



Cisco UCS 5108 Server Chassis Installation Guide

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CHAPTER 1

Overview

This chapter contains the following sections:

- [System Overview, on page 1](#)
- [Features and Benefits, on page 2](#)
- [Chassis Components, on page 4](#)
- [LEDs, on page 20](#)

System Overview

The Cisco UCS 5108 Server Chassis and its components are part of the Cisco Unified Computing System (UCS), which uses the Cisco UCS 5108 server system with the two I/O modules and the Cisco UCS Fabric Interconnects to provide advanced options and capabilities in server and data management. All servers are managed via the GUI or CLI with Cisco UCS Manager.

The Cisco UCS 5108 Server Chassis system consists of the following components:

- Chassis versions:
 - Cisco UCS 5108 server chassis—AC version (UCSB-5108-AC2 or N20-C6508)
 - Cisco UCS 5108 server chassis—DC version (UCSB-5108-DC2 or UCSB-5108-DC)
- I/O module (IOM) versions:
 - Cisco UCS 2408 I/O Module (UCS-IOM-2408)—Up to two I/O modules, each with 8 25-Gigabit SFP28 uplink ports and 32 10-Gigabit backplane ports
 - Cisco UCS 2304 I/O Module (UCS-IOM-2304V2 or UCS-IOM-2304)—Up to two I/O modules, each with 4 configurable 40-Gigabit uplink ports and 8 40-Gigabit backplane ports



Note You cannot mix UCS-IOM-2304V2 and UCS-IOM-2304 in the same chassis. UCS-IOM-2304V2 requires Cisco UCS Manager 4.0(4) or later.

- A number of SFP+ choices using copper or optical fiber
- Power supplies (N20-PAC5-2500W, UCSB-PSU-2500ACPL, or UCSB-PSU-2500DC48)—Up to four 2500 Watt, hot-swappable power supplies

- Fan modules (N20-FAN5)—Eight hot-swappable fan modules
- UCS B-Series blade servers, including:
 - Cisco UCS B200 M5 blade servers (UCSB-B200-M5)—Up to eight half-width blade servers, each containing two CPUs and holding up to two hard drives capable of RAID 0 or 1
 - Cisco UCS B200 M4 blade servers (UCSB-B200-M4)—Up to eight half-width blade servers, each containing two CPUs and holding up to two hard drives capable of RAID 0 or 1
 - Cisco UCS B480 M5 blade servers (UCSB-B480-M5)—Up to four full-width blade servers, each containing four CPUs and holding up to four hard drives capable of RAID 0, 1, 5, and 6
 - Cisco UCS B260 M4 blade servers (UCSB-EX-M4-1 or UCSB-EX-M4-2)—Up to four full-width blade servers, each containing two CPUs and a SAS RAID controller
 - Cisco UCS B460 M4 blade servers (UCSB-EX-M4-1 or UCSB-EX-M4-2)—Up to two full-width blade servers, each containing four CPUs and SAS RAID controllers
 - Cisco UCS B420 M4 blade servers (UCSB-B420-M4)—Up to four full-width blade servers, each containing four CPUs and holding up to four hard drives capable of RAID 0, 1, 5, and 10

Cisco UCS Mini Server Chassis, which is a smaller solution, consists of the following components:

- Cisco UCS 5108 server chassis—AC version (UCSB-5108-AC2)
- Cisco UCS 5108 server chassis—DC version (UCSB-5108-DC2)
- Cisco UCS 6324 Fabric Interconnect for the UCS Mini system (UCS-FI-M-6324)—Up to two integrated fabric interconnect modules, each providing four SFP+ ports of 10-Gigabit Ethernet and Fibre Channel over Ethernet (FCoE), and a QSFP+ port. This FI fits into the I/O module slot on the rear of the chassis.
- A number of SFP+ choices using copper or optical fiber
- Power supplies (UCSB-PSU-2500ACDV, UCSB-PSU-2500DC48, and UCSB-PSU-2500HVDC)—Up to four 2500 Watt, hot-swappable power supplies
- Fan modules (N20-FAN5)—Eight hot-swappable fan modules
- UCS B-Series blade servers, including the following:
 - Cisco UCS B200 M4 or M5 blade servers—Up to eight half-width blade servers, each containing two CPUs and holding up to two hard drives capable of RAID 0 or 1
- UCS C-Series rack servers, including the following:
 - Cisco UCS C240 M4 or C240 M5 rack servers and Cisco UCS C220 M4 or C220 M5 rack servers—Up to seven rack servers, either C240 or C220, or a combination of the two.

Features and Benefits

The Cisco UCS 5108 server chassis revolutionizes the use and deployment of blade-based systems. By incorporating unified fabric, integrated, embedded management, and fabric extender technology, the Cisco Unified Computing System enables the chassis to have fewer physical components, no independent management, and to be more energy efficient than traditional blade server chassis.

This simplicity eliminates the need for dedicated chassis management and blade switches, reduces cabling, and enables the Cisco Unified Computing System to scale to 40 chassis without adding complexity. The Cisco UCS 5108 server chassis is a critical component in delivering the Cisco Unified Computing System benefits of data center simplicity and IT responsiveness.

Table 1: Features and Benefits

Feature	Benefit
Management by Cisco UCS Manager	<p>Reduces total cost of ownership by removing management modules from the chassis, making the chassis stateless.</p> <p>Provides a single, highly available management domain for all system chassis, reducing administrative tasks.</p>
Unified fabric	Decreases TCO by reducing the number of network interface cards (NICs), host bus adapters (HBAs), switches, and cables needed.
Support for one or two UCS I/O Modules (or support for one or two UCS 6324 Fabric Interconnects in the UCS Mini chassis)	<p>Eliminates switches from the chassis, including the complex configuration and management of those switches, allowing a system to scale without adding complexity and cost.</p> <p>Allows use of two I/O modules for redundancy or aggregation of bandwidth.</p> <p>Enables bandwidth scaling based on application needs; blades can be configured from 1.25 Gbps to 40 Gbps or more.</p>
Auto discovery	Requires no configuration; like all components in the Cisco Unified Computing System, chassis are automatically recognized and configured by Cisco UCS Manager.
High-performance midplane	<p>Provides investment protection for new fabric extenders and future blade servers.</p> <p>Supports up to 2x 40 Gigabit Ethernet for every blade server slot.</p> <p>Provides 8 blades with 1.2 Tbps of available Ethernet throughput for future I/O requirements. (The Cisco UCS 6324 Fabric Interconnect in the UCS Mini chassis supports only 512 Gbps.)</p> <p>Provides reconfigurable chassis to accommodate a variety of form factors and functions.</p>

Feature	Benefit
Redundant hot swappable power supplies and fans	Provides high availability in multiple configurations. Increases serviceability. Provides uninterrupted service during maintenance. Available configured for AC or DC environments (mixing not supported)
Hot-pluggable blade servers, FEXes, and fabric interconnects	Provides uninterrupted service during maintenance and server deployment.
Comprehensive monitoring	Provides extensive environmental monitoring on each chassis Allows use of user thresholds to optimize environmental management of the chassis.
Efficient front-to-back airflow	Helps reduce power consumption and increase component reliability.
Tool-free installation	Requires no specialized tools for chassis installation. Provides mounting rails for easy installation and servicing.
Mixed blade configurations	Allows up to 8 half-width or 4 full-width blade servers, or any combination thereof, for outstanding flexibility. (When the UCS Mini chassis is configured with the 6324 Fabric Interconnect, only 8 half-width blades are supported.)

Chassis Components

This section lists an overview of chassis components.

Cisco UCS 5108 Server Chassis

The Cisco UCS 5100 Series Blade Server Chassis is a scalable and flexible blade server chassis for today's and tomorrow's data center that helps reduce total cost of ownership. There are two versions available that can be configured for AC (N20-C6508 and UCSB-5108-AC2) and two versions that can be configured for DC (UCSB-5108-DC and UCSB-5108-DC2) power environments. An additional version (UCSB-5108-HVDC) is available that can be configured for 200 - 380V DC environments.

The chassis is six rack units (6 RU) high and can mount in an industry-standard 19-inch rack with square holes (such as the Cisco R Series Racks) or in round hole racks when an adapter is used. The chassis can house up to eight half-width Cisco UCS B-Series Blade Servers and can accommodate both half- and full-width blade form factors.

Up to four hot-swappable AC, DC, or HVDC power supplies are accessible from the front of the chassis. These power supplies can be configured to support nonredundant, N+1 redundant, and grid-redundant

configurations. The rear of the chassis contains eight hot-swappable fans, four power connectors (one per power supply), and two I/O bays for I/O modules. A passive backplane provides support for up to 80 Gbps of I/O bandwidth to each half-width blade and 160 Gbps of I/O bandwidth to each full width-blade.

Scalability is dependent on both hardware and software. For more information, see the appropriate [UCS software release notes](#).

LEDs

LEDs on the chassis indicate system connectivity and failure warnings. See [LED Locations, on page 21](#) for details. There is also a flashing blue Beaconing LED and button that can be triggered manually or remotely from UCS Manager.

Buttons

The beaconing function LED is also a button. When triggered, beaconing of the server chassis is observable remotely from UCS Manager or by the flashing blue button/LED on the chassis.

Connectors

There are no user connectors such as RJ-45 ports on the chassis itself.

Midplane

The integral chassis midplane supports the following:

- 320 G total bandwidth to each of two I/O Modules
- Auto-discover of all components
- Redundant data and management paths
- 10 G Base-KR

The midplane is an entirely passive device.

Blade Servers

The Cisco UCS B-Series Blade Servers are based on industry-standard server technologies and provide the following:

- Up to two or four Intel multi-core processors, depending on the server
- Front-accessible, hot-swappable hard drives or solid-state disk (SSD) drives
- Depending on the server, support is available for up to three adapter card connections for up to 160 Gbps of redundant I/O throughput
- Industry-standard double-data-rate 4 (DDR4) memory
- Remote management through an integrated service processor that also executes policy established in Cisco UCS Manager software
- Local keyboard, video, and mouse (KVM) and serial console access through a front console port on each server

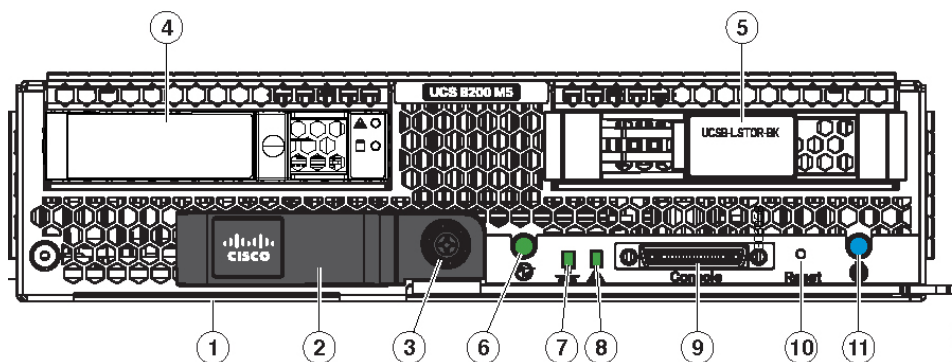
- Out-of-band access by remote KVM, Secure Shell (SSH), and virtual media (vMedia) as well as Intelligent Platform Management Interface (IPMI)

The Cisco UCS B-Series offers multiple blade server models. The supported processor family is indicated by M4 or M5 designations on the model.

Cisco UCS B200 M5 Blade Server

For full service and installation instructions, see the [Cisco UCS B200 M5 Blade Server Installation and Service Note](#). You can install up to eight UCS B200 M5 Blade Servers in a chassis.

Figure 1: Cisco UCS B200 M5 Front Panel

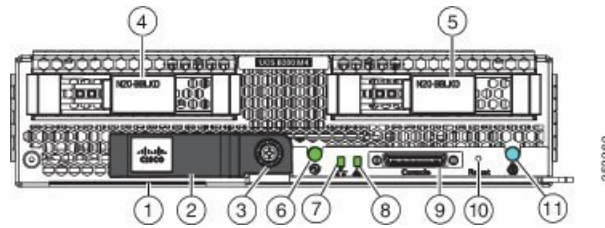


1	Asset pull tag Each server has a blank plastic tag that pulls out of the front panel which is provided so that you can add your own asset tracking label without interfering with the intended air flow.	2	Blade ejector handle
3	Ejector captive screw	4	Drive bay 1
5	Drive bay 2	6	Power button and LED
7	Network link status LED	8	Blade health LED
9	Local console connector	10	Reset button access
11	Locator button and LED		

Cisco UCS B200 M4 Blade Server

For full service and installation instructions, see the [Cisco UCS B200 M4 Blade Server Installation and Service Note](#). You can install up to eight UCS B200 M4 Blade Servers in a chassis.

Figure 2: Cisco UCS B200 M4 Front Panel



1	Asset pull tag Each server has a blank plastic tag that pulls out of the front panel which is provided so that you can add your own asset tracking label without interfering with the intended air flow.	2	Blade ejector handle
3	Ejector captive screw	4	Hard drive bay 1
5	Hard drive bay 2	6	Power button and LED
7	Network link status LED	8	Blade health LED
9	Local console connector	10	Reset button access
11	Locator button and LED		

Cisco UCS B480 M5 Blade Server

For full service and installation instructions, see the [Cisco UCS B480 M5 Blade Server Installation and Service Note](#). Up to four Cisco UCS B480 M5 Blade Servers can be installed in the Cisco UCS 5108 chassis.

Figure 3: Cisco UCS B480 M5 Blade Server Front Panel

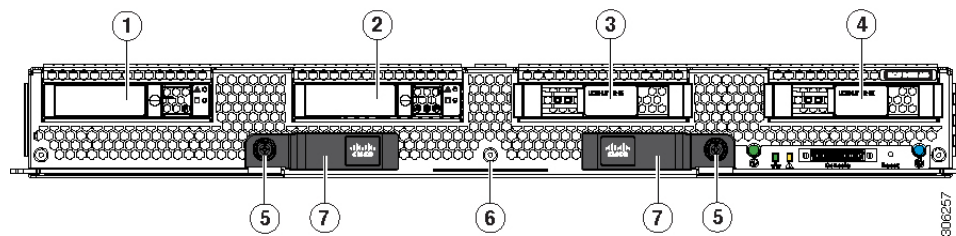
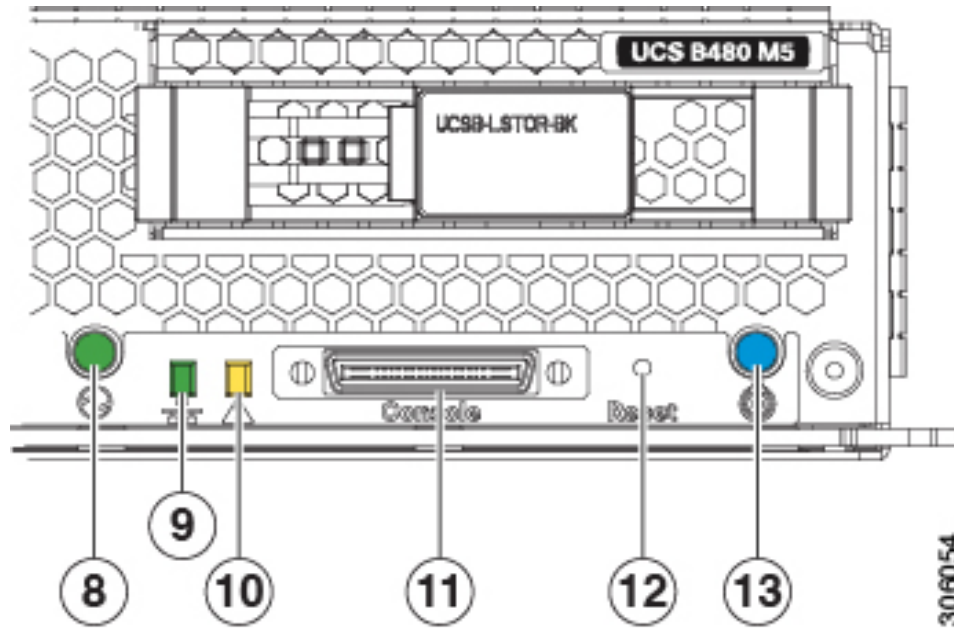


Figure 4: Cisco UCS B480 M5 Blade Server Front Panel LEDs

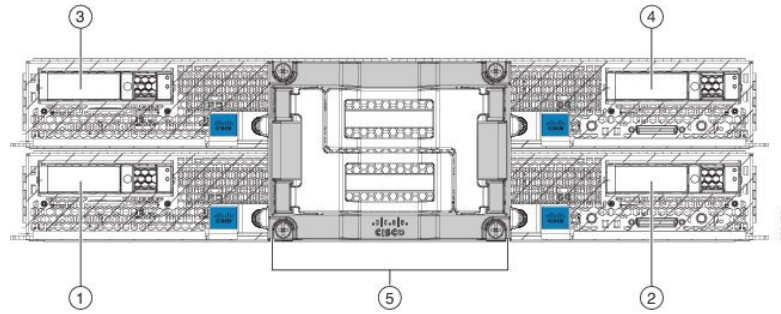


1	Drive bay 1	8	Power button/LED
2	Drive bay 2	9	Network link status LED
3	Drive bay 3	10	Blade health LED
4	Drive bay 4	11	Local console connector
5	Blade ejector thumbscrew	12	Reset button
6	Asset pull-tag	13	Locator button/LED
7	Blade ejector handle		

Cisco UCS B460 M4 Blade Server

For full service and installation instructions, see the [Cisco UCS B260 M4 and B460 M4 Scalable Blade Server Installation and Service Note](#). Up to two Cisco UCS B460 M4 Blade Servers can be installed in the Cisco UCS 5108 chassis.

Figure 5: Cisco UCS B460 M4 Blade Server

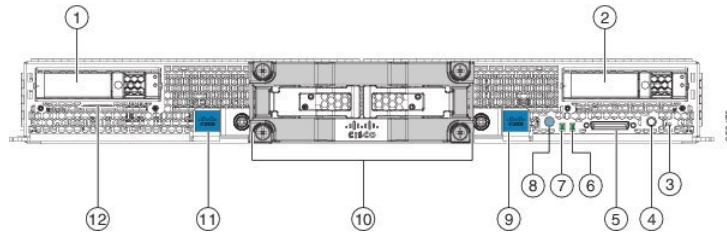


1	Drive bay 1	4	UCS Scalability Connector
2	Drive bay 2	5	Drive bay 4
3	Drive bay 3		

Cisco UCS B260 M4 Scalable Blade Server

For full service and installation instructions, see the [Cisco UCS B260 M4 and B460 M4 Scalable Blade Server Installation and Service Note](#). You can install up to four UCS B260 M4 Blade Servers in the Cisco UCS 5108 server chassis.

Figure 6: Cisco UCS B260 M4 Scalable Blade Server



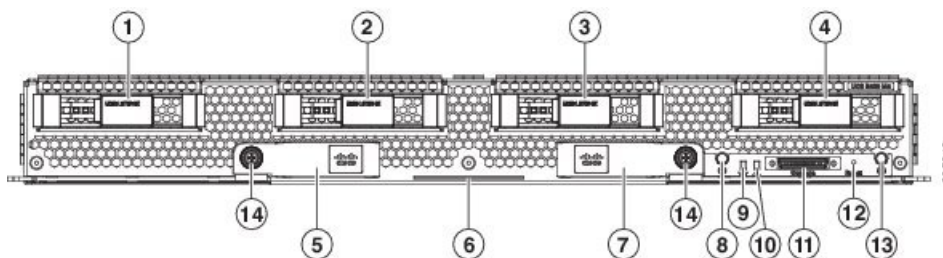
1	Drive bay 1	7	Network link status LED
2	Drive bay 2	8	Power button and LED
3	Reset button access	9	Right ejector handle
4	Beaconing button and LED	10	UCS Scalability Terminator
5	Local console connection	11	Left ejector handle

6	Blade health LED	12	Asset tag Each server has a blank plastic tag that pulls out of the front panel so you can add your own asset tracking label without interfering with the intended air flow.
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Cisco UCS B420 M4 Blade Server

For full service and installation instructions, see the [Cisco UCS B420 M4 Blade Server Installation and Service Note](#). You can install up to four UCS B420 M4 High Performance Blade Servers in a chassis.

Figure 7: Cisco UCS B420 M4 Blade Server Front Panel



1	Hard drive bay 1	8	Power button and LED
2	Hard drive bay 2	9	Network link status button
3	Hard drive bay 3	10	Blade health LED
4	Hard drive bay 4	11	Local console connection
5	Left ejector handle	12	Reset button access
6	Serial pull tab	13	Locate button
7	Right ejector handle	14	Ejector thumb screw

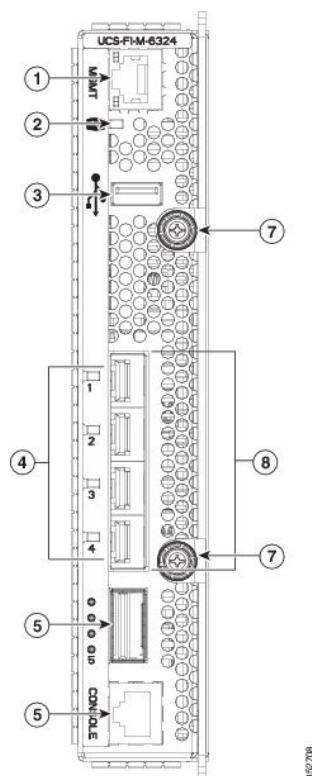
Adapter Cards

Depending on the model of server in question, one to three adapter cards will reside in each blade server, providing failover connectivity to each I/O module in the chassis. Cards are released on an ongoing basis.

Cisco UCS 6324 Fabric Interconnect For UCS Mini Chassis

The Cisco UCS 6324 Fabric Interconnect (UCS-FI-M-6324) is an integrated fabric interconnect and I/O module. It can be configured only with the UCS Mini versions of the chassis (UCSB-5108-AC2 and UCSB-5108-DC2).

Figure 8: Cisco UCS 6324 Fabric Interconnect



1	Management port	5	QSFP+ licensed server port
2	Power-on LED	6	Console management port
3	USB port	7	Ejector captive screws
4	Port LEDs	8	Four SPF+ unified ports

The Cisco UCS 6324 Fabric Interconnect connects directly to external Cisco Nexus switches through 10-Gigabit Ethernet ports and Fibre Channel over Ethernet (FCoE) ports.

The Cisco UCS 6324 Fabric Interconnect fits into the back of the Cisco UCS Mini chassis. Each Cisco UCS Mini chassis can support up to two UCS 6324 Fabric Interconnects, which enables increased capacity as well as redundancy.

Cisco UCS 2408 IOM

The Cisco UCS 2408 IOM is an I/O module (fabric extender) with 8 25-Gigabit SFP28 uplink ports to the fabric interconnect and 32 10-Gigabit backplane ports to support up to 8 half-width blade servers in the chassis. It can be hot-plugged into the rear of a Cisco UCS 5108 blade server chassis. A maximum of two UCS 2408 IOMs can be installed in a chassis.

The Cisco UCS 2408 IOM joins the fourth generation of UCS products, including the following hardware:

- Cisco UCS 6400 Series Fabric Interconnects

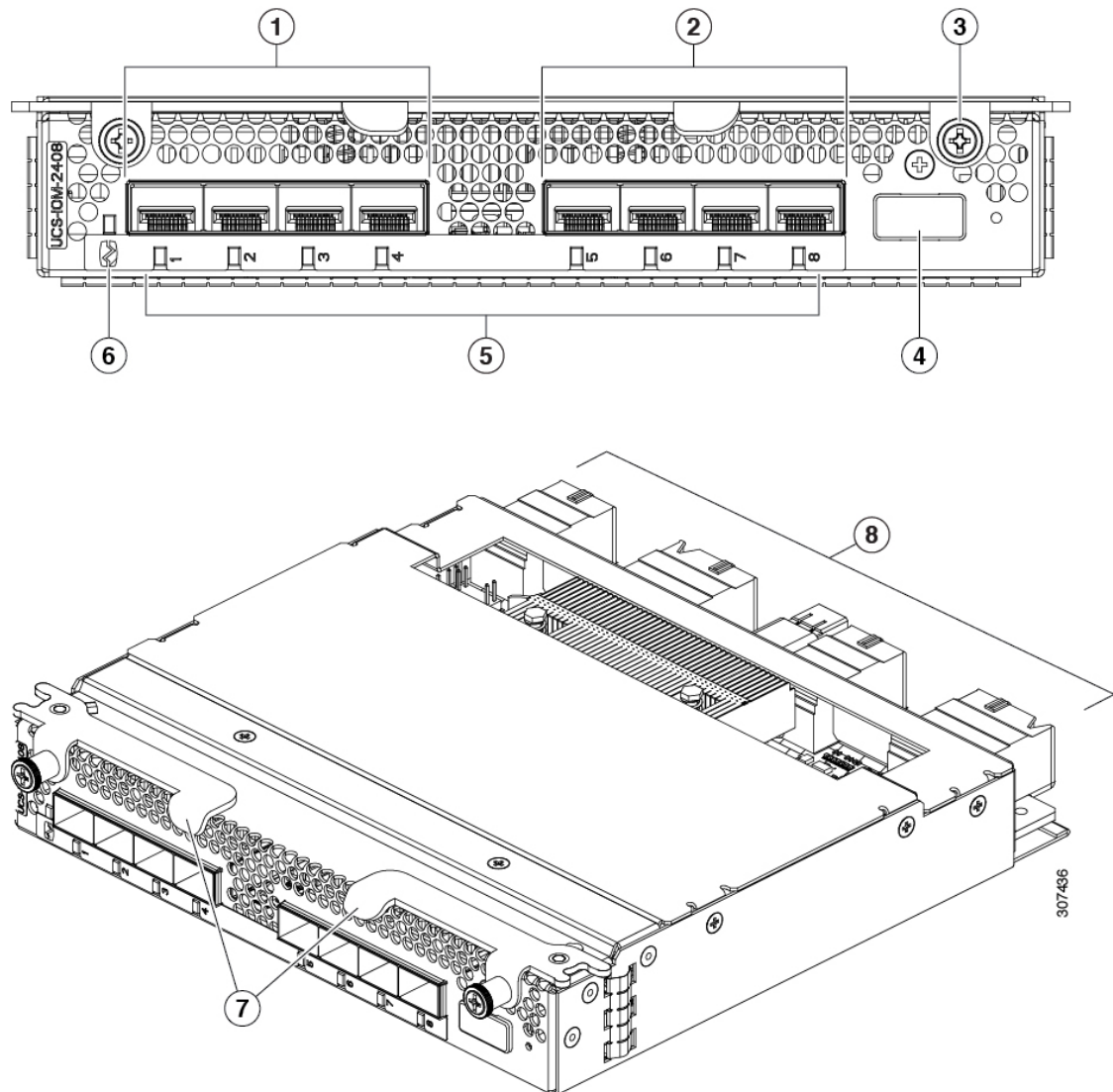


Note The UCS 2408 IOM is supported with the UCS 6400 Series FIs only.

- Multiple Cisco UCS 1300 Series and 1400 Series Virtual Interface Cards (VICs)
- M4 and M5 generations of Cisco UCS B-Series blade servers.
- The UCS 2408 IOM requires Cisco UCS Manager 4.0(4c) or later software.

The Cisco UCS 2408 IOM provides chassis management control and blade management control, including control of the chassis, fan trays, power supply units, and blades. It also multiplexes and forwards all traffic from the blade servers in the chassis to the 25-Gigabit Ethernet uplink network ports that connect to the fabric Interconnect. The IOM can also connect to a peer IOM to form a cluster interconnect (1G Ethernet connection).

Figure 9: Cisco UCS 2408 IOM



1	25-Gigabit uplink ports 1 - 4	2	25-Gigabit uplink ports 5 - 8
3	Thumbscrews for release latches (two)	4	HDMI combo connector: Ethernet management port and RS-232 serial via a Y-dongle cable.
5	SFP28 port-activity LEDs	6	IOM system status LED
7	Release latches (two)	8	Thirty-two 10-Gigabit backplane ports to the blade servers

LEDs

The front of the IOM has a system status LED and a port activity LED for each port.

Table 2: System Status LED States

State	Definition
Off	No power present
Green	Normal operation
Amber	Bootting or minor over-temperature alarm
Amber, blinking	Stopped in uboot due to user intervention or unable to come online; or major over-temperature alarm

Table 3: Port Indicator LED States

State	Definition
Off	Link enabled but not connected
Green	Link enabled and connected
Amber	Disabled by user
Amber, blinking	Disabled due to error

Buttons

There are no buttons on the IOM.

Connectors

There are 8 25-Gigabit SFP28 uplink ports on the front of the IOM.

The HDMI connector uses a special Y-dongle cable that includes Ethernet management and serial console connectors.

Cisco UCS 2304 IOM

The Cisco UCS 2304 IOM (Fabric Extender) is an I/O module with 8 40-Gigabit backplane ports and 4 40-Gigabit uplink ports. It can be hot-plugged into the rear of a Cisco UCS 5108 blade server chassis. A maximum of two UCS 2304 IOMs can be installed in a chassis.



Note There is an updated, Version 2 of the UCS 2304 IOM (UCS-IOM-2304V2). You cannot mix the original UCS-IOM-2304 and UCS-2304V2 in the same chassis. If you replace UCS-IOM-2304 with UCS-IOM-2304V2, you must replace both IOMs in the chassis.



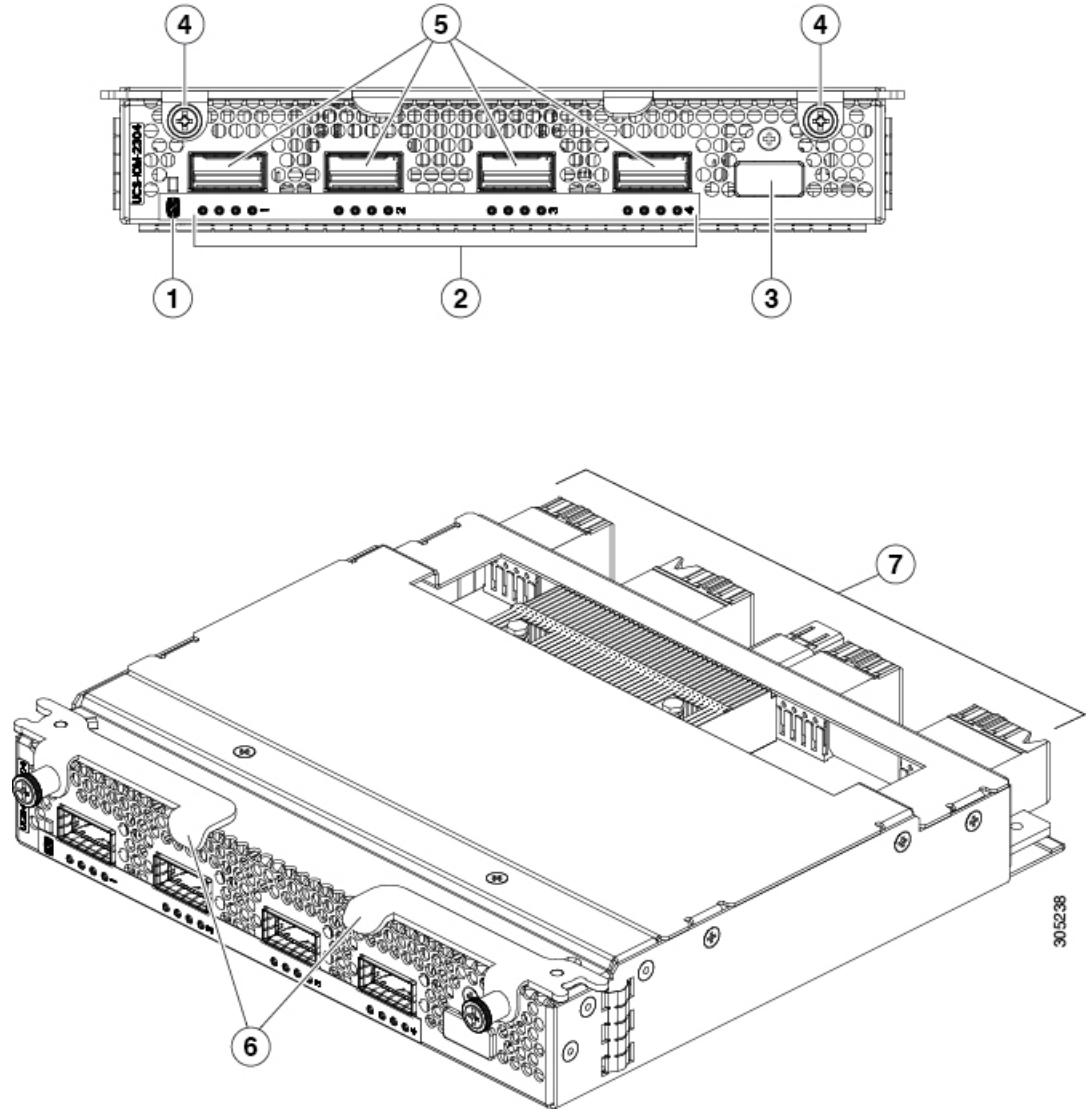
Note Version 2 of the UCS 2304 IOM (UCS-IOM-2304V2) requires Cisco UCS Manager 4.0(4) or later.

The Cisco UCS 2304 IOM joins the third generation of UCS products, including the following hardware:

- Cisco UCS 6332 fabric interconnect, an Ethernet or Fibre Channel over Ethernet (FCoE) chassis with 32 QSFP+ 40-Gigabit ports
- Cisco UCS 6332-16UP fabric interconnect, a Ethernet and Fibre Channel chassis with 16 1- or 10-Gigabit SFP+ ports or 16 4-, 8-, or 16-Gigabit Fibre Channel ports, and 24 40-Gigabit QSFP+ ports
- Multiple 1300 Series VICs

The Cisco UCS 2304 IOM provides chassis management control and blade management control, including control of the chassis, fan trays, power supply units, and blades. It also multiplexes and forwards all traffic from the blade servers in the chassis to the 10-Gigabit Ethernet uplink network ports that connect to the fabric Interconnect. The IOM can also connect to a peer IOM to form a cluster interconnect.

Figure 10: Cisco UCS 2304 IOM



1	System status LED	2	QSFP port activity LEDs
3	HDMI console connector and Ethernet management port	4	Captive screws for the insertion latches
5	40-Gigabit uplink ports	6	Insertions latches
7	40-Gigabit backplane ports		

LEDs

The front of the IOM has a system status LED and port activity LEDs.

Buttons

There are no buttons on the IOM.

Connectors

There are four QSFP, 40-Gigabit uplink ports on the front of the IOM. The Ethernet management port and console connector use an HDMI connector that connects to a special Y dongle to expose the 10/100 RJ45 port and console connections.

Power Distribution Unit (PDU)

The AC PDU (N01-UAC1) provides load balancing between the installed power supplies, as well as distributing power to the other chassis components. DC versions of the chassis use a different PDU with appropriate connectors. The PDU is not field-serviceable, and converting an AC chassis to a DC chassis by swapping the PDU is not supported, as the PDU is not separately orderable.

LEDs

No LEDs are on the PDU.

Buttons

No buttons are on the PDU.

Connectors

The AC version of the PDU has four power connectors rated for 15.5 A, 200-240V @ 50-60 Hz. Only use power cords that are certified by the relevant country safety authority or that are installed by a licensed or certified electrician in accordance with the relevant electrical codes. All connectors, plugs, receptacles, and cables must be rated to at least the amperage of inlet connector on the PSU or be independently fused in accordance with the relevant electrical code. See for more information about the supported power cords. See [Supported AC Power Cords and Plugs, on page 89](#) for more information.

The DC version of the PDU has eight dual-post lug power connections, four positive and four negative. A single dual-post lug grounding connection is also provided. The HDVC version of the PDU uses one Andersen SAF-D-GRID(R) connector per power supply.

Fan Modules

The chassis can accept up to eight fan modules (N20-FAN5). A chassis must have filler plates in place if no fan will be installed in a slot for an extended period.

LEDs

There is one LED indication of the fan module's operational state. See [Interpreting LEDs, on page 22](#) for details.

Buttons and Connectors

No buttons or connectors are on a fan module.

Power Supplies

Different power supplies are available to work with the AC (UCSB-PSU-2500ACPL or N20-PAC5-2500W) or DC (UCSB-PSU-2500DC48) versions of the chassis.

When configured with the Cisco UCS 6324 Fabric Interconnect, only the following power supplies are supported: UCSB-PSU-2500ACDV dual-voltage supply and UCSB-PSU-2500DC48 -48V DC power supply.

To determine the number of power supplies needed for a given configuration, use the [Cisco UCS Power Calculator](#) tool.

LEDs

Two LEDs indicate power connection presence, power supply operation, and fault states. See [Interpreting LEDs, on page 22](#) for details.

Buttons

There are no buttons on a power supply.

Connectors

The power connections are at the rear of the chassis on the PDU, with different types for AC, DC, or HVDC input. Four hot-swappable power supplies are accessible from the front of the chassis. These power supplies can be configured to support non-redundant, N+1 redundant, and grid-redundant configurations.

Power Supply Redundancy

Power supply redundancy functions identically for AC and DC configured systems. When considering power supply redundancy you need to take several things into consideration:

- AC power supplies are all single phase and have a single input for connectivity to customer power source (a rack PDU such as the Cisco RP Series PDU or equivalent).
- The number of power supplies required to power a chassis varies depending on the following factors:
 - The total "Maximum Draw" required to power all the components configured within that chassis—such as I/O modules, fans, blade servers (CPU and memory configuration of the blade servers).
 - The Desired Power Redundancy for the chassis. The supported power configurations are non-redundant, N+1 redundancy (or any requirement greater than N+1), and grid redundancy.

To configure redundancy, see the *Configuration Guide* for the version of Cisco UCS Manager that you are using. The configuration guides are available at the following URL:

http://www.cisco.com/en/US/products/ps10281/products_installation_and_configuration_guides_list.html.

Non-redundant Mode

In non-redundant mode, the system may go down with the loss of any supply or power grid associated with any particular chassis. We do not recommend running a production system in non-redundant mode. To operate in non-redundant mode, each chassis should have at least two power supplies installed. Supplies that are not used by the system are placed into standby. The supplies that are placed into standby depends on the installation

order (not on the slot number). The load is balanced across active power supplies, not including any supplies in standby.

When using Cisco UCS Release 1.3(1) or earlier releases, small configurations that use less than 25000W may be powered up on a single power supply. When using Cisco UCS Release 1.4(1) and later releases, the chassis requires a minimum of 2 power supplies.



Note In a non-redundant system, power supplies can be in any slot. Installing less than the required number of power supplies results in undesired behavior such as server blade shutdown. Installing more than the required amount of power supplies may result in lower power supply efficiency. At most, this mode will require two power supplies.

N+1 Redundancy

The N+1 redundancy configuration implies that the chassis contains a total number of power supplies to satisfy non-redundancy, plus one additional power supply for redundancy. All the power supplies that are participating in N+1 redundancy are turned on and equally share the power load for the chassis. If any additional power supplies are installed, Cisco UCS Manager recognizes these “unnecessary” power supplies and places them on standby.

If a power supply should fail, the surviving supplies can provide power to the chassis. In addition, UCS Manager turns on any "turned-off" power supplies to bring the system back to N+1 status.

To provide N+1 protection, the following number of power supplies is recommended:

- Three power supplies are recommended if the power configuration for that chassis requires greater than 2500 W or if using UCS Release 1.4(1) and later releases
- Two power supplies are sufficient if the power configuration for that chassis requires less than 2500 W or the system is using UCS Release 1.3(1) or earlier releases
- Four power supplies are recommended when running the dual-voltage power supply from a 100 - 120V source.

Adding an additional power supply to either of these configurations will provide an extra level of protection. Cisco UCS Manager turns on the extra power supply in the event of a failure and restores N+1 protection.



Note An n+1 redundant system has either two or three power supplies, which may be in any slot.

Grid Redundancy

The grid redundant configuration is sometimes used when you have two power sources to power a chassis or you require greater than N+1 redundancy. If one source fails (which causes a loss of power to one or two power supplies), the surviving power supplies on the other power circuit continue to provide power to the chassis. A common reason for using grid redundancy is if the rack power distribution is such that power is provided by two PDUs and you want the grid redundancy protection in the case of a PDU failure.

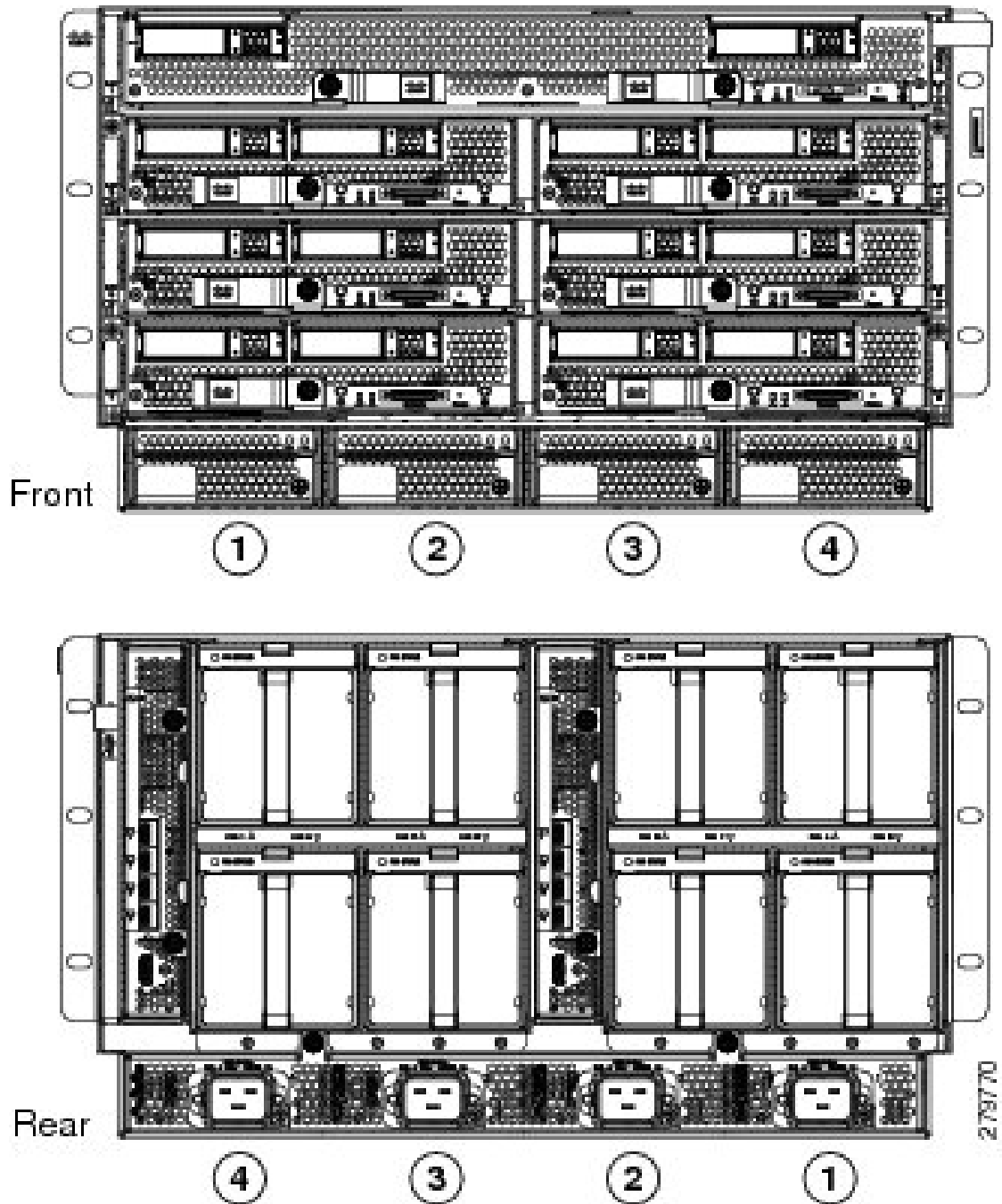
To provide grid redundant (or greater than N+1) protection, the following number of power supplies is recommended:

- Four power supplies are recommended if the power configuration for that chassis requires greater than 2500W or if using Cisco UCS Release 1.4(1) and later releases
- Two power supplies are recommended if the power configuration for that chassis requires less than 2500W or the system is using Cisco UCS Release 1.3(1) or earlier releases



Note Both grids in a power redundant system should have the same number of power supplies. If your system is configured for grid redundancy, slots 1 and 2 are assigned to grid 1 and slots 3 and 4 are assigned to grid 2. If there are only two power supplies (PS) in the a redundant mode chassis, they should be in slots 1 and 3. Slot and cord connection numbering is shown below.

Figure 11: Power Supply Bay and Connector Numbering



LEDs

LEDs on both the chassis and the modules installed within the chassis identify operational states, both separately and in combination with other LEDs.

LED Locations

Figure 12: LEDs on a Cisco UCS 5108 Server Chassis—Front View

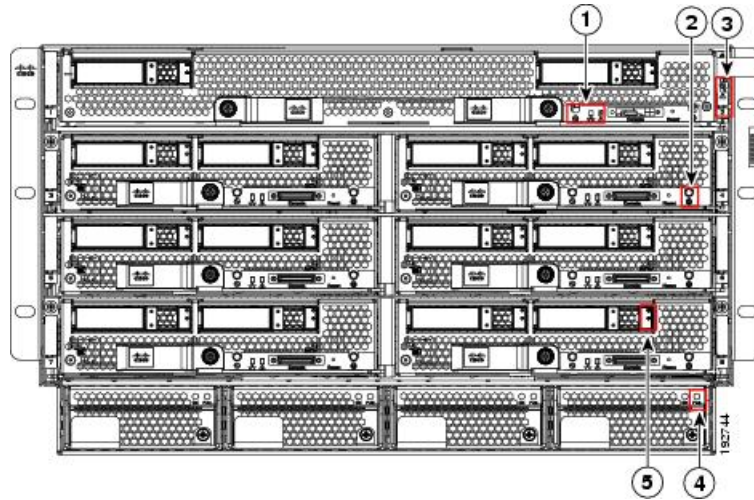


Figure 13: LEDs on the Cisco UCS 5108 Server Chassis—Rear View

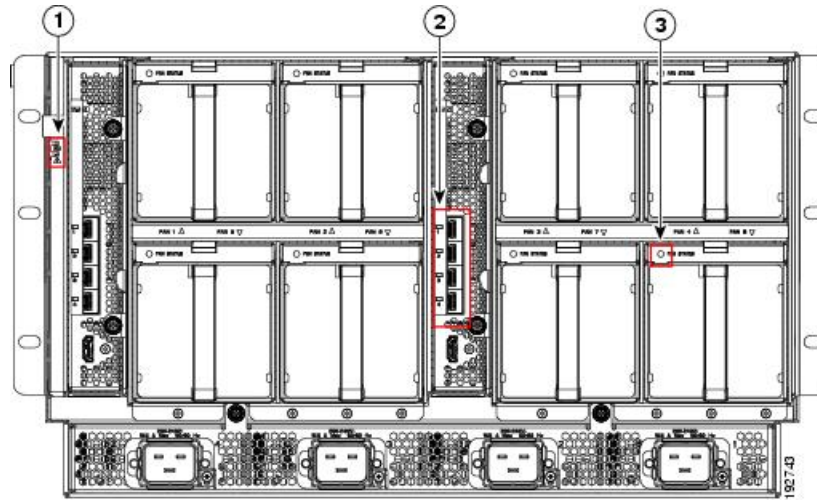
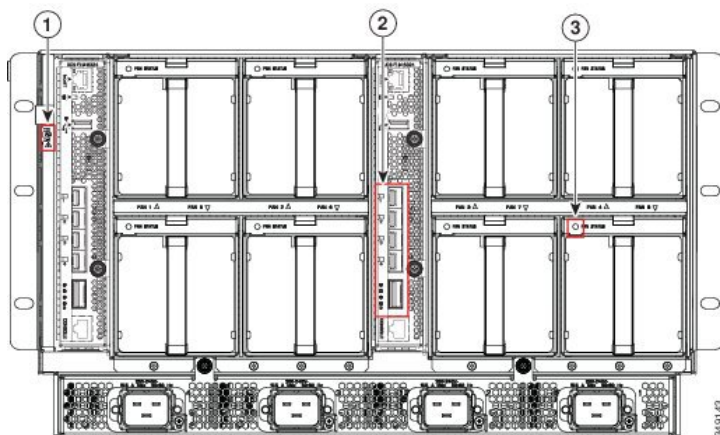




Figure 14: Cisco UCS 5108 Server Chassis—Rear View with the Cisco UCS 6324 Fabric Interconnect



Interpreting LEDs

Table 4: Chassis, Fan, and Power Supply LEDs

LED	Color	Description
Beaconing LED and button	Off	Beaconing not enabled.
	Blinking blue 1 Hz	Beaconing to locate a selected chassis—If the LED is not blinking, the chassis is not selected. You can initiate beaconing in UCS Manager or with the button.
Chassis connections 	Off	No power.
	Amber	No I/O module is installed or the I/O module is booting.
	Green	Normal operation.
Chassis health 	Solid amber	Indicates a component failure or a major over-temperature alarm.
Fan Module	Off	No power to the chassis or the fan module was removed from the chassis.
	Amber	Fan module restarting.
	Green	Normal operation.
	Blinking amber	The fan module has failed.
Power Supply		

LED	Color	Description
OK	Off	No power to the slot.
	Green	Normal operation.
	Blinking green	AC power is present but the PS is either in redundancy standby mode or is not fully seated.
Fail	Off	Normal operation.
	Amber	Over-voltage failure or over-temperature alarm.

Table 5: I/O Module LEDs



LED	Color	Description
Body 	Off	No power.
	Green	Normal operation.
	Amber	Booting or minor temperature alarm.
	Blinking amber	POST error or other error condition.
Port 1-4	Off	Link down.
	Green	Link up and operationally enabled.
	Amber	Link up and administratively disabled.
	Blinking amber	POST error or other error condition.

Table 6: UCS 2304 I/O Module LEDs

LED	Color	Description
System 	Off	Power off.
	Green	Normal operation.
	Amber	Booting or minor temperature alarm.
	Blinking amber	Stopped in U-Boot due to user intervention or unable to come online or major temperature alarm.

LED	Color	Description
Port 1-4	Off	Link enabled but no connected.
	Green	Link connected.
	Amber	Operator disabled.
	Blinking amber	Disabled due to error.

Table 7: Cisco UCS 6324 Fabric Interconnect LEDs







LED	Color	Description
Body 	Off	No power.
	Green	Normal operation.
	Amber	Booting or minor temperature alarm.
	Blinking amber	Stopped due to user intervention or unable to come online, or major temperature alarm.
Port 1-4	Off	Link enabled but not connected.
	Green	Link connected.
	Amber	Operator disabled.
	Blinking amber	Disabled due to error.

Table 8: Blade Server LEDs

LED	Color	Description
Power 	Off	Power off.
	Green	Normal operation.
	Amber	Standby.
Link 	Off	None of the network links are up.
	Green	At least one network link is up.
Health 	Off	Power off.
	Green	Normal operation.
	Amber	Minor error.
	Blinking Amber	Critical error.

LED	Color	Description
Activity	Off	Inactive.
 (Disk Drive)	Green	Outstanding I/O to disk drive.
Health	Off	No fault.
 (Disk Drive)	Amber	Some fault.



CHAPTER 2

Installation

This chapter contains the following sections:

- [Installation Notes and Warnings for the Cisco UCS 5108 Server Chassis, on page 27](#)
- [Installing the Chassis, on page 33](#)
- [Repacking the Chassis, on page 53](#)
- [SFP+ Transceivers, on page 53](#)

Installation Notes and Warnings for the Cisco UCS 5108 Server Chassis

The following notes and warnings apply to all installation tasks:



Note Before you install, operate, or service the system, see the [Regulatory Compliance and Safety Information for Cisco UCS](#) for important safety information.



Warning **IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS



Warning This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017

**Warning**

Only trained and qualified personnel must be allowed to install, replace, or service this equipment.
Statement 1030

Rack Requirements

This section provides the requirements for installing in a standard open rack, assuming an external ambient air temperature range of 50 to 95°F (10 to 35°C):

**Note**

Do not use racks that have obstructions. These obstructions could impair access to field-replaceable units (FRUs).

The Cisco R Series Racks are an ideal choice. If other racks will be used, the rack must be of the following type:

- Standard 19-inch (48.3 cm) four-post EIA rack, a minimum of 39.4 inches (100 cm) deep, with mounting rails that conform to English universal hole spacing per section 1 of ANSI/EIA-310-D-1992.
- The mounting holes of the rails in the rack must be square (unless the optional round hole adapter kit is used).
- The tool-less rack-mount kit shipped with the chassis is required. The adjustable rack rails shipped with each enclosure extend from 29 inches (73.66 cm) to 35 inches (88.9 cm)
- Front and rear doors—If your server rack includes closing front and rear doors, the doors must have 65 percent open perforated area evenly distributed from top to bottom to permit adequate airflow.

**Caution**

Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

The rack must also meet the following requirements:

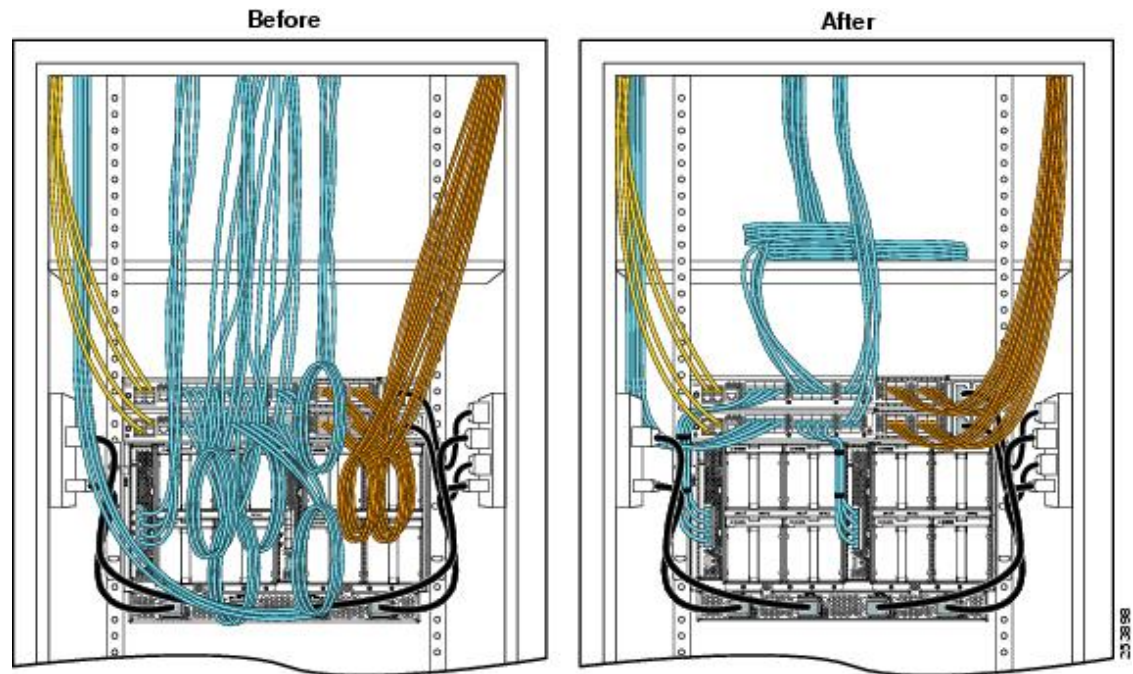
- The minimum available vertical rack space per chassis must be six RU (rack units), equal to 10.5 inches (26.7 cm).

Cable Management

To help with cable management, allow additional space in the rack above and below the chassis to make it easier to route copper cables (plus up to eight copper cables per Cisco UCS 5108 server chassis) through the rack.

Cable management can be an important factor in preventing overheating issues. In the following figure, the “before” illustration shows cables blocking the rear of the chassis, and preventing the fans from exhausting warm air from the chassis. This situation causes failed DIMMs in the blade servers, and seemingly random server shutdowns when internal temperatures exceed specification. Use cable ties and other wiring practices to keep the rear of the chassis unobstructed as shown in the “after” illustration.

Figure 15: Cable Management



Airflow Considerations

Airflow through the chassis is from front to back. Air enters the chassis through the blade servers and power supply grills at the front of the chassis and exits through the fan modules on the back of the chassis. To ensure proper airflow, follow these guidelines:

- Maintain ambient airflow throughout the data center to ensure normal operation.
- Consider the heat dissipation of all equipment when determining air-conditioning requirements. Do not allow the exhaust of one system to be the intake for another system.
- When evaluating airflow requirements, take into consideration that the hot air generated by equipment at the bottom of the rack can be drawn in the intake of the equipment above.
- Make sure that the exhaust at the rear of the chassis is unobstructed for at least 24 in. (61 cm). This includes obstruction due to messy cabling practices.
- Some blade servers ship with internal air baffles that are placed over the DIMMs and CPUs. They are used to channel airflow to where it is needed the most. The blades are designed to operate with air baffles installed and the system will not cool correctly if they are not installed.
- If an enclosed rack is used, the front door must be 65 percent perforated to ensure adequate airflow to the servers.

Moving Server Chassis

When lifting the chassis, be aware of its weight, and follow these guidelines:

**Caution**

Do not try to lift the chassis using the handles on the side. These handles are intended only for moving and adjusting the chassis position.

- Never lift the chassis alone—Always use two people to lift the chassis. If available, use a scissor jack or other lifting device designed for installing heavy equipment into data center racks.
- Disconnect all power and external cables before lifting the chassis.
- Remove all FEXes, power supplies, fans, and servers from the chassis before lifting.
- Ensure that your footing is solid and the weight of the system is evenly distributed between your feet.
- Lift the system slowly, keeping your back straight. Lift with your legs, not with your back. Bend at the knees, not at the waist.

**Caution**

Do not remove the Power Distribution Unit (PDU) located at the back of the chassis.

Installation Guidelines

When installing the chassis, follow these guidelines:

- Plan your site configuration and prepare the site before installing the chassis. See [Site Planning and Maintenance Records, on page 95](#) for the recommended site planning tasks. For details, see the [Cisco UCS Site Preparation Guide](#).
- Record the information listed in [Site Planning and Maintenance Records, on page 95](#) as you install and configure the chassis.
- Ensure that there is adequate space around the chassis to allow for servicing the chassis and for airflow.
- Ensure that the air-conditioning meets the heat dissipation requirements listed in [Technical Specifications, on page 83](#)
- Ensure that the cabinet or rack meets the requirements listed in [Rack Requirements, on page 28](#).

**Note**

Jumper power cords are available for use in a rack. See [Specifications for the Cisco UCS 5108 Blade Server Chassis Power Supply Units, on page 86](#).

- Ensure that the site power meets the power requirements listed in [Technical Specifications, on page 83](#). We recommend that you use a UPS to protect the UCS system. Using an unprotected supply exposes you to a risk of system failure due to input supply voltage variations or failures.

Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with systems such as the Cisco UCS, which can have substantial current draw fluctuations due to fluctuating data traffic patterns.

- Ensure that circuits are sized according to local and national codes. For North America, the power supply requires a 20 A circuit.

To prevent loss of input power, ensure that the total maximum loads on the circuits supplying power to the chassis are within the current ratings for the wiring and breakers.

- Use the following torque values when installing the chassis:
 - 10-32 screws: 20 in-lb

Required Equipment

Before you begin the installation, ensure that you have the following items:

- Number 1 and number 2 Phillips-head screwdrivers with torque measuring capabilities
- Tape measure and level
- ESD wrist strap or other grounding device
- Antistatic mat or antistatic foam

Unpacking and Inspecting the Chassis



Caution When handling chassis components, wear an ESD strap and handle modules by the carrier edges only.



Tip Keep the shipping container in case the chassis requires shipping in the future.



Note The chassis is thoroughly inspected before shipment. If any damage occurred during transportation or any items are missing, contact your customer service representative immediately.

Procedure

- Step 1** Remove the chassis from its cardboard container. Save all packaging material.
- Step 2** Compare the shipment to the equipment list provided by your customer service representative and verify that you have received the following items:
- Any printed documentation
 - Tool-less rack-mount kit (N20-CRMK2=)—mounting rails can be installed in a rack without the use of tools. The optional round hole adapter kit (N20-CRMK2-RHA=) does require tools.
 - ESD wrist strap
 - Cables with connectors (including the N20-BKVM=, which is the KVM/local I/O console dongle)
 - Any optional items ordered

- Step 3** Verify that all unused blade slots and power supply bays have blank covers.
-

Attaching the Round Hole Adapter Kit to the Rails (Optional)



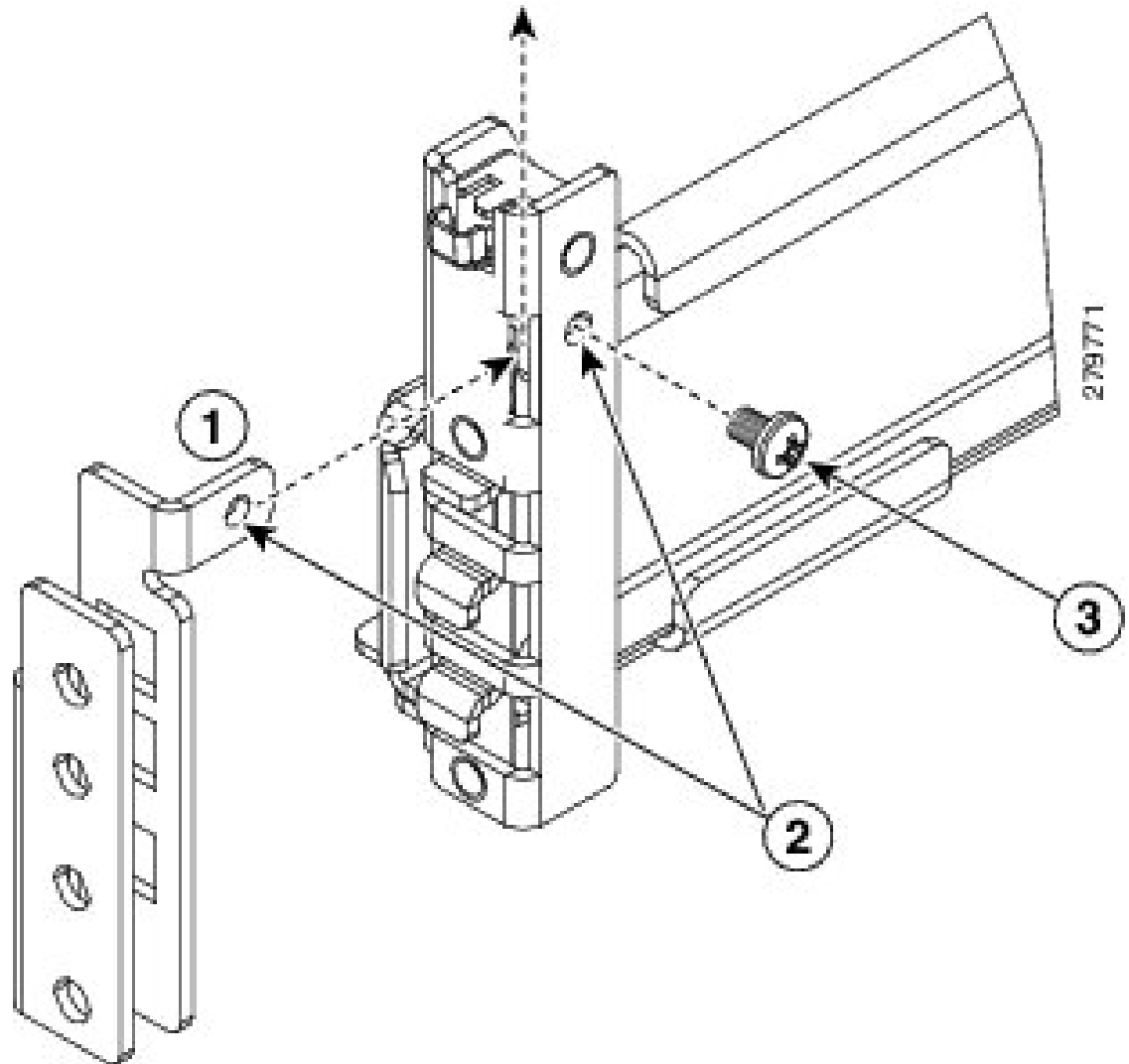
Note The chassis tool-less rails are designed for racks that have square mounting holes. You must use the round hole adapters (N20-CRMK2-RHA=) to install the chassis in racks that have round mounting holes.

This round hole adapter kit allows you to adapt the rail kit (N20-CRMK2=) to install into rack (front and/or rear) posts that use either threaded or non-threaded round holes. Four adapters in the kit are for adapting the rail kit to install into rack posts with threaded round holes, and the other four adapters in the kit are for adapting the rail kit to install into rack posts with non-threaded round holes. You can use a combination of adapters based on the type of holes in the rack posts. Various sizes and lengths of screws are also included in the kit.

Procedure

- Step 1** Insert the adapter tab into the mounting rail as shown in callout 1.
- Step 2** Slide the adapter up to lock it into position as shown in callout 2.
- Step 3** Secure the adapter into place using the provided pan-head screw as shown in callout 3.

Figure 16: Attaching the Round Hole Adapter (Optional)



Step 4 Repeat steps 1 to 3 for the other three adapters.

Installing the Chassis

This section describes how to install the chassis. This two part process consists of installing the rails into the rack and then installing the chassis into the rack and on to the rails.



Caution Never attempt to lift the chassis by using an installed module's handle as a grip point. Only use the handles on the sides of the chassis.



Caution If the rack has wheels, ensure that the brakes are engaged, the stabilizing pads are extended, or that the rack is otherwise stabilized.

Table 9: Contents of the Cisco UCS 5108 Server Chassis Rack-Mount Kit (N20-CRMK2=)

Quantity	Part Description
1	Left tool-less rack mount rail
1	Right tool-less rack mount rail
6	10-32 X 0.75 Phillips round washer head screws
6	10-32 X 0.125 cage nuts

Table 10: Contents of the Cisco UCS 5108 Server Round Hole Adapter Kit (N20-CRMK2-RHA=)

Quantity	Part Description
4	Round hole adapters (threaded)
4	Round hole adapters (un-threaded)
4	Adapter securing screws
16	Phillips head screws for securing the rails to the rack



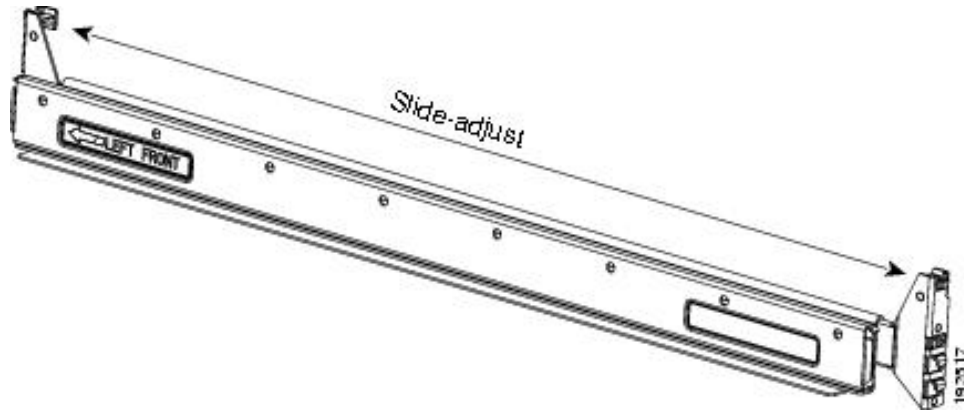
Warning The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device. Statement 1019

Installing the Rails

Procedure

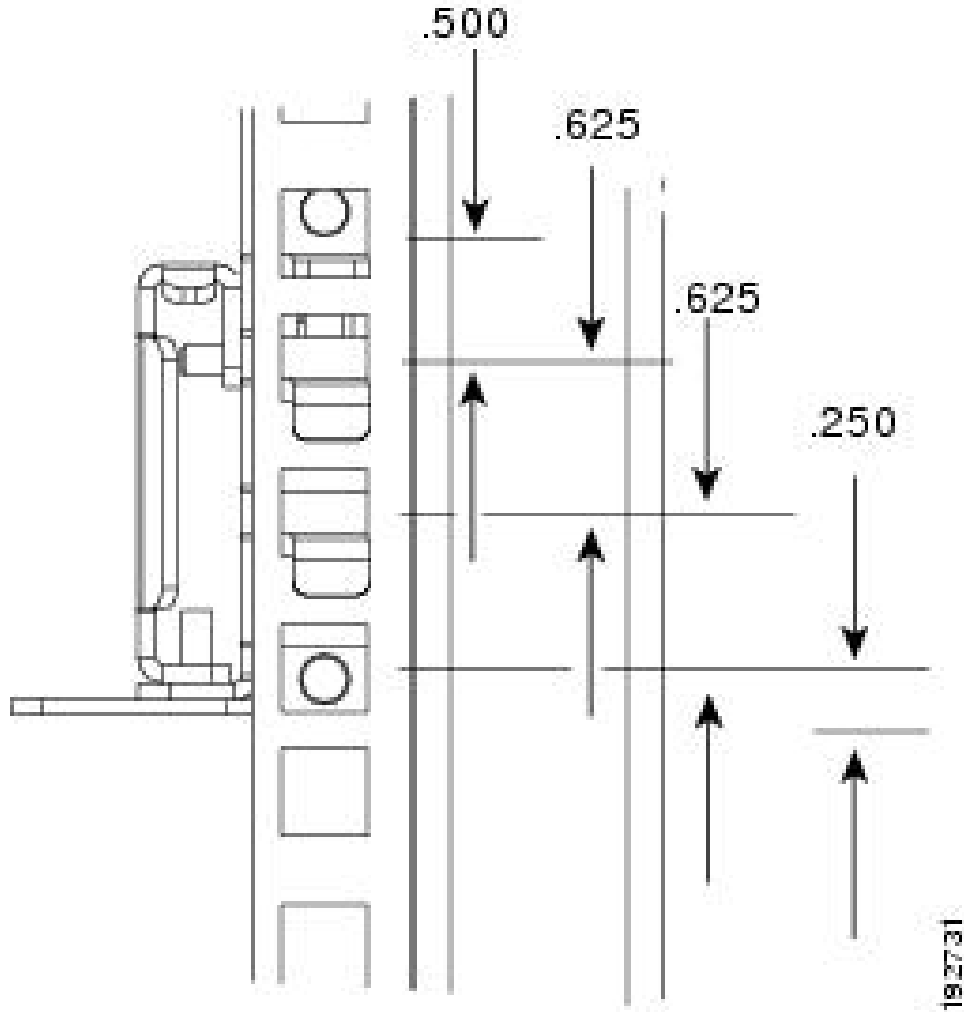
- Step 1** Remove the mounting template (Cisco 78-19093-01) from the accessory box. The template is designed to show you the proper holes within which the rails and cage nuts should be placed. Once the rack holes line up with the template, you should mark the holes so that their position is known after removing the template.
- Step 2** Adjust the length of the rail by sliding the ends of the rail back and forth until they match the depth of the rack.

Figure 17: Adjusting the Tool-less Rack Mount Rail



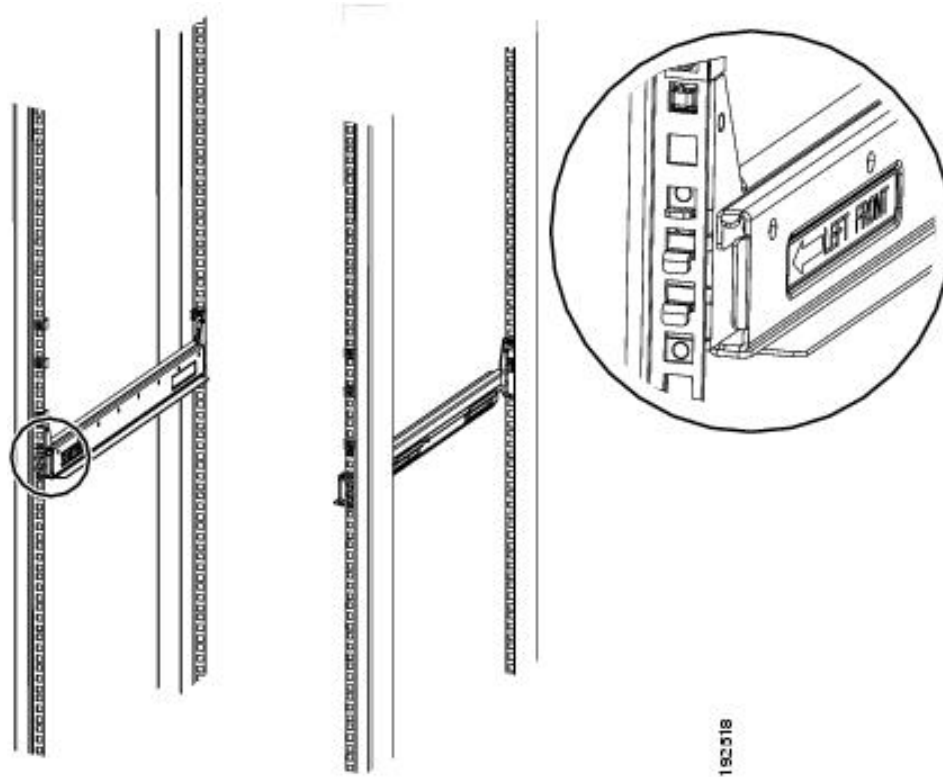
Step 3 Place the two hooks at each end of the rail into the first two holes at a rack unit boundary.

Figure 18: Hole Spacing for the Tool-less Rails in Relationship to a Rack Unit



The following figure shows a rail mounted into a rack in the proper position with respect to a rack-unit boundary. Measurements are in inches between the centers of the holes.

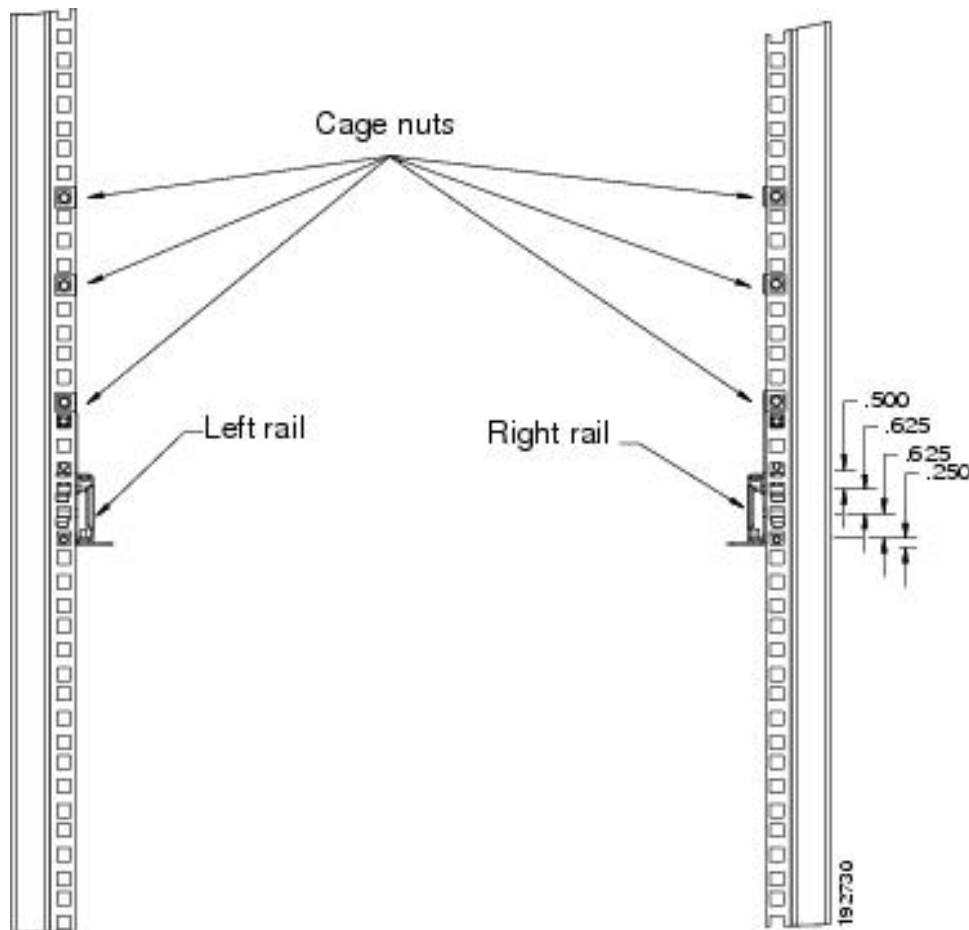
Figure 19: Installing Tool-less Chassis Support Rails into the Rack



- Step 4** Press down firmly on the rail until the hooks seat firmly and securely into the holes, and the spring clip latches into place.
- Step 5** Follow the same procedure to install the other rack rail.
- Step 6** Use a tape measure and level to verify that the rack rails are horizontal and at the same height.
- Step 7** Insert the cage nuts on to the rack in the needed square holes as shown below. When the rails are installed on a rack unit boundary, the first two cage nuts are installed into the seventh holes above the rails' horizontal plates. The next two cage nuts are installed into the fifth holes above the first cage nut. Finally, the two cage nuts are installed into the fourth holes above the second cage nuts.

Figure 20: Placement of Rails and Cage Nuts with Respect to the Rack Unit Boundary

Figure 21: Proper Placement for the Rails and Cage Nuts



- Step 8** Remove all power supplies, fan assemblies, server blades, and fabric extenders to lighten the chassis. Even with devices removed, the chassis weighs 90 lbs (40.83 kg).

Installing the Round Hole Adapter Kit

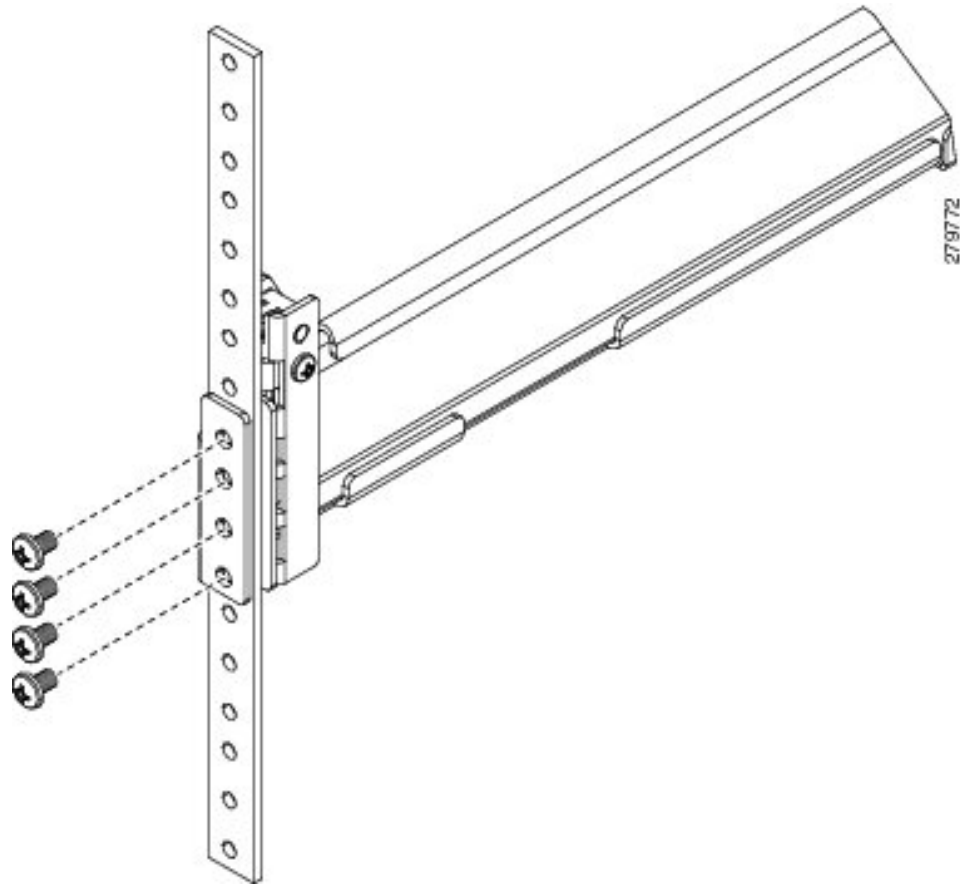
Before installing the chassis in a round hole rack, prepare the rails by adding the adapter kit according to the instructions in [Attaching the Round Hole Adapter Kit to the Rails \(Optional\)](#), on page 32.

Procedure

- Step 1** Remove the mounting template (Cisco 78-19093-01) from the accessory box. The template is designed to show you the proper holes within which the rails and cage nuts should be placed. Once the rack holes line up with the template, you should mark the holes so that their position is known after removing the template.
- Step 2** Adjust the length of the rail by sliding the ends of the rail back and forth until they match the depth of the rack.
- Step 3** Place the adapters and rails even with a rack boundary at each end of the rail.

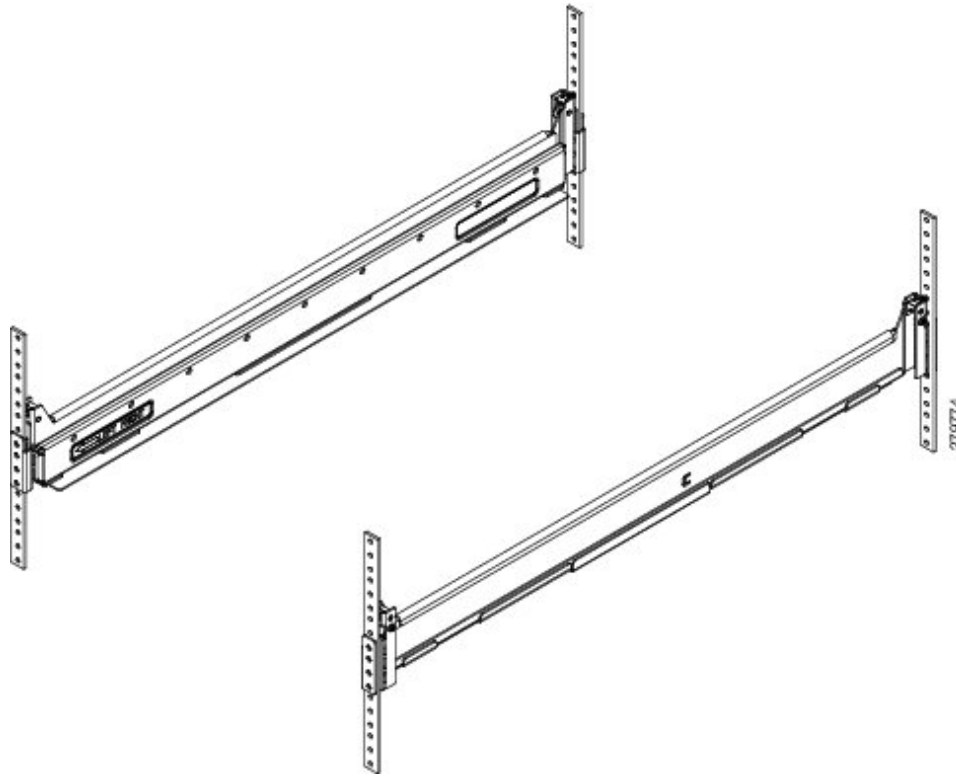
Step 4 Secure the rail to the rack with the provided pan head screws as shown below.

Figure 22: Attaching the Mounting Brackets to a Round Hole Rack



Step 5 Follow the same procedure to install the other rack rail as shown below.

Figure 23: Round Hole Adapter and Rails Installed in a Rack



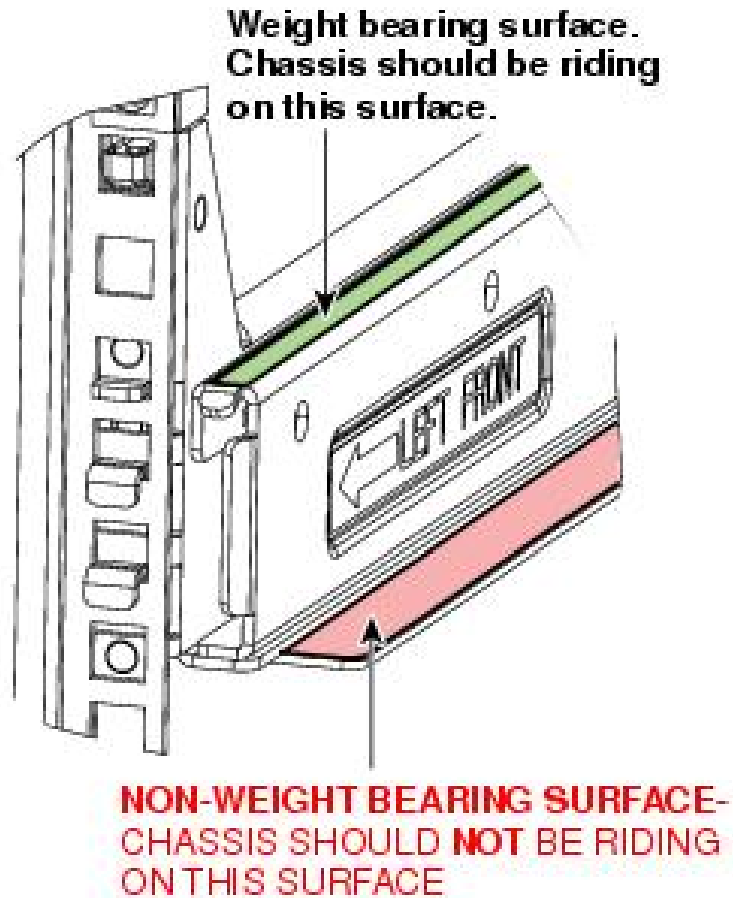
- Step 6** Use a tape measure and level to verify that both rack rails are horizontal and at the same height.
- Step 7** Remove all power supplies, fan assemblies, server blades, and I/O modules to lighten the chassis. Even with devices removed, the chassis weighs 90 lbs (40.83 kg).
-

Inserting the Chassis into the Rack

Procedure

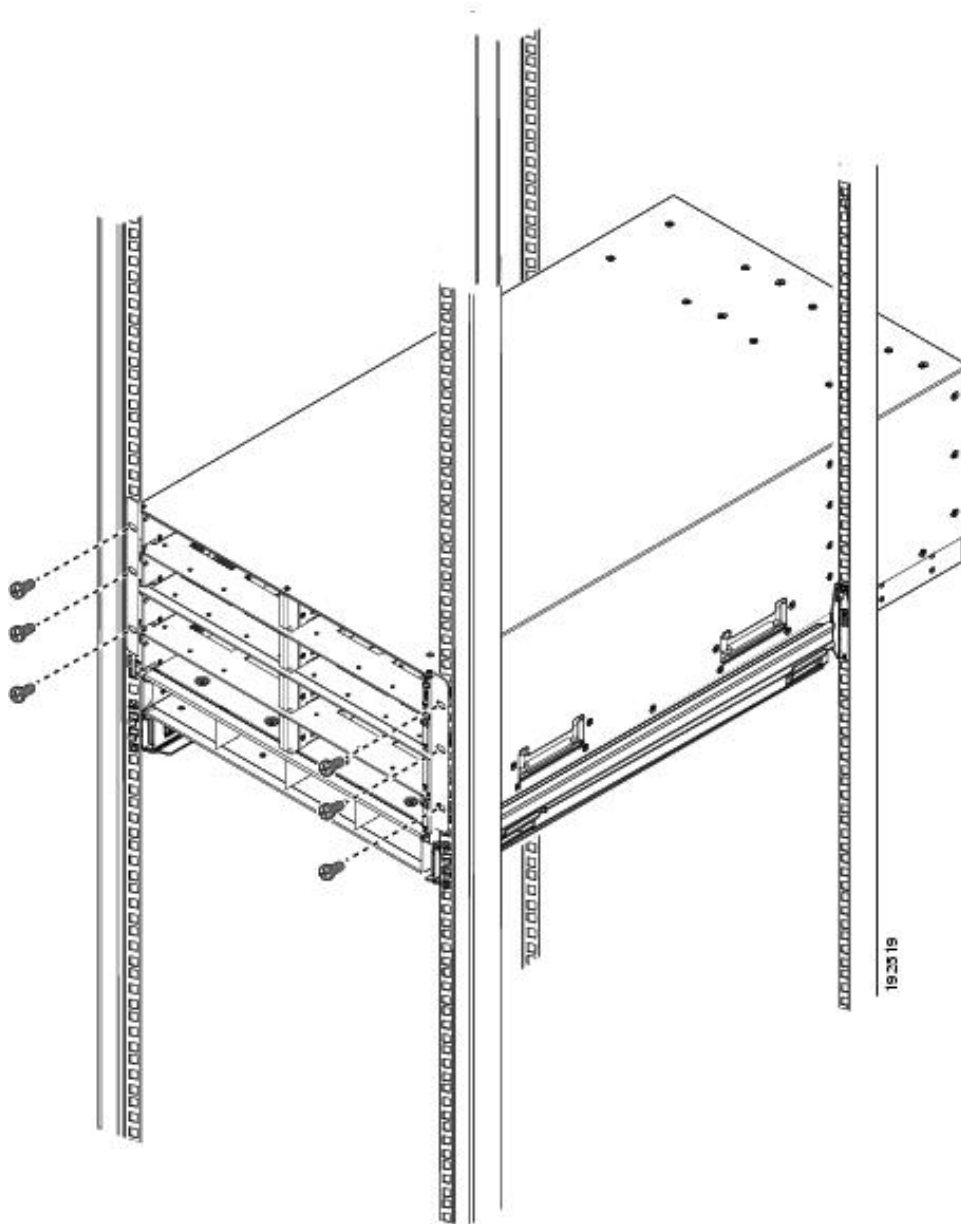
- Step 1** With the help of another person (or special lifting equipment), lift the chassis and place it on the mounting rail as shown.

Figure 24: Mounting Rail Weight Distribution (Square Hole Mount Shown)



Caution The mounting rails may come loose and cause the chassis to fall if the weight is resting on the wrong surface. Make sure that the bottom of the chassis is resting on the correct rail surface.

- Step 2** Slide the chassis into the rack until the front flange is flat against the cage nuts. (Cage nuts are not needed in round hole racks.)
- Step 3** Using the six Phillips round washer head screws and the cage nuts (used in square hole installations), secure the chassis by its flanges to the rack as shown.

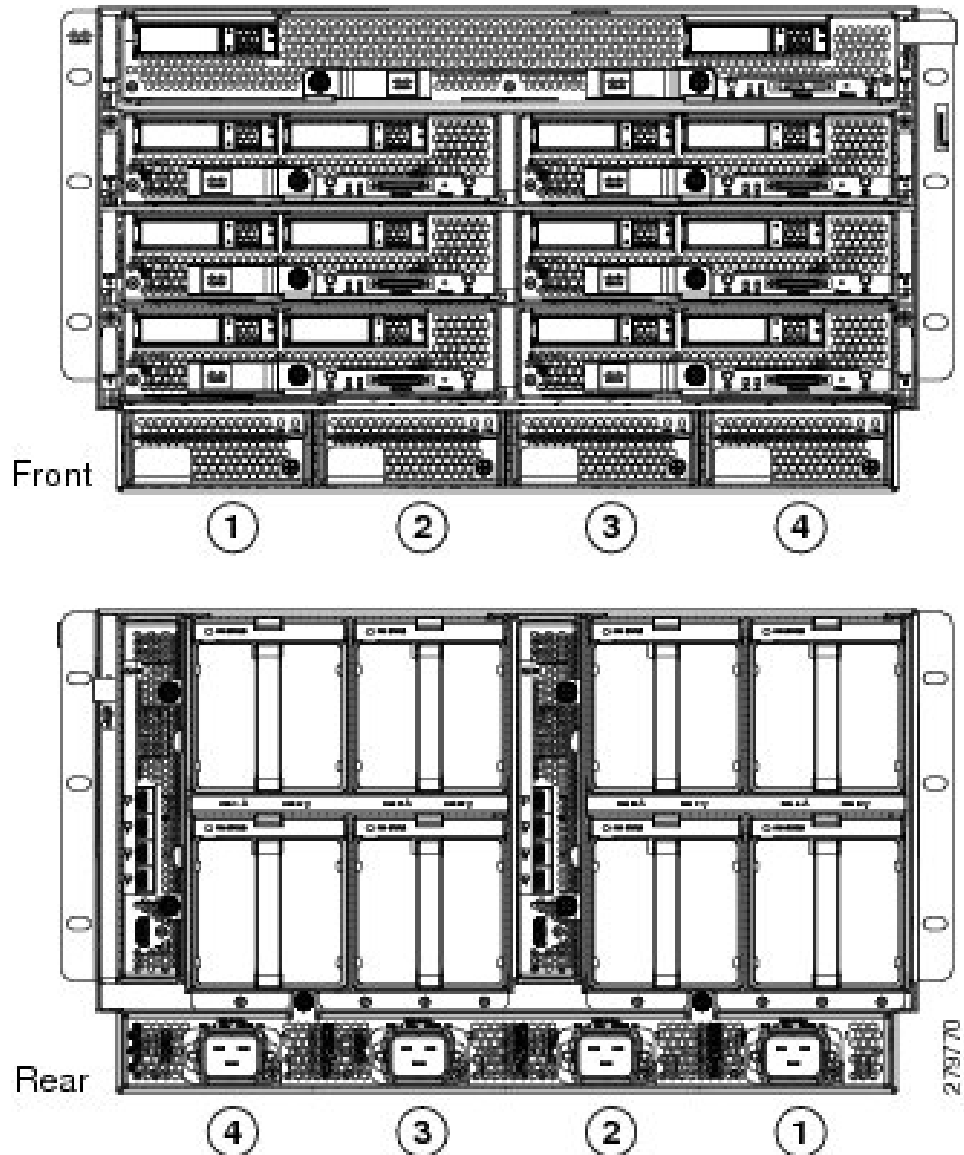
Figure 25: Securing the Chassis Into the Rack

Step 4 Replace all servers, fans, and power supplies back into their respective chassis slots.

Step 5 To power up the chassis, connect the appropriate AC power cables to the inlet connector corresponding to each installed power supply, and then connect the other end of the cables to the power source. For a DC installation, see [Connecting a DC Power Supply, on page 45](#). To determine the number of power supplies needed for a given configuration, use the [Cisco UCS Power Calculator](#) tool.

Note Both grids in a power redundant system should have the same number of power supplies. If your system is configured for grid redundancy, slots 1 and 2 are assigned to grid 1 and slots 3 and 4 are assigned to grid 2. If only two power supplies (PS) are in a redundant-mode chassis, they should be in slots 1 and 3. Slot and cord connection numbering is shown below.

Figure 26: Power Supply Bay and Connector Numbering

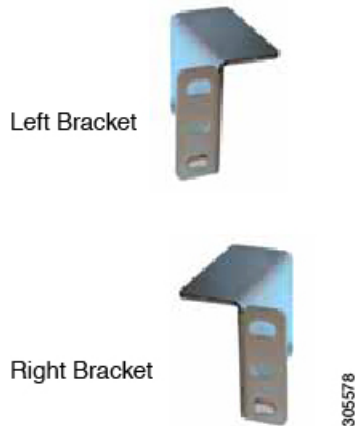


Step 6 Connect the server chassis to the fabric interconnect as described in [Proper FEX and Fabric Interconnect Port Connectivity](#), on page 50.

Installing Rear Brackets

Before shipping a preracked UCS 5108 chassis or UCS Mini chassis, you must install a pair of integration brackets (RACK-HW-016) to secure the rear of the chassis to the rack rail. The following figure shows the brackets.

Figure 27: Rear Integration Brackets



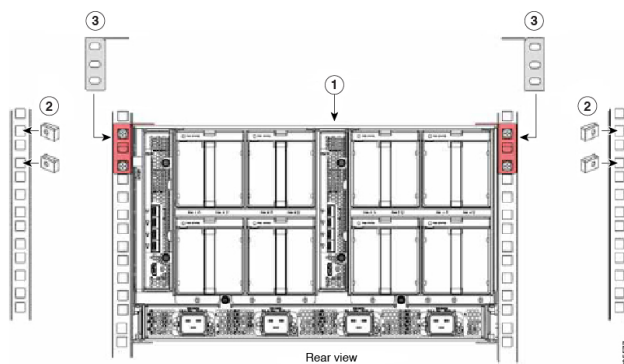
Use cage nuts and mounting screws to secure the brackets to the rack rail.

From the rear of the rack, the rear brackets should be installed as follows:

Procedure

-
- Step 1** Install the UCS 5108 or UCS Mini chassis. See callout 1 in the following figure.
 - Step 2** Attach the supplied cage nuts to the rack rails for the left and right brackets. See callout 2. The tightening torque is 45 lb-in (5.0 N-m).
 - Step 3** Secure the brackets using the supplied screws. See callout 3.

Figure 28: Installing the Rear Brackets to the Chassis



Connecting a DC Power Supply

This section describes how to connect power to the rear PDU terminals on the DC version chassis (UCSB-5108-DC) corresponding to a UCS 5108 DC power supply (UCSB-PSU-2500DC48).

Required Tools

You must have the following tools to perform this procedure:

- A Phillips screwdriver
- A 10-mm wrench or socket
- Connectors and wire for the DC circuit or circuits

DC Power Installation Procedure



Warning When stranded wiring is required, use approved wiring terminations, such as closed-loop or spade-type with upturned lugs. These terminations should be the appropriate size for the wires and should clamp both the insulation and conductor. Statement 1002



Warning Before performing any of the following procedures, ensure that power is removed from the DC circuit. Statement 1003



Warning A readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022



Warning Use copper conductors only. Statement 1025



Warning This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations. Statement 1045



Warning When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046



Warning Installation of the equipment must comply with local and national electrical codes. Statement 1074

**Warning**

Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place. Statement 1075

Procedure

-
- Step 1** Install the DC power supply in the chassis, making note of the bay number, so you are sure to connect the wiring to the appropriate terminals on the DC PDU at the chassis rear.
- Step 2** Verify that power is off to the DC circuit or circuits on the power supply that you are installing.
- Step 3** Ensure that all site power and grounding requirements have been met.
- Step 4** Remove the plastic cover from the DC terminals by squeezing the flanges at the top and bottom of the cover.
- Step 5** Connect the ground wires to the power supply terminal block, shown as a green wire below. Only one ground connection is required, though there may be up to four DC connections.
- Step 6** Connect the DC-input wires to the power supply terminal block. The proper wiring sequence is positive to positive (red wire), and negative to negative (black wire). The figure below shows a connection to terminal 1.

Note

The positive and negative wires can be installed pointing either to the right or to the left as long as the terminal cover is used. The figure below shows them pointed to the right. Panduit LCD4-14A-L connectors may be used for the supply and return wires, and Panduit LCD4-14AF-L or equivalent connectors may be used for the 90-degree ground lug wire. Both connections have double lugs with .25 inch holes measuring .625 inches from center to center.

Figure 29: Connecting DC Power to the Chassis (shows DC PDU only, Chassis is Omitted)

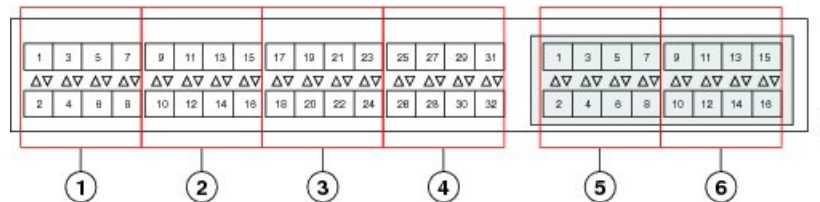
- Step 7** Replace the terminal cover as shown. This cover should always be in place when power is applied to the terminals.
- Step 8** Connect the other end of the power wires to a DC-power input source.
- Step 9** Set the DC disconnect switch in the circuit to ON.
- Caution** In a system with multiple power supplies, connect each power supply to a separate DC power source. In the event of a power source failure, if the second source is still available, it can maintain system operation.
- Step 10** Verify power supply operation by checking the power supply's front-panel LEDs. You should see the following:
- The LED labeled INPUT OK is green.
 - The LED labeled OUTPUT FAIL is not lit.
- Step 11** Check the power supply and system status from the UCS console by entering the show system command or the show power command, do using the GUI. For more information on these commands, refer to the command reference for your software.

Cabling Considerations for Fabric Port Channels

When you configure the links between the Cisco UCS 2200 Series FEX and a Cisco UCS 6200 series fabric interconnect in fabric port channel mode, the available virtual interface namespace (VIF) on the adapter varies depending on where the FEX uplinks are connected to the fabric interconnect ports.

Inside the 6248 fabric interconnect there are six sets of eight contiguous ports, with each set of ports managed by a single chip. When all uplinks from an FEX are connected to a set of ports managed by a single chip, Cisco UCS Manager maximizes the number of VIFs used in service profiles deployed on the blades in the chassis. If uplink connections from an IOM are distributed across ports managed by separate chips, the VIF count is decreased.

Figure 30: Port Groups for Fabric Port Channels



- Caution** Adding a second link to a fabric-port-channel port group is disruptive and will automatically increase the available amount of VIF namespace from 63 to 118. Adding further links is not disruptive and the VIF namespace stays at 118.

**Caution**

Linking a chassis to two fabric-port-channel port groups does not affect the VIF namespace unless it is manually acknowledged. The VIF namespace is then automatically set to the smaller size fabric port-channel port group usage (either 63 or 118 VIFs) of the two groups.

For high availability cluster-mode applications, we strongly recommend symmetric cabling configurations. If the cabling is asymmetric, the maximum number of VIFs available is the smaller of the two cabling configurations.

For more information on the maximum number of VIFs for your Cisco UCS environment, see the Configuration Limits document for your hardware and software configuration.

Proper FEX and Fabric Interconnect Port Connectivity

**Note**

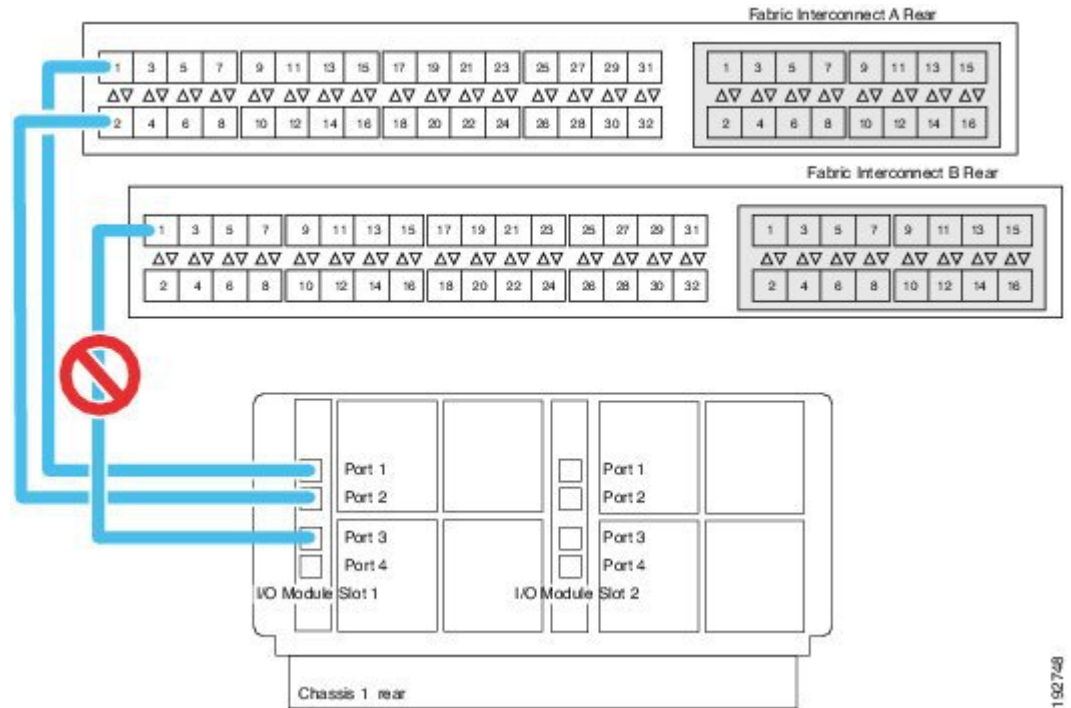
The following illustrations are for example only; you do not need to skip available ports to provide future expansion room. See the UCS Manager configuration guide for FI port configuration considerations and limitations.

Observe the following guidelines:

- When you connect the server chassis to the fabric interconnect, do not connect the FEXes to the fabric interconnect's expansion modules. While similar in appearance to the other ports on the fabric interconnect, the expansion modules are never used for direct chassis connections. They are typically used for SAN connectivity or network uplink.
- All ports of a FEX must be connected to only one fabric interconnect. You must connect each fabric interconnect to the chassis through its own FEX.
- If you need to connect to a second fabric interconnect, do the following:
 - The chassis must have a second FEX installed.
 - All ports of the second FEX must be connected to the second fabric interconnect only because the FEX is a fabric extender, which can only be connected to a single switch, or in this case, a fabric interconnect.

The following figure shows an invalid connection from a FEX to two separate fabric interconnects.

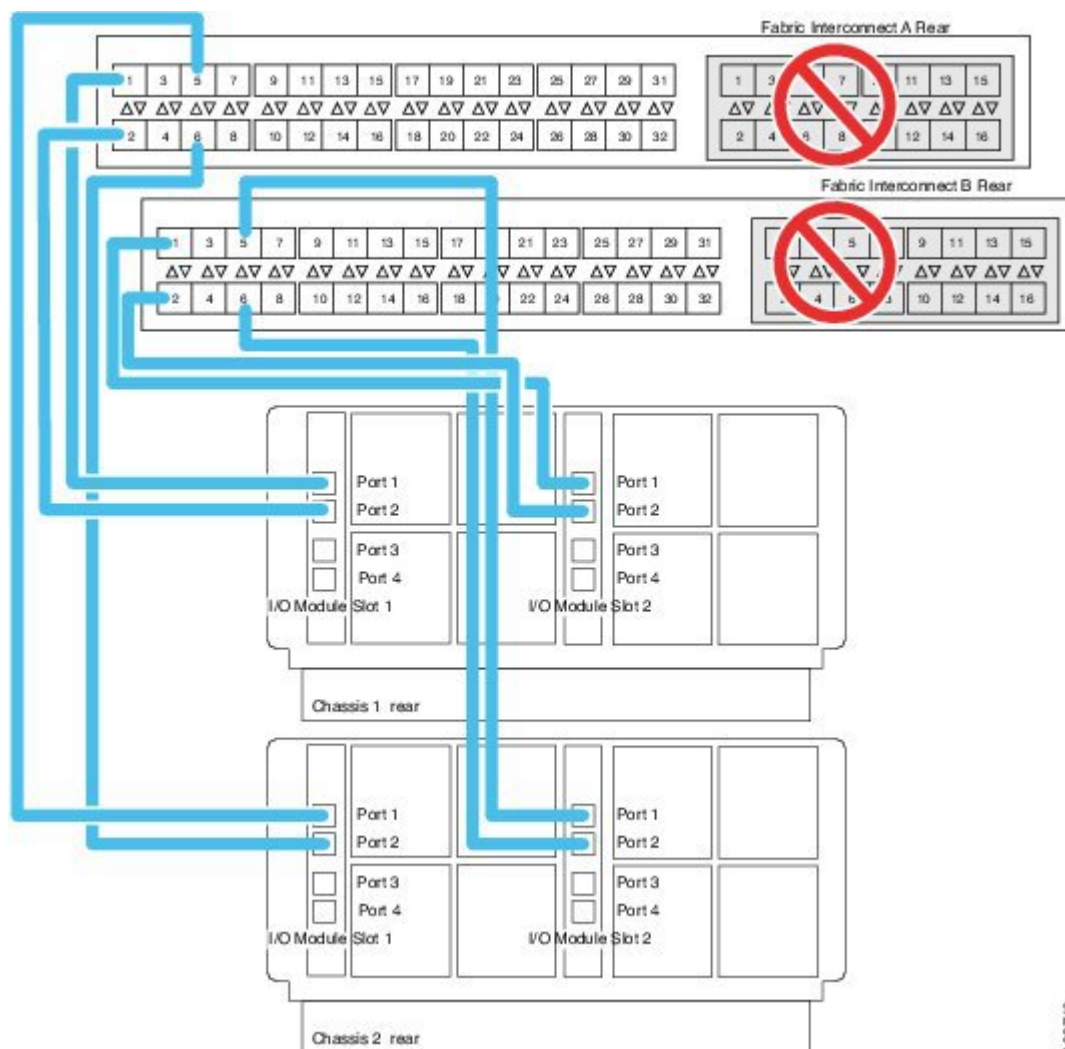
Figure 31: Invalid Connection for the Server Chassis and two Cisco UCS 6120XP Fabric Interconnects



- Both fabric interconnects should be wired identically: if port 1 on FEX 1 for a chassis goes to FI-A port 5, then port 1 on FEX 2 goes to FI-B port 5.

The following figure shows valid connections from FEXes in two chassis to two separate fabric interconnects. When you connect the server chassis to the fabric interconnect do not connect the FEXes to the fabric interconnect's expansion modules. While similar in appearance to the other ports on the fabric interconnect, the expansion modules are never used for direct chassis connections, they are used for uplink or SAN connections.

Figure 32: Proper Connection for the Server Chassis and two Cisco UCS 6120XP Fabric Interconnects



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Removing the Chassis from a Rack

Procedure

- Step 1** Use Cisco UCS Manager to do the following:
- Shut down the OS on all blade servers in the chassis.
 - Disable the Smart Call Home feature.
 - Decommission the chassis.

For details, see the *Configuration Guide* for the version of Cisco UCS Manager that you are using. The configuration guides are available at the following URL:

http://www.cisco.com/en/US/products/ps10281/products_installation_and_configuration_guides_list.html

- Step 2** Disconnect the power cords and networking cables from the chassis.
- Step 3** Remove all modules and blades from the chassis to lighten its weight.
- Step 4** Remove the screws holding the front rack-mount flange to the rack.
- Step 5** With two people holding the chassis, make sure that its weight is fully supported.
- Step 6** Gently slide the chassis off the rails, and out of the rack.
- Step 7** Replace the modules and blades in the server chassis.

Repacking the Chassis

If you need to repack the chassis, remove it from the rack by reversing the steps in the [Removing the Chassis from a Rack, on page 52](#) section, and then pack it for shipment. If possible, use the original packing materials and container to pack the chassis. Replacement packaging can be ordered using the following PIDS:

- If you have only half-width blades, use UCSB-5108-PKG-HW=.
- If you have full-width blades or a mix of full-width and half-width blades, use UCSB-PKG-FW=.

If you are returning the chassis to Cisco, contact your Cisco customer service representative to arrange for return shipment to Cisco.

SFP+ Transceivers

Each FEX within the chassis supports Small Form-Factor Pluggable (SFP+) copper or optical transceivers. Each transceiver runs at 10 Gb.

SFP+ Twinax Copper Transceivers

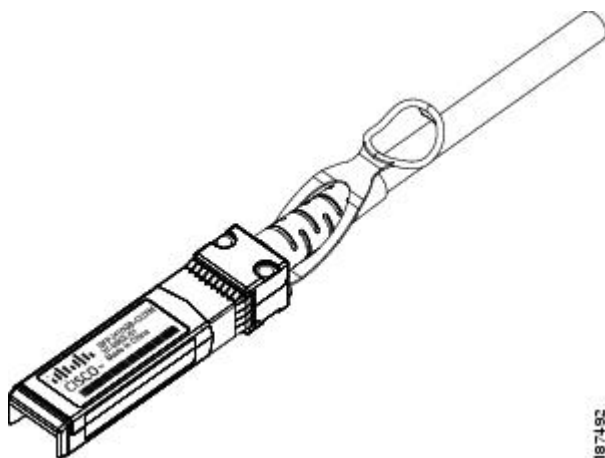
The FEX also supports Twinax copper transceivers. The enhanced SFP+ 10-Gb Ethernet transceiver is a bidirectional device with a transmitter and receiver in the same physical package. It has a 20-pin connector on the electrical interface.

Table 11: SFP+ 10 Gb Ethernet Transceiver

Model	Description
SFP-H10GB-CU1M	10-Gb Ethernet—copper SFP+ (1 m, 3.28 ft.)
SFP-H10GB-CU3M	10-Gb Ethernet—copper SFP+ (3 m, 9.84 ft.)
SFP-H10GB-CU5M	10-Gb Ethernet—copper SFP+ (5 m, 16.4 ft.)
SFP-H10GB-ACU7M	10-Gb Ethernet—copper SFP+ (7 m, 22.9 ft.)
SFP-H10GB-ACU10M	10-Gb Ethernet—copper SFP+ (10 m, 32.8 ft.)

The figure below shows the SFP-H10GB-CU5M transceiver. The rubber loop is used for removing the SFP+ from its port on the I/O module.

Figure 33: SFP+ 10 Gb Twinax Copper Transceiver



Optical SFP+ Transceivers

If distances greater than 10 meters (33 feet) must be spanned, the FEX also supports the substitution of the copper SFP+ by optical SFP+ transceivers. The SFP+ 10-Gb Ethernet optical transceiver is a bidirectional device with a transmitter and receiver in the same physical package. It has a duplex LC connector on the optical interface.

Model	Description
SFP-10G-SR	Short-range optical SFP+ (up to 300 m/ 984 feet)
SFP-10G-LR	Long-range optical SFP+ (up to 10 km/6.2 miles)
FET-10G	Cisco 10G Fabric Extender Transceiver, LC duplex connector

¹ While the SFP-10G-LR is supported by both the fabric interconnect and I/O module, the maximum distance will introduce latency issues that will affect overall performance.

Documentation for SFP+ 10-Gb Ethernet optical transceivers is at

http://www.cisco.com/en/US/docs/interfaces_modules/transceiver_modules/installation/note/78_15160.html

SFP and SFP+ Transceivers for the UCS 6324 Fabric Interconnect

Each UCS 6324 Fabric Interconnect supports up to four SFP optical or copper transceivers.

Table 12: SFP+ Transceivers

Model	Description
SFP-10G-SR	Short-range optical SFP+ (up to 300 m/ 984 feet)
SFP-10G-SR -X	Short-range optical SFP+ (up to 300 m/ 984 feet), extended temperature

Model	Description
FET-10G	Cisco 10G Fabric Extender Transceiver, LC duplex connector

Table 13: SFP Optical Transceivers

Model	Description
GLC-T	1-Gb Ethernet copper SFP module
GLC-SX-MM	1-Gb Ethernet short-range (up to 550 m / 1804.46 feet) SFP module
GLC-LH-SM	1-Gb Ethernet long-range (10 km / 32808.4 feet) SFP module
SFP-GE-T	1-Gb Ethernet extended temperature range module

The UCS 6324 Fabric Interconnect also supports Twinax copper transceivers. The enhanced SFP+ 10-Gb Ethernet transceiver is a bidirectional device with a transmitter and receiver in the same physical package. It has a 20-pin connector on the electrical interface.

Table 14: SFP+ 10 Gb Ethernet Transceivers

Model	Description
SFP-H10GB-CU1M	10-Gb Ethernet—copper SFP+ (1 m, 3.28 ft.)
SFP-H10GB-CU3M	10-Gb Ethernet—copper SFP+ (3 m, 9.84 ft.)
SFP-H10GB-CU5M	10-Gb Ethernet—copper SFP+ (5 m, 16.4 ft.)
SFP-H10GB-ACU7M	10-Gb Ethernet—copper SFP+ (7 m, 22.9 ft.)
SFP-H10GB-ACU10M	10-Gb Ethernet—copper SFP+ (10 m, 32.8 ft.)

Twinax Copper Cables for the UCS 6324 Fabric Interconnect

Twinax copper cables are available in various lengths for the UCS 6324 Fabric Interconnect. The 7 meter and 10 meter cables are active, which means that they contain active components with the SFP+ connector housing to improve signal quality. The ends of these cables have connectors that can plug directly into SFP receptacles.

Table 15: Twinax Copper Cables

Model	Description
SFP-H10GB-CU1M	10-Gb Ethernet—copper SFP+ (1 m, 3.28 ft.)
SFP-H10GB-CU3M	10-Gb Ethernet—copper SFP+ (3 m, 9.84 ft.)
SFP-H10GB-CU5M	10-Gb Ethernet—copper SFP+ (5 m, 16.4 ft.)

Model	Description
SFP-H10GB-ACU7M	10-Gb Ethernet—copper SFP+ (7 m, 22.9 ft.)
SFP-H10GB-ACU10M	10-Gb Ethernet—copper SFP+ (10 m, 32.8 ft.)

QSFP+ Copper Optical Transceivers for the UCS 6324 Fabric Interconnect

Each UCS 6324 Fabric Interconnect supports up one copper/optical transceiver.

Table 16: QSFP+ Copper/Optical Transceivers

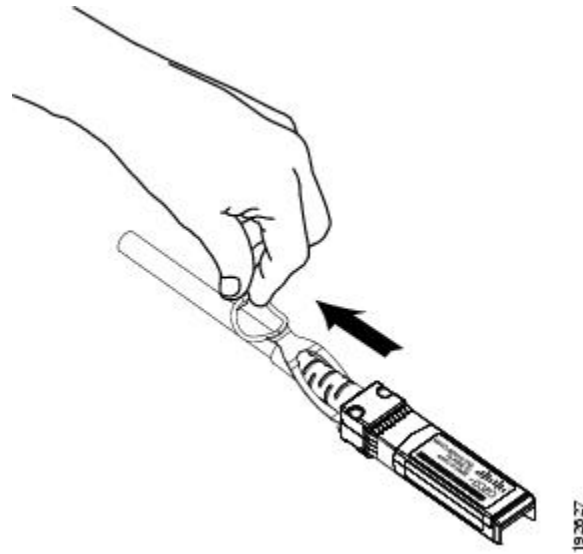
Model	Description
QSFP-4SFP10G-CU5M	40GBASE-CR4 QSFP+ to four 10GBASE-CU SFP+ direct attach breakout cable assembly, 5 meter passive
QSFP-4SFP10G-CU3M	40GBASE-CR4 QSFP+ to four 10GBASE-CU SFP+ direct attach breakout cable assembly, 3 meter passive
QSFP-4SFP10G-CU1M	40GBASE-CR4 QSFP+ to four 10GBASE-CU SFP+ direct attach breakout cable assembly, 1 meter passive
QSFP-4x10G-AC7M	40GBASE-CR4 QSFP+ to four 10GBASE-CU SFP+ direct attach breakout cable assembly, 7 meter active
QSFP-4x10G-AC10M	40GBASE-CR4 QSFP+ to four 10GBASE-CU SFP+ direct attach breakout cable assembly, 10 meter active

Replacing a Copper Twinax SFP+ Transceiver with an Optical SFP+ Transceiver

Procedure

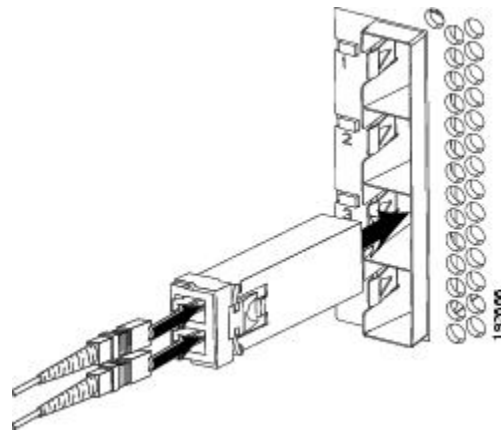
-
- Step 1** Remove the copper Twinax SFP+ from the FEX port by pulling gently on the rubber loop. The cable and SFP+ transceiver come out as a single unit, leaving the FEX port empty.

Figure 34: Removing a Twinax Copper SFP+ Transceiver



- Step 2** Insert the optical SFP+ transceiver into the FEX port. Make sure that it clicks firmly into place.
- Step 3** Plug the fiber-optic cable into the optical SFP+ transceiver.

Figure 35: Replacing a Copper SFP+ Transceiver with an Optical SFP+ Transceiver





CHAPTER 3

Installing and Removing Components

This chapter describes how to remove components from the chassis and how to install components into the chassis. This section contains the following section:

- [Components, on page 59](#)
- [Installing and Removing a Blade Server, on page 61](#)
- [Installing and Removing Power Supplies, on page 63](#)
- [Installing and Removing a Power Distribution Unit \(PDU\), on page 66](#)
- [Replacing an I/O Module \(or UCS 6324 Fabric Interconnect For UCS Mini\), on page 68](#)
- [Migrating from UCS 6200 to UCS 6454 Fabric Interconnects, on page 69](#)
- [Migrating to UCS 2408 IOMs, on page 74](#)
- [Migrating to UCS 6300 Series Fabric Interconnects, on page 76](#)
- [Installing and Removing a Fan Module, on page 79](#)

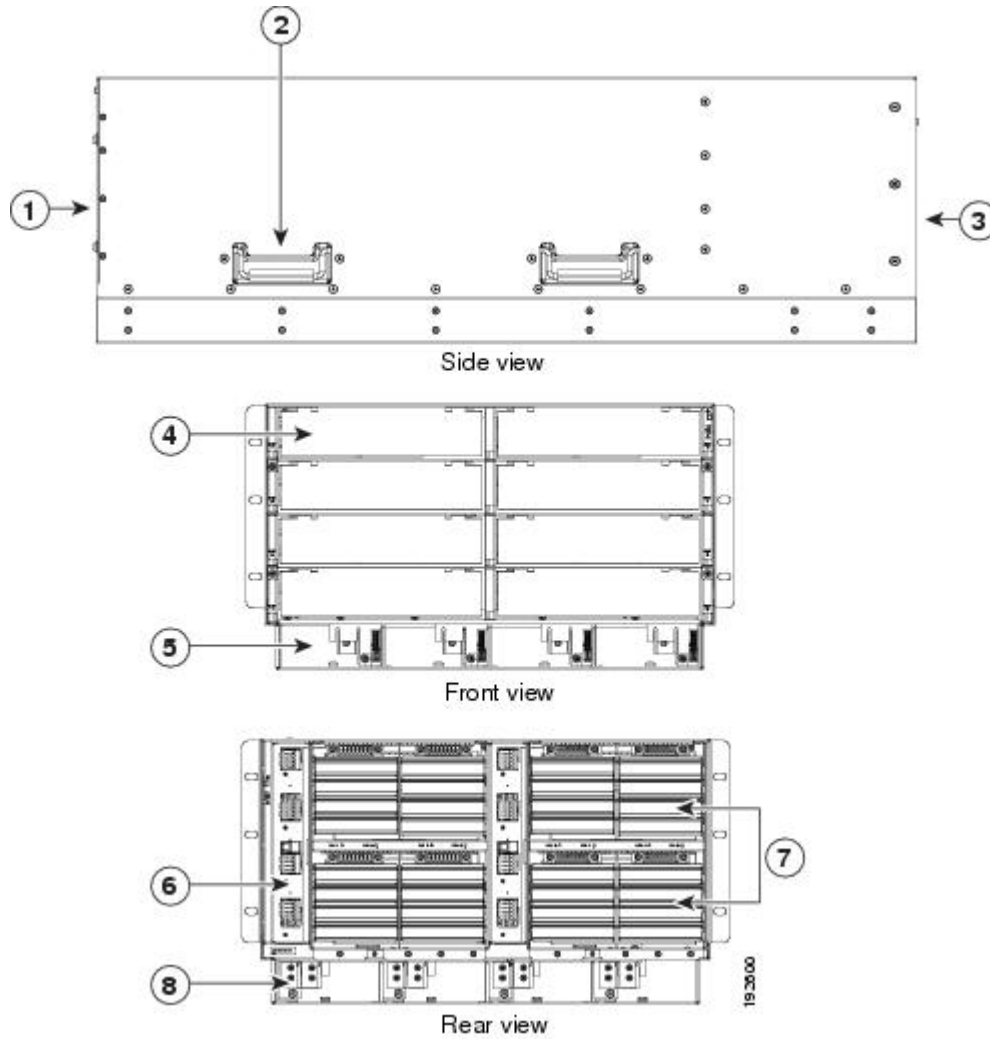
Components

The following figure shows an empty Cisco UCS 5108 server chassis and identifies the front, back, and module slots.



Note Whenever you remove a module from the chassis for an extended period of time, always replace the module with the appropriate blank panel. Failing to do so can result in heating and EMI issues. Blank panels can be ordered from Cisco Systems.

Figure 36: View of Cisco UCS 5108 Server Chassis



1	Front of chassis	5	Power supply slot (4 slots)
2	Chassis handle	6	Fabric interconnect or FEX slot (2 slots)
3	Rear of chassis	7	Fan slots (8 slots)
4	Half-width server slot (8 slots)	8	Power Distribution Unit (PDU) slot



Note Before you install, operate, or service the system, see the [Regulatory Compliance and Safety Information for Cisco UCS](#) for important safety information.



Warning IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS



Warning This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017



Warning Only trained and qualified personnel must be allowed to install, replace, or service this equipment. Statement 1030

Installing and Removing a Blade Server

There are two types of blade server supported, half-width and full-width. Their installation is similar but with important differences. For details, see the *Blade Server Installation and Service Note* for the type of blade server you are using. The server notes are available at the following URL:

http://www.cisco.com/en/US/products/ps10280/prod_installation_guides_list.html

Installing and Removing a Blade Server Hard Drive

You can remove blade server hard drives without removing the blade server from the chassis. All other component replacement for a blade server requires removing the blade from the chassis. Unused hard drive bays should always be covered with cover plates (N20-BBLKD) to assure proper cooling and ventilation. The chassis is omitted from illustrations here to simplify the drawing.



Caution To prevent ESD damage, wear grounding wrist straps during these procedures and handle modules by the carrier edges only.

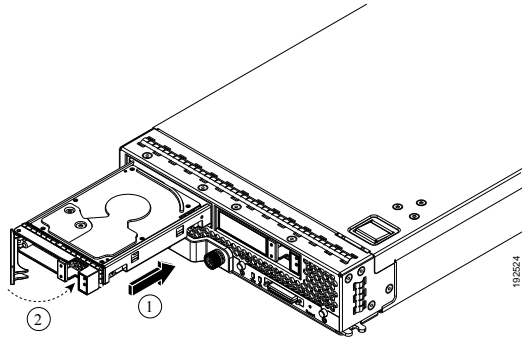
Installing a Blade Server Hard Drive

Procedure

- Step 1** Place the hard drive lever into the open position by pushing the release button.
- Step 2** Gently slide the hard drive into the opening in the blade server until it seats into place.
- Step 3** Push the hard drive lever into the closed position.

The following figure shows the positioning of a hard drive within a blade server.

Figure 37: Positioning a Hard Drive in a Blade Server (Cisco UCS B200 M1 shown)

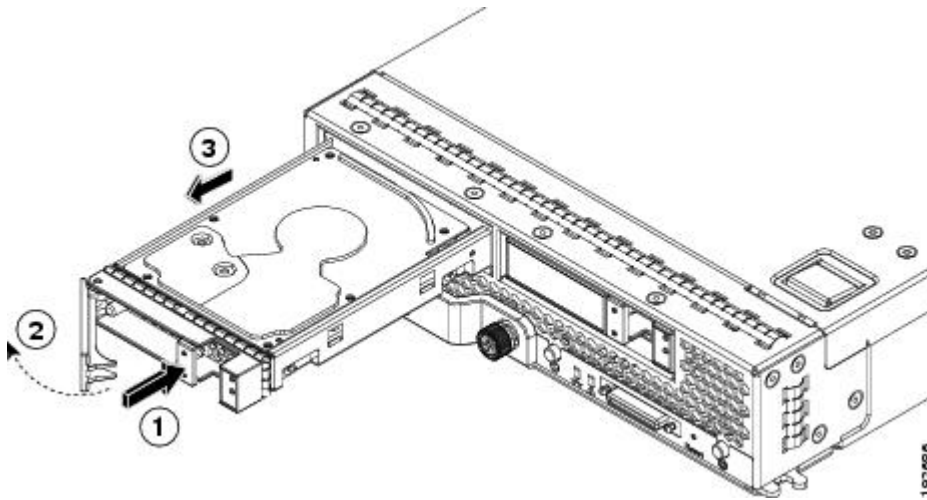


Removing a Blade Server Hard Drive

Procedure

Step 1 Push the button to release the ejector, and then pull the hard drive from its slot.

Figure 38: Pressing the Button on the Front of the Hard Drive to Deploy the Lever (Cisco UCS B200 M1 shown)



1	Release button	2	Hard drive lever
---	----------------	---	------------------

Step 2 Place the hard drive on an antistatic mat or antistatic foam if you are not immediately reinstalling it in another blade server.

Step 3 Install a blank faceplate (N20-BBLKD) to keep dust out of the blade server if the slot will remain empty.

Installing and Removing Power Supplies



Note The AC and DC power supplies are keyed to work only with the power distribution system in their respective chassis version. Mixing AC and DC in a given chassis is not supported.

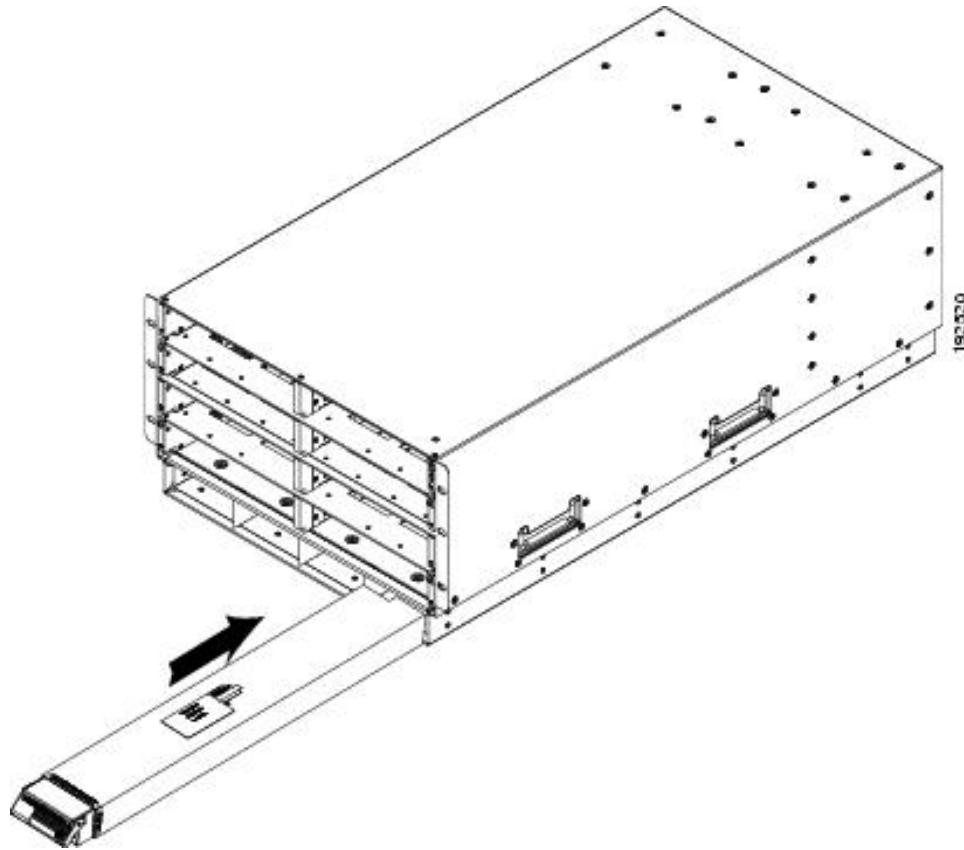
Installing a Power Supply

All power supply models (N20-PAC5-2500W, UCSB-PSU-2500ACPL, or UCSB-PSU-2500DC48) install using the same process.

Procedure

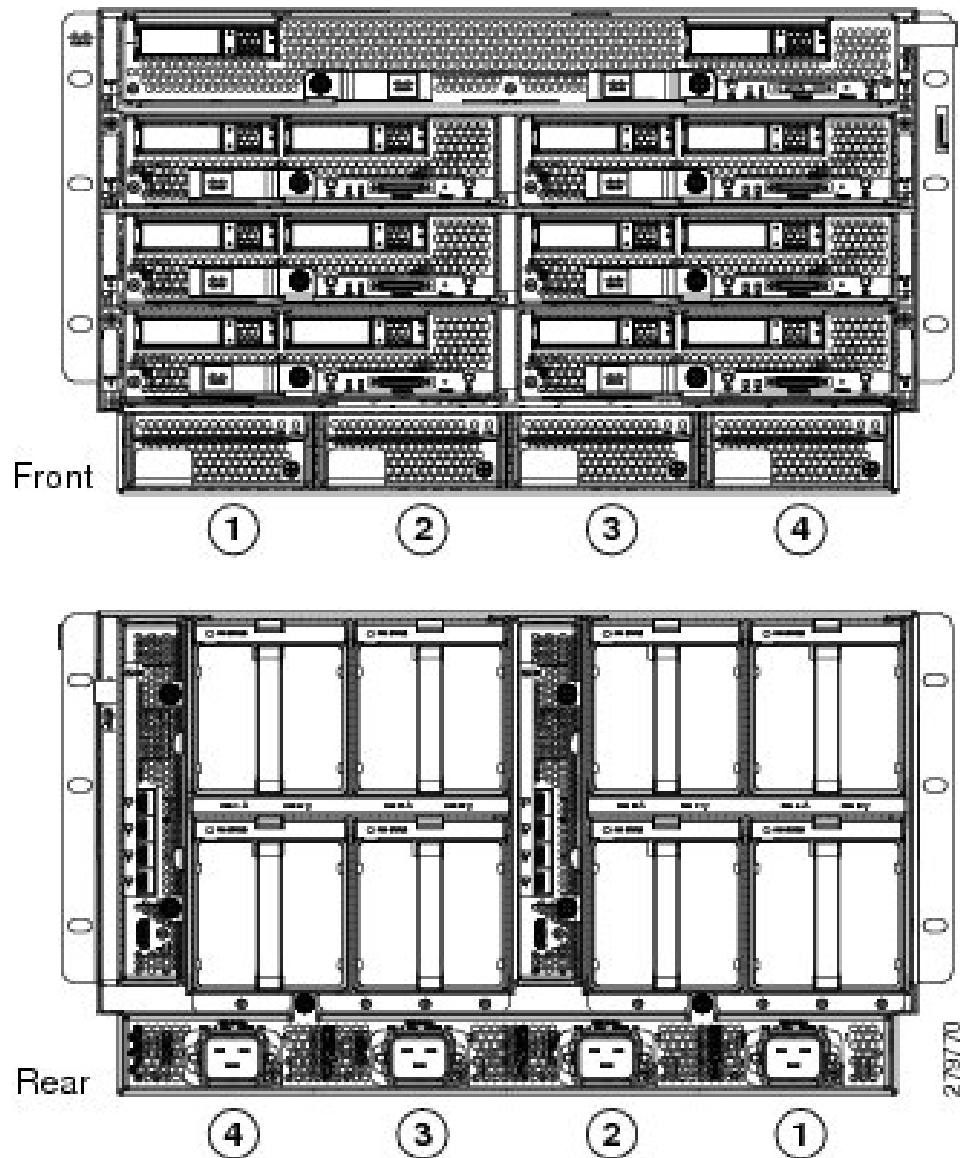
- Step 1** Place the power supply's handle in the up position.
- Step 2** Hold the power supply with both hands, and then slide it into the power supply bay,
- Step 3** Press the handle down, and give the power supply a gentle push inward to ensure that the power supply is fully seated into the Power Distribution Unit (PDU).
- Step 4** Tighten the captive screw.
- Step 5** For an AC installation, plug the power cable into the corresponding 220 VAC-inlet connector on the PDU at the rear of the chassis. For a DC environment, see [Connecting a DC Power Supply, on page 45](#).
- Note** Depending on the outlet receptacle on your rack's power distribution unit, you may need the optional jumper power cord to connect the Cisco UCS 5108 server chassis to an outlet receptacle.
- Step 6** Connect the other end of the power cable to the AC-power source.
- Step 7** Verify the power supply is operating by checking the power supply LEDs. See [LED Locations, on page 21](#) and [Interpreting LEDs, on page 22](#).

Figure 39: Positioning a Power Supply in the Cisco UCS Server Chassis



Note Both grids in a power redundant system should have the same number of power supplies. If your system is configured for grid redundancy, slots 1 and 2 are assigned to grid 1 and slots 3 and 4 are assigned to grid 2. If there are only two power supplies in a redundant- mode chassis, they should be in slots 1 and 3. This would be a very unusual configuration, with a single B200 blade server in the chassis. A larger configuration would require two power supplies per grid. Slot and cord connection numbering is shown below.

Figure 40: Power Supply Bay and Connector Numbering (AC Version Shown)



Removing a Power Supply



Caution

If you are using the Cisco UCS 5108 server chassis with one power supply (this is only supported in earlier versions of the system software), removing the power supply will cause the servers and chassis to shut down. If you are using more than two power supplies, and you remove one of them, the servers continue to operate as long as the other power supplies are sufficient to meet the power requirements of the number of servers in the chassis.

Procedure

- Step 1** Loosen the captive screw on the front of the power supply.
- Step 2** Lift up the power supply's handle to unseat the power supply.
- Step 3** Using the lever, pull the power supply from its slot. Place your other hand under the power supply to support it while you slide it out of the chassis.
- Step 4** Install a blank power supply filler panel (N20-CBLKP) if the power supply bay is to remain empty.
-

Installing and Removing a Power Distribution Unit (PDU)



Caution The Power Distribution Unit should only be replaced by a Cisco certified technician. This section is for reference only.



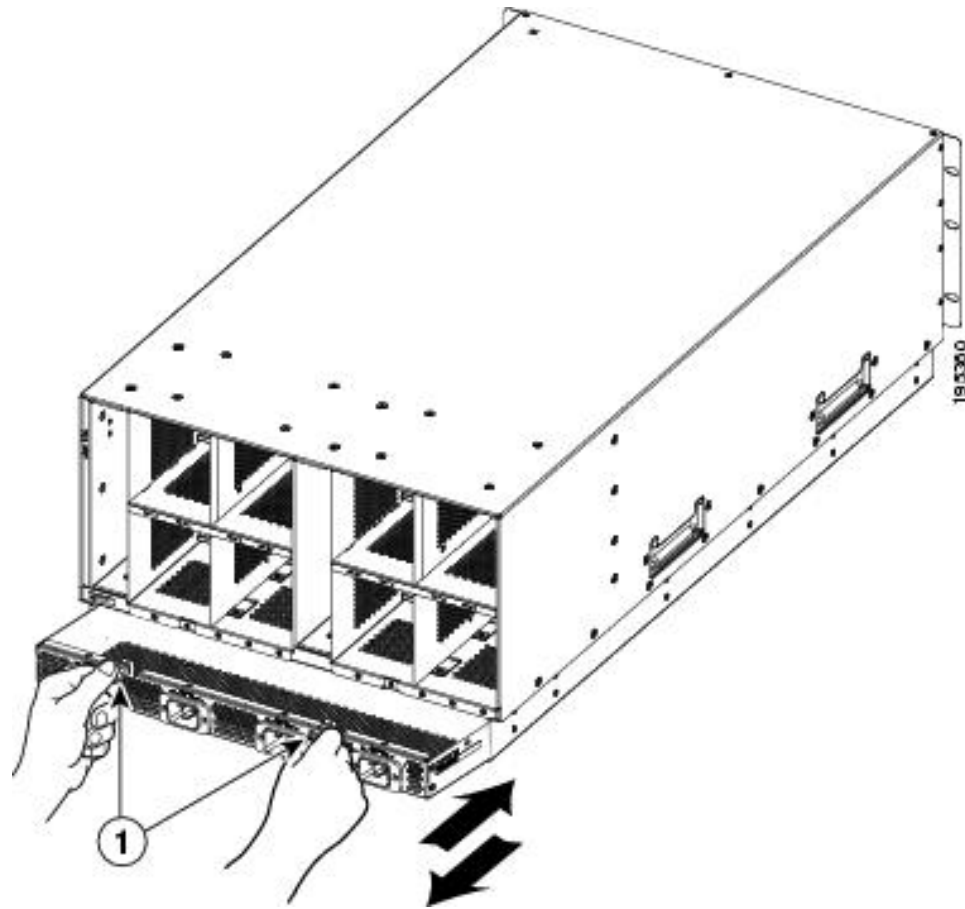
Caution You can not hot swap a PDU (N01-UAC1). The entire chassis will need to be shut down and all power cords should be unplugged before attempting this procedure.

Installing a PDU

Procedure

- Step 1** Hold the PDU module from below, with the captive screws at the top of the module.

Figure 41: Positioning a PDU (N01-UAC1) in the Cisco UCS Server Chassis, AC Version



- Step 2** Push the PDU module into the chassis until it seats properly. If power supplies are installed, you may need to partially remove them.
- Step 3** Tighten the captive screws.
- Step 4** If necessary, reseal the power supplies and restart the system to observe LED behavior.

Removing a PDU

Procedure

- Step 1** Partially remove all installed power supplies. If a power supply is seated into the PDU, removal is difficult or impossible.
- Step 2** Loosen the captive screws.
- Step 3** Pull the PDU clear of the chassis by pulling on the captive screws. Support its weight from below.

Replacing an I/O Module (or UCS 6324 Fabric Interconnect For UCS Mini)

The chassis houses two I/O modules (IOMs) that allow the blade servers in the chassis to communicate with Cisco UCS fabric interconnects.

In the Cisco UCS Mini Server Chassis, the same slot that is used for an IOM is used for the Cisco UCS 6324 Fabric Interconnect. Up to two of these modules can be installed in the chassis.



Note The Cisco UCS 2304 IOM cannot be installed in the same chassis with a UCS 2208XP or UCS 2204XP IOM except during migration.



Note There is a version 2 of the UCS 2304 IOM. You cannot mix UCS-IOM-2304V2 and UCS-IOM-2304 in the same chassis. If you replace one UCS-IOM-2304 with UCS-IOM-2304V2, you must replace both IOMs with V2.

UCS-IOM-2304V2 requires Cisco UCS Manager 4.0(4) or later.

Removing an IOM or UCS 6324 Fabric Interconnect

Procedure

- Step 1** Remove all cables from the IOM or UCS 6324 Fabric Interconnect.
- Step 2** Loosen the captive screws on the IOM or UCS 6324 Fabric Interconnect.
- Step 3** Pull the levers outward to unseat the IOM or UCS 6324 Fabric Interconnect.
- Step 4** Using the levers, pull the IOM or UCS 6324 Fabric Interconnect from its slot.
- Step 5** Only if the slot is to remain empty, install a blank IOM filler panel (N20-CBLKI).

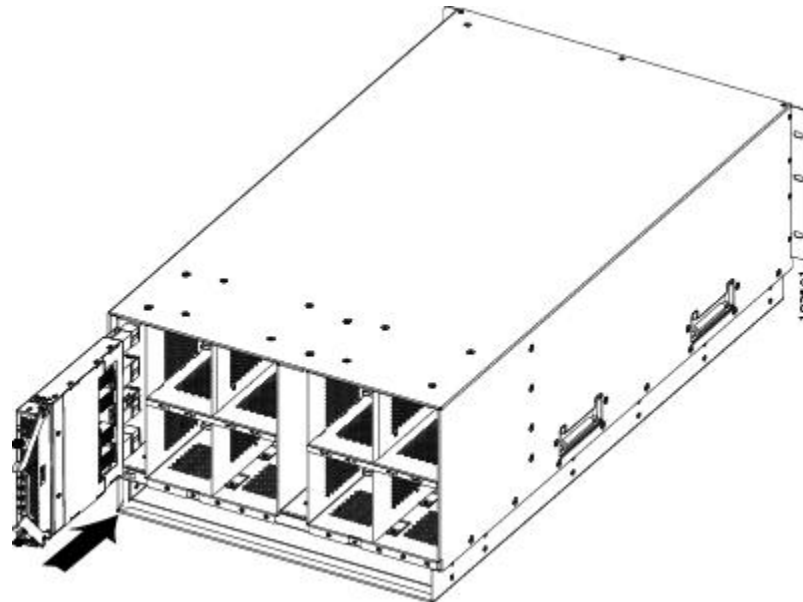
Note If you plan to remove an IOM or UCS 6324 fabric interconnect for an extended period of time, you must replace it with the N20-CBLKI blank to avoid EMI issues. Blanks can be ordered from Cisco.

Installing an IOM or UCS 6324 Fabric Interconnect

Procedure

- Step 1** Make sure that the two levers at the front of the FEX or the UCS 6324 Fabric Interconnect are pulled open.
- Step 2** Slide the FEX or UCS 6324 Fabric Interconnect into the chassis slot, ensuring that the module is fully seated.

Figure 42: Positioning an IOM or UCS 6324 Fabric Interconnect into the Server Chassis



- Step 3** Close the levers and tighten the captive screw on each lever.
- Step 4** Connect the networking cables (see [SFP+ Transceivers, on page 53](#) and [Proper FEX and Fabric Interconnect Port Connectivity, on page 50](#)).
- Step 5** Verify that the module is functioning correctly. See [LED Locations, on page 21](#) and [Interpreting LEDs, on page 22](#).

Migrating from UCS 6200 to UCS 6454 Fabric Interconnects

You can migrate UCS 6200 Series FIs to UCS 6454 FIs.



Note If you plan to migrate to UCS 2408 IOMs, you must first migrate from UCS 6200 Series FIs to UCS 6400 Series FIs. See [Supported Migration Paths, on page 69](#).

Supported Migration Paths

The following migration paths for FIs and IOMs are supported:

Starting Hardware	Migration To
UCS 6200 FI with 2200 IOMs	UCS 6400 Series FI with 2200 IOMs
UCS 6400 Series FI with 2200 IOMs	UCS 6400 Series FI with 2408 IOMs

Fabric Interconnect Migration Considerations

Ensure that the following prerequisites are met before beginning any procedures in this section:



Caution

Cisco UCS Manager Release 4.0(1a) is the minimum version that provides support for Cisco UCS 6454 Fabric Interconnects. To migrate from Cisco UCS 6200 Series to Cisco UCS 6454 Fabric Interconnects:

- Cisco UCS 6200 Series Fabric Interconnects must be on Cisco UCS Manager Release 4.0(1) or a later release.
- Cisco UCS 6454 Fabric Interconnects must be loaded with the same build version that is on the Cisco UCS 6200 Series Fabric Interconnect that it will replace.



Note

Cisco UCS 6454 FI requires Cisco UCS Manager 4.0(1a) or later. Cisco UCS 2408 IOM requires Cisco UCS Manager 4.0(4c) or later. If you will also be migrating to UCS 2408 IOM, upgrade to 4.0(4c) or later.

- Licenses from Cisco UCS 6200 Series Fabric Interconnects are not transferable to Cisco UCS 6454 Fabric Interconnects. You must obtain licenses for the Cisco UCS 6454 Fabric Interconnects before you upgrade.
- During migration, the Cisco UCS 6200 Series Fabric Interconnect and the Cisco UCS 6454 Fabric Interconnect must use the same allowed SSL protocol, either default or Only TLSv1.2, to successfully complete compatibility checks.
- Cisco UCS 6454 Fabric Interconnects use the IDLE fill pattern for FC uplink ports and FC storage ports when using 8 Gbps speed.

When migrating to Cisco UCS 6454 Fabric Interconnects and configuring FC Uplink Ports or FC Storage Ports at 8Gbps speed, ensure that the fill pattern is set as IDLE on the corresponding FC switch ports and the direct-attached FC storage array ports. If the fill pattern is not set as IDLE, FC uplink ports and FC storage ports operating at 8 Gbps might go to an errDisabled state, lose SYNC intermittently, or receive errors or bad packets.

Cisco UCS 6454 Fabric Interconnects do not support 8 Gbps direct-attached FC connectivity (FC uplink ports or FC storage ports) without fill-pattern set to IDLE. When migrating to Cisco UCS 6454 Fabric Interconnects from Cisco UCS 6200 Series Fabric Interconnects, do one of the following:

- Use a SAN switch between the Cisco UCS 6454 Fabric Interconnect and the storage array with 8 GB FC connectivity.
 - Upgrade the storage array to 16 GB or 32 GB FC connectivity.
- Before migrating from Cisco UCS 6200 Series Fabric Interconnects to Cisco UCS 6454 Fabric Interconnects, ensure that you unconfigure the unified ports on the Cisco UCS 6200 Series Fabric Interconnects.

After migrating to Cisco UCS 6454 Fabric Interconnects, reconfigure the unified ports based on their location on the Cisco UCS 6454 Fabric Interconnects, and reacknowledge the newly configured ports. For example, a unified port on a UCS 6248 Fabric Interconnect should be reconfigured on any port between 1 and 16 on a Cisco UCS 6454 Fabric Interconnect.

- Upgrading the fabric interconnect should be done before upgrading to a new FEX/IOM or virtual interface card.
- During fabric interconnect migration, image synchronization between fabric interconnects is not allowed. This is done to prevent incompatible images from getting synchronized. We recommend that you download B-Series and C-Series server software bundles again after migration is complete.
- Do not attempt to implement new software features from the new Cisco UCS software version until all required hardware is installed.
- Changes to the topology, such as the number of servers or uplink connections, should be performed after the fabric interconnect migration is complete.
- Make a detailed record of the cabling between FEXes/IOMs and fabric interconnects. You must preserve the physical port mapping to maintain the server pinning already configured and minimize down time.
- For a cluster configuration, both fabric interconnects must have symmetrical connection topologies between fabric interconnect and FEXes/IOMs.
- Cisco UCS VIC 1455 and 1457 adapters support cables of 10G and 25G speed. However, the cables connecting Cisco UCS VIC 1455 or 1457 adapter ports to each 6454 fabric interconnect must be of uniform speed-either all 10G or all 25G cables. If you connect these adapter ports to a 6454 fabric interconnect through a mix of 10G and 25G cables, UCS rack-mount server discovery fails and ports may go to a suspended state.
- Standalone installations should expect down time. Migrating or upgrading a fabric interconnect is inherently traffic disruptive.
- A best practice would be to perform a full configuration and software backup before performing this hardware upgrade.
- A WWN pool can include only WWNNs or WWPNS in the ranges from 20:00:00:00:00:00:00 to 20:FF:00:FF:FF:FF:FF or from 50:00:00:00:00:00:00 to 5F:FF:00:FF:FF:FF:FF. All other WWN ranges are reserved. When fibre channel traffic is sent through the UCS infrastructure the source WWPNS is converted to a MAC address. You cannot use WWPNS pool which can translate to source multicast MAC addresses. To ensure the uniqueness of the Cisco UCS WWNNs and WWPNS in the SAN fabric, Cisco recommends using the following WWN prefix for all blocks in a pool:
20:00:00:25:B5:XX:XX:XX

Port Mapping For Upgrades

The upgrade described here is primarily for upgrading a Cisco UCS 6248 fabric interconnect to a Cisco UCS 6454. The same considerations will also apply when upgrading a Cisco UCS 6296 fabric interconnect to a Cisco UCS 6454.



Note If you are using appliance ports for direct attached storage, you must add VLANs to the ethernet uplinks. This will ensure that vNICs can properly pin on boot.

On the UCS 6248 fabric interconnect, you can separate the 32 physical ports in slot one into two contiguous pools, low numbered ports being Ethernet ports and high numbered ports being Fibre Channel ports. On the UCS 6454 fabric interconnect, you can configure the first 16 ports as Fibre Channel ports (when using Cisco UCS Manager releases earlier than 4.0(4), only ports 1-8 are unified ports).

Because a UCS 6248 has 32 ports in slot 1 and a UCS 6454 has all ports in slot 1, any ports on GEM slots will be removed during the hardware upgrade process.

**Caution**

If you ever need to change the pool sizes for slot 1, you must reboot the fabric interconnect, which can lead to a service disruption. If you ever need to change the pool sizes for slot 2, you must reset the expansion module in slot 2. To minimize disruption, plan to have at least a few Ethernet uplink and Fibre Channel uplink ports configured on slot 1. Implement this fail-safe after the upgrade is complete and the system restabilizes.

Migrating to UCS 6454 Fabric Interconnect

The steps in this section apply to the following supported scenarios:

- Migrating from a UCS 6200 Series Fabric Interconnect to a UCS 6454 Fabric Interconnect

**Note**

Migration from UCS 6300 Series FIs to UCS 6400 Series is not supported at this time.

You can migrate from a UCS 6200 Series Fabric Interconnect to a UCS 6454 Fabric Interconnect. However, you cannot migrate back to a UCS 6200 Series Fabric Interconnect after you have migrated to a UCS 6454 Fabric Interconnect.

The UCS 6454 Fabric Interconnect is intended as a replacement for the UCS 6200 Series Fabric Interconnect, but not as a replacement for the higher speed (or 40Gb) UCS 6332/6332-16UP Fabric Interconnect. Therefore, Cisco has not tested or published a plan to migrate from UCS 6332/6332-16UP Fabric Interconnects to UCS 6454 Fabric Interconnects.

Unless otherwise noted, for more information about how to perform configuration procedures in Cisco UCS Manager for a particular step, see the appropriate [Cisco UCS Manager configuration guide](#) for Cisco UCS Manager Release 4.0.

Procedure

-
- Step 1** Download Cisco UCS Manager, Release 4.0 or later versions to the UCS 6200 Series Fabric Interconnects and upgrade to this version.
- Step 2** Evacuate traffic from the subordinate fabric interconnect to ensure there is no data traffic impact during migration.
See [Firmware Management Guide, FI Traffic Evacuation](#)
- Step 3** Unconfigure all the server ports on the subordinate fabric interconnect.
- Step 4** Power down the subordinate fabric interconnect by unplugging it from the power source.
If you are monitoring the migration using a KVM session, you may need to reconnect the KVM session when you power down the fabric interconnect.
- Step 5** Mount the replacement UCS 6454 fabric interconnect into either the same rack or an adjacent rack.
See the [Cisco UCS 6400 Series Fabric Interconnect Hardware Installation Guide](#).

- Step 6** Disconnect the cables from the chassis FEXes/IOMs to the subordinate fabric interconnect ports in slot 1 on the UCS 6200 Series Fabric Interconnect.
- Step 7** Connect these cables into the corresponding ports on slot 1 of one of the new Cisco UCS 6454 fabric interconnects, using the connection records to preserve the port mapping and the configured server pinning. To change the port mapping, especially while reconfiguring FC ports, you must reacknowledge the newly configured ports.
- Step 8** Connect the L1/L2 cables that you disconnected onto the new Cisco UCS 6454 fabric interconnect. L1 connects to L1; L2 connects to L2.
- Step 9** Connect the server and uplink cables.
See the [Cisco UCS 6400 Series Fabric Interconnect Hardware Installation Guide](#).
- Step 10** Connect the power to the new Cisco UCS 6454. It will automatically boot and run POST tests. If it reboots itself, this is a normal behavior.
Important Directly connect the console port to a terminal and observe the boot sequence. You should at some point see the Basic System Configuration Dialog, where you will configure the switch as a subordinate interconnect. If you do not see this dialog, you either have different builds of software on your old primary and new subordinate, or the new subordinate has previously been part of a cluster and will need to have all configuration information wiped before it can be added to a cluster as a subordinate. In either case, immediately disconnect the L1 and L2 connections and complete the bringup as a standalone fabric interconnect, then correct the issue before proceeding further.
- Step 11** Configure the server and uplink ports on the new Cisco UCS 6454 fabric interconnect.
- Step 12** Wait for the new subordinate Cisco UCS 6454 fabric interconnect to automatically synchronize the configuration and database/state information from the primary UCS 6200 Series Fabric Interconnect.
Synchronization between primary and subordinate fabric interconnects can take several minutes. You may see an error message that will persist until the server ports are enabled.
The port configuration is copied from the subordinate switch to the new hardware.
- Step 13** Verify that the data path is ready.
See [Firmware Management Guide, Verifying the Data Path](#).
Ensure that all faults are resolved before proceeding.
a. Verify and if necessary reconfigure the SAN pin group for FC ports in the associated service profile.
b. Verify and if necessary reconfigure the LAN pin group for Ethernet ports in the associated service profile.
c. Verify and if necessary reconfigure the port channel for uplink Ethernet ports.
- Step 14** Reconfigure the server ports that you unconfigured in Step 3.
a. If you have changed port mappings, you may need to reacknowledge the chassis or rack server connected to the subordinate fabric interconnect.
b. Verify and if necessary reconfigure Ethernet ports as server ports.
- Step 15** Restart stopped traffic flows by disabling fabric evacuation.
- Step 16** Promote the subordinate fabric interconnect to primary, and then repeat the process on the second new UCS 6454.

Cable the second new fabric interconnect identically to the first, and then allow the reconfiguration to be applied to the second new fabric interconnect.

Migrating to UCS 2408 IOMs



Note The Cisco UCS component compatibility with the UCS 2408 IOM is as follows:

- Requires Cisco UCS Manager 4.0(4e) or later software
 - Supported with the UCS 6400 Series FIs only
 - Supported with Cisco UCS 1300 and 1400 Series Virtual Interface Cards (VICs) only
 - Supported with Cisco UCS B-Series M4 and M5 server generations only
-

The steps in this section apply to the following supported scenarios:

- Migrating from UCS 6400 Series FIs *with* 2200 Series IOMs to UCS 6400 Series FIs with UCS 2408 IOMs.



Note If you plan to migrate to UCS 2408 IOMs, you must first migrate from UCS 6200 Series FIs to UCS 6400 Series FIs. See [Migrating from UCS 6200 to UCS 6454 Fabric Interconnects, on page 69](#).



Note Migration from UCS 2300 Series IOMs to UCS 2400 Series IOMs is not supported at this time.



Note If the primary and the subordinate IOMs are different models, the overall status of the IOMs is shown as **Peer Comm Problem**. However, the IOMs can still be replaced.

IOM 2408 connects only to the 6454 Fabric Interconnects. Please follow the steps described in 6454 migration-guide to ensure the UCS domains with IOM 2200 series have 6454 Fabric Interconnects.

Procedure

- Step 1** UCS IOM 2408 connects only to the UCS 6454 Fabric Interconnects. Follow the steps to ensure the UCS domains with IOM 2200 series have 6454 Fabric Interconnects. See [Migrating from UCS 6200 to UCS 6454 Fabric Interconnects, on page 69](#).
- Step 2** Ensure the supported 25-GbE transceivers and cables are used to connect the IOM 2408 with FI 6454. See the [Cisco UCS 2408 Fabrix Extender Data Sheet](#).

- Step 3** See the list of UCS components compatible with 2408 IOM above this procedure.
Use the hardware replacement procedures in [Replacing an I/O Module \(or UCS 6324 Fabric Interconnect For UCS Mini\)](#), on page 68.
- Step 4** Back up and export the Cisco UCS Manager configuration.
- Step 5** Perform UCSM infrastructure upgrade to version 4.0(4e) or above – Fabric Interconnect and IOM
- Step 6** Before starting the IOM migration, ensure that the UCS domain is fully operational with no faults.
- Step 7** From UCS Manager, validate that cluster HA redundancy state is present, that there are no faults, and identify the subordinate FI 6454 in the domain.
- Step 8** To have minimal traffic loss during migration, ensure there are redundant paths from the blade servers over fabrics A and B.
- Note** Because in-flight packet loss is expected during the IOM migration, perform the next set of operations only during a maintenance window.
- Step 9** On the subordinate FI 6454, unconfigure server ports that connect to the migrating IOM 220x. When you unconfigure the server ports, the primary FI takes over traffic forwarding.
- Step 10** Disconnect cables connecting the subordinate FI 6454 and the corresponding IOM 220x.
- Step 11** Remove and replace the migrating IOM 220x with IOM 2408. Connect the IOM 2408 to the subordinate FI 6454 with 25-gigabit ethernet cables. At this point, the migrating UCS chassis has a mix of IOM 220x and IOM 2408.
- Step 12** Configure server ports from UCS Manager on the subordinate FI 6454 ports connected to the IOM 2408, one-by-one to each chassis. Verify the 25GbE links come up between the IOM and FI.
- Step 13** Wait for auto-upgrade of IOM 2408 to complete. Due to a known limitation, the migration of IOM 2208 to IOM 2408 requires a reboot of the FI after replacing the IOM. After the reboot of the subordinate FI, wait for the subordinate FI and migrating IOM 2408 to be fully operational with traffic resuming over the subordinate FI fabric.
- Note** At this time, when migrating from UCS 2208 IOM to 2408 IOM, Vethernet interfaces are not pinned to server interfaces (HIFPC) dynamically on the FI. You must reboot the FI to bring up the Vethernet interfaces. Refer to the Release Notes for 4.0(4e) for more details. The issue is being tracked in CDETS CSCvr46327.
- [RNE for 4.0\(4e\) UCSM](#)
- Step 14** Ensure the IOM 2408 has loaded the latest firmware and verify there are no faults on UCS chassis with the new IOM 2408. Cluster HA redundancy will not be present due to mismatch of IOM's on the migrating UCS chassis but traffic forwarding over FI's is not affected.
- Step 15** After completing IOM migration on the subordinate FI, repeat steps 9 to 14 to replace the other IOM 220x connected to the *primary* FI 6454 and complete the IOM 2408 migration for the UCS domain.
- Note** After reload of the primary FI, fabric cluster failover will happen. However, this does not affect data traffic forwarding in the UCS domain.
- Step 16** With the completion of IOM 2408 migration on all the UCS 5108 chassis in the domain, verify that cluster HA redundancy is back on the Fabric Interconnects, that there are no faults on the UCS Manager, and that traffic is forwarding over the new IOM 2408s on both Fabric A and B.

Migrating to UCS 6300 Series Fabric Interconnects

Before starting the hardware migration, make the following changes to Cisco UCS Manager software:

- Download Cisco UCS Manager, Release 3.1 to the UCS 6200 Series Fabric Interconnects and upgrade to this version.
- Download Cisco UCS Manager, Release 3.1 to the UCS 6300 Series Fabric Interconnects.
- Ensure that all fabric interconnects have the same versions of the kickstart, system, and UCS Manager images.
- Upgrade the B-bundle if you plan to use the UCS 2304 IOM.



Note There is a version 2 of the UCS 2304 IOM. UCS-IOM-2304V2 requires Cisco UCS Manager 4.0(4) or later. You cannot mix UCS-IOM-2304V2 and UCS-IOM-2304 in the same chassis.

- If you plan to migrate to a UCS 6332-16UP Fabric Interconnect, determine the number of VSANs that are configured in your system. If more than 15 VSAN IDs are configured, reduce this number to 15 or less to avoid possible configuration issues with Fibre Channel or FCoE ports on a UCS 6332-16UP Fabric Interconnect. It is not necessary to reduce the number of configured VSANs before migrating to a UCS 6332 Fabric Interconnect.

You can migrate from a UCS 6200 Series Fabric Interconnect to a UCS 6300 Series Fabric Interconnect. You can also revert back to UCS 6200 Series Fabric Interconnect after you have migrated to a UCS 6300 Series Fabric Interconnect.

You cannot migrate from a UCS 6100 Series Fabric Interconnect to a UCS 6300 Series Fabric Interconnect.

Migrating to 6300 Series Fabric Interconnect Modules

The steps in this section apply to the following scenarios:

- Migrating from a UCS 6248 Fabric Interconnect to a UCS 6332 Fabric Interconnect with a UCS 2204 or UCS 2208 IOM
- Migrating from a UCS 6248 Fabric Interconnect to a UCS 6332-16UP Fabric Interconnect with a UCS 2304 IOM
- Migrating from a UCS 6296 Fabric Interconnect to a UCS 6332 Fabric Interconnect with a UCS 2204 or UCS 2208 IOM
- Migrating from a UCS 6296 Fabric Interconnect to a UCS 6332-16UP Fabric Interconnect with a UCS 2304 IOM



Note Following a migration, remove port-related configurations in the fabric interconnect and then reconfigure the ports. For example, you must reconfigure the SPAN destination ports after migrating from a UCS 6200 Series Fabric Interconnect to a UCS 6300 Series Fabric Interconnect.



Note As stated in the Prerequisites, make sure that you reduce the number of configured VSANs in your UCS system to 15 or less before you begin the migration, if you plan to migrate to a UCS 6332-16UP Fabric Interconnect. It is not necessary to reduce the number of configured VSANs before migrating to a UCS 6332 Fabric Interconnect.

Procedure

- Step 1** If you are upgrading to the Cisco UCS 6332-16UP, verify that the environment does not exceed 15 VSANs.
- Step 2** Download Cisco UCS Release 3.1(1) or later from the Cisco Support site at <https://software.cisco.com/download/navigator.html> and upgrade the existing Cisco UCS 6200 Series domain to Release 3.1(1) or later.
- Step 3** Fail over traffic from the subordinate server to the primary server. You can do this in several ways, as listed in the following table:

Failover Method	Considerations
Disable uplink	Individually disable the uplink ports for Ethernet, Fibre Channel, and FCoE connections. Ethernet only: A virtual network interface card (vNIC) with network control policy with a warning on “Action on Uplink Fail” will not be disabled. Thus, the NIC needs to be disabled manually for failover.
Disable all uplink interfaces	With a single click, this method disables all uplinks that are not in a port channel. This method needs to be implemented on Ethernet, Fibre Channel, and FCoE connections. Ethernet only: As with the disable uplink method, vNICs with network control policy with a warning on “Action on Uplink Fail” are not disabled. Manual intervention is required.
Disable all port channels	With a single click, this method disables all uplinks that are in a port channel, links that are not in a port channel are excluded. This method needs to be implemented on Ethernet, Fibre Channel, and FCoE connections. Ethernet only: As with the disable uplink method, vNICs with network control policy with a warning on “Action on Uplink Fail” are not disabled. Manual intervention is required.

Failover Method	Considerations
Fabric evacuation	This method disables all the server ports, which disables both the vNIC and virtual host bus adapter (vHBA) for the host. This method does not disable the virtual interface (VIF) on Cisco UCS C-Series servers that are directly connected to the fabric interconnect. For those connections, you need to disable the ports manually.

Note For Cisco UCS domains that use blades only, Cisco recommends the fabric evacuation method. This approach provides the fastest way to validate proper traffic failover. It also lets you back out the failover simply by turning the fabric evacuation off.

If Cisco UCS C-Series servers are directly attached to the fabric interconnect, then manually disable either the port or the uplink for Ethernet, Fibre Channel, and FCoE.

- Step 4** Verify that traffic is flowing over the primary fabric interconnect.
- Step 5** If the Cisco Nexus 2232PP 10GE is being retired and replaced by Cisco Nexus 2348UPQ 10GE, then decommission and remove old fabric extender from Cisco UCS Manager.
- Step 6** Port schemes between UCS 6200 and 6300 Series FIs are vastly different, so unconfigure all the ports on the subordinate interconnect and reconfigure the ports on the new fabric interconnect after it joins the cluster.
- Note** You do not need to delete the port-channel groups because they can be reused, but you should verify that the individual ports are removed from LAN and SAN port channels, VLAN groups, etc..
- Step 7** Remove the cable from the downed subordinate fabric interconnect.
- If you are replacing the IOM and Cisco Nexus 2232 with the Cisco UCS 2304 and Cisco Nexus 2348-UPQ, then make the replacement now.
- Step 8** Install the new Cisco UCS 6332 fabric interconnect and connect the L1 to L2 connections between the Cisco UCS 6200 Series primary interconnect to the Cisco UCS 6332 platform subordinate interconnect.
- Step 9** Reconnect the components (IOM, Cisco Nexus 2200 and 2300 Series, and Cisco UCS C-Series servers) to the Cisco UCS 6332 platform subordinate interconnect according to your port planning table.
- Step 10** Power up the Cisco UCS 6332 platform subordinate interconnect. If it is correctly cabled with the correct software version, then the subordinate interconnect will recognize that it is connecting to an existing cluster.
- Step 11** Enter **show cluster extended-state** to verify the cluster state.
- Step 12** Configure the ports (Fibre Channel ports, server ports, appliance ports, breakout ports, uplink ports, etc.) on the Cisco UCS 6332 platform subordinate fabric interconnect.
- Step 13** Verify server discovery. The IOM discovery process on the Cisco UCS 6332 platform subordinate interconnect may take a few minutes to complete and become operational. In certain situations, you may need to acknowledge the IOM (choose Equipment > Chassis > Chassis X > IO Modules > IO Module X).
- Cisco UCS C-Series servers that are directly connected with dual adapters or are connected to a different port require server acknowledgment to properly update the port mapping. To reduce the number of server reboots to one, you can perform this step after the other fabric interconnect has been replaced.
 - For servers connected to the Cisco Nexus 2200 platform fabric extenders, in most cases a fabric extender reacknowledgment will reestablish a connection. Otherwise, a server reacknowledgment is needed.
- Step 14** After all port configuration processes are complete, including the process of adding ports back into LAN and SAN port channels and VLAN groups, you need to validate LAN and SAN connectivity. Use the appropriate show commands, such as the following:

- show interface status
- show port channel summary
- show interface trunk
- show flogi database
- show fcns database

Note Note that a Cisco UCS M4 server with a Cisco UCS VIC 1340 and a port expander that is connected to a Cisco UCS 2304 IOM will be connected as a native 40-Gbps port. You can verify this connection by entering the show interface status command in the Cisco NX-OS Software shell.

- Step 15** Reestablish flow on the subordinate fabric interconnect, the Cisco UCS 6332 platform.
If a method other than fabric evacuation is used, then enable uplinks for Ethernet, Fibre Channel, and FCoE.
- Note** Some backplane ports may report link down because no service profile is associated with that server or the host is powered off.
- Step 16** Verify that traffic is flowing normally on the Cisco UCS 6332 platform subordinate interconnect.
- Step 17** After verifying traffic flow, promote the Cisco UCS 6332 platform subordinate interconnect to primary status by entering the **cluster lead b** command in the local-mgmt shell on the primary fabric interconnect.
- Step 18** Enter the **show cluster extended-state** command to verify that the primary role has switched to the Cisco UCS 6332 platform and that high availability (HA) is in the ready state.
- Step 19** Repeat the steps 3 through 14 to replace the other Cisco UCS 6200 Series Fabric Interconnect.
- Step 20** (Optional) Promote fabric interconnect A to the primary role with the command cluster lead a in the local-mgmt shell of the primary fabric interconnect (B).
- Step 21** Check for faults from old configurations, policies, software packages, etc. Remove any noncompliant configurations, policies, and software packages to clear faults.
-

Installing and Removing a Fan Module

You can hot swap a fan module (N20-FAN5) without causing an electrical hazard or damage to the system. However, you can only remove one fan module while the system is operating. Removing more than one fan module could cause overheating.



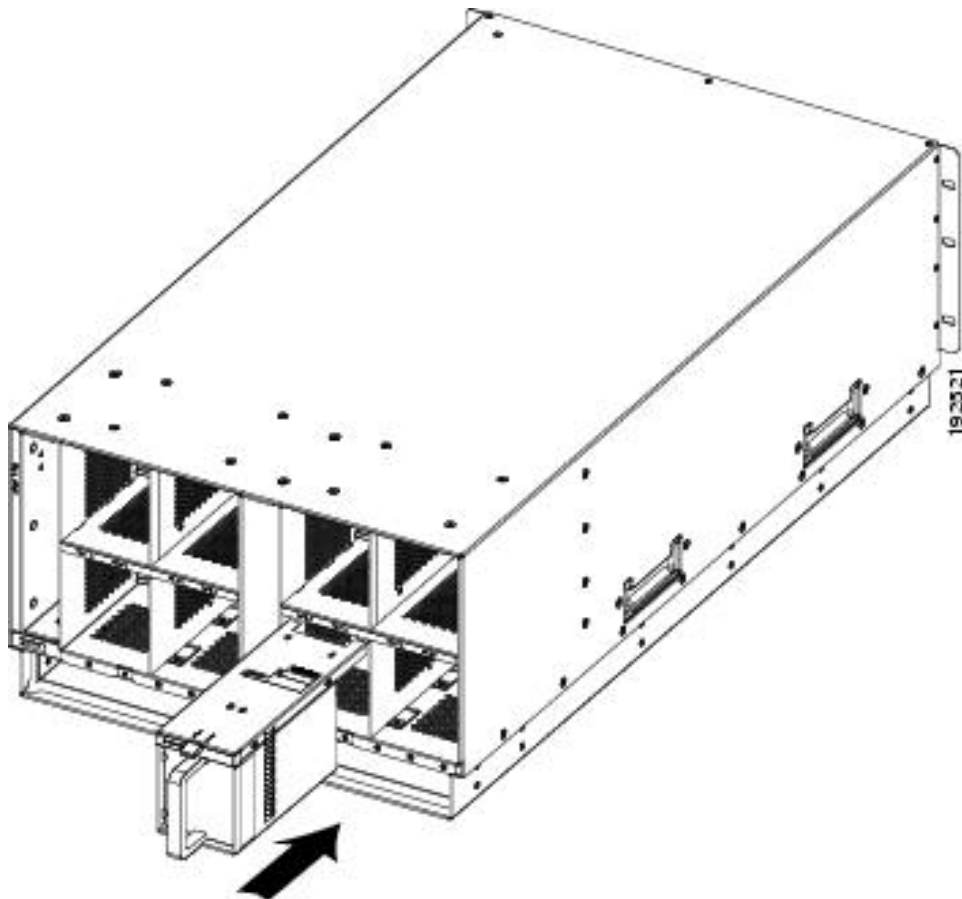
Note When a fan is removed, louvers inside the chassis prevent recirculation of air into the system or loss of cooling. However, you should not leave the chassis for extended periods of time without all fan modules in place.

Installing a Fan Module

Procedure

- Step 1** Hold the fan module with the spring latch at the top of the module.
- Step 2** Push the fan module into the chassis until it seats properly and the spring latch snaps into place.
- Step 3** Listen for the fans if the chassis is powered on. You should immediately hear it operating. If you do not hear it, ensure that the fan module is inserted completely in the chassis and the faceplate is flush with the outside surface of the chassis.
- Step 4** Verify that the LED behavior is as expected. See [LED Locations, on page 21](#) and [Interpreting LEDs, on page 22](#).

Figure 43: Positioning a Fan Module (N20-FAN5) in the Cisco UCS Server Chassis



Removing a Fan Module

Procedure

- Step 1** Hold the fan module by its handle.
- Step 2** Press down on the spring latch at the top of the fan module.
- Step 3** Pull the fan module clear of the chassis.

Note The chassis is designed to have all fan modules in place and operating at all times. Do not leave a fan module bay empty for longer than is necessary to replace it with a new fan module.



APPENDIX **A**

Technical Specifications

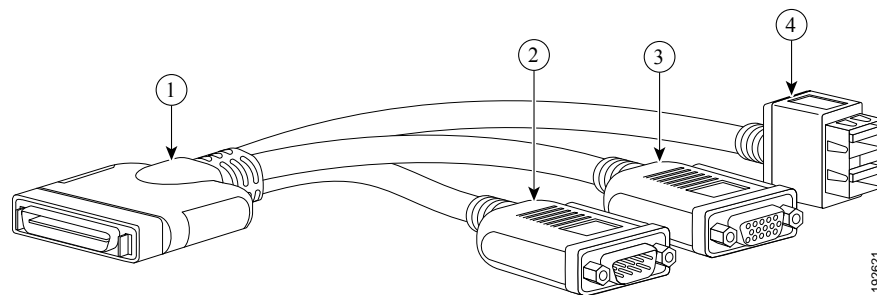
This appendix lists the technical specifications for the Cisco UCS 5108 server chassis and includes the following sections:

- [KVM Cable, on page 83](#)
- [Chassis Specifications, on page 84](#)
- [Environmental Specifications, on page 85](#)
- [Specifications for the Cisco UCS 5108 Blade Server Chassis Power Supply Units, on page 86](#)
- [Supported AC Power Cords and Plugs, on page 89](#)

KVM Cable

The KVM cable (N20-BKVM) provides a connection into a Cisco UCS blade 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 a blade server.

Figure 44: KVM Cable for Blade Servers



1	Connector to blade server slot	3	VGA connection for a monitor
2	DB9 serial connector	4	2-port USB connector for a mouse and keyboard

Chassis Specifications

Table 17: Cisco UCS Server Chassis

Description	Specification
Height x Width x Depth	10.5 in (26.7 cm) x 17.5 in (44.5 cm) x 32 in (81.2 cm)
Blade server slots	8
FEX slots	2
Fan module bays	8
Power supply bays	4
Backplane throughput	1.2 Tb aggregate

Table 18: Weight of the Chassis Components

Description	Specification
Empty chassis	90 lbs (40.83 kg)
FEX	2.5 lbs (1.13 kg)
UCS 6324 Fabric Interconnect	2.5 lbs (1.13 kg)
Fan module	1.8 lbs (0.82 kg)
B200 Blade Server	13.5 lbs (6.1 kg)
B230 Blade Server	18.0 lbs (8.16 kg) ⁵
B250 Blade Server	25 lbs (11.34 kg) ⁵
B440 Blade Server	34.5 lbs (15.65 kg) ⁵
Hard drive	0.8 lbs (0.36 kg)
Fully Populated UCS 5108 Server Chassis	Approximately 255 lbs (115.66 kg), depending on models and options selected

² The system weight listed here is an estimate for a fully configured system and will vary depending on the devices installed.

Environmental Specifications

Table 19: Environmental Specifications for the Chassis

Description	Specification
Temperature, operating within altitude: 0 to 10,000 feet (0 to 3,000 meters)	<p>50 to 95°F (10 to 35°C)</p> <p>(As altitude increases, maximum temperature decreases by 1°C per 300m.)</p> <p>System performance might be reduced for greater-than 165 W TDP processors if operating with a fan fault or above 32° C (89.6° F) system air inlet temperature, depending upon the application load. See the CPU Configuration Rules in your M5 blade server service note for more information.</p> <p>For general information, see the Cisco Unified Computing System Site Planning Guide: Data Center Power and Cooling.</p>
Temperature, non-operating within altitude: 0 to 40,000 feet (0 to 12,000 meters)	-40 to 149°F (-40 to 65°C)
Humidity (RH), noncondensing	<p>Operating: 10-90%, 28°C max. wet bulb</p> <p>Nonoperating: 5-93%, 38°C max wet bulb</p>
Altitude	<p>Operating – 0 to 10000 feet (0 to 3000 meters) Above 10,000 feet, maximum temperature decreases by 1°C per 1000 feet (~300 meters) above 10,000 feet</p> <p>Nonoperating – 40,000 ft (12,000 m)</p>
Sound Pressure Level	83 dBA—at normal operating temperature.

Environmental Conditions and Power Requirement Specifications for Twinax SFP+ Transceivers

Table 20: Environmental Conditions and Power Requirement for the SFP+ Transceiver

Parameter	Symbol	Min.	Max.	Unit
Storage temperature	TS	-40	85	°C
Case temperature	TC	0	50	°C
Module supply voltage	VCCT,R	3.1	3.5	V

Specifications for the Cisco UCS 5108 Blade Server Chassis Power Supply Units

Table 21: AC-input Gold Power Supply (N20-PAC5-2500W) Specifications

Description	Specification
AC-input voltage	Voltage Range 100-120 VAC, 200-240 VAC nominal (range: 90-132 VAC, 180-264 VAC)
AC-input frequency	50 to 60 Hz nominal (range: 47 to 63 Hz)
Maximum AC-input current	12.5 A @ 100 VAC 6.0 A @208 VAC
Maximum input VA	1250 VA at 100 VAC
Maximum output power per power supply	800 W @ 100-120 VAC 1050 W @ 200-240 VAC
Maximum inrush current	15 A (sub cycle duration)
Maximum hold up time	12 ms @ 770 W
Power supply output voltage	12 VDC
Power supply standby voltage	12 VDC
Efficiency Rating	Climate Savers Platinum Efficiency (80Plus Platinum Certified)
Form Factor	RSP2 (C-Series 1U and C3x60 Storage Server)
Input connector	IEC320 C14

Table 22: AC-input Platinum Power Supply (UCSB-PSU-2500ACPL) Specifications

Description	Specification
Minimum Software requirement	UCS Software Release 2.0(2)
AC-input voltage	200 to 240 VAC nominal (Range: 180 to 264 VAC)
AC-input frequency	50 and 60 Hz nominal (Range: 47 to 63 Hz)
AC-input current	< 16 Amps @ 200 VAC
Maximum Input VA	2790 VA @ 200 VAC
Maximum output power per power supply	2500 W (up to four power supplies)

Description	Specification
Maximum inrush current	35 A (sub cycle duration)
Maximum Heat Output	8530 BTU
Maximum hold up time	12 ms @ 2500 W
Power supply output voltage	12 VDC @ 208 A
Power supply standby voltage	3.3 VDC @ 5A
Efficiency Rating	Climate Savers Platinum
Efficiency (80 Plus Platinum Certified)	20% 50% 100% 90% 94% 91%
Input connector	IEC320 C20

Table 23: DC-Input Power Supply (UCSB-PSU-2500DC48) Specifications

Item	Specification
Minimum software requirement	Cisco UCS Software Release 2.0(1) Capability Catalog Version 42
DC-input voltage	-48 VDC to -60 VDC nominal (range: -40 VDC to -72 VDC)
Maximum output power	2500 W
Maximum inrush current	90 A (cold turn-on)
Current draw at min voltage	71 A
Current draw at max voltage	40 A
Maximum input VA	2840 W
Efficiency	88% at 10% load 88% at 20% load 92% at 50% load 88% at 100% load
DC input terminal block	Accepts Panduit LCD4-14AF-L or equivalent barrel-type lug terminals with 90-degree angle, two-hole tongue, which accommodates 1/0 AWG size copper wire. The connector tongue width is 0.82 in, the stud hole spacing is 5/8 in, and the hole size is 1/4 in.

Item	Specification
Maximum holdup time	8 ms at 50% load 4 ms at 100% load

Table 24: HVDC-Input Platinum Power Supply (UCSB-PSU-2500HVDC) Specifications

Item	Specification
DC-input voltage	200 to 380 VDC nominal (Range: 180 to 400 VDC)
Maximum DC-input current	15.5 Amps @ 200 VDC
Maximum output power	2500 W
Maximum inrush current	35 A
Efficiency rating	Climate Savers Platinum
Efficiency (80 Plus Platinum Certified)	10% 20% 50% 100% 93.5% 94.9% 95% 93%
Power supply output voltage	12 VDC
Maximum holdup time	12 ms 2500 W
Input connector	IEC320 C20

Table 25: AC-input Dual Voltage Platinum Power Supply (UCSB-PSU-2500ACDV) Specifications

Description	Specification
AC-input voltage	200 to 240 VAC nominal (Range: 180 to 264 VAC) 100 to 120 VAC nominal (Range: 90 to 127 VAC) supported only with the UCS 6324 Fabric Interconnect
AC-input frequency	50 and 60 Hz nominal (Range: 47 to 63 Hz)
AC-input current	< 15 Amps @ 200 VAC
Maximum Input VA	2790 VA @ 200 VAC
Maximum output power per power supply	2500 W @ 200 to 240 VAC 1300 W @ 100 to 120 VAC
Maximum inrush current	35 A (sub cycle duration)
Maximum Heat Output	8530 BTU
Maximum hold up time	12 ms @ 2500 W
Power supply output voltage	12 VDC @ 208 A

Description	Specification
Power supply standby voltage	3.3 VDC @ 5A
Efficiency Rating	Climate Savers Platinum
Efficiency (80 Plus Platinum Certified)	10% 20% 50% 100% 93.5% 94.9 % 95% 93%
Input connector	IEC320 C20

DC wiring must meet your local codes and regulations, we recommend using a licensed local electrician to install the DC wiring needed.

To determine the number of power supply units needed for the blade server, remember that each single slot server is budgeted a max 550 W and each full width server is budgeted a max 1100 W. For a more detailed estimate, contact Cisco Sales.

For information about supported power cords, see the [Cisco UCS 5108 Server Chassis Installation Guide](#).

Supported AC Power Cords and Plugs

The AC power connectors on the blade server chassis PDU use an IEC 320 C20 socket. Each chassis power supply has a separate power cord. The power cord that you use to connect the blade server power supply units to an AC power source will have an IEC 320 C19 plug on one end and on the other end one that conforms to the AC power outlet specifications for your country. See the following table to determine which cord to order for your blade server chassis power supply units. When you determine which power cord you need to order, you can verify that its plugs conform to the power outlets for your facility by clicking on its reference link.

The jumper power cords, for use in racks, are available as an optional alternative to the standard power cords. The optional jumper power cords have an IEC C19 connector (such as a Cisco RP Series PDU) on the end that plugs into the chassis' PDU and an IEC C20 connector on the end that plugs into an IEC C19 outlet receptacle. For more information, contact your Cisco Systems representative.



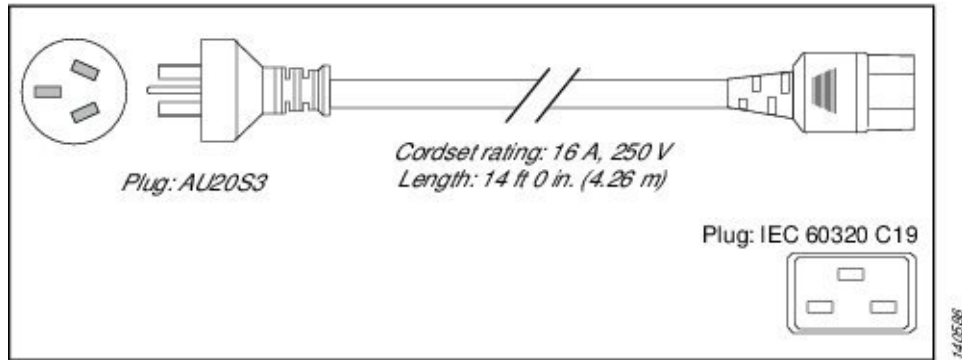
Note Only the regular power cords or jumper power cords provided with the chassis are supported.

Australia and New Zealand

Power Cord Part Number—CAB-AC-16A-AUS

Cord Set Rating—16A, 250 VAC

Figure 45: CAB-AC-16A-AUS Power Cord for the Cisco UCS 5108 Blade Server Chassis

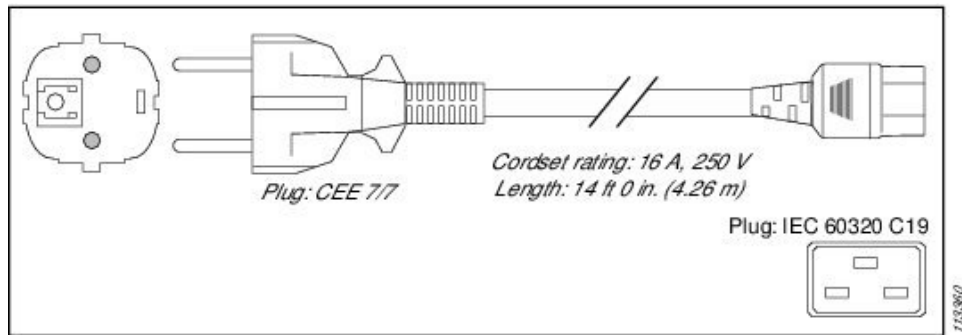


Continental Europe

Power Cord Part Number—CAB-AC-2500W-EU

Cord Set Rating—16A, 250 VAC

Figure 46: CAB-AC-2500W-EU Power Cord for the UCS 5108 Blade Server Chassis

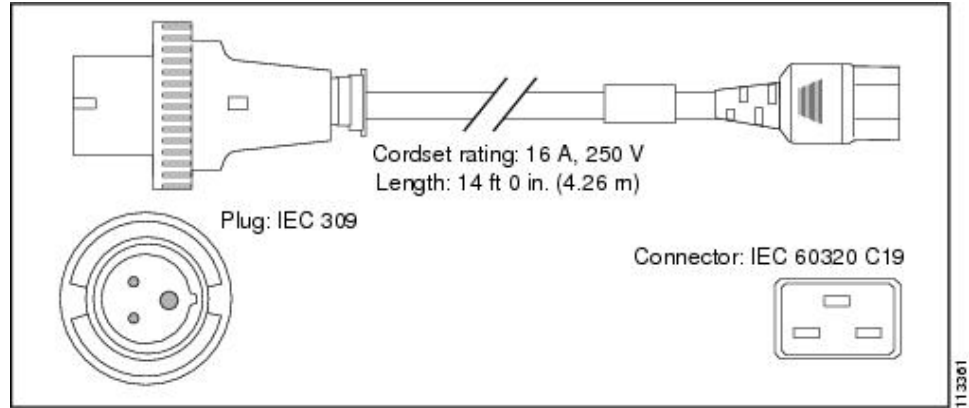


International

Power Cord Part Number—CAB-AC-2500W-INT

Cord Set Rating—16A, 250 VAC

Figure 47: CAB-AC-2500W-INT Power Cord for the UCS 5108 Blade Server Chassis

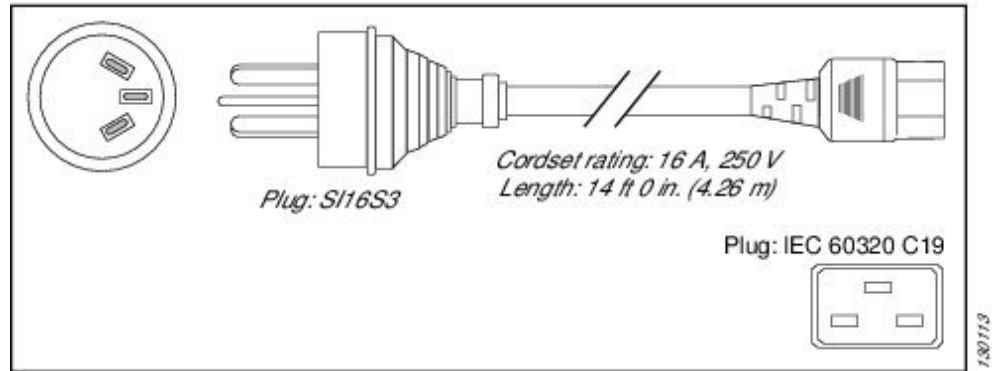


Israel

Power Cord Part Number—CAB-AC-2500W-ISRL

Cord Set Rating—16A, 250 VAC

Figure 48: CAB-AC-2500W-ISRL Power Cord for the UCS 5108 Blade Server Chassis



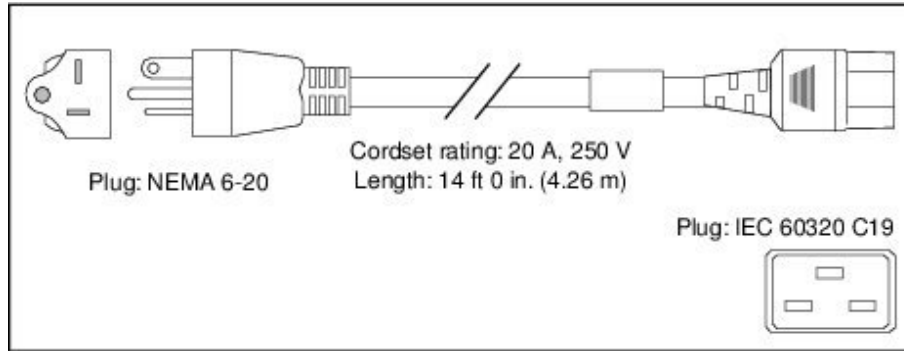
Japan and North America

Non-Locking 200 to 240 VAC operation

Power Cord Part Number—CAB-AC-2500W-US1

Cord Set Rating—16A, 250 VAC

Figure 49: CAB-AC-2500W-US1 Power Cord for the UCS 5108 Blade Server Chassis

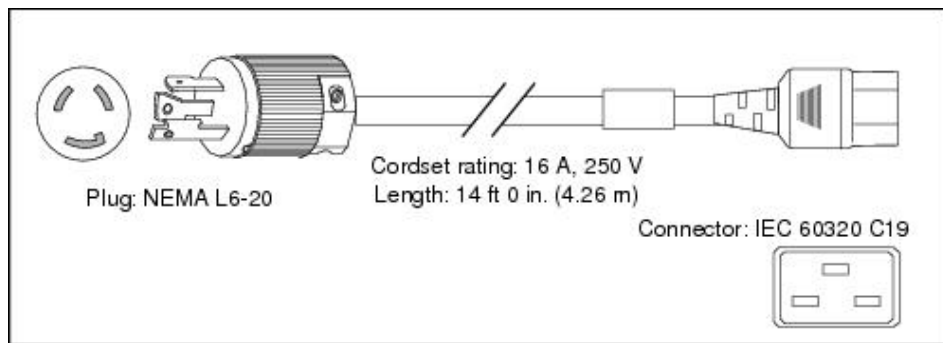


Locking 200 to 240 VAC Operation

Power Cord Part Number—CAB-AC-C6K-TWLK

Cord Set Rating—16A, 250 VAC

Figure 50: CAB-AC-C6K-TWLK Power Cord for the UCS 5108 Blade Server Chassis

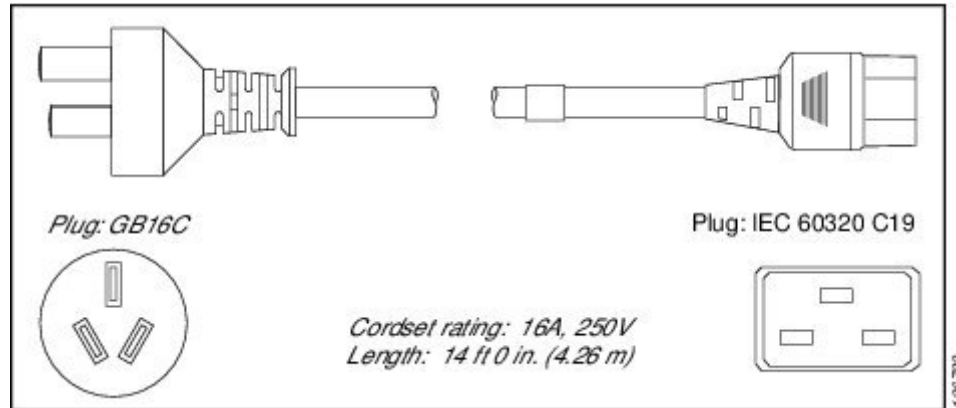


Peoples Republic of China

Power Cord Part Number—CAB-AC-16A-CH

Cord Set Rating—16A, 250 VAC

Figure 51: CAB-AC-16A-CH Power Cord for the Cisco UCS 5108 Blade Server Chassis



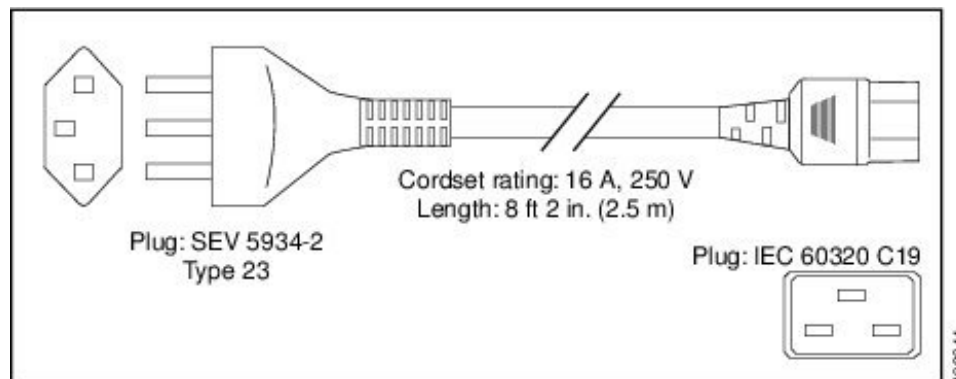
Taiwan

Power Cord—CAB-AC-C19-TW
 Plug—250 VAC 16 A, C19
 Length—7.5 feet / 2.3 meters

Switzerland

Power Cord Part Number—CAB-ACS-16
 Cord Set Rating—16A, 250 VAC

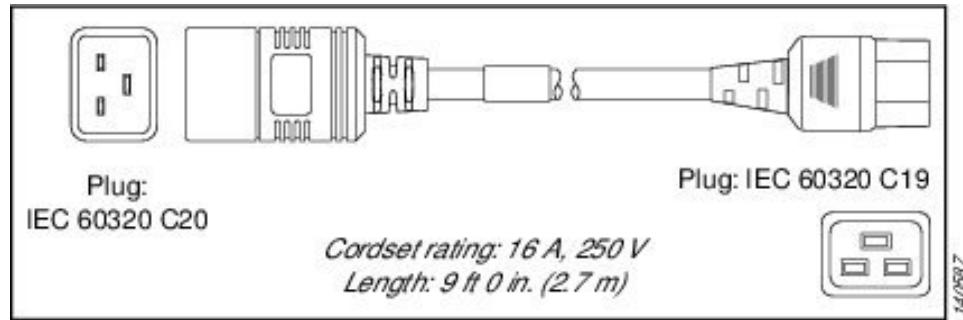
Figure 52: CAB-ACS-16 Power Cord for the UCS 5108 Blade Server Chassis



Power Distribution Unit (PDU)

Power Cord Part Number—CAB-C19-CBN
 Cord Set Rating—Not applicable

Figure 53: CAB-C19-CBN Power Cord for the UCS 5108 Blade Server Chassis





APPENDIX **B**

Site Planning and Maintenance Records



Note For information about how to query the chassis for configuration information, see the *Cisco UCS Configuration Guide*.

This appendix includes the following records to use when installing the Cisco UCS server chassis:

- [Site Preparation Checklist, on page 95](#)
- [Contact and Site Information, on page 97](#)
- [Chassis and Module Information, on page 98](#)
- [FEX Port Connection Record, on page 99](#)
- [UCS 6324 Fabric Interconnect Port Connection Record, on page 100](#)

Site Preparation Checklist

Planning the location and layout of your equipment is essential for successful network operation, ventilation, and accessibility. Consider heat dissipation when sizing the air-conditioning requirements for an installation.

Table 26: Site Planning Checklist

Task No.	Planning Activity	Verified By	Time	Date
1	Space evaluation: <ul style="list-style-type: none">• Space and layout• Floor covering• Impact and vibration• Lighting• Maintenance access			

Task No.	Planning Activity	Verified By	Time	Date
2	Environmental evaluation: <ul style="list-style-type: none"> • Ambient temperature • Humidity • Altitude • Atmospheric contamination • Air flow 			
3	Power evaluation: <ul style="list-style-type: none"> • Input power type • Power receptacles • Receptacle proximity to the equipment • Dedicated circuit for power supply • Dedicated (separate) circuits for redundant power supplies • UPS for power failures 			
4	Grounding evaluation: <ul style="list-style-type: none"> • Circuit breaker size • CO ground (AC- powered systems) 			

Task No.	Planning Activity	Verified By	Time	Date
5	Cable and interface equipment evaluation: <ul style="list-style-type: none"> • Cable type • Connector type • Cable distance limitations • Interface equipment (transceivers) 			
6	EMI evaluation: <ul style="list-style-type: none"> • Distance limitations for signaling • Site wiring • RFI levels 			

³ Verify that the power supply installed in the chassis has a dedicated AC source circuit.

⁴ UPS: uninterruptable power supply.

⁵ EMI: electromagnetic interference.

⁶ RFI: radio frequency interference.

Contact and Site Information

Use the following worksheet to record contact and site information.

Table 27: Contact and Site Information

Contact person	
Contact phone	
Contact e-mail	
Building/site name	
Data center location	
Floor location	
Address (line 1)	
Address (line 2)	

City	
State	
Zip code	
Country	

Chassis and Module Information

Use the following worksheets to record information about the server chassis and the modules it contains.

Contract Number _____

Chassis Serial Number _____

Product Number _____

Table 28: Device Information

Device	Serial Number	Notes
Blade Server-1		
Blade Server-2		
Blade Server-3		
Blade Server-4		
Blade Server-5		
Blade Server-6		
Blade Server-7		
Blade Server-8		
I/O Module-1		
I/O Module-2		



Note The serial numbers of all server chassis modules can be obtained using Cisco UCS Manager.

FEX Port Connection Record

Table 29: Chassis FEX to Fabric Interconnect Port Connection Record

FEX		Connected to			
Number	Port	Fabric Interconnect A or B	Slot	Port	Connection notes
1	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
2	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				

UCS 6324 Fabric Interconnect Port Connection Record

Table 30: Port Connection Record

Fabric Interconnect		Connected to		
Number	Port	Slot	Port	Connection notes
1	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
2	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			