.

Table 9   Intel® 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 1:4 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:

Cisco UCS B480 M5 Server Installation Guide

For detailed DIMM/PMEM informations, refer to

Cisco UCS B480 M5 Memory Guide

STEP 4 CHOOSE OPTIONAL FRONT MEZZANINE: Storage Controller or GPU

The UCS B480 M5 supports two front mezzanine slots. The front mezzanine slots can accommodate a storage controller with drive bays, NVMe Passthrough, or GPU. Refer to *Table 10* for available front mezzanine cards and *Table 11* for supported configurations.

Table 10 Front Mezzanine Cards

Product ID (PID)	PID Description
Storage Controller[1,2,3]	
UCSB-MRAID12G[1,4]	Cisco FlexStorage 12G SAS RAID controller with drive bays
UCSB-MRAID12G-HE[1,5]	Cisco FlexStorage 12G SAS RAID controller with 2 GB flash-backed write cache and drive bays
UCSB-LSTOR-PT[1,2]	Cisco FlexStorage Passthrough module w/drive bays
UCSB-LSTOR-BK[6]	Cisco FlexStorage blanking panel w/o controller, w/o drive bays
Front GPU	
UCSB-GPU-P6-F[7]	NVIDIA GRID P6 Front Mezzanine

Notes

1. To support a minimum of two hard disk drives (HDD) or solid-state drives (SSD), a Cisco FlexStorage 12G SAS RAID controller or Cisco FlexStorage 12G SAS RAID controller with 2 GB flash-backed write cache with drive bays is required. If support for four HDD or SSD drives is required, select a Cisco FlexStorage 12G SAS RAID controller and a Cisco FlexStorage Passthrough module.
2. To support a minimum of two NVMe drives, a Cisco FlexStorage Passthrough module with drive bays is required. To support four NVMe drives, select two Cisco FlexStorage Passthrough modules.
3. The two RAID cards and Passthrough are three different cards and cannot be upgraded or downgraded.
4. The Cisco FlexStorage 12G SAS RAID Controller is based on the LSI 3108 ROC and runs the iMegaRAID software stack. It provides 12 Gbps RAID functionality for SAS/SATA SSD/HDD and has RAID 0, 1, and JBOD support. If supercapacitor needs to be replaced, it can be done so by ordering UCSB-MRAID-SC=. See Installation Document for instructions
5. The Cisco FlexStorage 12G SAS RAID controller with 2 GB Flash-backed write cache is based on the LSI 3108 ROC and runs the LSI MegaRAID Software Stack. It provides 12 Gbps RAID Functionality for SAS/SATA HDD/SSD and has RAID 0, 1, 5 and 6 support.

   The flash-backed write cache provides RAID controller cache protection using NAND flash memory and a supercapacitor. In the event of a power or server failure, cached data is automatically transferred from the RAID controller DRAM write cache to flash. Once power is restored, the data in the NAND flash is copied back into the DRAM write cache until it can be flushed to the disk drives.
6. For servers that do not need local storage, and where no storage controllers are included, storage blanking panels are auto-populated as a part of configuration rules. To ensure proper airflow drive blanks must be installed when no drive bays and when GPUs are installed.
7. For GPU P6, maximum cards per node supported is four.

See *Figure 4 on page 26* for a top view of the B480 M5 server with and without the Cisco FlexStorage SAS RAID controller and drive bays. See *Figure 5 on page 26* for a front view of these configurations. When no drive bays are installed, blanking panels must be installed.

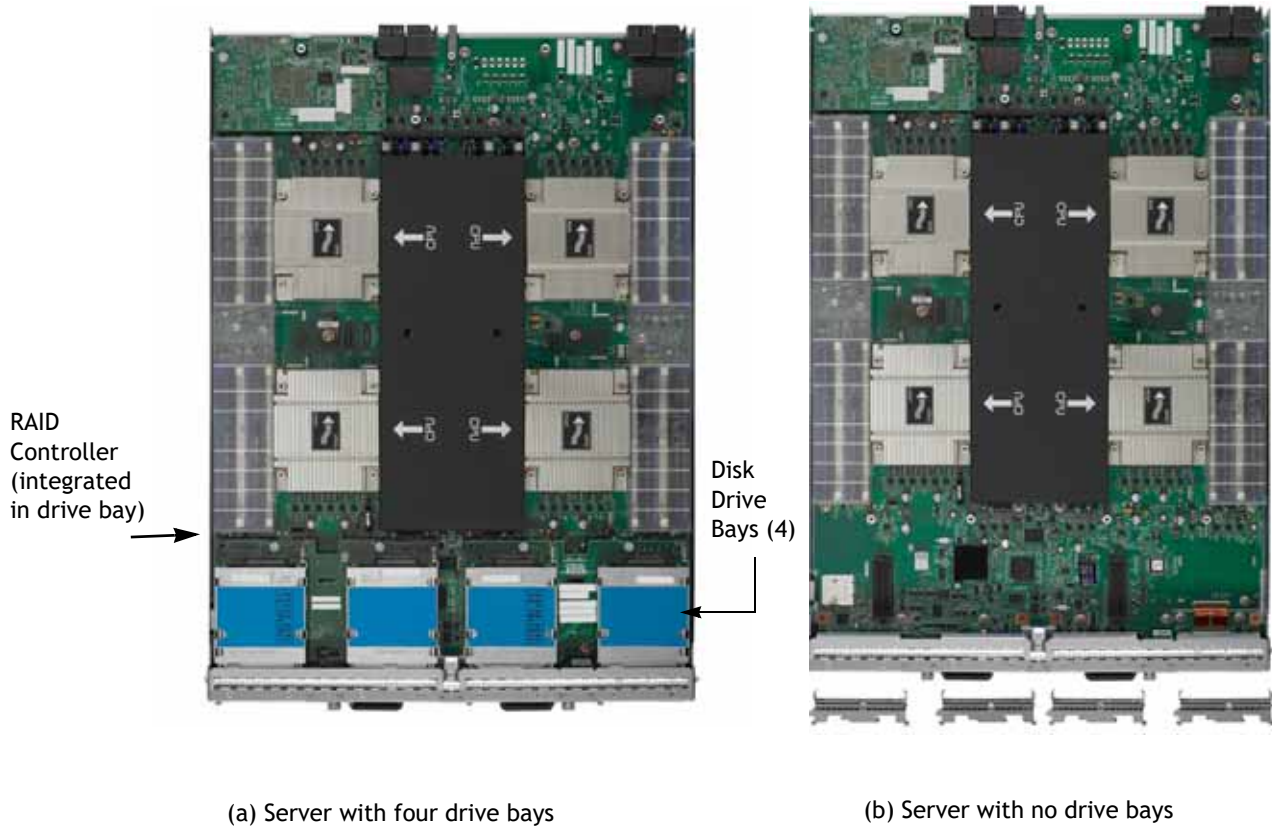**Figure 4**   UCS B480 M5 With and Without Drive Bays (Top View)

RAID
Controller
(integrated
in drive bay)

Disk
Drive
Bays (4)

(a) Server with four drive bays

(b) Server with no drive bays

Figure 5   UCS B480 M5 With and Without Drive Bays (Front View)

Blanking Panels

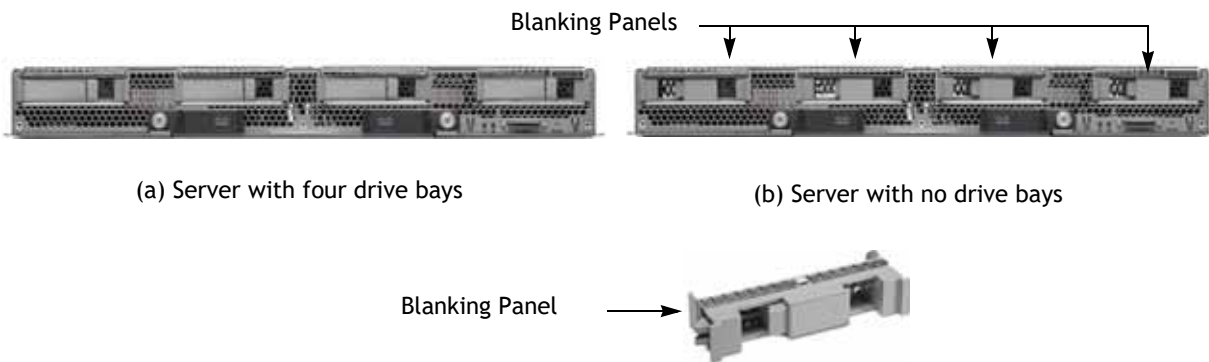(a) Server with four drive bays

(b) Server with no drive bays

Blanking Panel

Table 11   Supported Front Mezzanine Configurations[1]

Front Mezzanine Slot 1	Front Mezzanine Slot 2	Drives Supported	RAID Level
Cisco FlexStorage 12G SAS RAID controller	Not populated	2 x HDD/SSD	0, 1
Cisco FlexStorage 12G SAS RAID controller	Cisco FlexStorage Passthrough Module	4 x HDD/SSD or 2 x HDD/SSD and 2 x NVMe	0, 1, 10, 5, 6, 50, 60 (depending on number of drives in RAID set)
Cisco FlexStorage Passthrough Module	Not populated	2 x NVMe	None
Cisco FlexStorage Passthrough Module	Cisco FlexStorage Passthrough Module	4 x NVMe	None
GPU or not populated	GPU or not populated	None	None
Cisco FlexStorage 12G SAS RAID controller	GPU	2 x HDD/SSD	0, 1
Cisco FlexStorage Passthrough Module	GPU	2 x NVMe	None

Notes

1. Any empty drive bays must be fitted with blanking panels to maintain proper cooling airflow.

NOTE: For supported rear mezzanine configurations, see *STEP 6 CHOOSE REAR MEZZANINE CARDS, page 33*.

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STEP 5   CHOOSE HARD DISK DRIVES or SOLID-STATE DRIVES (OPTIONAL)

The UCS B480 M5 can be ordered with or without drives. If you ordered one of the RAID controller with drive bay options in *CHOOSE OPTIONAL FRONT MEZZANINE: Storage Controller or GPU on page 25* (UCSB-MRAID12G or UCSB-MRAID12G-HE for drive bays one and two, and optionally UCSB-LSTOR-PT for drive bays three and four), you can order drives listed in this section. The B480 M5 provides up to four hot plug 2.5" SFF drive bays.

Choose Drives

The drives supported on the UCS B480 M5 are listed in *Table 12*.

Table 12 Available Drive Options

Product ID (PID)	Description	Drive Type	Speed	Endurance	Size
HDD[1]					
UCS-HD900G15K12G	900 GB 12G SAS 15K RPM SFF HDD	SAS	15K RPM	N/A	900 GB
UCS-HD600G15K12G	600 GB 12G SAS 15K RPM SFF HDD	SAS	15K RPM	N/A	600 GB
UCS-HD300G15K12G	300 GB 12G SAS 15K RPM SFF HDD	SAS	15K RPM	N/A	300 GB
UCS-HD24TB10KS4K	2.4 TB 12G SAS 10K RPM SFF HDD (4K)[2]	SAS	10K RPM	N/A	2.4 TB
UCS-HD18TB10KS4K	1.8 TB 12G SAS 10K RPM SFF HDD (4K)[2]	SAS	10K RPM	N/A	1.8 TB
UCS-HD12TB10K12G	1.2 TB 12G SAS 10K RPM SFF HDD	SAS	10K RPM	N/A	1.2 TB
UCS-HD600G10K12G	600 GB 12G SAS 10K RPM SFF HDD	SAS	10K RPM	N/A	600 GB
UCS-HD300G10K12G	300 GB 12G SAS 10K RPM SFF HDD	SAS	10K RPM	N/A	300 GB
SSD[1]					
Enterprise Performance SSDs					
UCS-SD400G12S4-EP	400 GB 2.5 inch Ent Performance 12G SAS SSD (10X endurance) (SanDisk Lightning II)	SAS	12G	Ent. Perf 10X	400 GB
UCS-SD400GSAS3-EP	400GB 2.5 inch Enterprise performance 12G SAS SSD(3X DWPD)	SAS	12G	Ent. Perf 3X	400 GB
UCS-SD800GSAS3-EP	800GB 2.5 inch Enterprise performance 12G SAS SSD(3X endurance) (Toshiba PX05)	SAS	12G	Ent. Perf 3X	800 GB
UCS-SD16TSASS3-EP	1.6TB 2.5 inch Enterprise performance 12G SAS SSD(3X endurance) (Toshiba PX05)	SAS	12G	Ent. Perf 3X	1.6 TB
UCS-SD32TSASS3-EP	3.2TB 2.5 inch Enterprise performance 12G SAS SSD(3X DWPD)	SAS	12G	Ent. Perf 3X	3.2 TB
UCS-SD800GH3-EP	800GB 2.5 inch Enterprise performance 12G SAS SSD (3X DWPD)	SAS	12G	Ent. Perf 3X	800 GB

Table 12 Available Drive Options

UCS-SD16TH3-EP	1.6TB 2.5 inch Enterprise performance 12G SAS SSD (3X DWPD)	SAS	12G	Ent. Perf 3X	1.6 TB
UCS-SD32TH3-EP	3.2TB 2.5in Enterprise performance 12G SAS SSD (3X DWPD)	SAS	12G	Ent. Perf 3X	3.2 TB
UCS-SD480GIS3-EP	480GB 2.5in Enterprise performance 6G SATA SSD(3X endurance) (Intel S4600/S4610)	SATA	6G	Ent. Perf 3X	480 GB
UCS-SD960GIS3-EP	960GB 2.5in Enterprise performance 6G SATA SSD(3X endurance) (Intel S4600/S4610)	SATA	6G	Ent. Perf 3X	960 GB
UCS-SD19TIS3-EP	1.9TB 2.5in Enterprise performance 6G SATA SSD(3X endurance) (Intel S4600/S4610)	SATA	6G	Ent. Perf 3X	1.9 TB
UCS-SD480GMB3X-EP	480GB 2.5in Enterprise performance 6G SATA SSD (3X endurance)	SATA	6G	Ent. Perf 3X	480 GB
UCS-SD960GMB3X-EP	960GB 2.5in Enterprise performance 6G SATA SSD (3X endurance)	SATA	6G	Ent. Perf 3X	960 GB
UCS-SD19TMB3X-EP	1.9TB 2.5in Enterprise performance 6G SATA SSD (3X endurance)	SATA	6G	Ent. Perf 3X	1.9 TB
Enterprise Value SSDs					
UCS-SD480GSAS-EV	480 GB 2.5 inch Enterprise Value 12G SAS SSD (Toshiba PX05)	SAS	12G	Ent. Value	480 GB
UCS-SD960GSAS-EV	960GB 2.5 inch Enterprise Value 12G SAS SSD (Toshiba PX05)	SAS	12G	Ent. Value	960 GB
UCS-SD19TSAS-EV	1.9TB 2.5 inch Enterprise Value 12G SAS SSD	SAS	12G	Ent. Value	1.9 TB
UCS-SD38TSAS-EV	3.8TB 2.5 inch Enterprise Value 12G SAS SSD (Toshiba PX05)	SAS	12G	Ent. Value	3.8 TB
UCS-SD960GH1-EV	960GB 2.5 inch Enterprise Value 12G SAS SSD (1X endurance)	SAS	12G	Ent. Value	960 GB
UCS-SD19TH1-EV	1.9TB 2.5 inch Enterprise Value 12G SAS SSD (1X endurance)	SAS	12G	Ent. Value	1.9 TB
UCS-SD38TH1-EV	3.8TB 2.5 inch Enterprise Value 12G SAS SSD (1X endurance)	SAS	12G	Ent. Value	3.8 TB
UCS-SD960GBKS4-EV	960GB 2.5 inch Enterprise Value 6G SATA SSD (Samsung SATA PM863A/PM883)	SATA	6G	Ent. Value	960 GB
UCS-SD38TBKS4-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD (Samsung SATA PM863A/PM883)	SATA	6G	Ent. Value	3.8 TB
UCS-SD76T61X-EV	7.6TB 2.5 inch Enterprise Value 6G SATA SSD	SATA	6G	Ent. Value	7.6 TB

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Table 12 Available Drive Options

UCS-SD76TBMS4-EV	7.6TB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	6G	Ent. Value	7.6 TB
UCS-SD38TBMS4-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	6G	Ent. Value	3.8 TB
UCS-SD19TBMS4-EV	1.9TB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	6G	Ent. Value	1.9 TB
UCS-SD16TBMS4-EV	1.6TB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	6G	Ent. Value	1.6 TB
UCS-SD960GBMS4-EV	960GB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	6G	Ent. Value	960 GB
UCS-SD480GBMS4-EV	480 GB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	6G	Ent. Value	480 GB
UCS-SD240GBMS4-EV	240GB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	6G	Ent. Value	240 GB
UCS-SD120GBMS4-EV	120 GB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100/5200)	SATA	6G	Ent. Value	120 GB
UCS-SD480GBIS6-EV	480GB 2.5 inch Enterprise Value 6G SATA SSD (Intel S4500/S4150)	SATA	6G	Ent. Value	480 GB
UCS-SD960GBIS6-EV	960GB 2.5 inch Enterprise Value 6G SATA SSD (Intel S4500/S4150)	SATA	6G	Ent. Value	960 GB
UCS-SD38TBIS6-EV	3.8TB 2.5 inch Enterprise Value 6G SATA SSD (Intel S4500/S4150)	SATA	6G	Ent. Value	3.8 TB
Self-Encrypted Drives (SEDs)					
UCS-SD960GBHBNK9	960GB Enterprise value SAS SSD (1X FWPD, SED)	SAS		Ent. Value	960 GB
UCS-SD38T2HBNK9	3.8TB Enterprise value SAS SSD (1X FWPD, SED)	SAS		Ent. Value	3.8 TB
UCS-HD600G15K9	600GB 12G SAS 15K RPM SFF HDD (SED)	SAS	15K RPM	N/A	600 GB
UCS-HD12G10K9	1.2 TB 12G SAS 10K RPM SFF HDD (SED)	SAS	10K RPM	N/A	1.2 TB
UCS-HD18G10K9	1.8TB 12G SAS 10K RPM SFF HDD (4K format, SED)	SAS	10K RPM	N/A	1.8 TB
UCS-HD24T10BNK9	2.4 TB 12G SAS 10K RPM SFF HDD (SED)	SAS	10K RPM	N/A	2.4 TB
NVMe Drives [3],[4],[5]					
UCSB-NVMEHW-H7680	7.7TB 2.5in U.2 HGST SN200 NVMe High Perf. Value Endurance	NVMe	High Perf	High Endurance	7.7 TB
UCSB-NVMEHW-H6400	Cisco 2.5" U.2 6.4TB HGST SN200 NVMe High Perf. High Endurance	NVMe	High Perf	High Endurance	6.4 TB

Table 12 Available Drive Options

UCSB-NVMEHW-H3200	Cisco 2.5" U.2 3.2TB HGST SN200 NVMe High Perf. High Endurance	NVMe	High Perf	High Endurance	3.2 TB
UCSB-NVMEHW-H1600	Cisco 2.5" U.2 1.6TB HGST SN200 NVMe High Perf. High Endurance	NVMe	High Perf	High Endurance	1.6 TB
UCSB-NVMEHW-H800	800GB 2.5in U.2 HGST SN200 NVMe High Perf. High Endurance	NVMe	High Perf	High Endurance	800 GB
UCSB-NVMEHW-I2000	Cisco 2.5" U.2 2TB Intel P4600 NVMe High Perf. High Endurance	NVMe	High Perf	High Endurance	2.0 TB
UCSB-NVMEHW-I8000	Cisco 2.5" U.2 8TB Intel P4510 NVMe High Perf. Value Endurance	NVMe	High Perf	Value Endurance	8.0 TB
UCSB-NVMEXPB-I375	Cisco 2.5in U.2 375GB Intel P4800 NVMe Med. Perf	NVMe	Med Perf	Med Perf	375 GB
UCSB-NVMEXP-I750	750GB 2.5in Intel Optane NVMe Extreme Perf	NVMe	Extrm Perf	Extrm Perf	750 GB
UCSB-NVME2H-I1000	Cisco 2.5" U.2 1,0 TB Intel P4510 NVMe High Perf. Value Endurance	NVMe	High Perf	High Perf	1.0 TB
UCSB-NVME2H-I1600	Cisco 2.5" U.2 1.6TB Intel P4610 NVMe High Perf. High Endurance	NVMe	High Perf	High Endurance	1.0 TB
UCSB-NVME2H-I2TBV	Cisco 2.5" U.2 2TB Intel P4500 NVMe High Perf. Value Endurance	NVMe	High Perf	Value Endurance	2.0 TB
UCSB-NVME2H-I3200	Cisco 2.5" U.2 3.2TB Intel P4610 NVMe High Perf. High Endurance	NVMe	High Perf	High Endurance	3.2 TB
UCSB-NVME2H-I4000	Cisco 2.5" U.2 4.0TB Intel P4510 NVMe High Perf. Value Endurance	NVMe	High Perf	Value Endurance	4.0 TB

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

Notes

1. HDDs and SSDs require either of the following storage controllers in the front mezzanine slot

   UCSB-MRAID12G

   UCSB-MRAID12G-HE

2. For 4K native (4Kn) drives:

   VMWare ESXi 6.0 does not support 4Kn Drives. 4Kn drive support with VMWare is available in release 6.7 and later.

   4K native drives require UEFI Boot

3. NVMe drives require the following storage controller in the front mezzanine slot: UCSB-LSTOR-PT.

4. If HDDs or SSDs are going to be in a RAID group, two identical drives are required.

5. If HDD or SSD are in JBOD Mode, drives can be different.

Supported Configurations

■ Select up to 4 of the drives listed in *Table 12*. Selection is dependent on the number of drive bays selected in *CHOOSE OPTIONAL FRONT MEZZANINE: Storage Controller or GPU on page 25*.

Notes

■ When creating a RAID volume, mixing different capacity drives causes the system to use the lowest-capacity drive.

■ Mixing of drive types is supported, but performance may be impacted.

■ Multiple RAID volumes are supported. RAID volumes should use the same media type.

STEP 6   CHOOSE REAR MEZZANINE CARDS

> NOTE: The mezzanine cards listed in this section are installed in the three rear mezzanine connectors.
>
> - Mezzanine slot 1 the rear mLOM connector
> - Mezzanine slot 2 is rear mezzanine connector 1
> - Mezzanine slot 2 is rear mezzanine connector 2
>
> See *System Board on page 56* for the locations of these connectors.

The mezzanine card offerings are:

■   Cisco Virtual Interface Cards (VICs)

Cisco has developed 1300 and1400 series Virtual Interface Cards (VICs) to provide flexibility to create multiple NIC and HBA devices.The VIC features are listed here:

— 1300 and 1400 Series VICs include enhancements including network overlay offload support for NVGRE and VXLAN, and RoCE services.1300 Series VICs support PCIe Gen 3.0 for greater bandwidth.

— Two Converged Network Adapter (CNA) ports, supporting both Ethernet and FCoE.

— Delivers up to 80 Gbps total I/O throughput to the server.

— VICs support either a maximum of dual 4x10Gbps Unified I/O ports or 2x40 (native) Gbps Unified I/O ports.

— Supports up to 256 fully functional unique and independent PCIe adapters and interfaces.

— Provides virtual machine visibility from the physical network and a consistent network operations model for physical and virtual servers.

— Supports customer requirements for a wide range of operating systems and hypervisors.

For additional capabilities please refer to the following VIC data sheets link:

https://www.cisco.com/c/en/us/support/servers-unified-computing/ucs-virtual-interface-card/tsd-products-support-series-home.html?dtid=osscdc000283

■   Cisco UCS Storage Accelerator

Cisco UCS Storage Accelerators are designed specifically for the Cisco UCS B-series M5 blade servers and integrate seamlessly to allow improvement in performance and relief of I/O bottlenecks.

■   GPUs

NVIDIA GPUs are designed specifically for the Cisco UCS B Series M5 blade servers and provide outstanding processing power to offload the CPUs.

Table 13 shows the supported mezzanine cards.

To help ensure that your operating system is compatible with the cards you have selected, please check the Hardware Compatibility List at this link:

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

Choose a Rear Mezzanine Adapter

The supported rear mezzanine adapters in the UCS B480 M5 are listed in *Table 13*.

Table 13 Supported Mezzanine Cards

Product ID (PID)	PID Description	Connector
Virtual Interface Cards (VICs)		
UCSB-MLOM-40G-04[1]	UCS VIC 1440 modular LOM for blade servers	mLOM
UCSB-MLOM-40G-03[1]	UCS VIC 1340 modular LOM for blade servers	mLOM
UCSB-VIC-M84-4P	Cisco UCS VIC 1480 mezzanine adapter	Rear Mezzanine
UCSB-VIC-M83-8P	Cisco UCS VIC 1380 mezzanine adapter	Rear Mezzanine
Cisco Storage Accelerators (rear mezzanine)		
UCSB-F-H-5607	UCS Blade PCIe/NVMe Storage Mezz 560 GB High Endurance	Rear Mezzanine
UCSB-F-H-32003	UCS Blade PCIe/NVMe Storage Mezz 3200 GB Medium Endurance	Rear Mezzanine
Port Expander Card for VIC Option		
UCSB-MLOM-PT-01[2]	Cisco UCS Port Expander Card for VIC. This is a hardware option to enable an additional 4 ports of the VIC 1340 or 1440, bringing the total capability of the VIC 1340 or 1440 to a dual native 40G interface or a dual 4x10GbE port-channeled interface.	Rear Mezzanine
GPUs		
UCSB-GPU-P6-R[3]	NVIDIA GRID P6 Rear Mezzanine	Rear Mezzanine

Notes

1. The VIC 1440/1480 are supported with the 6200/6300/6400 Series Fabric Interconnects.
2. The Port Expander (only VIC 1440) is not supported with the 2408XP Fabric Extender
3. For GPU P6, maximum cards per node supported is four.

Supported Configurations

Table 14 and *Table 15 on page 36* show the supported adapter combinations. The configuration rules are summarized as follows:

■ You must select at least one VIC.

■ Mezzanine slot 1(MLOM) is dedicated for the VIC 1340 or 1440 only. No other mezzanine card can be placed in mezzanine slot 1.

■ The Port Expander requires an mLOM card and can only be placed in mezzanine slot 2.

■ You can select up to two Storage Acceleration mezzanine cards.

■ You cannot mix VIC 1440 mezzanine cards with 1380 mezzanine cards or VIC 1340 cards with 1480 cards.

Select a mezzanine card combination according to the following tables.

NOTE: CPU1 controls mezzanine slot 1 (mLOM), CPU 3 controls mezzanine slot 2, and CPU 4 controls mezzanine slot 3.

Table 14 Supported Rear Mezzanine Card Combinations for 2 CPUs Installed

Adapter Configurations			IO Module Aggregate Bandwidth (Gb/s)				Fabric Inter-connects
Mezzanine Slot 1[1]	Mezzanine Slot 2[2]	Mezzanine Slot 3[3]	2 x 2408XP	2 x 2304	2 x 2208XP	2 x 2204XP	
VIC 1340	Not Populated	Not Populated	40	40[4]	40[2]	20	62xx, 63xx or 6454[5]
	Port Expander Card[6]	Not Populated	80	80[7,8]	80[9]	40[2]	
VIC 1440	Not Populated	Not Populated	40	40[2]	40[2]	20	62xx, 63xx or 6454[3]
	Port Expander Card	Not Populated	80	80[5]	Not Supported	Not Supported	

Notes
1. Rear mLOM connector (see *System Board on page 56*)
2. Rear mezzanine connector 1 (see *System Board on page 56*)
3. Rear mezzanine connector 2 (see *System Board on page 56*)
4. This is two 2x10Gbps port-channeled.
5. FI-6454 and/or VIC 1400 requires UCSM 4.0(1) or greater.
6. The Port Expander is enabled by a passthrough and does not require CPU 3 to be installed.
7. This is a dual native 40G interface.
8. When operating in 4x10Gbps mode, bandwidth drops to 40 Gbps.
9. This is two 4x10Gbps port-channeled.

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Table 15 Supported Rear Mezzanine Card Combinations for 4 CPUs Installed

Adapter Configurations			IO Module Aggregate Bandwidth (Gb/s)				Fabric Inter-connects
Mezzanine Slot 1[1]	Mezzanine Slot 2[2]	Mezzanine Slot 3[3]	2 x 2408XP	2 x 2304[4]	2 x 2208XP	2 x 2204XP	
VIC 1340	GPU or Not Populated	GPU or Not Populated	40	40[5]	40[2]	20	62xx, 63xx or 6454[6]
	Port Expander	GPU or Not Populated	80	80[7]	80[8]	80[2]	
	GPU or Not Populated	1380	120	120[9]	120[10]	60[11]	
	Port Expander	1380	160	160[12]	160[13]	80[14]	
	1380	1380	160	160	160	80	
	Cisco UCS Storage Accelerator	GPU or Not Populated	40	80[15]	80[12]	40[16]	
	GPU or Not Populated	Cisco UCS Storage Accelerator	40	40[2]	40[2]	20	
VIC 1440	GPU or Not Populated	GPU or Not Populated	40	40[2]	40[2]	20	62xx, 6332,6332-16UP or 6454[6]
	Port Expander	GPU or Not Populated	80	80[4,17]	Not supported	Not supported	
	GPU or Not Populated	1480[3]	120[18]	120[6]	80[14]	40[8]	
	Port Expander	1480[3]	160[18]	160[9,19]	Not supported	Not supported	
	1480	1480	160[18]	160	120	60	
	Cisco UCS Storage Accelerator	GPU or Not Populated	40	80[20]	40[2]	20	
	GPU or Not Populated	Cisco UCS Storage Accelerator	40	40[2]	40[2]	20	
Note: for the configuration in the following rows, slot 2 and 3 must have identical types of storage cards.							
VIC 1340	Cisco UCS Storage Accelerator	Cisco UCS Storage Accelerator	40	80[12]	80[12]	40	62xx, 63xx, or 6454[6]
VIC 1440[3]	Cisco UCS Storage Accelerator	Cisco UCS Storage Accelerator	40	80[16]	40[2]	20	62xx, 6332,6332-16UP or 6454[6]

Notes
1. Rear mLOM connector (see *System Board on page 56*)
2. Rear mezzanine connector 1 (see *System Board on page 56*)
3. Rear mezzanine connector 2 (see *System Board on page 56*)
4. The 2304 is only supported with the FI-6300.
5. This is two 2x10Gbps port-channeled.
6. The FI-6454 and/or VIC 1400 requires UCSM 4.0(1) or greater.
7. This is a dual native 40G interface.
8. This is four 4x10Gbps port-channeled.
9. Mezz slot 1 (mLOM) is two 2x10Gbps port-channeled, and VIC 1x80 is a dual native 40G interface.

10. This is six 2x10Gbps port-channeled.
11. Mezz slot 1 (mLOM) is dual 10Gbps and the VIC 1x80 is two 2x10 port-channeled
12. This four native 40G interface
13. This is two 4x10Gbps port-channeled
14. This is four 2x10Gbps port-channeled
15. If running 3.2(1) or greater and equipped with either storage accelerator or SKU UCSB-F-FIO-1300MP (EOL) or UCSB-F-FIO-1600MS (EOL), then there is a dual 40G (4x10G port-channeled) interface for the 2008 or a dual native 40G interface for the 2304. Otherwise the bandwidth is 20G (2x10Gbps port-channeled) per FI.
16. If running 3.2(1) or greater and equipped with either storage accelerator or SKU UCSB-F-FIO-1300MP (EOL) or UCSB-F-FIO-1600MS (EOL), then there is a dual 20G (2x10Gbps port-channeled)
17. When operating in 4x10 Gbps mode, the bandwidth drops to 40Gbps (two 2x10Gbps port-channeled).
18. Supported starting with UCSM 4.1(2) and 1440+PE or 1480 can have 40G towards IOM-2408. The maximum single-flow is 25 Gbps with an aggregate of 40 Gbps. To avoid IOM transient drops due to a speed mismatch of 40 Gbps towards the server and 25 Gbps towards the fabric interconnect (FI), vNIC rate-limiting to 25 Gbps is recommended.
19. When operating in 4x10 Gbps mode, then BW drops to 40 Gbps
20. If running 3.2(1) or greater and equipped with the either storage accelerator or SKU UCSB-F-FIO-1300MP or UCSB-F-FIO-1600MS, then there is a dual native 40G interface for the 2304. If operating in 4x10Gbps mode, then the bandwidth drops to 40G (two 2x10Gbps port-channeled)

STEP 7   ORDER A TRUSTED PLATFORM MODULE (OPTIONAL)

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

The TPM ordering information is listed in *Table 16*.

Table 16 Trusted Platform Module

Product ID (PID)	PID Description
UCSX-TPM2-001	Trusted Platform Module for UCS (SPI-based)
UCSX-TPM2-002	Trusted Platform Module 2.0 for UCS servers
UCSX-TPM2-002B	Trusted Platform Module2.0 M5 UCS svr (FIPS 140-2 Compliant)

> NOTE: TPM installation is supported after-factory. However, a TPM installs with a one-way screw and cannot be replaced, upgraded, or moved to another server. If a server with a TPM is returned, the replacement server must be ordered with a new TPM. If there is no existing TPM in the server, you can install TPM 2.0.

STEP 8   CHOOSE OPTIONAL SECURE DIGITAL CARDS or M.2 DEVICES

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 17*.

Table 17 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 18*) along with a mini storage carrier or a boot-optimized RAID controller (see *Table 19*).

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 18*.

Table 18 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 19 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 4.2(1) 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 19*.
  - 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 18*.

> 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 9   ORDER INTERNAL USB 3.0 DRIVE (OPTIONAL)

You can order one optional internal USB 3.0 drive. The USB drive ordering information is listed in *Table 20*.

Table 20 USB 3.0 Drive

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

NOTE: A clearance of 0.950 inches (24.1 mm) is required for the USB device to be inserted and removed (see Figure 6)

Figure 6   USB Clearance
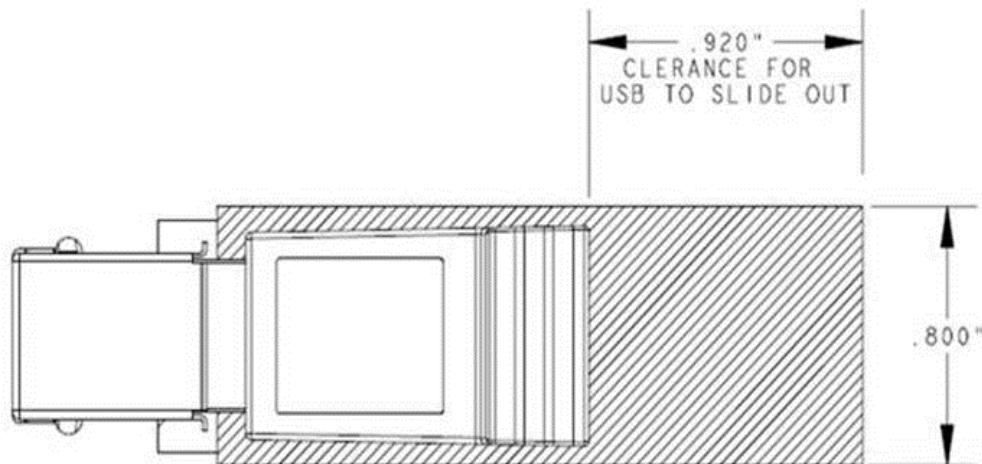
STEP 10 CHOOSE OPERATING SYSTEM AND VALUE-ADDED SOFTWARE

Several software programs are available. Select as desired from *Table 21*.

Select

- Cisco Software (*Table 21*)
- OEM Software (*Table 22*)
- Operating System (*Table 23*)

Table 21 Cisco Software

Product ID (PID)	PID Description
UCS Director	
CUIC-PHY-SERV-BM-U	Cisco UCS Director Resource Lic - 1 Phy Sevr node bare metal
CUIC-PHY-SERV-U	Cisco UCS Director Resource Lic - One physical Server node
CUIC-TERM	Acceptance of Cisco UCS Director License Terms
UCS B-Series Firmware Package	
N20-FW016	UCS 5108 Blade Chassis FW Package 4.0
N20-FW017	UCS 5108 Blade Chassis FW Package 4.1
Nexus 1000V for Hyper-V and vSphere	
N1K-VSG-UCS-BUN	Nexus 1000V Adv Edition for vSphere Paper License Qty 1
UCS Multi-Domain Manager	
UCS-MDMGR-1S	UCS Multi-Domain Manager (Central) Per Server License

Table 22 OEM Software

Product ID (PID)	PID Description
VMware vCenter	
VMW-VCS-STD-1A	VMware vCenter 6 Server Standard, 1 yr support required
VMW-VCS-STD-3A	VMware vCenter 6 Server Standard, 3 yr support required
VMW-VCS-STD-5A	VMware vCenter 6 Server Standard, 5 yr support required
VMW-VCS-FND-1A	VMware vCenter 6 Server Foundation (4 Host), 1 yr supp reqd
VMW-VCS-FND-3A	VMware vCenter 6 Server Foundation (4 Host), 3 yr supp reqd
VMW-VCS-FND-5A	VMware vCenter 6 Server Foundation (4 Host), 5 yr supp reqd

Table 23   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
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
RHEL-SAP-2S2V-3S	RHEL for SAP Apps (1-2 CPU, 1-2 VN); Prem 3-Yr SnS

Table 23   *(continued)*Operating System

Product ID (PID)	PID Description
RHEL-SAPH-2S2V-1S	RHEL for SAP Hana (1-2 CPU, 1-2 VN); Prem 1-Yr SnS
RHEL-SAPH-2S2V-3S	RHEL for SAP Hana (1-2 CPU, 1-2 VN); Prem 3-Yr SnS
RHEL-SAPHHAS2S-1S	RHEL for SAP Hana,HA,SmartM (1-2 CPU & VN); Std 1Yr SnS Reqd
RHEL-SAPHHAS2S-3S	RHEL for SAP Hana,HA,SmartM (1-2 CPU & VN); Std 3Yr SnS Reqd
RHEL-SAPHHAP2S-1S	RHEL for SAP Hana,HA,SmartM (1-2 CPU &VN); Prem 1Yr SnS Reqd
RHEL-SAPHHAP2S-3S	RHEL for SAP Hana,HA,SmartM (1-2 CPU &VN); Prem 3Yr SnS Reqd
VMware	
VMW-VSP-STD-1A	VMware vSphere 6 Standard (1 CPU), 1-yr, Support Required
VMW-VSP-STD-3A	VMware vSphere 6 Standard (1 CPU), 3-yr, Support Required
VMW-VSP-STD-5A	VMware vSphere 6 Standard (1 CPU), 5-yr, Support Required
VMW-VSP-EPL-3A	VMware vSphere 6 Ent Plus (1 CPU), 3-yr, Support Required
VMW-VSP-EPL-1A	VMware vSphere 6 Ent Plus (1 CPU), 1-yr, Support Required
VMW-VSP-EPL-5A	VMware vSphere 6 Ent Plus (1 CPU), 5-yr, Support Required
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
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

Table 23   *(continued)*Operating System

Product ID (PID)	PID Description
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 11 CHOOSE OPERATING SYSTEM MEDIA KIT (OPTIONAL)

Choose the optional operating system media listed in *Table 24*.

Table 24 OS Media

Product ID (PID)	PID Description
MSWS-19-ST16C-RM	Windows Server 2019 Stan (16 Cores/2 VMs) Rec Media DVD Only
MSWS-19-DC16C-RM	Windows Server 2019 DC (16Cores/Unlim VM) Rec Media DVD Only

STEP 12 CHOOSE SERVICE and SUPPORT LEVEL

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

Unified Computing Warranty, No Contract

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

- Three-year parts coverage.

- Next business day (NBD) onsite parts replacement eight hours a day, five days a week.

- 90-day software warranty on media.

- Ongoing downloads of BIOS, drivers, and firmware updates.

- UCSM updates for systems with Unified Computing System Manager. These updates include minor enhancements and bug fixes that are designed to maintain the compliance of UCSM with published specifications, release notes, and industry standards.

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 25*.

Table 25 Cisco SNTC for UCS Service (PID UCSB-B480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-PREM-SBB480M5	C2P	Yes	SNTC 24X7X2OS
CON-UCSD8-SBB480M5	UCSD8	Yes	UC SUPP DR 24X7X2OS*
CON-C2PL-SBB480M5	C2PL	Yes	LL 24X7X2OS**
CON-OSP-SBB480M5	C4P	Yes	SNTC 24X7X4OS
CON-UCSD7-SBB480M5	UCSD7	Yes	UCS DR 24X7X4OS*
CON-C4PL-SBB480M5	C4PL	Yes	LL 24X7X4OS**
CON-USD7L-SBB480M5	USD7L	Yes	LLUCS HW DR 24X7X4OS***

Table 25 Cisco SNTC for UCS Service (PID UCSB-B480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-OSE-SBB480M5	C4S	Yes	SNTC 8X5X4OS
CON-UCSD6-SBB480M5	UCSD6	Yes	UC SUPP DR 8X5X4OS*
CON-SNCO-SBB480M5	SNCO	Yes	SNTC 8x7xNCDOS****
CON-OS-SBB480M5	CS	Yes	SNTC 8X5XNBDOS
CON-UCSD5-SBB480M5	UCSD5	Yes	UCS DR 8X5XNBDOS*
CON-S2P-SBB480M5	S2P	No	SNTC 24X7X2
CON-S2PL-SBB480M5	S2PL	No	LL 24X7X2**
CON-SNTP-SBB480M5	SNTP	No	SNTC 24X7X4
CON-SNTPL-SBB480M5	SNTPL	No	LL 24X7X4**
CON-SNTE-SBB480M5	SNTE	No	SNTC 8X5X4
CON-SNC-SBB480M5	SNC	No	SNTC 8x7xNCD****
CON-SNT-SBB480M5	SNT	No	SNTC 8X5XNBD
CON-SW-SBB480M5	SW	No	SNTC NO RMA
Note: For PID UCSB-B480-M5-U, select Service SKU with BB480M5U suffix (Example: CON-PREM- BB480M5U)			
For PID UCSB-B480-M5-CH, select Service SKU with B480M5CH suffix (Example: CON-PREM- B480M5CH)			
*Includes Drive Retention (see *UCS Drive Retention Service on page 54*)			
**Includes Local Language Support (see *Local Language Technical Support for UCS on page 54*) – 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 26*

Table 26 SNTC for Cisco UCS Onsite Troubleshooting Service (PID UCSB-B480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-OSPT-SBB480M5	OSPT	Yes	24X7X4OS Trblshtg

Cisco UCS B480 M5 Blade Server

Table 26 SNTC for Cisco UCS Onsite Troubleshooting Service (PID UCSB-B480-M5)

CON-OSPTD-SBB480M5	OSPTD	Yes	24X7X4OS TrblshtgDR*
CON-OSPTL-SBB480M5	OSPTL	Yes	24X7X4OS TrblshtgLL**
CON-OPTLD-SBB480M5	OPTLD	Yes	24X7X4OS TrblshtgLLD***

Note: For PID UCSB-B480-M5-U, select Service SKU with BB480M5U suffix (Example: CON-PREM- BB480M5U)

 For PID UCSB-B480-M5-CH, select Service SKU with B480M5CH suffix (Example: CON-PREM- B480M5CH)

*Includes Drive Retention (see *UCS Drive Retention Service on page 54*)

**Includes Local Language Support (see *Local Language Technical Support for UCS on page 54*) – Only

***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 27*.

Table 27 Solution Support for UCS Service (PID UCSB-B480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-SSC2P-SBB480M5	SSC2P	Yes	SOLN SUPP 24X7X2OS
CON-SSC4P-SBB480M5	SSC4P	Yes	SOLN SUPP 24X7X4OS
CON-SSC4S-SBB480M5	SSC4S	Yes	SOLN SUPP 8X5X4OS
CON-SSCS-SBB480M5	SSCS	Yes	SOLN SUPP 8X5XNBDOS
CON-SSDR7-SBB480M5	SSDR7	Yes	SSPT DR 24X7X4OS*
CON-SSDR5-SBB480M5	SSDR5	Yes	SSPT DR 8X5XNBDOS*
CON-SSS2P-SBB480M5	SSS2P	No	SOLN SUPP 24X7X2
CON-SSSNP-SBB480M5	SSSNP	No	SOLN SUPP 24X7X4
CON-SSSNE-SBB480M5	SSSNE	No	SOLN SUPP 8X5X4

Table 27 Solution Support for UCS Service (PID UCSB-B480-M5) *(continued)*

Service SKU	Service Level GSP	On Site?	Description
CON-SSSNC-SBB480M5	SSSNC	No	SOLN SUPP NCD**
CON-SSSNT-SBB480M5	SSSNT	No	SOLN SUPP 8X5XNBD
Note: For PID UCSB-B480-M5-U, select Service SKU with BB480M5U suffix (Example: CON-PREM- BB480M5U)			
For PID UCSB-B480-M5-CH, select Service SKU with B480M5CH suffix (Example: CON-PREM- B480M5CH)			
*Includes Drive Retention (see *UCS Drive Retention Service on page 54*)			
**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 28*

Table 28 SNTC for UCS Hardware Only Service (PID UCSB-B480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-UCW7-SBB480M5	UCW7	Yes	UCS HW 24X7X4OS
CON-UCWD7-SBB480M5	UCWD7	Yes	UCS HW+DR 24X7X4OS*
CON-UCW7L-SBB480M5	UCW7L	Yes	LL UCS 24X7X4OS**
CON-UWD7L-SBB480M5	UWD7L	Yes	LL UCS DR 24X7X4OS***
CON-UCW5-SBB480M5	UCW5	Yes	UCS HW 8X5XNBDOS
CON-UCWD5-SBB480M5	UCWD5	Yes	UCS HW+DR 8X5XNBDOS*

Note: For PID UCSB-B480-M5-U, select Service SKU with BB480M5U suffix (Example: CON-PREM-B480M5U)

 For PID UCSB-B480-M5-CH, select Service SKU with B480M5CH suffix (Example: CON-PREM- B480M5CH)

*Includes Drive Retention (see *UCS Drive Retention Service on page 54*)

**Includes Local Language Support (see *Local Language Technical Support for UCS on page 54*) – Only

***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 29*.

Table 29 PSS for UCS (PID UCSB-B480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-PSJ8-SBB480M5	PSJ8	Yes	UCS PSS 24X7X2 OS
CON-PSJ7-SBB480M5	PSJ7	Yes	UCS PSS 24X7X4 OS
CON-PSJD7-SBB480M5	PSJD7	Yes	UCS PSS 24X7X4 DR*
CON-PSJ6-SBB480M5	PSJ6	Yes	UCS PSS 8X5X4 OS
CON-PSJD6-SBB480M5	PSJD6	Yes	UCS PSS 8X5X4 DR*
CON-PSJ4-SBB480M5	PSJ4	No	UCS SUPP PSS 24X7X2
CON-PSJ3-SBB480M5	PSJ3	No	UCS SUPP PSS 24X7X4
CON-PSJ2-SBB480M5	PSJ2	No	UCS SUPP PSS 8X5X4
CON-PSJ1-SBB480M5	PSJ1	No	UCS SUPP PSS 8X5XNBD

Note: For PID UCSB-B480-M5-U, select Service SKU with BB480M5U suffix (Example: CON-PREM- BB480M5U)

For PID UCSB-B480-M5-CH, select Service SKU with B480M5CH suffix (Example: CON-PREM- B480M5CH)

*Includes Drive Retention (see *UCS Drive Retention Service on page 54*)

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 30*

Table 30 PSS for UCS Hardware Only (PID UCSB-B480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-PSW7-SBB480M5	PSW7	Yes	UCS W PSS 24X7X4 OS
CON-PSWD7-SBB480M5	PSWD7	Yes	UCS W PSS 24X7X4 DR*
CON-PSW6-SBB480M5	PSW6	Yes	UCS W PSS 8X5X4 OS
CON-PSWD6-SBB480M5	PSWD6	Yes	UCS W PSS 8X5X4 DR*
CON-PSW4-SBB480M5	PSW4	No	UCS W PL PSS 24X7X2
CON-PSW3-SBB480M5	PSW3	No	UCS W PL PSS 24X7X4
CON-PSW2-SBB480M5	PSW2	No	UCS W PL PSS 8X5X4

Note: For PID UCSB-B480-M5-U, select Service SKU with BB480M5U suffix (Example: CON-PREM- BB480M5U)

For PID UCSB-B480-M5-CH, select Service SKU with B480M5CH suffix (Example: CON-PREM- B480M5CH)

*Includes Drive Retention (see *UCS Drive Retention Service on page 54*)

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 31*.

Table 31 Combined Support Service for UCS (PID UCSB-B480-M5)

Service SKU	Service Level GSP	On Site?	Description
CON-NCF2P-SBB480M5	NCF2P	Yes	CMB SVC 24X7X2OS

Table 31 Combined Support Service for UCS (PID UCSB-B480-M5)

CON-NCF4P-SBB480M5	NCF4P	Yes	CMB SVC 24X7X4OS
CON-NCF4S-SBB480M5	NCF4S	Yes	CMB SVC 8X5X4OS
CON-NCFCS-SBB480M5	NCFCS	Yes	CMB SVC 8X5XNBDOS
CON-NCF2-SBB480M5	NCF2	No	CMB SVC 24X7X2
CON-NCFP-SBB480M5	NCFP	No	CMB SVC 24X7X4
CON-NCFE-SBB480M5	NCFE	No	CMB SVC 8X5X4
CON-NCFT-SBB480M5	NCFT	No	CMB SVC 8X5XNBD
CON-NCFW-SBB480M5	NCFW	No	CMB SVC SW

Note: For PID UCSB-B480-M5-U, select Service SKU with BB480M5U suffix (Example: CON-PREM- BB480M5U)

For PID UCSB-B480-M5-CH, select Service SKU with B480M5CH suffix (Example: CON-PREM- B480M5CH)

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

## STEP 13 CHOOSE LOCAL KVM I/O CABLE* (OPTIONAL)

The local KVM I/O cable ships with every UCS 5108 blade chassis accessory kit. The cable provides a connection into the server, providing a DB9 serial connector, a VGA connector for a monitor, and dual USB ports for a keyboard and mouse. With this cable, you can create a direct connection to the operating system and the BIOS running on the server.

The local KVM I/O cable ordering information is listed in *Table 32*.

Table 32 Local KVM I/O Cable

Product ID (PID)	PID Description
N20-BKVM=	Local KVM I/O cable for UCS servers console port

Figure 7   Local KVM I/O Cable
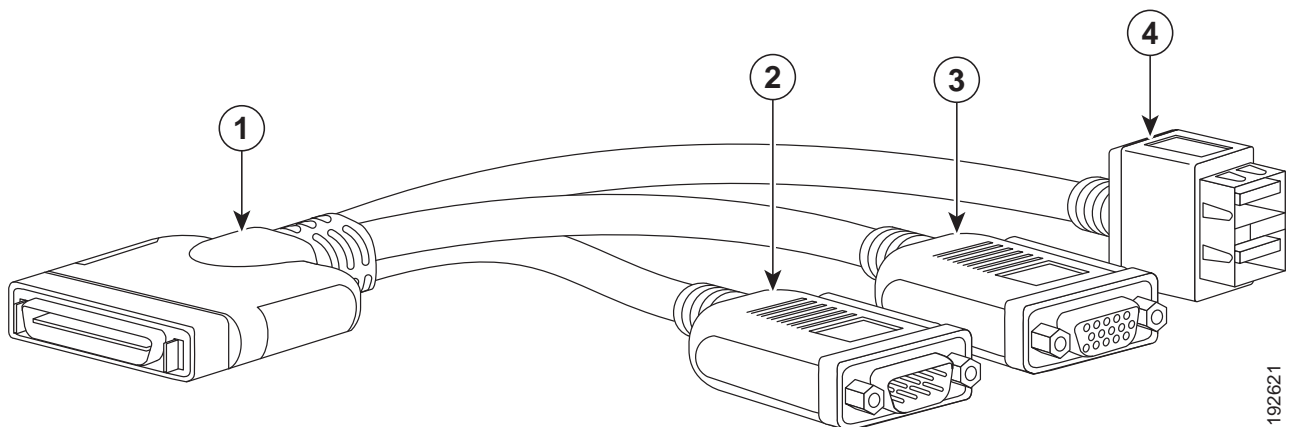
1	Connector (to server front panel)	3	VGA connector (for a monitor)
2	DB-9 serial connector	4	Two-port USB connector (for a mouse and keyboard)

NOTE: The blade chassis ships with the local KVM I/O cable.

SUPPLEMENTAL MATERIAL

System Board

A top view of the UCS B480 M5 system board is shown in *Figure 8*.

Figure 8   UCS B480 M5 System Board
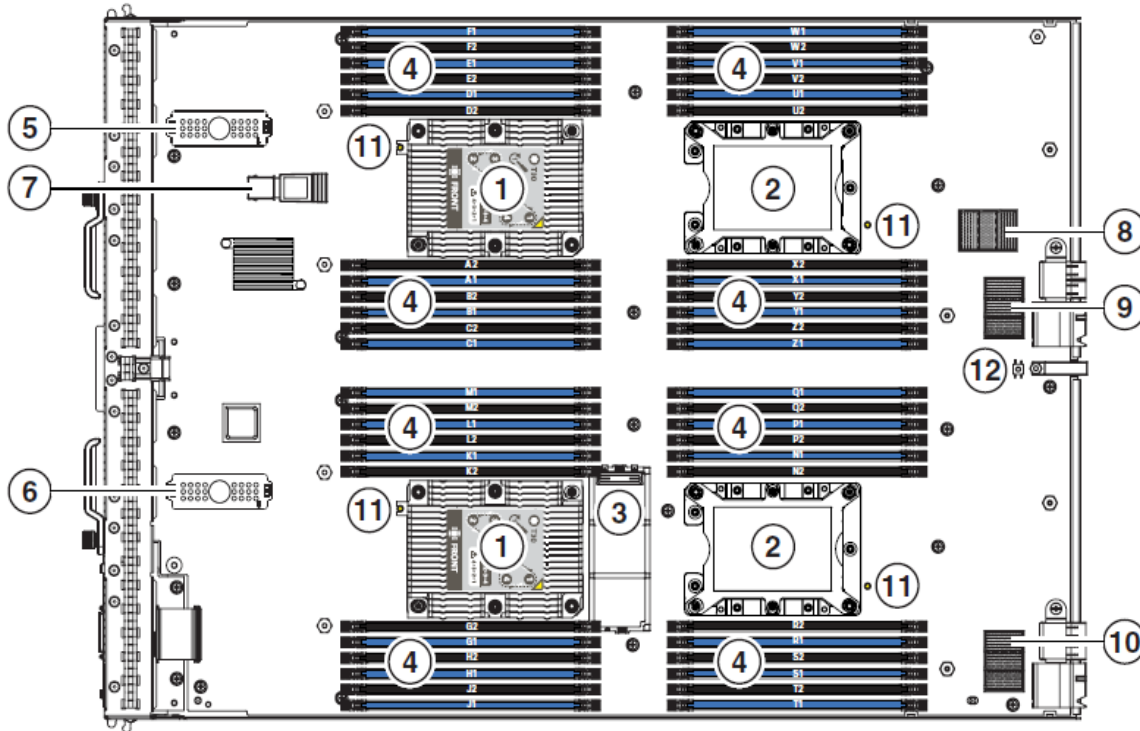
1	Front CPUs (CPU1 and CPU2) sockets (populated)	7	USB connector (populated)
2	Rear CPUs (CPU3 and CPU4) sockets (not populated)	8	mLOM connector (rear mezzanine slot 1)
3	Mini storage connector	9	Rear mezzanine connector 1 (rear mezzanine slot 2)
4	DIMM slots	10	Rear mezzanine connector 2 (rear mezzanine slot 3)
5	Front mezzanine connector 1	11	CPU heat sink install guide pins
6	Front mezzanine connector 2	12	Diagnostic button

DIMM Physical Layout

The overall DIMM and CPU physical layout is shown in *Figure 9*.

Figure 9   DIMM and CPU Layout
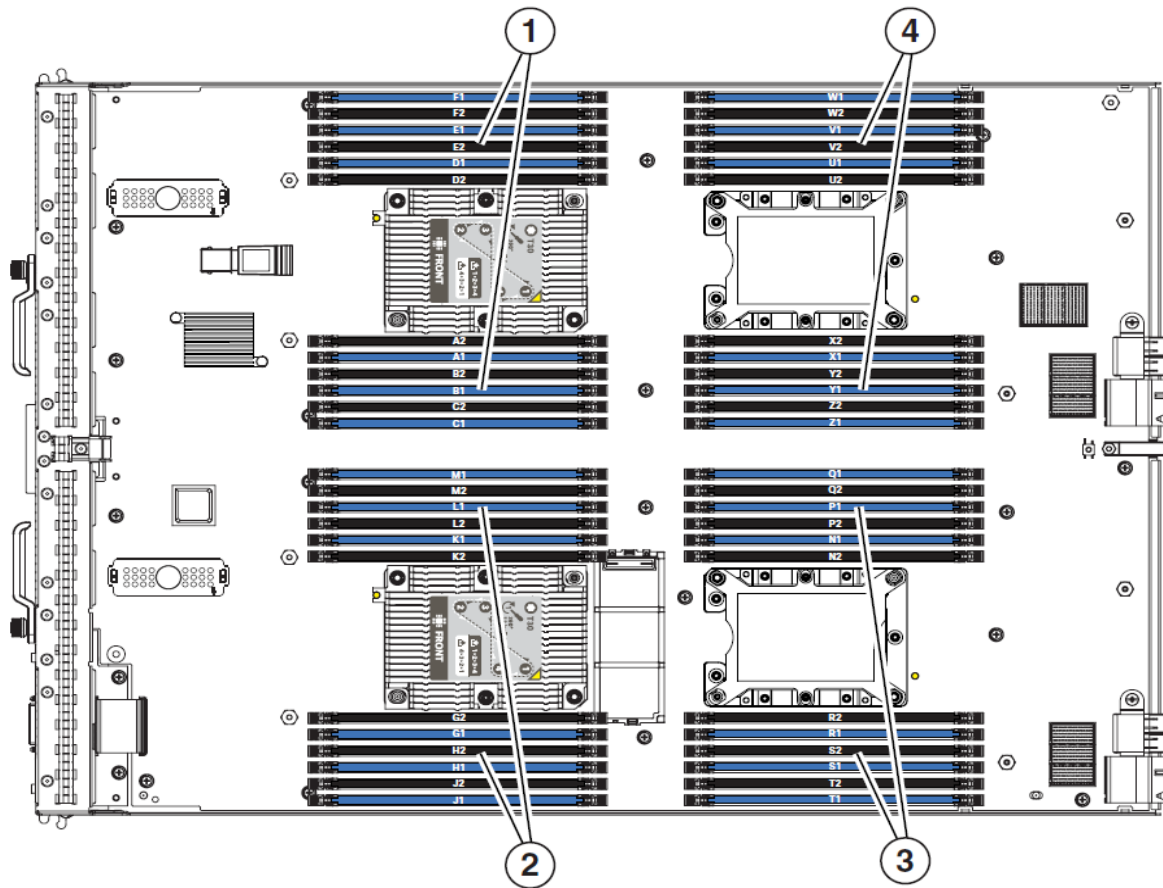
1	Channel A - F DIMMs for CPU 1	3	Channel N - T DIMMs for CPU 3
2	Channel G - L DIMMs for CPU 2	4	Channels U - Z DIMMs for CPU 4

            Cisco UCS B480 M5 Blade Server

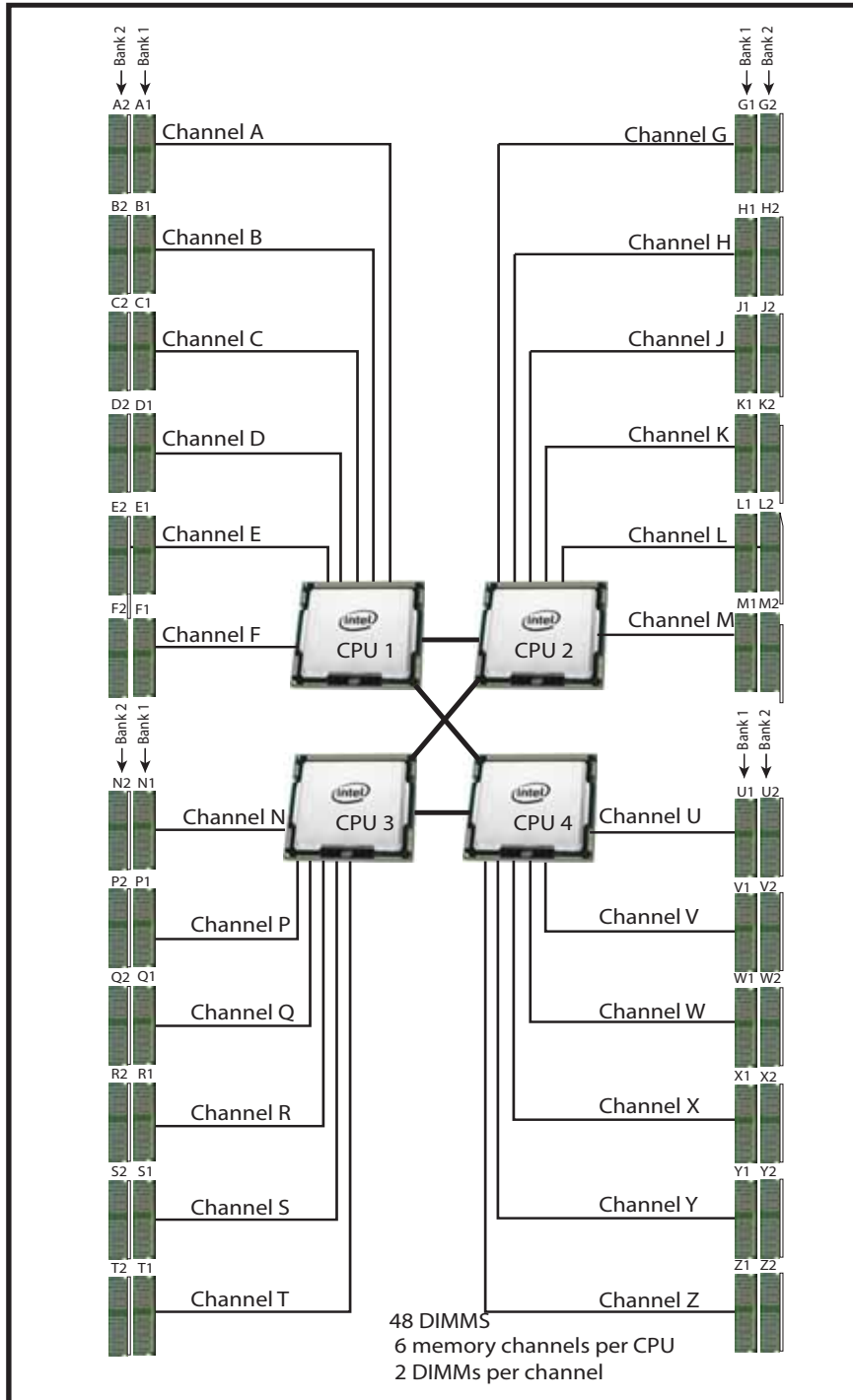*Figure 10* shows how channels are physically laid out on the blade server. The DIMM slots are contiguous to their associated CPU.

Figure 10   Physical Representation of DIMMs and CPUs
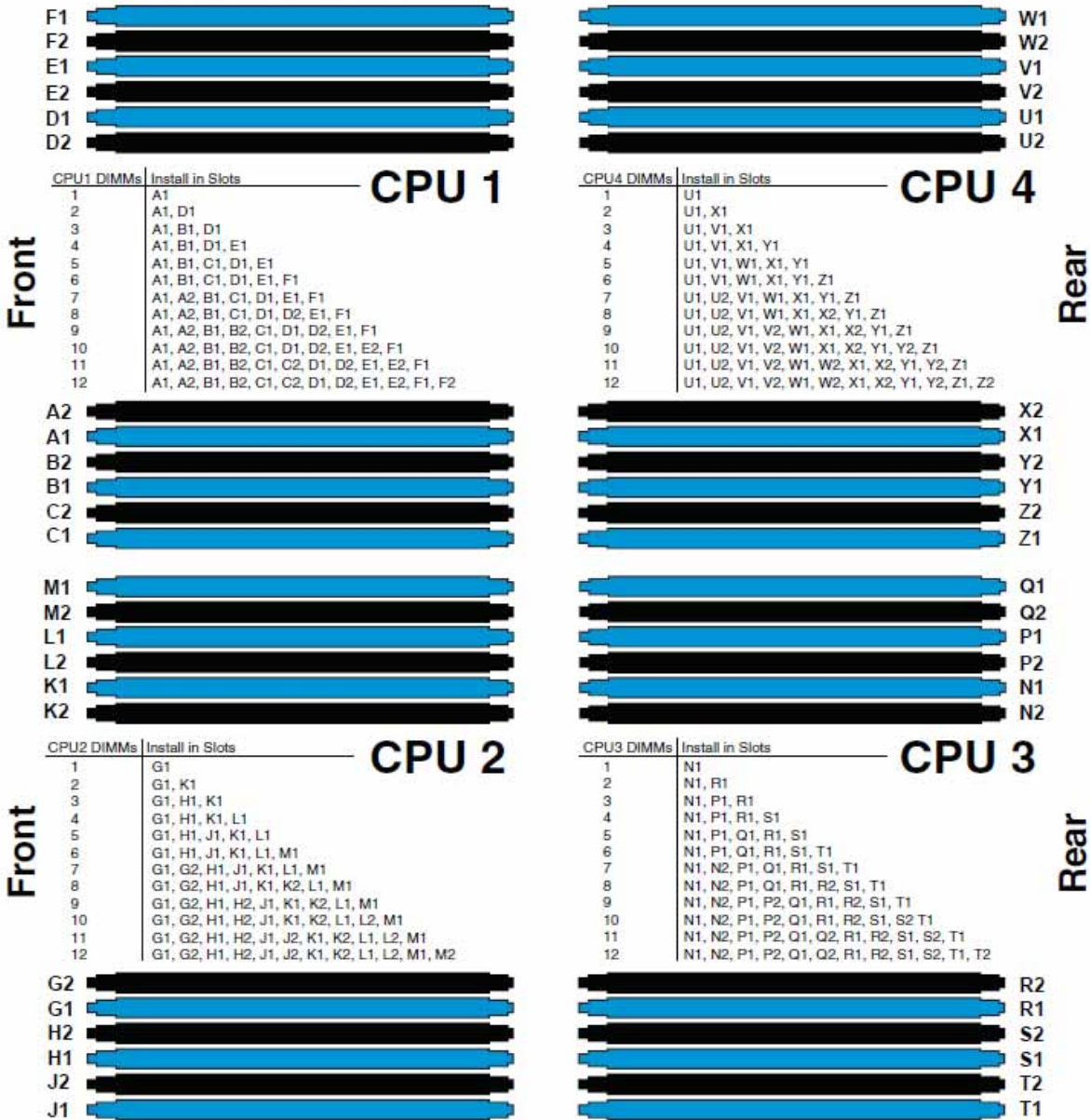
DIMM and CPU Logical Layout

Memory is organized as shown in *Figure 11*.

Figure 11   UCS B480 M5 Memory Organization

> NOTE: All non-populated DIMM slots must have a DIMM blank (UCS-DIMM-BLK) installed.

Each CPU controls six memory channels and 12 DIMM slots, as follows:

- CPU1: Channels A, B, C, D, E, and F
    - Bank 1 - A1, B1, C1, D1, E1, and F1 (blue DIMM slots)
    - Bank 2 - A2, B2, C2, D2, E2, and F2 (black DIMM slots)
- CPU2: Channels G, H, J, K, L, and M
    - Bank 1 - G1, H1, J1, K1, L1, and M1 (blue DIMM slots)
    - Bank 2 - G2, H2, J2, K2, L2, and M2 (black DIMM slots)
- CPU3: Channels N, P, Q, R, S, and T
    - Bank 1 - N1, P1, Q1, R1, S1, and T1 (blue DIMM slots)
    - Bank 2 - N2, P2, Q2, R2, S2, and T2 (black DIMM slots)
- CPU4: Channels U, V, W, X, Y, and Z
    - Bank 1 - U1, V1, W1, X1, Y1, and Z1 (blue DIMM slots)
    - Bank 2 - U2, V2, W2, X2, Y2, and Z2 (black DIMM slots)

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 33*

Table 33 DIMM Rules for B480 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. Do not mix TSV-RDIMMS with LRDIMMs nor RDIMMs	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
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 *CHOOSE MEMORY on page 14* 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 B480 M5 Memory Guide*," available at

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

Cisco UCS B480 M5 Blade Server

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)

NETWORK CONNECTIVITY

For network connectivity, details please review the Cisco UCS 5108 Blade Server Chassis Spec Sheet.

SPARE PARTS

This section lists the upgrade and service-related parts for the UCS B480 M5 server. Some of these parts are configured with every server or with every UCS 5108 blade server chassis.

Table 34 Spare Parts

Product ID (PID)	PID Description
Rack	
RACK-BLANK-001=	Blanking panels (qty 12), 1U, plastic, toolless.Recommended to ensure proper airflow. Fill all empty RU spaces in the front of the rack. Because each blanking panel PID includes 12 panels, use the following calculation: 42RU - occupied RU = available RU. Divide available RU by 12 to determine PID order quantity.
RACK-CBLMGT-001=	Cable mgt D rings (qty 10), metal.Use the D rings to bundle system cables to ensure proper airflow.
RACK-CBLMGT-003=	Brush strip (qty 1), 1 U.The brush strip promotes proper airflow while allowing cables to be passed from the front to the rear of the rack.
RACK-CBLMGT-011=	Cable mgt straps (qty 10), Velcro.Use the Velcro straps to bundle system cables to ensure proper airflow.
RACK2-JOIN-001=	Rack joining kit.Use the kit to connect adjacent racks within a row. Order 1 unit less than the number of racks in the row.
RACK2-GRND-001=	Cisco R42612 grounding kit
Local KVM I/O Cable	
N20-BKVM=	KVM local IO cable for UCS servers console port
CPU Accessories	
UCSB-HS-M5-F	CPU Heat Sink for UCS B-Series M5 CPU socket (Front)
UCSB-HS-M5-R	CPU Heat Sink for UCS B-Series M5 CPU socket (Rear)
UCS-CPU-TIM=	Single CPU thermal interface material syringe for M5 server HS seal
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
Memory	
UCS-DIMM-BLK	UCS DIMM Blanks
UCS-MR-128G8RS-H=	128 GB DDR4-2666-MHz TSV-RDIMM/8R/x4
UCS-MR-X64G4RS-H=	64 GB DDR4-2666-MHz TSV-RDIMM/4R/x4
UCS-ML-X64G4RS-H=	64 GB DDR4-2666-MHz LRDIMM/4R/x4

Table 34 Spare Parts

UCS-MR-X32G2RS-H=	32 GB DDR4-2666-MHz RDIMM/2R/x4
UCS-ML-X32G2RS-H=	32 GB DDR4-2666-MHz LDIMM/2R/x4
UCS-MR-X16G1RS-H=	16 GB DDR4-2666-MHz RDIMM/1R/x4
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
Storage Controller	
UCSB-MRAID-SC=	Supercap for FlexStorage 12G SAS RAID controller w/1GB FBWC
UCSB-MRAID12G=	Cisco FlexStorage 12G SAS RAID controller with drive bays
UCSB-MRAID12G-HE=	Cisco FlexStorage 12G SAS RAID controller with 2 GB flash-backed write cache and drive bays
UCSB-LSTOR-PT=	Cisco FlexStorage Passthrough module w/drive bays
UCSB-LSTOR-BK=	Cisco FlexStorage blanking panel w/o controller, w/o drive bays
Drives	
HDDs	
HDDs (15K RPM)	
UCS-HD300G15K12G=	300 GB 12G SAS 15K RPM SFF HDD
UCS-HD600G15K12G=	600 GB 12G SAS 15K RPM SFF HDD
UCS-HD900G15K12G=	900 GB 12G SAS 15K RPM SFF HDD
HDDs (10K RPM)	
UCS-HD300G10K12G=	300 GB 12G SAS 10K RPM SFF HDD
UCS-HD600G10K12G=	600 GB 12G SAS 10K RPM SFF HDD
UCS-HD12TB10K12G=	1.2 TB 12G SAS 10K RPM SFF HDD
UCS-HD18TB10KS4K=	1.8 TB 12G SAS 10K RPM SFF HDD (4K)
UCS-HD24TB10KS4K=	2.4 TB 12G SAS 10K RPM SFF HDD (4K)
Enterprise Performance SSDs (High endurance, supports up to 10X or 3X DWPD (drive writes per day))	
SAS SSDs	
UCS-SD800GSAS3-EP=	800GB 2.5 inch Enterprise performance 12G SAS SSD(3X endurance) (Toshiba PX05)
UCS-SD16TSASS3-EP=	1.6TB 2.5 inch Enterprise performance 12G SAS SSD(3X endurance) (Toshiba PX05)
UCS-SD800GH3-EP=	800GB 2.5 inch Enterprise performance 12G SAS SSD (3X DWPD)
UCS-SD16TH3-EP=	1.6TB 2.5 inch Enterprise performance 12G SAS SSD (3X DWPD)
UCS-SD32TH3-EP=	3.2TB 2.5in Enterprise performance 12G SAS SSD (3X DWPD)

Table 34 Spare Parts

UCS-SD400GSAS3-EP=	400GB 2.5 inch Enterprise performance 12G SAS SSD(3X DWPD)
UCS-SD32TSASS3-EP=	3.2TB 2.5 inch Enterprise performance 12G SAS SSD(3X DWPD)
SATA SSDs	
UCS-SD480GIS3-EP=	480GB 2.5in Enterprise performance 6G SATA SSD(3X endurance) (IntelS4600/S4610)
UCS-SD960GIS3-EP=	960GB 2.5in Enterprise performance 6G SATA SSD(3X endurance) (IntelS4600/S4610)
UCS-SD19TIS3-EP=	1.9TB 2.5in Enterprise performance 6G SATA SSD(3X endurance) (IntelS4600/S4610)
UCS-SD480GMB3X-EP=	480GB 2.5in Enterprise performance 6GSATA SSD(3X endurance)
UCS-SD960GMB3X-EP=	960GB 2.5in Enterprise performance 6GSATA SSD(3X endurance)
UCS-SD19TMB3X-EP=	1.9TB 2.5in Enterprise performance 6GSATA SSD(3X endurance)
UCS-SD76TBMS4-EV=	7.6TB 2.5 inch Enterprise Value 6G SATA SSD (Micron 5100)
UCS-SD480GBIS6-EV=	480GB 2.5 inch Enterprise Value 6G SATA SSD (Intel S4500/S4150)
UCS-SD960GBIS6-EV=	960GB 2.5 inch Enterprise Value 6G SATA SSD (Intel S4500/S4150)
UCS-SD38TBIS6-EV=	3.8TB 2.5 inch Enterprise Value 6G SATA SSD (Intel S4500/S4150)
Self-Encrypted Drives (SED)	
UCS-SD480GBHBNK9=	480GB Enterprise value SAS SSD (1X FWPD, SED)
UCS-SD960GBHBNK9=	960GB Enterprise value SAS SSD (1X FWPD, SED)
UCS-SD38TBHBNK9=	3.8TB Enterprise value SAS SSD (1X FWPD, SED)
UCS-HD600G15K9=	600GB 12G SAS 15K RPM SFF HDD (SED)
UCS-HD12G10K9=	1.2 TB 12G SAS 10K RPM SFF HDD (SED)
UCS-HD18G10K9=	1.8TB 12G SAS 10K RPM SFF HDD (4K format, SED)
UCS-HD24T10BNK9=	2.4 TB 12G SAS 10K RPM SFF HDD (4K) SED
NVMe	
UCSB-NVMEHW-I2000=	Cisco 2.5" U.2 2TB Intel P4600 NVMe High Perf. High Endurance
UCSB-NVMEHW-I8000=	Cisco 2.5" U.2 8TB Intel P4510 NVMe High Perf. Value Endurance
UCSB-NVMEXPB-I375=	Cisco 2.5in U.2 375GB Intel P4800 NVMe Med. Perf
UCSB-NVME2H-I1000=	Cisco 2.5" U.2 1,0 TB Intel P4510 NVMe High Perf. Value Endu
UCSB-NVME2H-I1600=	Cisco 2.5" U.2 1.6TB Intel P4610 NVMe High Perf. High Endurance
UCSB-NVME2H-I2TBV=	Cisco 2.5" U.2 2TB Intel P4500 NVMe High Perf. Value Endurance

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Table 34 Spare Parts

UCSB-NVME2H-I3200=	Cisco 2.5" U.2 3.2TB Intel P4610 NVMe High Perf. High Endurance
UCSB-NVME2H-I4000=	Cisco 2.5" U.2 4.0TB Intel P4510 NVMe High Perf. Value Endurance
Supported Mezzanine cards	
UCSB-MLOM-40G-04=	UCS VIC 1440 modular LOM for blade servers mLOM
UCSB-MLOM-40G-03=	UCS VIC 1340 modular LOM for blade servers mLOM
UCSB-VIC-M84-4P=	Cisco UCS VIC 1480 mezzanine adapter Rear Mezzanine
UCSB-VIC-M83-8P=	Cisco UCS VIC 1380 mezzanine adapter
Port Expander Card for VIC option	
UCSB-MLOM-PT-01=	Cisco UCS Port Expander Card for VIC.
GPUs	
UCSB-GPU-P6-F=	NVIDIA GRID P6 Front Mezzanine
UCSB-GPU-P6-R=	NVIDIA GRID P6 Rear Mezzanine
Cisco Storage Accelerators	
UCSB-F-H-5607=	UCS Blade PCIe/NVMe Storage Mezz 560 GB High Endurance
UCSB-F-H-32003=	UCS Blade PCIe/NVMe Storage Mezz 3200 GB Medium Endurance
Trusted Platform Module	
UCSX-TPM2-001=	Trusted Platform Module for UCS (SPI-based)
UCSX-TPM2-002=	Trusted Platform Module 2.0 for UCS servers
UCSX-TPM2-002B=	Trusted Platform Module2.0 M5 UCS svr (FIPS 140-2 Compliant)
Secure Digital Cards	
UCS-SD-128G=	128 GB SD Card for UCS servers
UCS-SD-64G-S=	64 GB SD Card for UCS servers
UCS-SD-32G-S=	32 GB SD Card for UCS servers
UCS-MSTOR-SD=	SD module card (holds up to 2)
M.2 SATA SSDs	
UCS-M2-240GB=	240 GB M.2 SATA SSD
UCS-MSTOR-M2=	M.2 module card (holds up to 2)
Boot-Optimized RAID controller	
UCS-M2-HWRAID =	Cisco Boot optimized M.2 Raid controller
USB 3.0 Drive	

Table 34 Spare Parts

UCS-USBFLSHB-16GB=	UCS Servers 16 GB Flash USB Drive
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
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=	

Table 34 Spare Parts

VMware vCenter	
VMW-VCS-STD-1A=	VMware vCenter 6 Server Standard, 1 yr support required
VMW-VCS-STD-3A=	VMware vCenter 6 Server Standard, 3 yr support required
VMW-VCS-STD-5A=	VMware vCenter 6 Server Standard, 5 yr support required
VMW-VCS-FND-1A=	VMware vCenter 6 Server Foundation (3 Host), 1 yr supp reqd
VMW-VCS-FND-3A=	VMware vCenter 6 Server Foundation (3 Host), 3 yr supp reqd
VMW-VCS-FND-5A=	VMware vCenter 6 Server Foundation (3 Host), 5 yr supp reqd
Red Hat	
RHEL-2S2V-1A=	Red Hat Enterprise Linux (1-2 CPU,1-2 VN)
RHEL-2S2V-3A=	Red Hat Enterprise Linux (1-2 CPU,1-2 VN)
RHEL-2S2V-1S=	Red Hat Enterprise Linux (1-2 CPU,1-2 VN)
RHEL-2S2V-3S=	Red Hat Enterprise Linux (1-2 CPU,1-2 VN)
RHEL-2S-HA-1S=	RHEL High Availability (1-2 CPU)
RHEL-2S-HA-3S=	RHEL High Availability (1-2 CPU)
RHEL-2S-RS-1S=	RHEL Resilient Storage (1-2 CPU)
RHEL-2S-RS-3S=	RHEL Resilient Storage (1-2 CPU)
RHEL-2S-SFS-1S=	RHEL Scalable File System (1-2 CPU)
RHEL-2S-SFS-3S=	RHEL Scalable File System (1-
RHEL-2S2V-5A=	Red Hat Enterprise Linux (1-2 CPU,1-2 VN)
RHEL-2S-HA-1A=	RHEL High Availability (1-2 CPU)
RHEL-2S-HA-3A=	RHEL High Availability (1-2 CPU)
RHEL-2S-HA-5A=	RHEL High Availability (1-2 CPU)
RHEL-2S-RS-1A=	RHEL Resilent Storage (1-2 CPU)
RHEL-2S-RS-3A=	RHEL Resilent Storage (1-2 CPU)
RHEL-2S-RS-5A=	RHEL Resilent Storage (1-2 CPU)
RHEL-2S-SFS-1A=	RHEL Scalable File System (1-2 CPU)
RHEL-2S-SFS-3A=	RHEL Scalable File System (1-2 CPU)
RHEL-2S-SFS-5A=	RHEL Scalable File System (1-2 CPU)
Red Hat SAP	
RHEL-SAP-2S2V-1S=	RHEL for SAP Apps (1-2 CPU, 1-2 VN)

Table 34 Spare Parts

RHEL-SAP-2S2V-3S=	RHEL for SAP Apps (1-2 CPU, 1-2 VN)
RHEL-SAPH-2S2V-1S=	RHEL for SAP Hana (1-2 CPU, 1-2 VN)
RHEL-SAPH-2S2V-3S=	RHEL for SAP Hana (1-2 CPU, 1-2 VN)
RHEL-SAPHHAP2S-1S=	RHEL for SAP Hana,HA,SmartM (1-2 CPU &VN)
RHEL-SAPHHAP2S-3S=	RHEL for SAP Hana,HA,SmartM (1-2 CPU &VN)
VMware	
VMW-VSP-STD-1S=	VMware vSphere 6 Standard (1 CPU), 1-yr Vmware SnS Reqd
VMW-VSP-STD-3S=	VMware vSphere 6 Standard (1 CPU), 3-yr Vmware SnS Reqd
VMW-VSP-EPL-1S=	VMware vSphere 6 Ent Plus (1 CPU), 1-yr Vmware SnS Reqd
VMW-VSP-EPL-3S=	VMware vSphere 6 Ent Plus (1 CPU), 3-yr Vmware SnS Reqd
VMW-VSP-STD-1A=	VMware vSphere 6 Standard (1 CPU), 1-yr, Support Required
VMW-VSP-STD-3A=	VMware vSphere 6 Standard (1 CPU), 3-yr, Support Required
VMW-VSP-STD-5A=	VMware vSphere 6 Standard (1 CPU), 5-yr, Support Required
VMW-VSP-EPL-3A=	VMware vSphere 6 Ent Plus (1 CPU), 3-yr, Support Required
VMW-VSP-EPL-1A=	VMware vSphere 6 Ent Plus (1 CPU), 1-yr, Support Required
VMW-VSP-EPL-5A=	VMware vSphere 6 Ent Plus (1 CPU), 5-yr, Support Required
SLES and SAP	
SLES-SAP-2S2V-1A=	SLES for SAP Apps (1-2 CPU, 1-2 VM)
SLES-SAP-2SUV-1A=	SLES for SAP Apps (1-2 CPU, Unl VM)
SLES-SAP-2S2V-3A=	SLES for SAP Apps (1-2 CPU, 1-2 VM)
SLES-SAP-2SUV-3A=	SLES for SAP Apps (1-2 CPU, Unl VM)
SLES-SAP-2S2V-5A=	SLES for SAP Apps (1-2 CPU, 1-2 VM)
SLES-SAP-2SUV-5A=	SLES for SAP Apps (1-2 CPU, Unl VM)
SLES-SAP-2S2V-1S=	SLES for SAP Apps (1-2 CPU, 1-2 VM)
SLES-SAP-2SUV-1S=	SLES for SAP Apps (1-2 CPU, Unl VM)
SLES-SAP-2S2V-3S=	SLES for SAP Apps (1-2 CPU, 1-2 VM)
SLES-SAP-2SUV-3S=	SLES for SAP Apps (1-2 CPU, Unl VM)
SLES-SAP-2S2V-5S=	SLES for SAP Apps (1-2 CPU, 1-2 VM)
SLES-SAP-2SUV-5S=	SLES for SAP Apps (1-2 CPU, Unl VM)
SUSE	

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Table 34 Spare Parts

SLES-2S2V-1A=	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM)
SLES-2SUV-1A=	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM)
SLES-2S2V-3A=	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM)
SLES-2SUV-3A=	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM)
SLES-2S2V-5A=	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM)
SLES-2SUV-5A=	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM)
SLES-2S2V-1S=	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM)
SLES-2SUV-1S=	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM)
SLES-2S2V-3S=	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM)
SLES-2SUV-3S=	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM)
SLES-2S2V-5S=	SUSE Linux Enterprise Svr (1-2 CPU,1-2 VM)
SLES-2SUV-5S=	SUSE Linux Enterprise Svr (1-2 CPU,Unl VM)
SLES-2S-HA-1S=	SUSE Linux High Availability Ext (1-2 CPU)
SLES-2S-HA-3S=	SUSE Linux High Availability Ext (1-2 CPU)
SLES-2S-HA-5S=	SUSE Linux High Availability Ext (1-2 CPU)
SLES-2S-GC-1S=	SUSE Linux GEO Clustering for HA (1-2 CPU)
SLES-2S-GC-3S=	SUSE Linux GEO Clustering for HA (1-2 CPU)
SLES-2S-GC-5S=	SUSE Linux GEO Clustering for HA (1-2 CPU)
SLES-2S-LP-1S=	SUSE Linux Live Patching Add-on (1-2 CPU)
SLES-2S-LP-3S=	SUSE Linux Live Patching Add-on (1-2 CPU)

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 8*.

(3) Carefully remove and replace 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/hw/blade-servers/B480M5/B480M5_chapter_011.html#task_xhs_hcz_tz.

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 8*.

(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/hw/blade-servers/B480M5/B480M5_chapter_011.html#task_xhs_hcz_tz.

(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 5 on page 16*.

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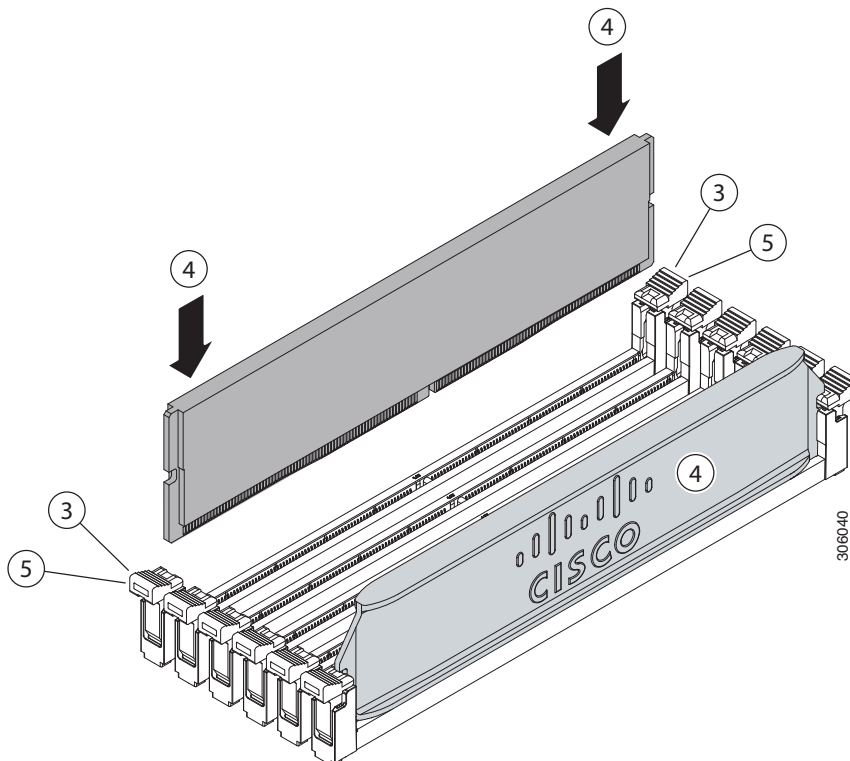
(4) Press evenly on both ends of the DIMM/PMEM until it clicks into place in its slot.

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 C240 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 35* to determine if still supported.

Table 35 EOL Products

EOS option PID	Description	EOL bulletin link
DRIVES		
Enterprise Value SSDs		
UCS-SD150GBKS4-EV	150 GB 2.5 inch Enterprise Value 6G SATA SSD	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-740779.html
UCS-SD480GBKS4-EV	480 GB 2.5 inch Enterprise Value 6G SATA SSD	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-740779.html
UCS-SD960GIKS4-EV	960GB 2.5 inch Enterprise Value 6G SATA SSD	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-740779.html
UCS-SD16TBKS4-EV	1.6TB 2.5 inch Enterprise Value 6G SATA SSD	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-740779.html
UCS-SD150GBKS4-EV	150 GB 2.5 inch Enterprise Value 6G SATA SSD	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-740779.html
HX-SD480GBKSS-EV	480GB 2.5 in Enterprise Value 6G SATA SSD(1FWPD)-PM86	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-servers/eos-eol-notice-c51-742066.html
UCS-SD240GBKS4-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-SD480GBKSS-EV	480GB 2.5 in Enterprise Value 6G SATA SSD(1FWPD)-PM86	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-servers/eos-eol-notice-c51-742066.html
UCS-SD16TBKS4-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-SD480GH1-EV	480GB 2.5 inch Enterprise Value 12G SAS SSD (1X endurance)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743832.html
Enterprise Performance SSDs		
UCS-SD200G12S3-EP	200GB 2.5 inch Enterprise performance 6G SATA SSD(3 FWPD)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-739513.html
UCS-SD480G12S3-EP	480GB 2.5 inch Ent. Performance 6GSATA SSD(3X endurance)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-739513.html

Table 35 EOL Products

EOS option PID	Description	EOL bulletin link
UCS-SD800G12S3-EP	800GB 2.5 inch Enterprise performance 6G SATA SSD(3 FWPD)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-739513.html
UCS-SD16TB12S3-EP	1.6TB 2.5 inch Ent. Performance 6GSATA SSD(3X endurance)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-739513.html
UCS-SD400GH3-EP	400GB 2.5 inch Enterprise performance 12G SAS SSD (3X DWPD)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-739513.html
UCS-SD800G12S4-EP	800 GB 2.5 inch Ent. Performance 12G SAS SSD (10X endurance) (Samsung 1635)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-741644.html
UCS-SD16TB12S4-EP	1.6 TB 2.5 inch Ent. Performance 12G SAS SSD (10X endurance) (SanDisk Lightning II)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-741644.html
HDD		
UCS-HD900G10K12G	900GB 12G SAS 10K RPM SFF HDD	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-740779.html
SED		
UCS-SD38TBHBNK9	3.8TB Enterprise value SAS SSD (1X FWPD, SED),FIPS 140-2	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742823.html
UCS-SD480GBHBNK9	480GB Enterprise value SAS SSD (1X FWPD, SED),FIPS 140-2	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742823.html
UCS-SD480G2HBNK9	480GB Enterprise value SAS SSD (1X FWPD, SED)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-743832.html
NVMe		
UCSB-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
UCSB-NVMEXP-I375	375GB 2.5in Intel Optane NVMe Extreme	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-742509.html
UCSB-NVMELW-I1000	Cisco 2.5" U.2 1 TB 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
UCSB-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
UCSB-NVMELW-I2000	Cisco 2.5" U.2 2 TB 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

Table 35 EOL Products

EOS option PID	Description	EOL bulletin link
UCSB-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
UCSB-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
UCSB-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
UCSB-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
UCSB-NVMELW-I500	Cisco 2.5" U.2 500GB Intel P4501 NVMe Med. Perf. Value Endurance	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-servers/eos-eol-notice-c51-742066.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
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
MEZZANINE ADAPTERS		
UCSB-F-H32003	UCS Blade PCIe/NVMe Storage Mezz 3200GB Medium Endurance	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-739513.html
UCSB-F-H5607	UCS Blade PCIe/NVMe Storage Mezz 560GB High Endurance	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/eos-eol-notice-c51-739513.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

Table 35 EOL Products

EOS option PID	Description	EOL bulletin link
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
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
UCSM Software		
N20-FW015	UCS 5108 Blade Chassis FW Package 3.2	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-manager/eos-eol-notice-c51-743144.html

Cisco UCS B480 M5 Blade Server

TECHNICAL SPECIFICATIONS

Dimensions and Weight

Table 36 UCS B480 M5 Dimensions and Weight

Parameter	Value
Height	1.95 in. (50 mm)
Width	16.5 in.(419 mm)
Depth	24.4 in. (620 mm)
Weight	■ Base server weight = 17.780 lb (8.1 kg) ■ Minimally configured server with 2 CPUs, 2 heatsinks, 2 RDIMMs, 1 Mezz, 4 HDD blank) = 21.098 lb (9.57 kg) ■ Minimally configured server with 2 CPUs, 2 heatsinks, 2 LRDIMMs, 1 Mezz, 4 HDD blank) = 21.206 lb (9.62 kg) ■ Fully configured server with 4 CPU, 4 heatsinks, 48 RDIMMs, 3 Mezz, 2 RAID, 4 HDD) = 30.704 lb (13.93 kg) ■ Fully configured server with 4 CPU, 4 heatsinks, 48 LRDIMMs, 3 Mezz, 2 RAID, 4 HDD) = 33.296 lb (15.10 kg)

Power Specifications

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

http://ucspowercalc.cisco.com

NOTE: When using 256 GB DDR DIMMs (UCS-ML-256G8RT-H) in this server, the blade-level power capping must be set to 1300 W. For information about blade-level power capping, see the Power Capping and Power Management chapter in the Cisco UCS Manager Server Management Guide for your release: Cisco UCS Manager Configuration Guides.