



System Overview

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Overview

The Cisco UCS C220 M7 server is a one-rack unit server that can be used standalone, or as part of the Cisco Unified Computing System, which unifies computing, networking, management, virtualization, and storage access into a single integrated architecture. Cisco UCS also enables end-to-end server visibility, management, and control in both bare metal and virtualized environments. Each Cisco UCS C220 M7 has two CPU sockets that can support the following Intel® Xeon® Scalable Processors:

- Fourth Generation Intel Xeon Scalable Server Processors
- Fifth Generation Intel Xeon Scalable Server Processors

Additionally, the server supports the following features with one CPU or two identical CPUs:

- 32 DDR5 DIMMs (RDIMM), 4400 MHz (2 DPC), up to 5600 MHz (1DPC) support for RDIMMs.
16 DIMMs are supported per CPU for a total system memory of 4 TB (up to 128 GB DDR5 DIMMs)
- DDR5 DIMM capacities vary based on the CPU type for the compute node:
 - Intel Fourth Generation Xeon Scalable Processors support 16, 32, 64, and 128 GB DDR5 DIMMs
 - Intel Fifth Generation Xeon Scalable Processors support 16, 32, 64, 96, and 128 GB DDR5 DIMMs
- The server's DIMM configuration differs depending on which generation of CPU is populated on the server:
 - With Fourth Generation Intel Xeon Scalable Server Processors, the compute node supports DDR5 DIMMs up to 4800 MT/s with 1DPC, and up to 4400 MT/s with 2DPC
 - With Fifth Generation Intel Xeon Scalable Server Processors, the compute node supports DDR5 DIMMs up to 5600 MT/s with 1 DPC, and up to 4400 MT/s with 2DPC

- 3 PCI Express riser connectors, which provide slots for full-height and half-height PCIe adapters in rear mezzanine slots.
- Two power supplies (PSUs) with support for 1+1 and cold redundancy power redundancy modes. For supported PSUs, see [Power Specifications](#).
- One 1 Gigabit Ethernet dedicated management port.
- Internal storage consisting of one M.2 daughter slot.
- Rear mezzanine connectivity options include:
 - One mLOM card provides 2 100 Gig Ethernet ports.
 - An optional Intel X710 OCP 3.0 card is supported in the mLOM slot through the use of an interposer card.
- One mLOM/VIC slot provides 10G/25G/40G/50G/100G/200G connectivity. Supported cards are:
 - Cisco UCS VIC 15428 mLOM with four 10G/25G/50G SFP+/SFP28/SFP56/QSFP56 ports that support Ethernet or Fibre Channel over Ethernet (FCoE).
 - Cisco UCS VIC 15427 Quad Port CNA MLOM (UCSC-M-V5Q50GV2) supports:
 - a x16 PCIe Gen4 Host Interface to the rack server
 - four 10G/25G/50G SFP+/SFP28/SFP56 ports
 - 4GB DDR4 Memory, 3200 MHz
 - Integrated blower for optimal ventilation
 - Secure boot support
 - Cisco UCS VIC 15425 Quad Port 10G/25G/50G SFP56 CNA PCIe (UCSC-P-V5Q50G-D)
 - a x16 PCIe Gen4 Host Interface to the rack server
 - Four 10G/25G/50G QSFP56 ports
 - 4GB DDR4 Memory, 3200MHz
 - Integrated blower for optimal ventilation
 - Cisco UCS VIC 15237 Dual Port 40G/100G/200G QSFP56 mLOM (UCSC-M-V5D200GV2) supports:
 - a x16 PCIe Gen4 Host Interface to the rack server
 - two 40G/100G/200G QSFP/QSFP28/QSFP56 ports
 - 4GB DDR4 Memory, 3200 MHz
 - Integrated blower for optimal ventilation
 - Secure boot support
 - Cisco VIC 15238 mLOM with two 40G/100G/200G QSFP/QSFP28 ports that support Ethernet or Fibre Channel over Ethernet (FCoE).

- Cisco UCS VIC 15235 Dual Port 40G/100G/200G QSFP56 CNA PCIe (UCSC-P-V5D200G-D)
 - a x16 PCIe Gen4 Host Interface to the rack server
 - two 40G/100G/200G QSFP56 ports
 - 4GB DDR4 Memory, 3200MHz
 - Integrated blower for optimal ventilation
- Two KVM ports, one on the front of the server and on the rear
- Modular Trusted Platform Module (TPM 2.0)
- Two different front-loading hardware configurations are available:
 - The Cisco UCS C220 M7 SFF (UCSC-C220-M7S): This model supports only small form-factor (SFF) drives and has a 10-drive backplane. Supports up to 10 front-loading 2.5-inch SAS/SATA drives, and up to 4 of the drives can be NVMe.

When this model is configured with the Cisco 24G Tri-Mode RAID controller (UCSC-RAID-HP), up to 10 NVMe drives are supported.
 - The Cisco UCS C220 M7 NVMe (UCSC-C220-M7N): This model supports only small form-factor (SFF) drives and has a 10-drive backplane. Supports up to 10 front-loading 2.5-inch NVMe-only SSDs.
- Rear PCI risers are supported as one to three half-height half-length (HHHL) PCIe risers, or one to two full-height $\frac{3}{4}$ length PCIe risers.
- The server provides an internal slot for one of the following:
 - SATA Interposer to control SATA drives from the PCH (AHCI), or
 - Cisco 12G RAID controller with cache backup to control SAS/SATA drives, or
 - Cisco 12G SAS pass-through HBA to control SAS/SATA drives
 - Cisco 24G Tri-Mode Raid Controller with cache backup to control SAS/SATA/NVMe drives

External Features

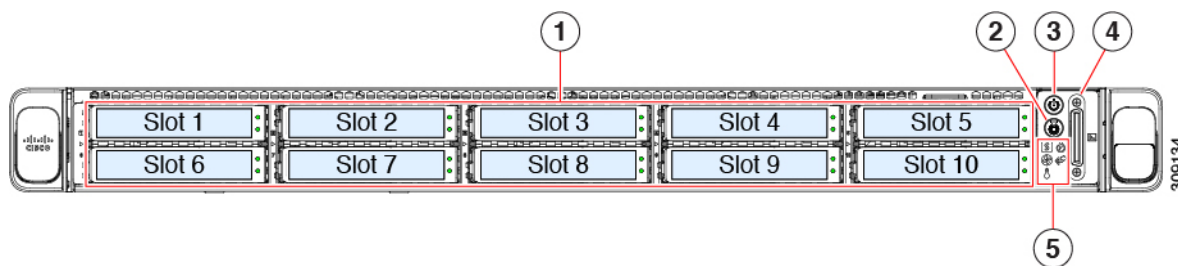
This topic shows the external features of the server versions.

Cisco UCS C220 M7 Server Front Panel Features

The following figure shows the front panel features of the small form-factor drive versions of the server.

For definitions of LED states, see [Front-Panel LEDs](#).

Figure 1: Cisco UCS C220 M7 Server Front Panel



1	Drive bays 1 – 10 support SAS/SATA hard disk drives (HDDs) and solid-state drives (SSDs). As an option, drive bays 1-4 can contain up to 4 NVMe drives in any number up to 4. Drive bays 5 through 10 support only SAS/SATA HDDs or SSDs. NVMe drives are supported in a dual CPU server only.	2	Unit identification button/LED
3	Power button/power status LED	4	KVM connector (used with KVM cable that provides one DB-15 VGA, one DB-9 serial, and two USB 2.0 connectors)
5	System LED cluster: <ul style="list-style-type: none"> • Fan status LED • System status LED • Power supply status LED • Network link activity LED • Temperature status LED For definitions of LED states, see Status LEDs and Buttons .		-

Cisco UCS C220 M7 Server Rear Panel Features

The rear panel features can be different depending on the number and type of PCIe cards in the server.

You must choose the risers you want for your server configuration. Rear PCIe risers can be one of the following configurations:

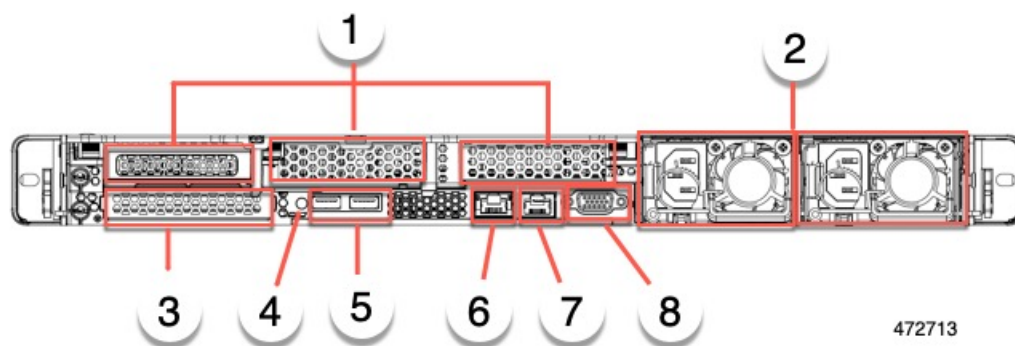
- Half-height risers:
 - one half-height, $\frac{3}{4}$ length riser (not shown). With this configuration, PCIe slot (slot 1) supports one half-height, $\frac{3}{4}$ length, x16 lanes PCIe card and is controlled by CPU 1.
 - three half-height, $\frac{3}{4}$ length risers. See "UCS C220 M7 Server Rear Panel, Half Height, $\frac{3}{4}$ Length PCIe Cards" below.
- A server with 1 CPU supports up to two half-height, $\frac{3}{4}$ length risers in slot 1 and slot 2, or up to 1 full-height, full length riser in slot 1.

- Full-height risers: Two full height, 3/4 length risers. See "Cisco UCS C220 M7 Server Rear Panel, Full Height, 3/4 Length PCIe Cards" below.
- A server with 2 CPUs supports these riser options plus the previous options.



Note For definitions of LED states, see [Rear-Panel LEDs](#).

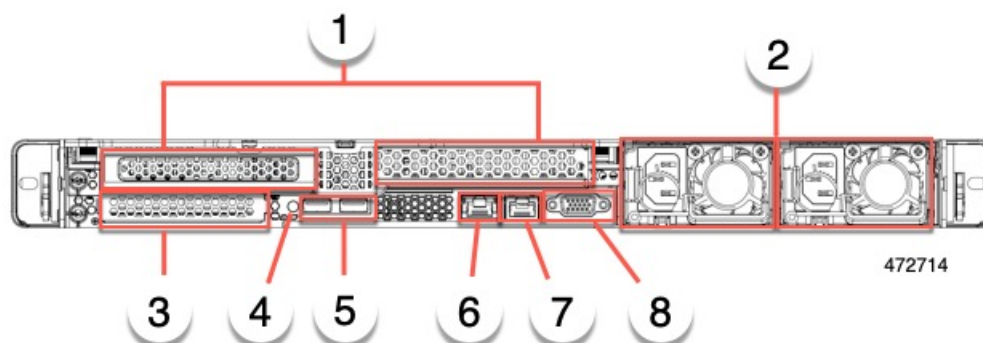
Figure 2: Cisco UCS C220 M7 Server Rear Panel, Half Height, 3/4 Length PCIe Cards



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<p>1</p>	<p>PCIe slots, three</p> <p>This configuration accepts three card in riser slots 1, 2, and 3 as follows:</p> <ul style="list-style-type: none"> • Riser 1, which is controlled by CPU 1: <ul style="list-style-type: none"> • Supports one PCIe slot (slot 1) • Slot 1 is half-height, 3/4 length, x16 • Riser 2, which is controlled by CPU 1: <ul style="list-style-type: none"> • Supports one PCIe slot (slot 2) • Slot 2 is half-height, 3/4 length, x16 • Riser 3, which is controlled by CPU 2: <ul style="list-style-type: none"> • Supports one PCIe slot (slot 3) • Slot 3 is half-height, 3/4 length, x16 	<p>2</p> <p>Power supply units (PSUs), two which can be redundant when configured in 1+1 power mode.</p>
<p>3</p>	<p>Modular LAN-on-motherboard (mLOM) card or OCP card bay (x16 PCIe lane) for an Intel X710 OCP 3.0 card.</p>	<p>4</p> <p>System identification button/LED</p>
<p>5</p>	<p>USB 3.0 ports (two)</p>	<p>6</p> <p>1-Gb Ethernet dedicated management port</p>
<p>7</p>	<p>COM port (RJ-45 connector)</p>	<p>8</p> <p>VGA video port (DB-15 connector)</p>

Figure 3: Cisco UCS C220 M7 Server Rear Panel, Full Height, 3/4 Length PCIe Cards

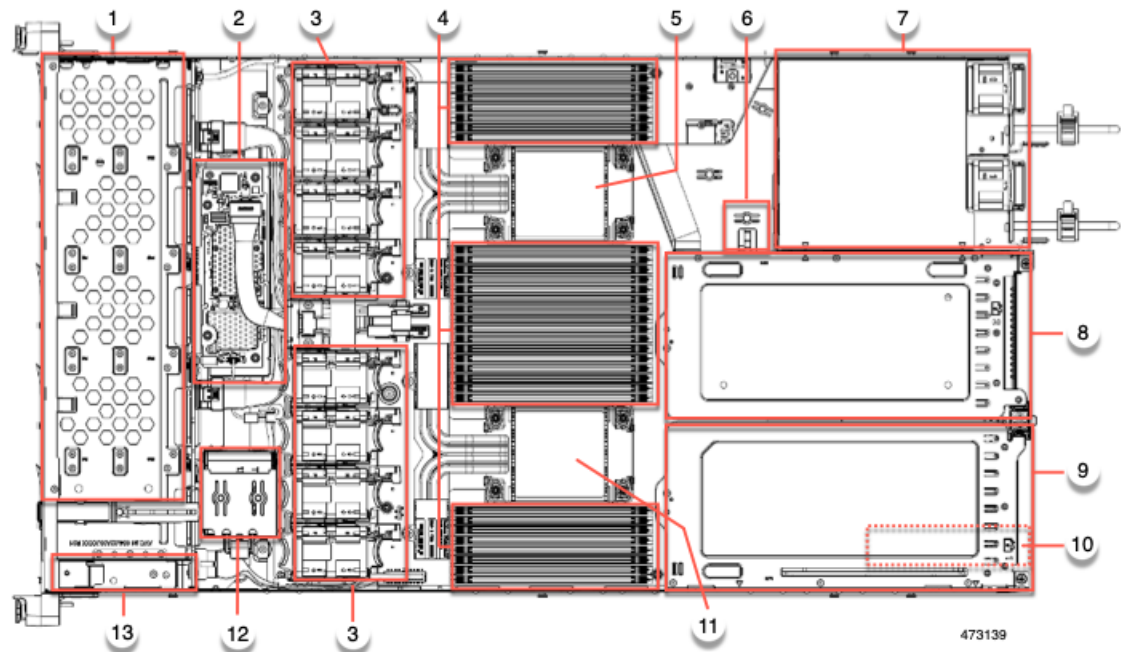


1	<p>PCIe slots, two</p> <p>This configuration accepts two cards in riser slots 1 and 2 as follows:</p> <ul style="list-style-type: none"> • Riser 1, which is controlled by CPU 1: <ul style="list-style-type: none"> • Plugs into riser 1 motherboard connector • Supports one full-height, 3/4 length, x16 PCIe card • Riser 2, which is controlled by CPU 2: <ul style="list-style-type: none"> • Plugs into riser 3 motherboard connector • Supports one full-height, 3/4 length, x16 PCIe card 	2	<p>Power supply units (PSUs), two which can be redundant when configured in 1+1 power mode.</p>
3	<p>Modular LAN-on-motherboard (mLOM) card or OCP card bay (x16 PCIe lane) for an Intel X710 OCP 3.0 card</p>	4	<p>Unit identification button/LED</p>
5	<p>USB 3.0 ports (two)</p>	6	<p>1-Gb Ethernet dedicated management port</p>
7	<p>COM port (RJ-45 connector)</p>	8	<p>VGA video port (DB-15 connector)</p>

Serviceable Component Locations

This topic shows the locations of the field-replaceable components and service-related items. The view in the following figure shows the server with the top cover removed.

Figure 4: Cisco UCS C220 M7 Server, Full Height, ¾ Length PCIe Cards, Serviceable Component Locations



1	Front-loading drive bays 1–10 support SAS/SATA drives.	2	M7 modular RAID card or SATA Interposer card
3	Cooling fan modules, eight. Each fan is hot-swappable	4	DIMM sockets on motherboard, 32 total, 16 per CPU Eight DIMM sockets are placed between the CPUs and the server sidewall, and 16 DIMM sockets are placed between the two CPUs.
5	Motherboard CPU socket two (CPU2)	6	M.2 module connector Supports a boot-optimized RAID controller with connectors for up to two SATA M.2 SSDs
7	Power Supply Units (PSUs), two	8	PCIe riser slot 2 Accepts 1 full height, ¾ length PCIe riser card.
9	PCIe riser slot 1 Accepts 1 full height, ¾ length (x16 lane) PCIe riser card	10	Modular LOM (mLOM) card bay or Intel X710 OCP 3.0 card on chassis floor (x16 PCIe lane) The mLOM/OCP card bay sits below PCIe riser slot 1.
11	Motherboard CPU socket one (CPU1)	12	SuperCap module mounting bracket The SuperCap module (not shown) that mounts into this location provides RAID write-cache backup.
13	Front Panel Controller board	-	

The view in the following figure shows the individual component locations and numbering, including the FH 3/4 length PCIe cards.

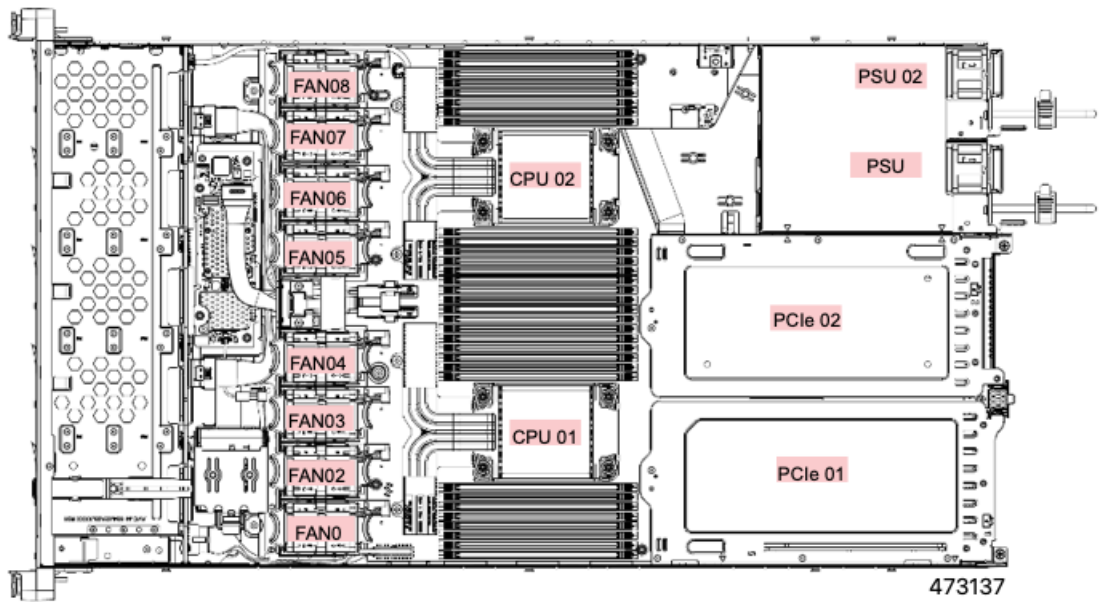
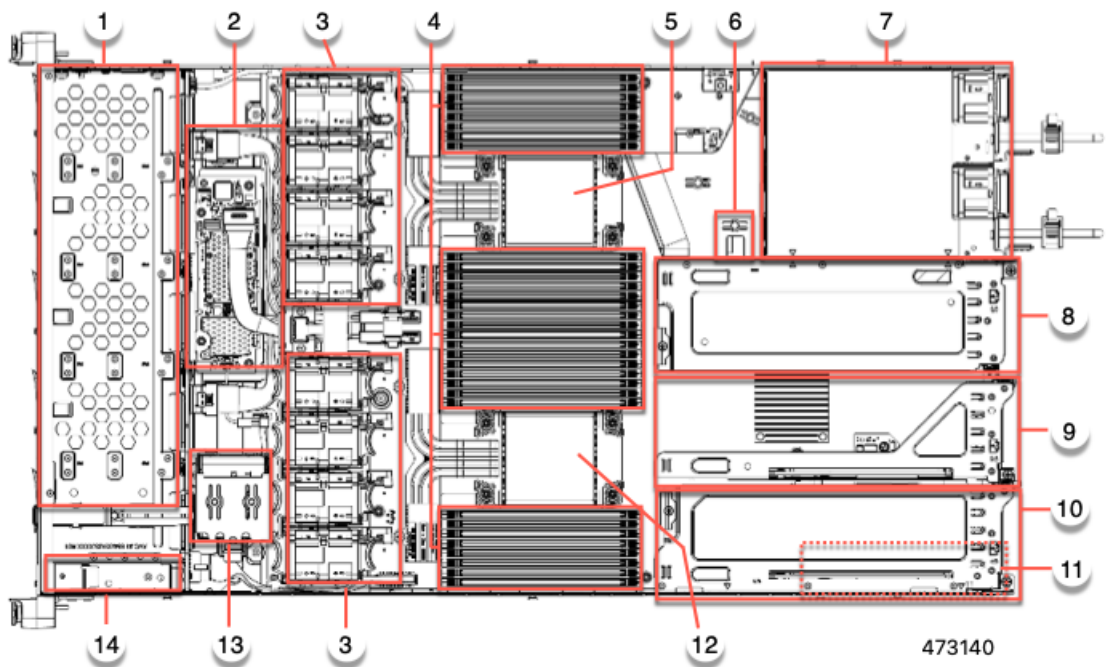


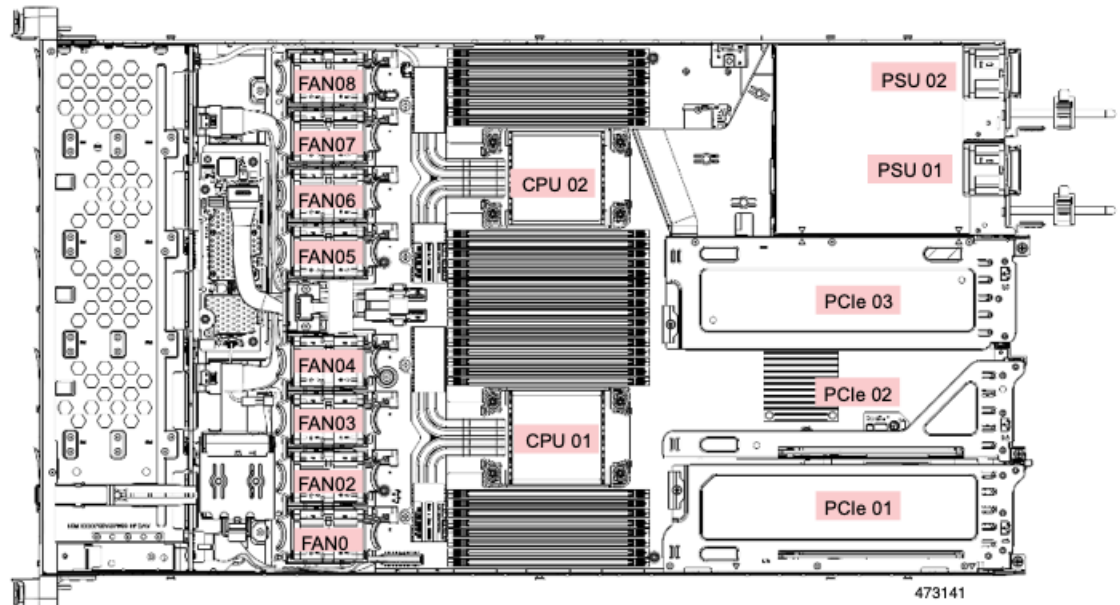
Figure 5: Cisco UCS C220 M7 Server, Half Height, Half Length PCIe Cards, Serviceable Component Locations



1	Front-loading drive bays 1–10 support SAS/SATA drives.	2	M7 modular RAID card or SATA Interposer card
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3	Cooling fan modules, eight. Each fan is hot-swappable	4	DIMM sockets on motherboard, 32 total, 16 per CPU Eight DIMM sockets are placed between the CPUs and the server sidewall, and 16 DIMM sockets are placed between the two CPUs.
5	Motherboard CPU socket CPU2 is the top socket.	6	M.2 module connector Supports a boot-optimized RAID controller with connectors for up to two SATA M.2 SSDs
7	Power Supply Units (PSUs), two	8	PCIe riser slot 3 Accepts 1 half height, half width PCIe riser card.
9	PCIe riser slot 2 Accepts 1 half height, half width PCIe riser card.	10	PCIe riser slot 1 Accepts 1 half height, half width PCIe riser card
11	Modular LOM (mLOM) or Intel X710 OCP 3.0 card bay on chassis floor (x16 PCIe lane) The mLOM/OCP card bay sits below PCIe riser slot 1.	12	Motherboard CPU socket CPU1 is the bottom socket.
13	SuperCap module mounting bracket The SuperCap module (not shown) that mounts into this location provides RAID write-cache backup.	14	Front Panel Controller board

The view in the following figure shows the individual component locations and numbering, including the HHHL PCIe slots.



The Technical Specifications Sheets for all versions of this server, which include supported component part numbers, are at [Cisco UCS Servers Technical Specifications Sheets](#) (scroll down to *Technical Specifications*).

Summary of Server Features

The following table lists a summary of server features.

Feature	Description
Chassis	One rack-unit (1RU) chassis
Central Processor	Up to two 4th Generation Intel Xeon Scalable Processors
Memory	32 slots for registered DIMMs (RDIMMs), DDR5 DIMMs, 4400 MHz (2 DPC), 4800 MHz (1 DPC).
Multi-bit error protection	This server supports multi-bit error protection.
Video	<p>The Cisco Integrated Management Controller (CIMC) provides video using the Aspeed AST2600 VGA video/graphics controller:</p> <ul style="list-style-type: none"> • Integrated 2D graphics core with hardware acceleration • DDR3 memory interface supports up to 512 MB of addressable memory (8 MB is allocated by default to video memory) • Supports display resolutions up to 1920 x 1200 16bpp @ 60Hz • High-speed integrated 24-bit RAMDAC • Single lane PCI-Express host interface running at Gen 2 speed
Network and management I/O	<p>Rear panel:</p> <ul style="list-style-type: none"> • One 1-Gb Ethernet dedicated management port (RJ-45 connector) • One RS-232 serial port (RJ-45 connector) • One VGA video connector port (DB-15 connector) • Two USB 3.0 ports <p>Front panel:</p> <ul style="list-style-type: none"> • One front-panel keyboard/video/mouse (KVM) connector that is used with the KVM breakout cable. The breakout cable provides two USB 2.0, one VGA, and one DB-9 serial connector.
Modular LOM	<p>One dedicated socket (x16 PCIe lane) that can be used to add an mLOM card for additional rear-panel connectivity. As an optional hardware configuration, the Cisco CNIC mLOM module supports up to four 1G/10G ports with RJ45 connectors or SFP+ interfaces.</p> <p>An optional Intel X710 OCP 3.0 NIC is supported in the mLOM slot.</p>

Feature	Description
Power	<p>Up to two of the following hot-swappable power supplies:</p> <ul style="list-style-type: none"> • 770 W (AC). <p>The 770W power supply is supported in a single CPU configuration, but dual 770 W PSUs are required. A single 770W PSU is not a supported configuration.</p> <ul style="list-style-type: none"> • 1050 W (DC) • 1200 W (AC) • 1600 W (AC) • 2300 W (AC) <p>One power supply is mandatory; one more can be added for 1 + 1 redundancy.</p>
ACPI	The advanced configuration and power interface (ACPI) 4.0 standard is supported.
Front Panel	The front panel provides status indicators and control buttons
Cooling	Eight hot-swappable fan modules for front-to-rear cooling.
InfiniBand	In addition to Fibre Channel, Ethernet and other industry-standards, the PCI slots in this server support the InfiniBand architecture up HDR IB (200Gbps).
Expansion Slots	<p>Three half-height riser slots:</p> <ul style="list-style-type: none"> • Riser 1 (controlled by CPU 1): One x16 PCIe Gen4/Gen5 Slot, (Cisco VIC), HHHL length PCI card, NCSI support, hot plug not supported. • Riser 2 (controlled by CPU 1): One x16 PCIe Gen4/Gen5 Slot, HHHL card only, no NCSI support, hot plug not supported. Only used in a 3 HHHL riser configuration • Riser 3 (controlled by CPU 2): One x16 PCIe Gen4 Slot, (Cisco VIC), HHHL length PCI card, NCSI support, hot plug not supported. <p>Two full-height riser slots</p> <ul style="list-style-type: none"> • Riser 1 (controlled by CPU 1): One x16 PCIe Gen4/Gen5 Slot, full-height, 3/4 length, NCSI support, hot plug not supported. • Riser 3 (controlled by CPU 2): One x16 PCIe Gen4/Gen5 Slot, full-height, 3/4 length, NCSI support, hot plug not supported.

Feature	Description
Interfaces	<p>Rear panel:</p> <ul style="list-style-type: none"> • One 1Gbase-T RJ-45 management port • One RS-232 serial port (RJ45 connector) • One DB15 VGA connector • Two USB 3.0 port connectors • One flexible modular LAN on motherboard (mLOM) slot that can accommodate an optional Intel X710 OCP 3.0 card <p>Front panel:</p> <ul style="list-style-type: none"> • One KVM console connector, which supplies the pins for a KVM break out cable that supports the following: <ul style="list-style-type: none"> • Two USB 2.0 connectors • One VGA DB15 video connector • One serial port (RS232) RJ45 connector
Integrated Management Processor	<p>Baseboard Management Controller (BMC) running Cisco Integrated Management Controller (CIMC) firmware.</p> <p>Depending on your CIMC settings, the CIMC can be accessed through the 1GE dedicated management port, the 1GE/10GE LOM ports, or a Cisco virtual interface card (VIC).</p> <p>CIMC supports managing the entire server platform, as well providing management capabilities for various individual subsystems and components, such as PSUs, Cisco VIC, GPUs, MRAID and HBA storage controllers, and so on.</p>

Feature	Description
Storage Controllers	<p>The SATA Interposer board, Cisco 12G SAS RAID Controller with 4GB FBWC, Cisco 12G SAS HBA, or Cisco 24G Tri-Mode RAID Controller. Only one of these at a time can be used.</p> <p>A Cisco 9500-8e 12G SAS HBA can be plugged into available PCIe risers for external JBOD attach. This HBA can be used at the same time as one of the other storage controllers.</p> <ul style="list-style-type: none"> • SATA Interposer board: AHCI support of up to eight SATA-only drives (slots 1-4 and 6-9 only) • Cisco 12G RAID controller <ul style="list-style-type: none"> • RAID support (RAID 0, 1, 5, 6, 10) and SRAID0 • Supports up to 10 front-loading SFF drives • Cisco 12G SAS HBA <ul style="list-style-type: none"> • No RAID support • JBOD/Pass-through Mode support • Supports up to 10 SFF front-loading SAS/SATA drives • Cisco 12G 9500-8e SAS HBA <ul style="list-style-type: none"> • No RAID support • Supports external JBOD attach (supports up to 1024 SAS/SATA devices) • Plugs into an appropriate PCIe riser slot (up to two supported) • Cisco 24G Tri-Mode RAID Controller with 4GB cache (UCSC-RAID-HP): <ul style="list-style-type: none"> • Supports up to 10 front-loading SFF SAS/SATA or U.3 NVMe drives • Provides RAID 0/1/5/6/10/50/60 • Supports RAID for U.3 NVMe drives only • Drives behind this controller are hot swappable regardless of media type <p>Drive slots 1 through 4 support NVMe drives through direct attach to CPU 2.</p> <p>For a detailed list of storage controller options, see Supported Storage Controllers and Cables.</p>
Modular LAN over Motherboard (mLOM) or OCP slot	<p>The dedicated mLOM slot on the motherboard can flexibly accommodate the following cards:</p> <ul style="list-style-type: none"> • Cisco UCS VIC 15428 mLOM with four 10G/25G/50G SFP+/SFP28/SFP56 ports that support Ethernet or Fibre Channel over Ethernet (FCoE). • Cisco VIC 15238 mLOM with two 40G/100G/200G QSFP/QSFP28/QSFP56 ports that support Ethernet or Fibre Channel over Ethernet (FCoE). • Intel Ethernet Network Adapter X710 Open Compute Project (OCP) 3.0 card

Feature	Description
UCSM	Unified Computing System Manager (UCSM) runs in the Fabric Interconnect and automatically discovers and provisions some of the server components.