Cisco Cloud Services Platform 2100 Hardware Installation Guide

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Cisco Cloud Services Platform 2100 Hardware Installation Guide
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CONTENTS

PART 1

Cisco CSP 2100 (CSP-2100)

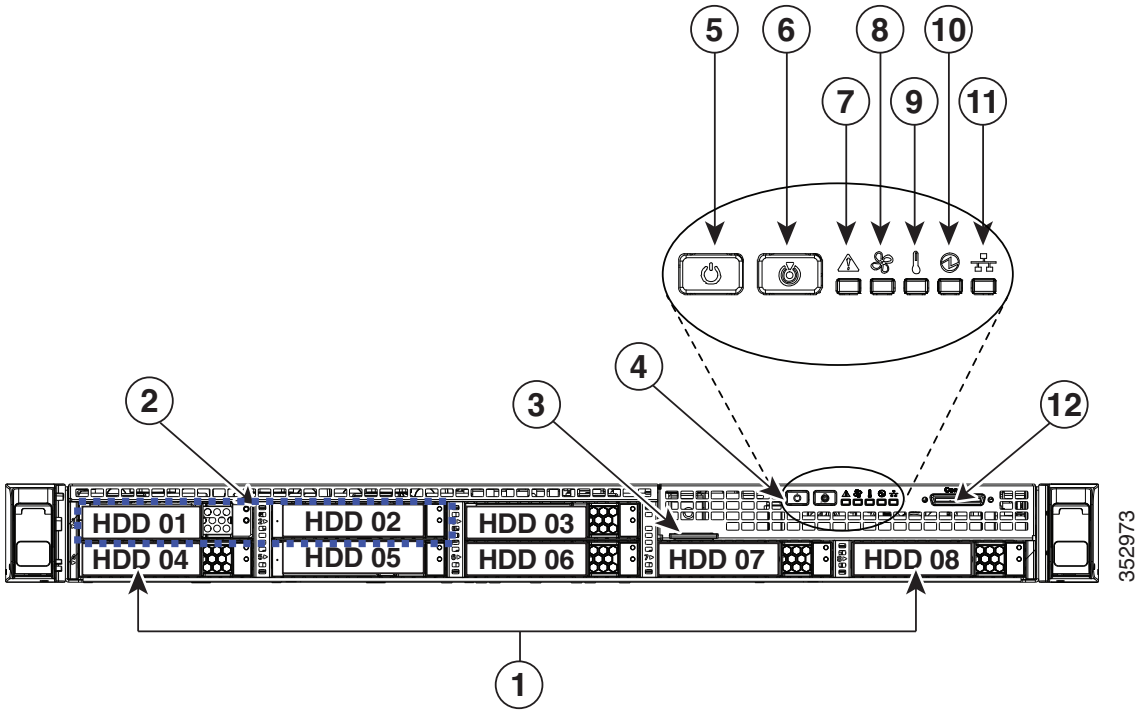
Overview of Cisco CSP 2100

This chapter provides an overview of the Cisco CSP 2100 features:

External Features Overview

Cisco CSP 2100 supports small form-factor (SFF) drives with eight-drive backplane. It holds up to eight 2.5-inch hard drives or solid state drives. Figure 1-1 shows the front panel of Cisco CSP 2100.

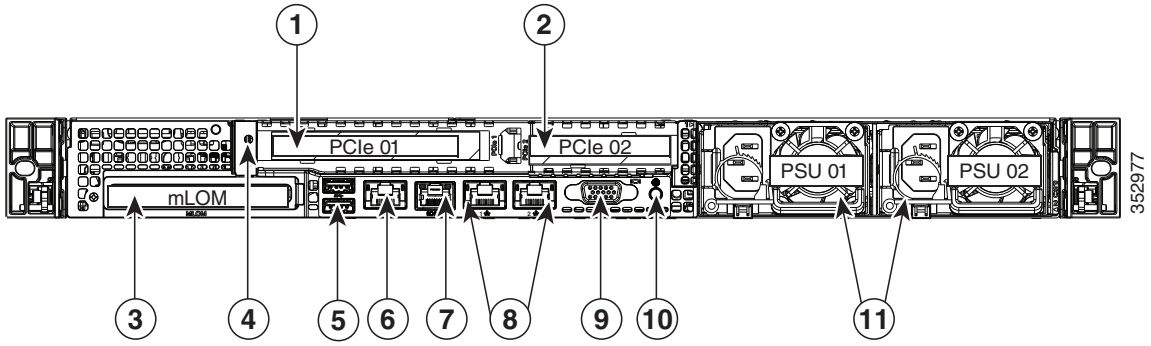
Figure 1-1 Cisco CSP 2100 (SFF Drives, 8-Drive) Front Panel Features



1	Drives (up to eight 2.5-inch drives)	**7**	Fan status LED
2	Pull-out asset tag	**8**	Temperature status LED
3	Operations panel buttons and LEDs	**9**	Power supply status LED
4	Power button/power status LED	**10**	Network link activity LED
5	Unit identification button/LED	**11**	KVM connector (used with KVM cable that provides two USB 2.0, one VGA, and one serial connector)
6	System status LED		

Figure 1-2 shows the rear panel features of Cisco CSP 2100.

Figure 1-2 Cisco CSP 2100 Rear Panel Features

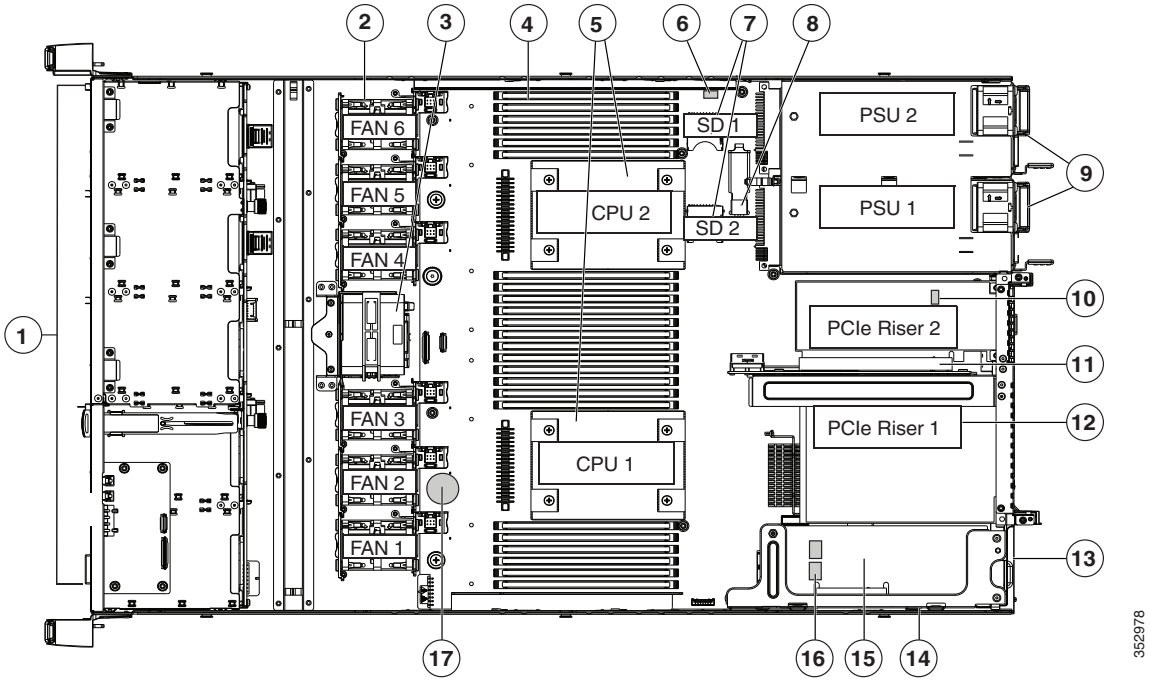


1	PCIe riser 1/slot 1	**7**	Serial port (RJ-45 connector)
2	PCIe riser 2/slot 2	**8**	Dual 1-Gb Ethernet ports (LAN1 and LAN2)
3	Modular LAN-on-motherboard (mLOM) card slot	**9**	VGA video port (DB-15)
4	Grounding-lug hole (for DC power supplies)	**10**	Rear unit identification button/LED
5	USB 3.0 ports (two)	**11**	Power supplies (up to two, redundant as 1+1)
6	1-Gb Ethernet dedicated management port		

Replaceable Component Locations

This section shows the locations of the field-replaceable components. The view in Figure 1-3 is from the top down with the top cover and air baffle removed.

Figure 1-3 Replaceable Component Locations



1	Drives (SAS/SATA drives are hot-swappable)	**10**	Trusted platform module (TPM) socket on motherboard (not visible in this view)
2	Cooling fan modules (six)	**11**	PCIe riser 2 (half-height PCIe slot 2)
3	Supercap Power Module (RAID backup) mounting bracket	**12**	PCIe riser 1 (full-height PCIe slot 1)
4	DIMM sockets on motherboard (24)	**13**	Modular LOM (mLOM) connector on chassis floor
5	CPUs and heatsinks (up to two)	**14**	Cisco modular RAID controller PCIe riser (dedicated riser with horizontal socket)
6	Embedded SATA RAID header for RAID 5 key	**15**	Cisco modular RAID controller card
7	SD card bays on motherboard (two)	**16**	Embedded SATA RAID mini-SAS connectors on motherboard (not visible in this view)
8	Internal USB 3.0 port on motherboard	**17**	RTC battery on motherboard
9	Power supplies (up to two, hot-swappable when redundant as 1+1)		

Summary of Cisco CSP 2100 Features

Table 1-1 lists the features of Cisco CSP 2100.

Table 1-1 Cisco CSP 2100 Features

Feature	Description
Chassis	One rack-unit (1RU) chassis.
Processors	Up to two Intel Xeon E5-2600 v3 Series processors.
Memory	24 DDR4 DIMM[1] sockets on the motherboard (12 each CPU).
Multi-bit error protection	Multi-bit error protection is supported.
Baseboard management	BMC, running Cisco Integrated Management Controller (CIMC) firmware. Depending on your CIMC settings, CIMC can be accessed through the 1-Gb dedicated management port, or the 1-Gb Ethernet LOM ports.
Network and management I/O	Supported connectors: • One 1-Gb Ethernet dedicated management port • Two 1-Gb BASE-T Ethernet LAN ports • One RS-232 serial port (RJ-45 connector) • One 15-pin VGA[2] connector • Two USB[3] 3.0 connectors • One front-panel KVM connector that is used with the KVM cable, which provides two USB 2.0, one VGA, and one serial (DB-9) connector.
Modular LOM	Dedicated socket that can be used to add an mLOM card for additional rear-panel connectivity (up to four 1-Gb or 10-Gb Ethernet ports).
WoL	1-Gb BASE-T Ethernet LAN ports support the wake-on-LAN (WoL) standard.
Power	Two power supplies: • AC power supplies 770 W AC each. Do not mix power supply types or wattages in Cisco CSP 2100. Redundant as 1+1. See Power Specifications, page 4-3.
ACPI	The advanced configuration and power interface (ACPI) 4.0 standard is supported.
Cooling	Six hot-swappable fan modules for front-to-rear cooling.
PCIe I/O	Two horizontal PCIe[4] expansion slots on two risers (single riser assembly). See Replacing a PCIe Card, page 3-37 for specifications of the slots.
InfiniBand	The bus slots in Cisco CSP 2100 support the InfiniBand architecture.
Storage	Drives are installed into front-panel drive bays that provide hot-swappable access for SAS/SATA drives. Cisco CSP 2100 supports SFF drives, with eight-drive backplane. Cisco CSP 2100 can hold up to eight 2.5-inch hard drives or solid state drives.
Internal USB	One internal USB 3.0 port on the motherboard that you can use with a USB thumb drive for additional storage.

Table 1-1 Cisco CSP 2100 Features (continued)

Feature	Description (continued)
SD cards	Two internal bays on the motherboard for up to two SD cards. The two flash drives can be configured in a RAID 1 configuration.
Disk Management (RAID)	Cisco CSP 2100 has a dedicated internal riser for a PCIe-style Cisco modular RAID controller card.
RAID Backup	Cisco CSP 2100 has a mounting bracket for the supercap power module that is used with Cisco modular RAID controller card.
Video	VGA video resolution up to 1920 x 1200, 16 bpp at 60 Hz, and up to 256 MB of video memory.

1. DIMM = dual inline memory module
2. VGA = video graphics array
3. USB = universal serial bus
4. PCIe = peripheral component interconnect express

Installing Cisco CSP 2100

This chapter describes how to install Cisco CSP 2100, and includes the following sections:

Note Before you install, operate, or service Cisco CSP 2100, review the *Regulatory Compliance and Safety Information for Cisco Cloud Services Platform 2100* 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

Unpacking and Inspecting Cisco CSP 2100

Caution When handling internal Cisco CSP 2100 components, wear an ESD strap and handle modules by the carrier edges only.

Tip Keep the shipping container in case Cisco CSP 2100 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.

Step 1 Remove Cisco CSP 2100 from its cardboard container and save all packaging material.

Step 2 Compare the shipment to the equipment list provided by your customer service representative. Verify that you have all items.

Step 3 Check for damage and report any discrepancies or damage to your customer service representative. Have the following information ready:

- Invoice number of shipper (see the packing slip)
- Model and serial number of the damaged unit
- Description of damage
- Effect of damage on the installation

Preparing for the Cisco CSP 2100 Installation

This section provides information about preparing for the Cisco CSP 2100 installation, and it includes the following topics:

Installation Guidelines

Warning **To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of: 40° C (104° F).**
Statement 1047

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

Warning **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 250 V, 15 A.**
Statement 1005

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

Caution To ensure proper airflow it is necessary to rack the Cisco CSP 2100s using rail kits. Physically placing the units on top of one another or "stacking" without the use of the rail kits blocks the air vents on top of the Cisco CSP 2100s, which could result in overheating, higher fan speeds, and higher power consumption. We recommend that you mount your Cisco CSP 2100s on rail kits when you are installing them into the rack because these rails provide the minimal spacing required between the Cisco CSP 2100s. No additional spacing between the Cisco CSP 2100s is required when you mount the units using rail kits.

Caution Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with systems such as Cisco CSP 2100, which can have substantial current draw fluctuations from fluctuating data traffic patterns.

When you are installing Cisco CSP 2100, use the following guidelines:

- Plan your site configuration and prepare the site before installing Cisco CSP 2100. The site planning for Cisco CSP 2100 is similar to that for Cisco UCS server. See the *Cisco UCS Site Preparation Guide* for the recommended site planning tasks.
- Ensure that there is adequate space around Cisco CSP 2100 to allow for servicing and for adequate airflow. The airflow in Cisco CSP 2100 is from front to back.
- Ensure that the air-conditioning meets the thermal requirements listed in the Cisco CSP 2100 Specifications, page 4-1.
- Ensure that the cabinet or rack meets the requirements listed in the "Rack Requirements" section on page 2-4.
- Ensure that the site power meets the power requirements listed in the Cisco CSP 2100 Specifications, page 4-1. If available, you can use an uninterruptible power supply (UPS) to protect against power failures.

Rack Requirements

This section provides the requirements for the standard open racks. The rack must be of the following type:

- A standard 19-in. (48.3-cm) wide, four-post EIA rack, with mounting posts that conform to English universal hole spacing, per section 1 of ANSI/EIA-310-D-1992.
- The rack post holes can be square 0.38-inch (9.6 mm), round 0.28-inch (7.1 mm), #12-24 UNC, or #10-32 UNC when you use the supplied slide rails.
- The minimum vertical rack space per Cisco CSP 2100 must be one RU, equal to 1.75 in. (44.45 mm).

Equipment Requirements

The slide rails sold by Cisco Systems for Cisco CSP 2100 do not require tools for installation.

Slide Rail Adjustment Range

The slide rails for Cisco CSP 2100 have an adjustment range of 24 to 36 inches (610 to 914 mm).

Installing Cisco CSP 2100 In a Rack

Installing the Slide Rails

This section describes how to install Cisco CSP 2100 in a rack using the rack kits that are sold by Cisco.

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**
This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
Statement 1006

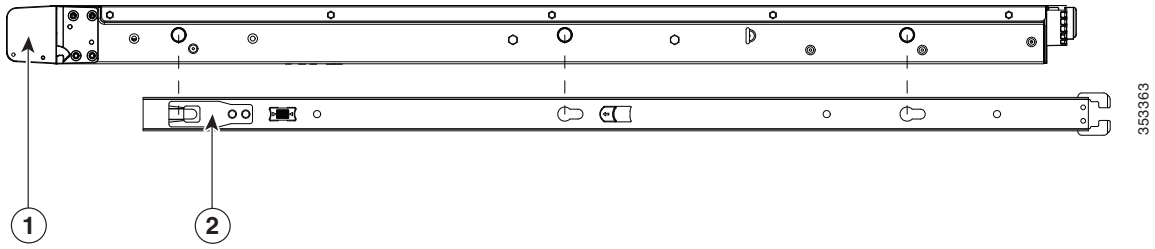
Step 1 Attach the inner rails to the sides of Cisco CSP 2100:

a. Align an inner rail with one side of Cisco CSP 2100 so that the three keyed slots in the rail align with the three pegs on the side of Cisco CSP 2100 (see Figure 2-1).

b. Set the keyed slots over the pegs, and then slide the rail toward the front to lock it in place on the pegs. The front slot has a metal clip that locks over the front peg.

c. Install the second inner rail to the opposite side of Cisco CSP 2100.

Figure 2-1 Attaching Inner Rail to Side of Cisco CSP 2100

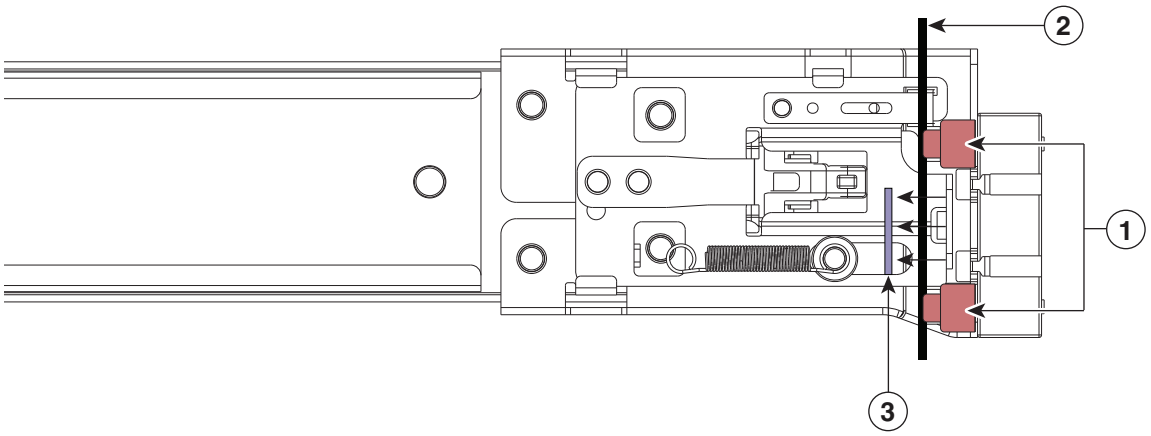


1	Front of Cisco CSP 2100	2	Locking clip on inner rail

Step 2 Open the front securing plate on both slide-rail assemblies. The front end of the slide-rail assembly has a spring-loaded securing plate that must be open before you can insert the mounting pegs into the rack-post holes (see Figure 2-2).

On the *outside* of the assembly, push the green arrow button toward the rear to open the securing plate.

Figure 2-2 Front Securing Mechanism, Inside of Front End



1	Front mounting pegs	**3**	Securing plate shown pulled back to open position
2	Rack post		

Step 3 Install the outer slide rails into the rack:

a. Align one slide-rail assembly front end with the front rack-post holes that you want to use.

The slide rail front-end wraps around the outside of the rack post and the mounting pegs enter the rack-post holes from the outside-front (see Figure 2-2).

Note The rack post must be between the mounting pegs and the *open* securing plate.

b. Push the mounting pegs into the rack-post holes from the outside-front.

c. Press the securing plate release button, marked PUSH. The spring-loaded securing plate closes to lock the pegs in place.

d. Adjust the slide-rail length, and then push the rear mounting pegs into the corresponding rear rack-post holes. The slide rail must be level front-to-rear.

The rear mounting pegs enter the rear rack-post holes from the inside of the rack post.

e. Attach the second slide-rail assembly to the opposite side of the rack. Ensure that the two slide-rail assemblies are at the same height with each other and are level front-to-back.

f. Pull the inner slide rails on each assembly out toward the rack front until they hit the internal stops and lock in place.

Step 4 Insert Cisco CSP 2100 into the slide rails:

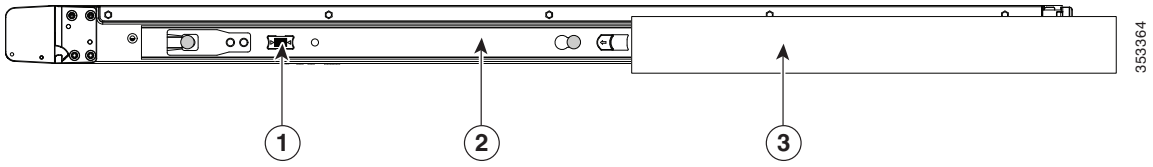
Caution Cisco CSP 2100 can weigh up to **67 pounds (59 kilograms)** when fully loaded with components. We recommend that you use a minimum of two people or a mechanical lift when lifting Cisco CSP 2100. Attempting this procedure alone could result in personal injury or equipment damage.

a. Align the rear of the inner rails that are attached to Cisco CSP 2100 sides with the front ends of the empty slide rails on the rack.

b. Push the inner rails into the slide rails on the rack until they stop at the internal stops.

c. Slide the release clip toward the rear on both inner rails, and then continue pushing Cisco CSP 2100 into the rack until its front slam latches engage with the rack posts.

Figure 2-3 Inner Rail Release Clip



1	Inner rail release clip	**3**	Outer rail attached to rack post
2	Inner rail attached to Cisco CSP 2100 and inserted into outer rail		

Step 5 (Optional) Secure the Cisco CSP 2100 in the rack more permanently by using the two screws that are provided with the slide rails. Perform this step if you plan to move the rack with Cisco CSP 2100 installed.

With Cisco CSP 2100 fully pushed into the slide rails, open a hinged slam latch lever on the front of the Cisco CSP 2100 and insert the screw through the hole that is under the lever. The screw threads into the static part of the rail on the rack post and prevents Cisco CSP 2100 from being pulled out. Repeat for the opposite slam latch.

Initial Cisco CSP 2100 Setup

Connecting and Powering On Cisco CSP 2100 (Standalone Mode)

Note This section describes how to power on Cisco CSP 2100, assign an IP address, and connect to Cisco CSP 2100 management when using the Cisco CSP 2100 *in standalone mode*.

Cisco CSP 2100 is shipped with these default settings:

- The NIC mode is Shared LOM EXT.

  Shared LOM EXT mode enables the 1-Gb Ethernet ports and the ports on any installed Cisco network interface card (NIC) to access Cisco Integrated Management Interface (CIMC).If you want to use the 10/100/1000 dedicated management ports to access CIMC, you can connect to the Cisco CSP 2100 and change the NIC mode as described in Step 1 of the following procedure.
- The NIC redundancy is active-active. All Ethernet ports are utilized simultaneously.
- DHCP is enabled.
- IPv4 is enabled.

There are two methods for connecting to the system for initial setup:

- Local setup—Use this procedure if you want to connect a keyboard and monitor to the system for setup. This procedure can use a KVM cable (Cisco PID N20-BKVM) or the ports on the rear of the Cisco CSP 2100. See Local Connection Procedure, page 2-8.
- Remote setup—Use this procedure if you want to perform setup through your dedicated management LAN. See Remote Connection Procedure, page 2-9.

Note To configure the system remotely, you must have a DHCP server on the same network as the system. Your DHCP server must be pre-configured with the range of MAC addresses for this server node. The MAC address is printed on a label on the rear of the server node. This server node has a range of six MAC addresses assigned to the CIMC. The MAC address printed on the label is the beginning of the range of six contiguous MAC addresses.

Local Connection Procedure

Step 1 Attach a power cord to each power supply in your Cisco CSP 2100, and then attach each power cord to a grounded AC power outlet. See Power Specifications, page 4-3 for power specifications.

Wait for approximately two minutes to let the Cisco CSP 2100 boot in standby power during the first bootup.

You can verify system power status by looking at the system Power Status LED on the front panel (see External Features Overview, page 1-1). The system is in standby power mode when the LED is amber.

Step 2 Connect a USB keyboard and VGA monitor to the Cisco CSP 2100 using one of the following methods:

- Connect a USB keyboard and VGA monitor to the corresponding connectors on the rear panel (see External Features Overview, page 1-1).

- Connect an optional KVM cable (Cisco PID N20-BKVM) to the KVM connector on the front panel (see External Features Overview, page 1-1 for the connector location). Connect your USB keyboard and VGA monitor to the KVM cable.

Step 3 Open the CIMC Configuration Utility:

a. Press and hold the front panel power button for four seconds to boot the Cisco CSP 2100.

b. During bootup, press **F8** when prompted to open the CIMC Configuration Utility.

This utility has two windows that you can switch between by pressing F1 or F2.

Step 4 Continue with CIMC Configuration Utility Setup, page 2-10.

Remote Connection Procedure

Step 1 Attach a power cord to each power supply in your Cisco CSP 2100, and then attach each power cord to a grounded AC power outlet. See Power Specifications, page 4-3 for power specifications.

Wait for approximately two minutes to let the Cisco CSP 2100 boot in standby power during the first bootup.

You can verify system power status by looking at the system Power Status LED on the front panel (see External Features Overview, page 1-1). The system is in standby power mode when the LED is amber.

Step 2 Plug your management Ethernet cable into the dedicated management port on the rear panel (see External Features Overview, page 1-1).

Step 3 Allow your pre-configured DHCP server to assign an IP address to the server node.

Step 4 Use the assigned IP address to access and log in to the CIMC for the server node. Consult with your DHCP server administrator to determine the IP address.

Note The default user name for the server is *admin*. The default password is *password*.

Step 5 From the CIMC Server Summary page, click **Launch KVM Console**. A separate KVM console window opens.

Step 6 From the CIMC Summary page, click **Power Cycle Server**. The system reboots.

Step 7 Select the KVM console window.

Note The KVM console window must be the active window for the following keyboard actions to work.

Step 8 When prompted, press **F8** to enter the CIMC Configuration Utility. This utility opens in the KVM console window.

This utility has two windows that you can switch between by pressing F1 or F2.

Step 9 Continue with CIMC Configuration Utility Setup, page 2-10.

CIMC Configuration Utility Setup

The following procedure is performed after you connect to the system and open the CIMC Configuration Utility.

Step 1 Set NIC mode and NIC redundancy:

a. Set the NIC mode to choose which ports to use to access CIMC for Cisco CSP 2100 management (see Figure 1-2 on page 1-2 for identification of the ports):

- Shared LOM EXT (default)—This is the shared LOM extended mode, the factory-default setting. With this mode, the Shared LOM and Cisco Card interfaces are both enabled.

  In this mode, DHCP replies are returned to both the shared LOM ports and the Cisco card ports. If the system determines that the Cisco card connection is not getting its IP address from the Cisco CSP 2100 because the Cisco CSP 2100 is in standalone mode, further DHCP requests from the Cisco card are disabled. Use the Cisco Card NIC mode if you want to connect to CIMC through a Cisco card in standalone mode.
- Shared LOM—The 1-Gb Ethernet ports are used to access CIMC. You must select a NIC redundancy and IP setting.
- Dedicated—The dedicated management port is used to access CIMC. You must select a NIC redundancy and IP setting.

b. Use this utility to change the NIC redundancy to your preference. Cisco CSP 2100 has three possible NIC redundancy settings:

- None—The Ethernet ports operate independently and do not fail over if there is a problem. This setting can be used only with the Dedicated NIC mode.
- Active-standby—If an active Ethernet port fails, traffic fails over to a standby port.
- Active-active—All Ethernet ports are utilized simultaneously. The Shared LOM EXT mode can have only this NIC redundancy setting. Shared LOM and Cisco Card modes can have both Active-standby and Active-active settings.

Step 2 Choose whether to enable DHCP for dynamic network settings, or to enter static network settings.

Note Before you enable DHCP, you must pre-configure your DHCP server with the range of MAC addresses for this server. The MAC address is printed on a label on the rear of the server. This server has a range of six MAC addresses assigned to CIMC. The MAC address printed on the label is the beginning of the range of six contiguous MAC addresses.

The static IPv4 and IPv6 settings include the following:

- The CIMC IP address.
- The prefix/subnet.

  For IPv6, valid values are 1–127.
- The gateway.

  For IPv6, if you do not know the gateway, you can set it as none by entering **::** (two colons).
- The preferred DNS server address.

  For IPv6, you can set this as none by entering **::** (two colons).

Step 3 (Optional) Use this utility to make VLAN settings.

Step 4 Press **F1** to go to the second settings window, then continue with the next step.

From the second window, you can press **F2** to switch back to the first window.

Step 5 (Optional) Set a hostname for the server.

Step 6 (Optional) Enable dynamic DNS and set a dynamic DNS (DDNS) domain.

Step 7 (Optional) If you check the Factory Default check box, the server reverts to the factory defaults.

Step 8 (Optional) Set a default user password.

Step 9 (Optional) Enable auto-negotiation of port settings or set the port speed and duplex mode manually.

Note Auto-negotiation is applicable only when you use the Dedicated NIC mode. Auto-negotiation sets the port speed and duplex mode automatically based on the switch port to which the server is connected. If you disable auto-negotiation, you must set the port speed and duplex mode manually.

Step 10 (Optional) Reset port profiles and the port name.

Step 11 Press **F5** to refresh the settings that you made. You might have to wait about 45 seconds until the new settings appear and the message, "Network settings configured" is displayed before you reboot the server in the next step.

Step 12 Press **F10** to save your settings and reboot the Cisco CSP 2100.

Note If you chose to enable DHCP, the dynamically assigned IP and MAC addresses are displayed on the console screen during bootup.

Use a browser and the IP address of the CIMC to connect to the CIMC management interface. The IP address is based upon the settings that you made (either a static address or the address assigned by your DHCP server).

Note The default username for the server is *admin*. The default password is *admin*.

For information about managing the Cisco CSP 2100, see the *Cisco Cloud Services Platform 2100 Quick Start Guide* and *Cisco Cloud Services Platform 2100 Command Reference*. These guides are available at the following page:

http://www.cisco.com/c/en/us/support/switches/cloud-services-platform-2100/tsd-products-support-series-home.html

System BIOS and CIMC Firmware

This section includes information about the system BIOS and it includes the following sections:

Updating the BIOS and CIMC Firmware

Caution When you upgrade the BIOS firmware, you must also upgrade the CIMC firmware to the same version or the server does not boot. Do not power off the server until the BIOS and CIMC firmware are matching or the server does not boot.

Cisco provides the Cisco Host Upgrade Utility to assist with simultaneously upgrading the BIOS, CIMC, and other firmware to compatible levels.

The server uses firmware obtained from and certified by Cisco. Cisco provides release notes with each firmware image. There are several methods for updating the firmware:

- **Recommended method for system components firmware update**: Use the Cisco Host Upgrade Utility to simultaneously upgrade the CIMC, BIOS, LOM, and LSI storage controller to compatible levels.

  See the *Cisco Host Upgrade Utility Quick Reference Guide* for your firmware level at the documentation roadmap link below.
- You can upgrade the BIOS using the EFI interface or from a Windows or a Linux platform. The procedure to upgrade the BIOS is similar to that used for the Cisco UCS C-Series Rack Mount server. For detailed information, see the *Cisco UCS C-Series Rack-Mount Server BIOS Upgrade Guide*.
- You can upgrade the CIMC and BIOS firmware by using the CIMC GUI interface. The procedure to upgrade the CIMC and BIOS is similar to that used for the Cisco UCS C-Series Rack Mount server. For detailed information, see the *Cisco UCS C-Series Rack-Mount Server Configuration Guide.*
- You can upgrade the CIMC and BIOS firmware by using the CIMC CLI interface. The procedure to upgrade the CIMC and BIOS is similar to that used for the Cisco UCS C-Series Rack Mount server. For detailed information, see the *Cisco UCS C-Series Rack-Mount Server CLI Configuration Guide.*

For links to the documents listed above, see the documentation roadmap at the following URL:

http://www.cisco.com/go/unifiedcomputing/c-series-doc

Accessing the System BIOS

Step 1 Enter the BIOS setup utility by pressing the **F2** key when prompted during bootup.

Note The version and build of the current BIOS are displayed on the Main page of the utility.

Step 2 Use the arrow keys to select the BIOS menu page.

Step 3 Highlight the field to be modified by using the arrow keys.

Step 4 Press **Enter** to select the field that you want to change, and then modify the value in the field.

Step 5 Press the right arrow key until the Exit menu screen is displayed.

Step 6 Follow the instructions on the Exit menu screen to save your changes and exit the setup utility (or Press **F10**). You can exit without saving changes by pressing **Esc**.

Maintaining Cisco CSP 2100

This chapter describes how to diagnose system problems using LEDs. It also provides information about how to install or replace hardware components, and it includes the following sections:

Cisco CSP 2100 Monitoring and Management Tools

Cisco Integrated Management Interface

You can monitor the Cisco CSP 2100 inventory, health, and system event logs by using the built-in Cisco Integrated Management Controller (CIMC) GUI or CLI interfaces. The procedure to monitor the Cisco CSP 2100 inventory, health, and system event logs is similar to that used for the Cisco UCS C-Series servers. See the user documentation for your firmware release at the following URL:

http://www.cisco.com/en/US/products/ps10739/products_installation_and_configuration_guides_list.html

Cisco CSP 2100 Configuration Utility

The Configuration Utility for Cisco CSP 2100 can aid and simplify the following tasks:

- Monitoring server inventory and health
- Diagnosing common server problems with diagnostic tools and logs
- Setting the BIOS booting order
- Configuring some RAID configurations
- Installing operating systems

You can download the ISO image from Cisco.com. See the user documentation for your version of the utility at the following URL:

http://www.cisco.com/en/US/products/ps10493/products_user_guide_list.html

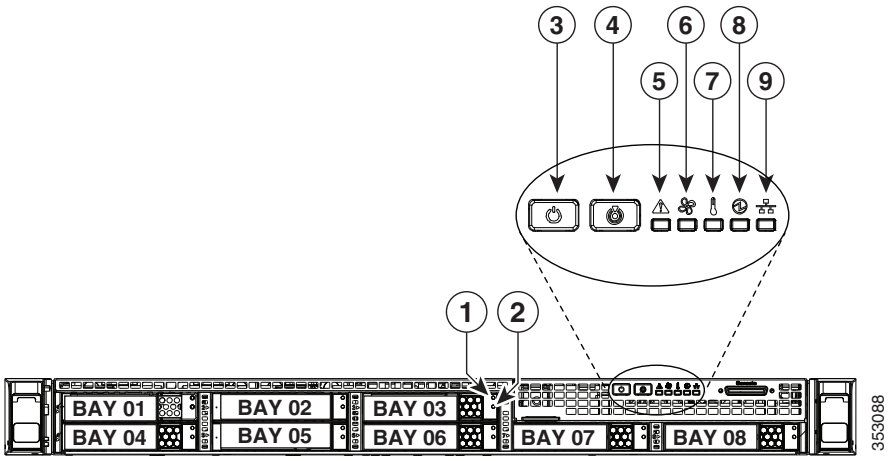
Status LEDs and Buttons

This section describes the location and meaning of LEDs and buttons and includes the following topics

Front Panel LEDs

Figure 3-1 shows the front panel LEDs. Table 3-1 defines the LED states.

Figure 3-1 Front Panel LEDs



1	Hard drive fault LED	**6**	Fan status LED
2	Hard drive activity LED	**7**	Temperature status LED
3	Power button/power status LED	**8**	Power supply status LED
4	Identification button/LED	**9**	Network link activity LED
5	System status LED		

Table 3-1 Front Panel LEDs, Definitions of States

	LED Name	State
1	Hard drive fault	• Off—The hard drive is operating properly. • Amber—Drive fault detected. • Amber, blinking—The device is rebuilding. • Amber, blinking with one-second interval—Drive locate function activated.
2	Hard drive activity	• Off—There is no hard drive in the hard drive tray (no access, no fault). • Green—The hard drive is ready. • Green, blinking—The hard drive is reading or writing data.

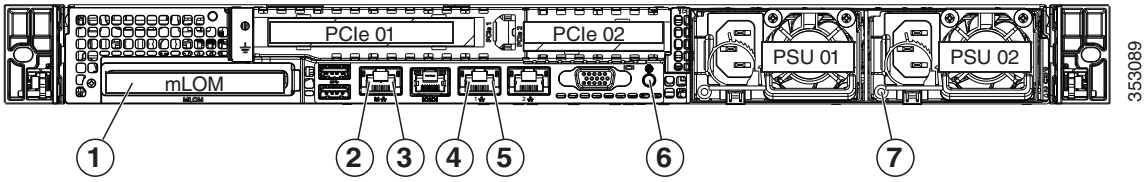
Table 3-1 Front Panel LEDs, Definitions of States (continued)

	LED Name	State
3	Power button/LED	• Off—There is no AC power to the Cisco CSP 2100. • Amber—The Cisco CSP 2100 is in standby power mode. Power is supplied only to the CIMC and some motherboard functions. • Green—The Cisco CSP 2100 is in main power mode. Power is supplied to all Cisco CSP 2100 components.
4	Unit identification	• Off—The unit identification function is not in use. • Blue—The unit identification function is activated.
5	System status	• Green—The Cisco CSP 2100 is running in normal operating condition. • Green, blinking—The Cisco CSP 2100 is performing system initialization and memory check. • Amber, steady—The Cisco CSP 2100 is in a degraded operational state. For example: – Power supply redundancy is lost. – CPUs are mismatched. – At least one CPU is faulty. – At least one DIMM is faulty. – At least one drive in a RAID configuration failed. • Amber, blinking—The Cisco CSP 2100 is in a critical fault state. For example: – Boot failed. – Fatal CPU and/or bus error is detected. – Cisco CSP 2100 is in an over-temperature condition.
6	Fan status	• Green—All fan modules are operating properly. • Amber, steady—One or more fan modules breached the critical threshold. • Amber, blinking—One or more fan modules breached the non-recoverable threshold.
7	Temperature status	• Green—The Cisco CSP 2100 is operating at normal temperature. • Amber, steady—One or more temperature sensors breached the critical threshold. • Amber, blinking—One or more temperature sensors breached the non-recoverable threshold.
8	Power supply status	• Green—All power supplies are operating normally. • Amber, steady—One or more power supplies are in a degraded operational state. • Amber, blinking—One or more power supplies are in a critical fault state.
9	Network link activity	• Off—The Ethernet link is idle. • Green—One or more Ethernet LOM ports are link-active, but there is no activity. • Green, blinking—One or more Ethernet LOM ports are link-active, with activity.

Rear Panel LEDs and Buttons

Figure 3-2 shows the rear panel LEDs and buttons. Table 3-2 defines the LED states.

Figure 3-2 Rear Panel LEDs and Buttons



1	Optional mLOM card LEDs (not shown, see Table 3-2)	**5**	1-Gb Ethernet link status LED
2	1-Gb Ethernet dedicated management link status LED	**6**	Rear unit identification button/LED
3	1-Gb Ethernet dedicated management link speed LED	**7**	Power supply status LED
4	1-Gb Ethernet link speed LED		

Table 3-2 Rear Panel LEDs, Definitions of States

	LED Name	State
1	Optional mLOM 10-Gb SFP+ (there is a single status LED)	• Off—No link is present. • Green, steady—Link is active. • Green, blinking—Traffic is present on the active link.
1	Optional mLOM 10-Gb BASE-T link speed	• Off—Link speed is 10 Mbps. • Amber—Link speed is 100 Mbps/1 Gbps. • Green—Link speed is 10 Gbps.
1	Optional mLOM 10-Gb BASE-T link status	• Off—No link is present. • Green—Link is active. • Green, blinking—Traffic is present on the active link.
2	1-Gb Ethernet dedicated management link speed	• Off—Link speed is 10 Mbps. • Amber—Link speed is 100 Mbps. • Green—Link speed is 1 Gbps.
3	1-Gb Ethernet dedicated management link status	• Off—No link is present. • Green—Link is active. • Green, blinking—Traffic is present on the active link.
4	1-Gb Ethernet link speed	• Off—Link speed is 10 Mbps. • Amber—Link speed is 100 Mbps. • Green—Link speed is 1 Gbps.

Table 3-2 Rear Panel LEDs, Definitions of States (continued)

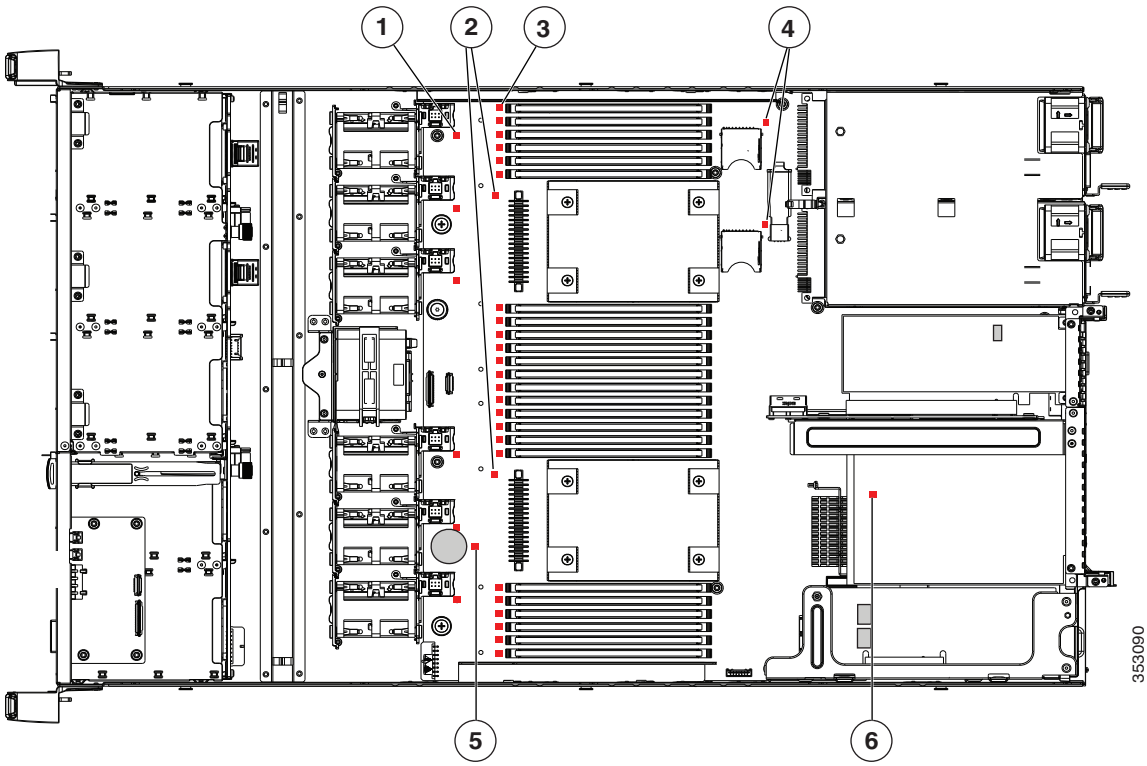
	LED Name	State
5	1-Gb Ethernet link status	• Off—No link is present. • Green—Link is active. • Green, blinking—Traffic is present on the active link.
6	Rear unit identification	• Off—The unit identification LED is not in use. • Blue—The unit identification LED is activated.
7	Power supply status	AC power supplies: • Off—No AC input (12 V main power off, 12 V standby power off). • Green, blinking—12 V main power off; 12 V standby power on. • Green, solid—12 V main power on; 12 V standby power on. • Amber, blinking—Warning detected but 12 V main power on. • Amber, solid—Critical error detected; 12 V main power off.

Internal Diagnostic LEDs

The Cisco CSP 2100 has internal fault LEDs for CPUs, DIMMs, fan modules, SD cards, the RTC battery, and the mLOM card. These LEDs are available only when the Cisco CSP 2100 is in standby power mode. An LED lights amber to indicate a faulty component.

See Figure 3-3 for the locations of these internal LEDs.

Figure 3-3 Internal Diagnostic LED Locations



1	Fan module fault LEDs (one next to each fan connector on the motherboard)	**4**	SD card fault LEDs (one next to each bay)
2	CPU fault LEDs (one in front of each CPU)	**5**	RTC battery fault LED
3	DIMM fault LEDs (one in front of each DIMM socket on the motherboard)	**6**	mLOM card fault LED (on motherboard next to mLOM socket)

Table 3-3 Internal Diagnostic LEDs, Definition of States

LED Name	State
Internal diagnostic LEDs (all)	• Off—Component is functioning normally. • Amber—Component has failed.

Preparing for Cisco CSP 2100 Component Installation

This section describes how to prepare for component installation, and it includes the following topics:

Required Equipment

The following equipment is used to perform the procedures in this chapter:

- Number 2 Phillips-head screwdriver
- Electrostatic discharge (ESD) strap or other grounding equipment such as a grounded mat

Shutting Down and Powering Off the Cisco CSP 2100

The Cisco CSP 2100 can run in two power modes:

- Main power mode—Power is supplied to all Cisco CSP 2100 components and any operating system on your drives can run.
- Standby power mode—Power is supplied only to the service processor and the cooling fans and it is safe to power off the Cisco CSP 2100 from this mode.

You can invoke a graceful shutdown or a hard shutdown by using either of the following methods:

- Use the CIMC management interface.
- Use the **Power** button on the Cisco CSP 2100 front panel. To use the **Power** button, follow these steps:

Step 1 Check the color of the Power Status LED (see the "Front Panel LEDs" section on page 3-2).

- Green—Cisco CSP 2100 is in main power mode and must be shut down before it can be safely powered off. Go to Step 2.
- Amber—Cisco CSP 2100 is already in standby mode and can be safely powered off. Go to Step 3.

Step 2 Invoke either a graceful shutdown or a hard shutdown:

Caution To avoid data loss or damage to your operating system, you should always invoke a graceful shutdown of the operating system.

- Graceful shutdown—Press and release the **Power** button. The operating system performs a graceful shutdown and the Cisco CSP 2100 goes to standby mode, which is indicated by an amber Power Status LED.
- Emergency shutdown—Press and hold the **Power** button for 4 seconds to force the main power off and immediately enter standby mode.

Step 3 Disconnect the power cords from the power supplies in your Cisco CSP 2100 to completely power off the Cisco CSP 2100.

Removing and Replacing the Cisco CSP 2100 Top Cover

Step 1 Remove the top cover (see Figure 3-4).

a. If the cover latch is locked, use a screwdriver to turn the lock 90-degrees counterclockwise to unlock it. See Figure 3-4.

b. Lift on the end of the latch that has the green finger grip. The cover is pushed back to the open position as you lift the latch.

c. Lift the top cover straight up from the Cisco CSP 2100 and set it aside.

Step 2 Replace the top cover:

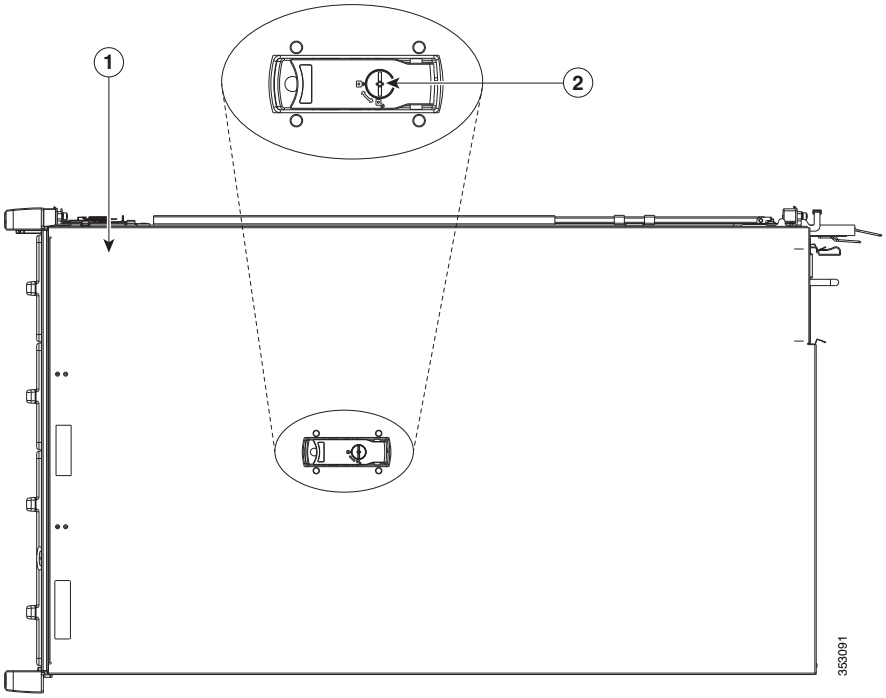
Note The latch must be in the fully open position when you set the cover back in place, which allows the opening in the latch to sit over a peg that is on the fan tray.

a. With the latch in the fully open position, place the cover on top of the Cisco CSP 2100 about one-half inch (1.27 cm) behind the lip of the front cover panel. The opening in the latch should fit over the peg that sticks up from the fan tray.

b. Press the cover latch down to the closed position. The cover is pushed forward to the closed position as you push down the latch.

c. If desired, lock the latch by using a screwdriver to turn the lock 90-degrees clockwise.

Figure 3-4 Removing the Top Cover



1	Top cover	**2**	Locking cover latch

Serial Number Location

The serial number for the Cisco CSP 2100 is printed on a label on the top of the Cisco CSP 2100, near the front.

Hot-Swap Replacement

Some components can be removed and replaced without powering off and removing AC power from the Cisco CSP 2100. For hot-swap replacement, you do not have to precondition or shut down the component in the software before you remove it for the following components:

- SAS/SATA drives
- Cooling fan modules
- Power supplies (when 1+1 redundant)

Installing or Replacing Cisco CSP 2100 Components

Warning **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.** Statement 1029

Caution When handling Cisco CSP 2100 components, wear an ESD strap to avoid damage.

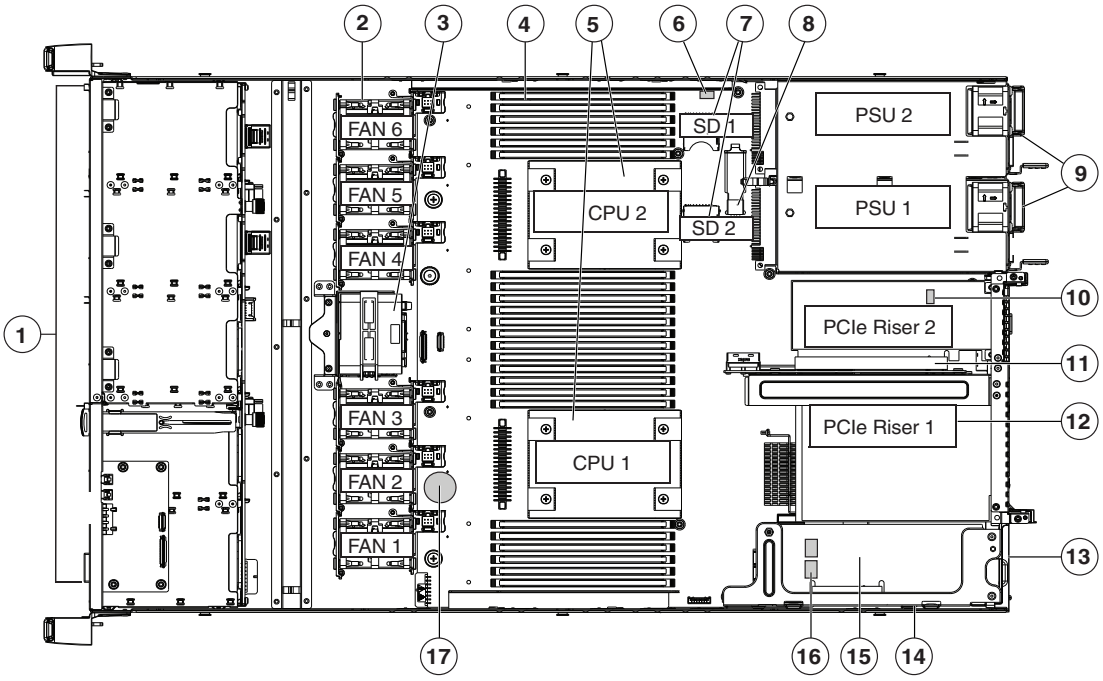
Tip You can press the unit identification button on the front panel or rear panel to turn on a flashing unit identification LED on the front and rear panels of the Cisco CSP 2100. This button allows you to locate the specific Cisco CSP 2100 that you are servicing when you go to the opposite side of the rack. You can also activate these LEDs remotely by using the CIMC interface. See the "Status LEDs and Buttons" section on page 3-2 for locations of these LEDs.

This section describes how to install and replace Cisco CSP 2100 components, and it includes the following topics:

Replaceable Component Locations

This section shows the locations of the field-replaceable components. The view in Figure 3-5 is from the top down with the top cover and air baffle removed.

Figure 3-5 Replaceable Component Locations



1	Drives (SAS/SATA drives are hot-swappable)	**10**	Trusted platform module (TPM) socket on motherboard (not visible in this view)
2	Cooling fan modules (six)	**11**	PCIe riser 2 (half-height PCIe slot 2)
3	Supercap Power Module (RAID backup) mounting bracket	**12**	PCIe riser 1 (full-height PCIe slot 1)
4	DIMM sockets on motherboard (24)	**13**	Modular LOM (mLOM) connector on chassis floor
5	CPUs and heatsinks (up to two)	**14**	Cisco modular RAID controller PCIe riser (dedicated riser with horizontal socket)
6	Embedded SATA RAID header for RAID 5 key	**15**	Cisco modular RAID controller card
7	SD card bays on motherboard (two)	**16**	Embedded SATA RAID mini-SAS connectors on motherboard (not visible in this view)
8	Internal USB 3.0 port on motherboard	**17**	RTC battery on motherboard
9	Power supplies (up to two, hot-swappable when redundant as 1+1)		

Replacing Hard Drives or Solid State Drives

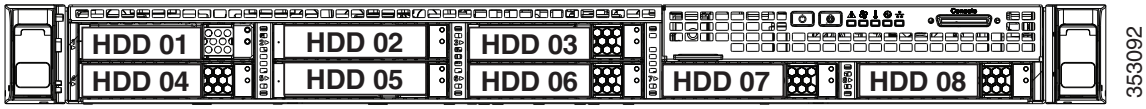
This section includes the following information:

Drive Population Guidelines

Cisco CSP 2100 supports the small form factor (SFF) drives and can hold up to eight 2.5-inch hard drives or solid state drives.

The drive-bay numbering is shown in Figure 3-6.

Figure 3-6 Drive Numbering, SFF Drives, Eight-Drive Version



Observe these drive population guidelines for optimum performance:

- When populating drives, add drives to the lowest-numbered bays first.
- Keep an empty drive blanking tray in any unused bays to ensure proper airflow.
- You can mix hard drives and SSDs in the same Cisco CSP 2100. However, you cannot configure a logical volume (virtual drive) that contains a mix of hard drives and SSDs. That is, when you create a logical volume, it must contain all hard drives or all SSDs.

Drive Replacement Procedure

Tip You do not have to shut down or power off the Cisco CSP 2100 to replace SA/SATA hard drives or solid state drives because they are hot-swappable.

Step 1 Remove the drive that you are replacing or remove a blank drive tray from the bay:

a. Press the release button on the face of the drive tray. See Figure 3-7.

b. Grasp and open the ejector lever and then pull the drive tray out of the slot.

c. If you are replacing an existing drive, remove the four drive-tray screws that secure the drive to the tray and then lift the drive out of the tray.

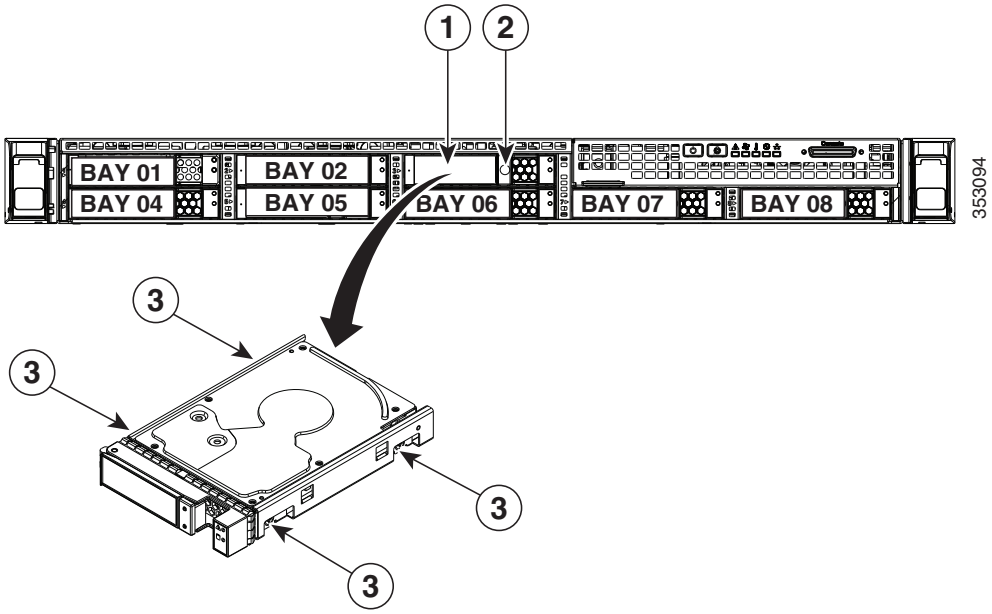
Step 2 Install a new drive:

a. Place a new drive in the empty drive tray and install the four drive-tray screws.

b. With the ejector lever on the drive tray open, insert the drive tray into the empty drive bay.

c. Push the tray into the slot until it touches the backplane, and then close the ejector lever to lock the drive in place.

Figure 3-7 Replacing Hard Drives



1	Ejector lever	**3**	Drive tray securing screws (4)
2	Release button		–

Replacing Fan Modules

The six fan modules in Cisco CSP 2100 are numbered as follows when you are facing the front of Cisco CSP 2100 (also see Figure 3-9).

Figure 3-8 Fan Module Numbering

FAN 6	FAN 5	FAN 4	FAN 3	FAN 2	FAN 1

Tip Each fan module has a fault LED next to the fan connector on the motherboard that lights amber if the fan module fails. Standby power is required to operate these LEDs.

Caution You do not have to shut down or power off the Cisco CSP 2100 to replace fan modules because they are hot- swappable. However, to maintain proper cooling, do not operate the Cisco CSP 2100 for more than one minute with any fan module removed.

Step 1 Remove a fan module that you are replacing (see Figure 3-9):

a. Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

b. Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

c. Grasp the fan module at its front and on the green connector. Lift straight up to disengage its connector from the motherboard and free it from the two alignment pegs.

Step 2 Install a new fan module:

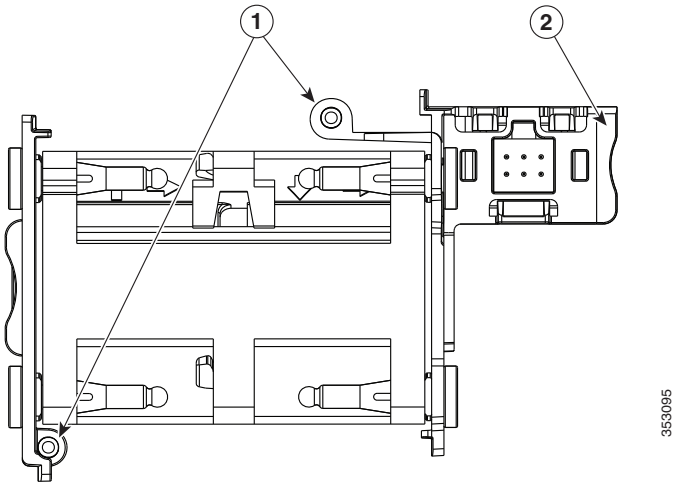
a. Set the new fan module in place, aligning its two openings with the two alignment pegs on the motherboard. See Figure 3-9.

b. Press down gently on the fan module connector to fully engage it with the connector on the motherboard.

c. Replace the top cover.

d. Replace the Cisco CSP 2100 in the rack.

Figure 3-9 Top View of Fan Module



1	Openings in fan module for motherboard alignment pegs	**2**	Fan connector to motherboard

Replacing the Motherboard RTC Battery

Warning **There is danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.** [Statement 1015]

The real-time clock (RTC) battery retains system settings when the Cisco CSP 2100 is disconnected from power. The battery model is CR2032 or equivalent.

Step 1 Remove the RTC battery (see Figure 3-10):

a. Power off the Cisco CSP 2100 as described in Shutting Down and Powering Off the Cisco CSP 2100, page 3-7.

b. Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

c. Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

d. Locate the RTC battery. See Figure 3-10.

e. Gently remove the battery from the holder on the motherboard.

Step 2 Install an RTC battery:

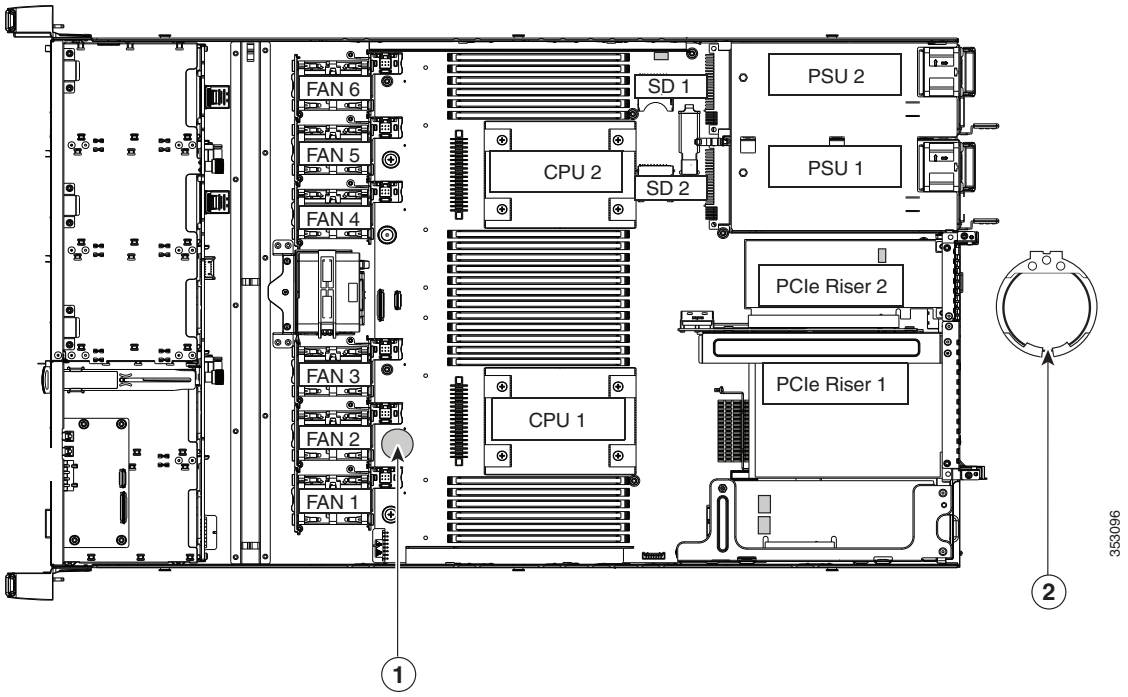
a. Insert the battery into its holder and press down until it clicks in place.

Note The positive side of the battery marked "3V+" should face upward.

b. Replace the top cover.

c. Replace the Cisco CSP 2100 in the rack, replace cables, and power on the Cisco CSP 2100 by pressing the **Power** button.

Figure 3-10 Motherboard RTC Battery Location



1	RTC battery holder on motherboard	**2**	Prying point on battery in holder

Replacing the Supercap Power Module (RAID Backup)

Cisco CSP 2100 supports installation of one supercap Power module (SCPM). The unit mounts to a bracket that is in the middle of the row of fan modules (see Figure 3-11).

The SCPM provides approximately three years of backup for the disk write-back cache DRAM in the case of a sudden power loss by offloading the cache to the NAND flash.

Warning **There is danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.**
Statement 1015

Step 1 Remove an existing SCPM (see Figure 3-11).

a. Power off the Cisco CSP 2100 as described in Shutting Down and Powering Off the Cisco CSP 2100, page 3-7.

b. Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

c. Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

d. Disconnect the SCPM cable from the existing SCPM.

e. Release the securing clip on the bracket retainer bar and then open the retainer bar (see Figure 3-11).

f. Lift the SCPM free of the bracket and set it aside.

Step 2 Install a new SCPM:

a. Set the new SCPM into the mounting bracket.

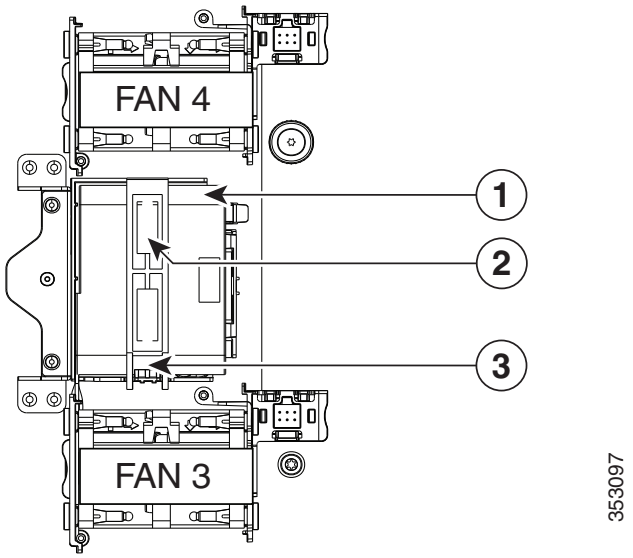
b. Connect the cable from the Cisco modular RAID controller to the new SCPM.

c. Close the retainer bar over the SCPM. Push down until the securing clip clicks and holds down the retainer bar.

d. Replace the top cover.

e. Replace the Cisco CSP 2100 in the rack, replace cables, and then power on the Cisco CSP 2100 by pressing the **Power** button.

Figure 3-11 SCPM Bracket Location



1	SCPM mounting bracket between fans 3 and 4	**3**	Retainer bar securing clip
2	Retainer bar		

Replacing DIMMs

This section includes the following topics:

Caution DIMMs and their sockets are fragile and must be handled with care to avoid damage during installation.

Caution Cisco does not support third-party DIMMs. Using non-Cisco DIMMs in the Cisco CSP 2100 might result in system problems or damage to the motherboard.

Note To ensure the best Cisco CSP 2100 performance, it is important that you are familiar with memory performance guidelines and population rules before you install or replace DIMMs.

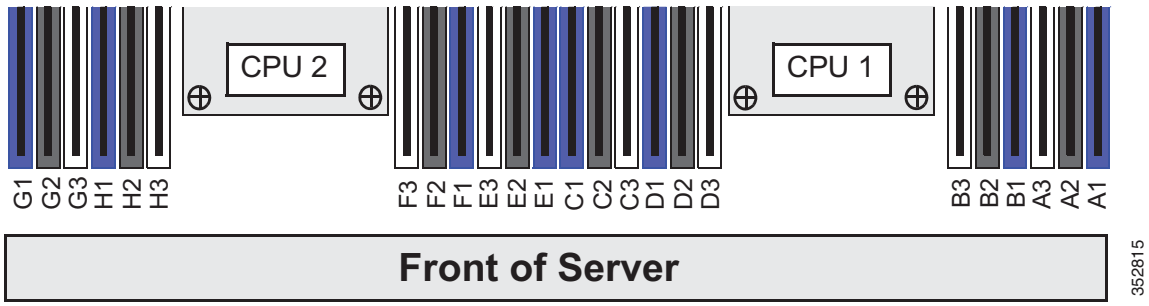
Memory Performance Guidelines and Population Rules

This section describes the type of memory that the Cisco CSP 2100 requires and its effect on performance. The section includes the following topics:

DIMM Slot Numbering

Figure 3-12 shows the numbering of the DIMM slots.

Figure 3-12 DIMM Slots and CPUs



DIMM Population Rules

Observe the following guidelines when installing or replacing DIMMs:

Observe the following guidelines when installing or replacing DIMMs:

- Each CPU supports four memory channels.
  - CPU1 supports channels A, B, C, and D.
  - CPU2 supports channels E, F, G, and H.
- Each channel has three DIMM sockets (for example, channel A = slots A1, A2, and A3).
  - A channel can operate with one, two, or three DIMMs installed.
  - If a channel has only one DIMM, populate slot 1 first (the blue slot).
- When both CPUs are installed, populate the DIMM sockets of each CPU identically.
  - Fill blue #1 slots in the channels first: A1, E1, B1, F1, C1, G1, D1, H1
  - Fill black #2 slots in the channels second: A2, E2, B2, F2, C2, G2, D2, H2
  - Fill white #3 slots in the channels third: A3, E3, B3, F3, C3, G3, D3, H3
- Any DIMM installed in a DIMM socket for which the CPU is absent is not recognized. In a single-CPU configuration, populate the channels for CPU1 only (A, B, C, D).
- Memory mirroring reduces the amount of memory available by 50 percent because only one of the two populated channels provides data. When memory mirroring is enabled, DIMMs must be installed in sets of 4, 6, or 8 as described in Memory Mirroring and RAS, page 3-23.
- Observe the DIMM mixing rules shown in Table 3-4.

Table 3-4 DIMM Mixing Rules for Cisco CSP 2100

DIMM Parameter	DIMMs in the Same Channel	DIMMs in the Same Bank
DIMM Capacity: RDIMM = 8 or 16 GB LRDIMM = 32 or 64 GB	• You can mix different capacity DIMMs in the same channel (for example, A1, A2, A3).	• You can mix different capacity DIMMs in the same bank. However, for optimal performance DIMMs in the same bank (for example, A1, B1, C1, D1) should have the same capacity.
DIMM Speed: 2133 or 2400 MHz	You can mix speeds, but DIMMs will run at the speed of the slowest DIMMs/CPUs installed in the channel.	You can mix speeds, but DIMMs will run at the speed of the slowest DIMMs/CPUs installed in the bank.
DIMM Type: RDIMMs or LRDIMMs	You cannot mix DIMM types in a channel.	You cannot mix DIMM types in a bank.

Memory Mirroring and RAS

The Intel E5-2600 CPUs within the Cisco CSP 2100 support memory mirroring only when an even number of channels are populated with DIMMs. If one or three channels are populated with DIMMs, memory mirroring is automatically disabled. Furthermore, if memory mirroring is used, DRAM size is reduced by 50 percent for reasons of reliability.

The memory mirroring configuration for Cisco CSP 2100 is similar to that of Cisco UCS C-Series servers. You can refer to Cisco UCS C-Series Rack Server specification sheet for details on populating recommended memory mirroring configurations:

Cisco UCS C220 M4 High Density Rack Server (Small Form-Factor Disk Drive Model) Specification Sheet

Lockstep Channel Mode

When you enable lockstep channel mode, each memory access is a 128-bit data access that spans four channels.

Lockstep channel mode requires that all four memory channels on a CPU must be populated identically with regard to size and organization. DIMM socket populations within a channel (for example, A1, A2, A3) do not have to be identical but the same DIMM slot location across all four channels must be populated the same.

For example, DIMMs in sockets A1, B1, C1, and D1 must be identical. DIMMs in sockets A2, B2, C2, and D2 must be identical. However, the A1-B1-C1-D1 DIMMs do not have to be identical with the A2-B2-C2-D2 DIMMs.

DIMM Replacement Procedure

This section includes the following topics:

Identifying a Faulty DIMM

Each DIMM socket has a corresponding DIMM fault LED, directly in front of the DIMM socket. See Figure 3-3 for the locations of these LEDs. The LEDs light amber to indicate a faulty DIMM. To operate these LEDs from the supercap power source, remove AC power cords and then press the **unit identification** button. See also Internal Diagnostic LEDs, page 3-6.

Replacing DIMMs

Step 1 Remove the DIMM that you are replacing:

a. Power off the Cisco CSP 2100 as described in the Shutting Down and Powering Off the Cisco CSP 2100, page 3-7.

b. Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

c. Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

d. Identify the faulty DIMM by observing the DIMM slot fault LEDs on the motherboard.

e. Open the ejector levers at both ends of the DIMM slot, and then lift the DIMM out of the slot.

Step 2 Install a new DIMM:

Note Before installing DIMMs, see the population guidelines: Memory Performance Guidelines and Population Rules, page 3-21.

f. Align the new DIMM with the empty slot on the motherboard. Use the alignment key in the DIMM slot to correctly orient the DIMM.

g. Push down evenly on the top corners of the DIMM until it is fully seated and the ejector levers on both ends lock into place.

h. Replace the top cover.

i. Replace the Cisco CSP 2100 in the rack, replace cables, and then power on the Cisco CSP 2100 by pressing the **Power** button.

Replacing CPUs and Heatsinks

This section contains the following topics:

CPU Configuration Rules

This Cisco CSP 2100 has two CPU sockets. Each CPU supports four DIMM channels (12 DIMM slots). See Figure 3-12.

- Cisco CSP 2100 can operate with one CPU or two identical CPUs installed.
- The minimum configuration is that Cisco CSP 2100 must have at least CPU1 installed. Install CPU1 first, and then CPU2.
- The following restrictions apply when using a single-CPU configuration:
  - The maximum number of DIMMs is 12 (only CPU1 channels A, B, C, and D).
  - PCIe riser 2/slot 2 is unavailable.

CPU Replacement Procedure

Caution CPUs and their motherboard sockets are fragile and must be handled with care to avoid damaging pins during installation. The CPUs must be installed with heatsinks and their thermal pads to ensure proper cooling. Failure to install a CPU correctly might result in damage to the Cisco CSP 2100.

Note Cisco CSP 2100 uses the new independent loading mechanism (ILM) CPU sockets, so no Pick-and-Place tools are required for CPU handling or installation. Always grasp the plastic frame on the CPU when handling.

Step 1 Power off the Cisco CSP 2100 as described in Shutting Down and Powering Off the Cisco CSP 2100, page 3-7.

Step 2 Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

Step 3 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

Step 4 Remove the plastic air baffle that sits over the CPUs.

Step 5 Remove the heatsink that you are replacing. Use a Number 2 Phillips-head screwdriver to loosen the four captive screws that secure the heatsink and then lift it off of the CPU.

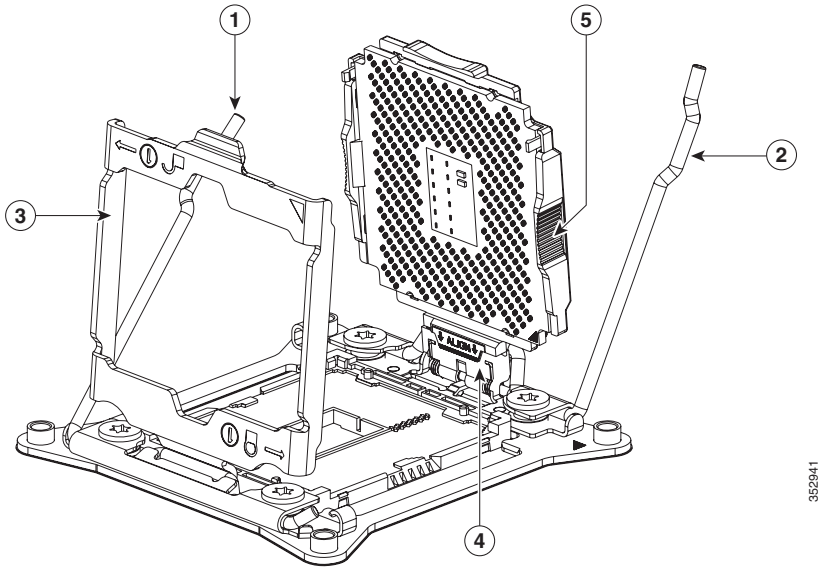
Note Alternate loosening each screw evenly to avoid damaging the heatsink or CPU.

Step 6 Open the CPU retaining mechanism:

a. Unclip the first retaining latch labeled with the icon, and then unclip the second retaining latch labeled with the icon. See Figure 3-13.

b. Open the hinged CPU cover plate.

Figure 3-13 CPU Socket



1	CPU retaining latch	**4**	Hinged CPU seat
2	CPU retaining latch	**5**	Finger grips on plastic CPU frame
3	Hinged CPU cover plate		

Step 7 Remove any existing CPU:

a. With the latches and hinged CPU cover plate open, swing up the CPU in its hinged seat to the open position, as shown in Figure 3-13.

b. Grasp the CPU by the finger grips on its plastic frame and lift it up and out of the hinged CPU seat.

c. Set the CPU aside on an anti-static surface.

Step 8 Install a new CPU:

a. Grasp the new CPU by the finger grips on its plastic frame and align the tab on the frame that is labeled “ALIGN” with the SLS mechanism, as shown in Figure 3-14.

b. Insert the tab on the CPU frame into the seat until it stops and is held firmly.

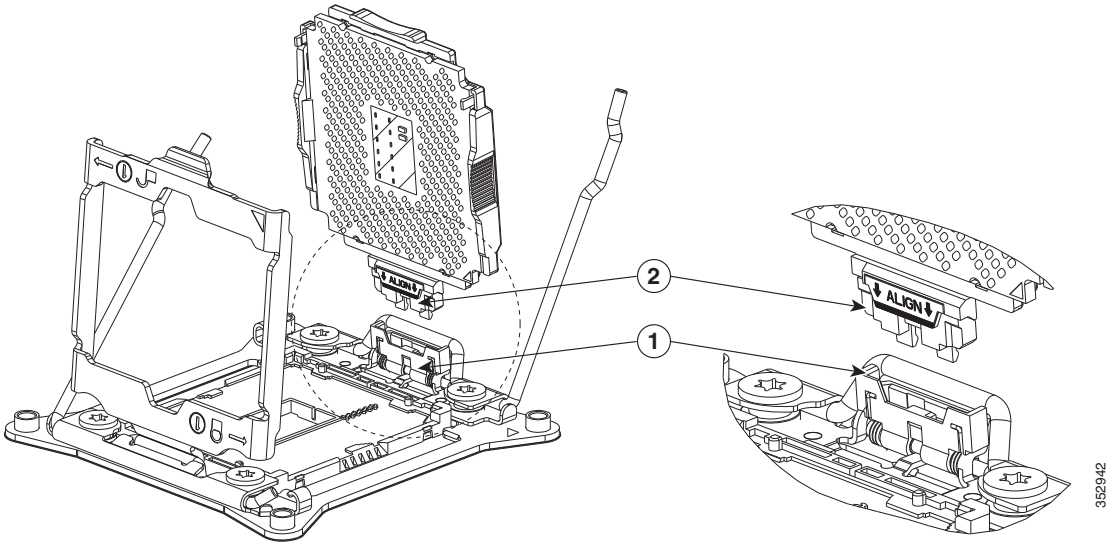
The line below the word “ALIGN” should be level with the edge of the seat, as shown in Figure 3-14.

c. Swing the hinged seat with the CPU down until the CPU frame clicks in place and holds flat in the socket.

d. Close the hinged CPU cover plate.

e. Clip down the CPU retaining latch with the icon, and then clip down the CPU retaining latch with the icon. See Figure 3-13.

Figure 3-14 CPU and Socket Alignment Features



1	SLS mechanism on socket	**2**	Tab on CPU frame (labeled ALIGN)

Step 9 Install a heat sink:

Caution The heat sink must have new thermal grease on the heat sink-to-CPU surface to ensure proper cooling. If you are reusing a heat sink, you must remove the old thermal grease. If you are installing a new heat sink, skip to Step c.

a. Apply the cleaning solution, which is included with the heatsink cleaning kit (shipped with spare CPUs), to the old thermal grease and let it soak for a least 15 seconds.

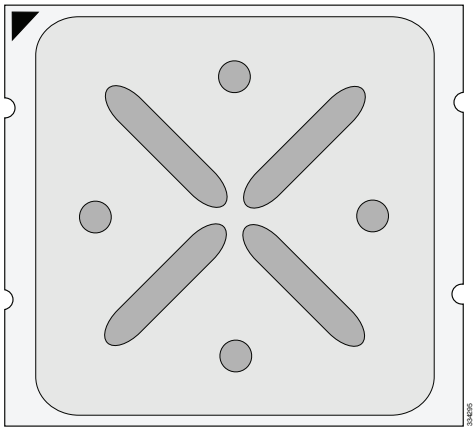
b. Wipe all of the old thermal grease off the old heat sink using the soft cloth that is included with the heatsink cleaning kit. Be careful to not scratch the heat sink surface.

c. Apply thermal grease from the syringe that is included with the new CPU to the top of the CPU.

Apply about half the syringe contents to the top of the CPU in the pattern that is shown in Figure 3-15.

Note If you do not have a syringe of thermal grease, you can order a spare (**Cisco PID UCS-CPU-GREASE3=**). This syringe has a white cap.

Figure 3-15 Thermal Grease Application Pattern



d. Align the four heatsink captive screws with the motherboard standoffs, and then use a Number 2 Phillips-head screwdriver to tighten the captive screws evenly.

Note Alternate tightening each screw evenly to avoid damaging the heatsink or CPU.

Step 10 Replace the air baffle.

Step 11 Replace the top cover.

Step 12 Replace the Cisco CSP 2100 in the rack, replace cables, and then power on the Cisco CSP 2100 by pressing the **Power** button.

Additional CPU-Related Parts to Order with RMA Replacement Motherboards

When a return material authorization (RMA) of the motherboard or CPU is done on a Cisco CSP 2100, additional parts might not be included with the CPU or motherboard spare bill of materials (BOM). The TAC engineer might need to add the additional parts to the RMA to help ensure a successful replacement.

- Scenario 1—You are reusing the existing heatsinks:
  - Heat sink cleaning kit (UCSX-HSCK=)
  - Thermal grease kit for Cisco CSP 2100 (UCS-CPU-GREASE3=)
- Scenario 2—You are replacing the existing heatsinks:
  - Heat sink (UCSC-HS-C220M4=)
  - Heat sink cleaning kit (UCSX-HSCK=)

A CPU heatsink cleaning kit is good for up to four CPU and heatsink cleanings. The cleaning kit contains two bottles of solution, one to clean the CPU and heatsink of old thermal interface material and the other to prepare the surface of the heatsink.

New heatsink spares come with the required thermal grease. It is important to clean the old thermal grease off of the CPU prior to installing the heatsinks. Therefore, when you are ordering new heatsinks, you must order the heatsink cleaning kit.

Replacing an Internal SD Card

The Cisco CSP 2100 has two internal SD card bays on the motherboard.

Dual SD cards are supported. RAID 1 support can be configured through the CIMC interface.

Step 1 Remove the SD card that you are replacing:

a. Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

b. Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

c. Locate the SD card that you are replacing on the motherboard (see Figure 3-16).

d. Push on the top of the SD card, and then release it to allow it to spring up in the slot.

e. Remove the SD card from the slot.

Step 2 Install an SD card:

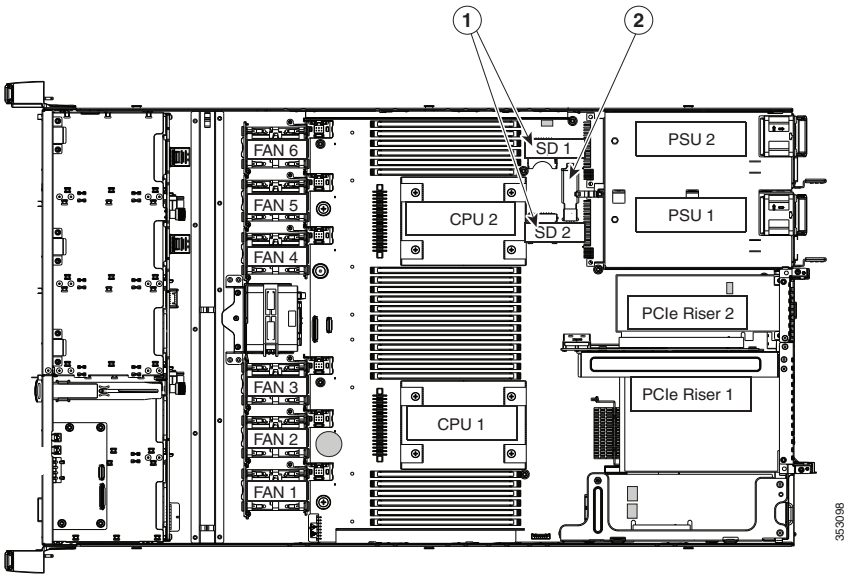
a. Insert the SD card into the slot with the label side facing up.

b. Press on the top of the card until it clicks in the slot and stays in place.

c. Replace the top cover.

d. Replace the Cisco CSP 2100 in the rack.

Figure 3-16 SD Card Bays and USB Port Locations on the Motherboard



1	SD card bays SD1 and SD2	**2**	USB 3.0 port

Enabling or Disabling the Internal USB Port

Caution We do not recommend that you hot-swap the internal USB drive while the Cisco CSP 2100 is powered on.

The factory default is for all USB ports on the Cisco CSP 2100 to be enabled. However, the internal USB port can be enabled or disabled in the Cisco CSP 2100 BIOS. See Figure 3-16 for the location of the USB port on the motherboard.

Step 1 Enter the BIOS Setup Utility by pressing the **F2** key when prompted during bootup.

Step 2 Navigate to the **Advanced** tab.

Step 3 On the Advanced tab, select **USB Configuration**.

Step 4 On the USB Configuration page, select **USB Ports Configuration**.

Step 5 Scroll to **USB Port: Internal**, press **Enter**, and then choose either **Enabled** or **Disabled** from the dialog box.

Step 6 Press **F10** to save and exit the utility.

Replacing a Cisco Modular RAID Controller Riser (Internal Riser 3)

Cisco CSP 2100 has a dedicated internal riser (riser 3) that is only used for the Cisco modular RAID controller card. This riser plugs into a dedicated motherboard socket and provides a horizontal socket for the Cisco modular RAID controller card.

Step 1 Prepare the Cisco CSP 2100 for component installation:

a. Power off the Cisco CSP 2100 as described in Shutting Down and Powering Off the Cisco CSP 2100, page 3-7.

b. Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

c. Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

Step 2 Remove the existing RAID controller riser (see Figure 3-17):

a. If the existing riser has a card in it, disconnect the SAS cable from the card.

b. Lift the riser straight up to disengage the riser from the motherboard socket. The riser bracket must also lift off of two pegs that hold it to the inner chassis wall.

c. Set the riser upside down.

d. Remove the card from the riser. Loosen the single thumbscrew that secures the card to the riser bracket and then pull the card straight out from its socket on the riser (see Figure 3-18).

Step 3 Install a new RAID controller riser:

a. Set the new riser upside down.

b. Install the RAID controller card into the new riser. Align the connector on the card with the socket on the riser and then carefully push it into the socket. Tighten the single thumbscrew that secures the card to the riser bracket (see Figure 3-18 on page 3-34).

c. Align the connector on the riser with the socket on the motherboard. At the same time, align the two slots on the back side of the bracket with the two pegs on the inner chassis wall.

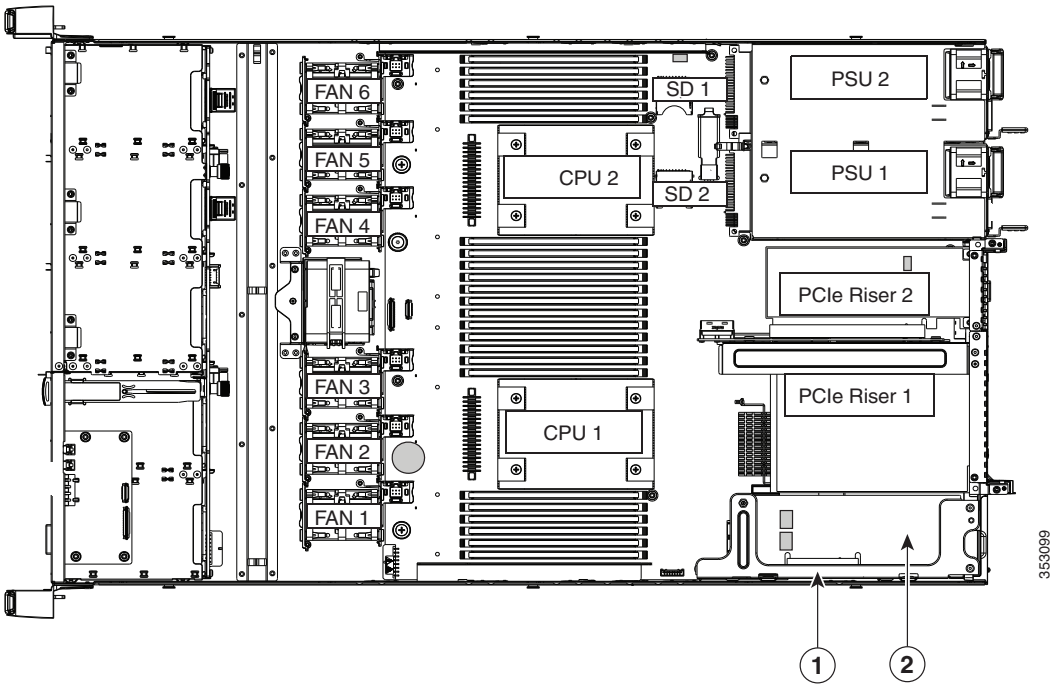
d. Push down gently to engage the riser connector with the motherboard socket. The metal riser bracket must also engage the two pegs that secure it to the chassis wall.

e. Reconnect the SAS cable to its connector on the RAID controller card.

Step 4 Replace the top cover.

Step 5 Replace the Cisco CSP 2100 in the rack, replace cables, and then power on the Cisco CSP 2100 by pressing the **Power** button.

Figure 3-17 Cisco Modular RAID Controller Riser (Internal Riser 3) Location



1	Cisco modular RAID controller riser assembly (top of bracket)	**2**	Cisco modular RAID controller card in riser

Replacing a Cisco Modular RAID Controller Card

Cisco CSP 2100 can use a Cisco modular RAID controller card that plugs into a horizontal socket on a dedicated internal riser (riser 3).

Note You cannot use a hardware RAID controller card and the embedded RAID controller at the same time.

Step 1 Prepare the Cisco CSP 2100 for component installation:

a. Power off the Cisco CSP 2100 as described in Shutting Down and Powering Off the Cisco CSP 2100, page 3-7.

b. Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

c. Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

Step 2 Remove the RAID controller riser from the Cisco CSP 2100 (see Figure 3-17):

a. Disconnect the SAS cable from the existing RAID controller card.

b. Lift the riser straight up to disengage the riser from the motherboard socket. The riser bracket must also lift off of two pegs that hold it to the inner chassis wall.

c. Set the riser upside down.

Step 3 Remove the card from the riser:

a. Loosen the single thumbscrew that secures the card to the metal riser bracket (see Figure 3-18).

b. Pull the card straight out from its socket on the riser and the guide channel on the riser bracket.

Step 4 Install the RAID controller card into the new riser:

a. With the riser upside down, align the connector on the card with the socket on the riser. The end of the card should also go into the guide channel on the riser bracket (see Figure 3-18).

b. Carefully push on both corners of the card until it is seated in the socket.

c. Tighten the single thumbscrew that secures the card to the riser bracket.

Step 5 Return the riser to the Cisco CSP 2100:

a. Align the connector on the riser with the socket on the motherboard. At the same time, align the two slots on the back side of the bracket with the two pegs on the inner chassis wall.

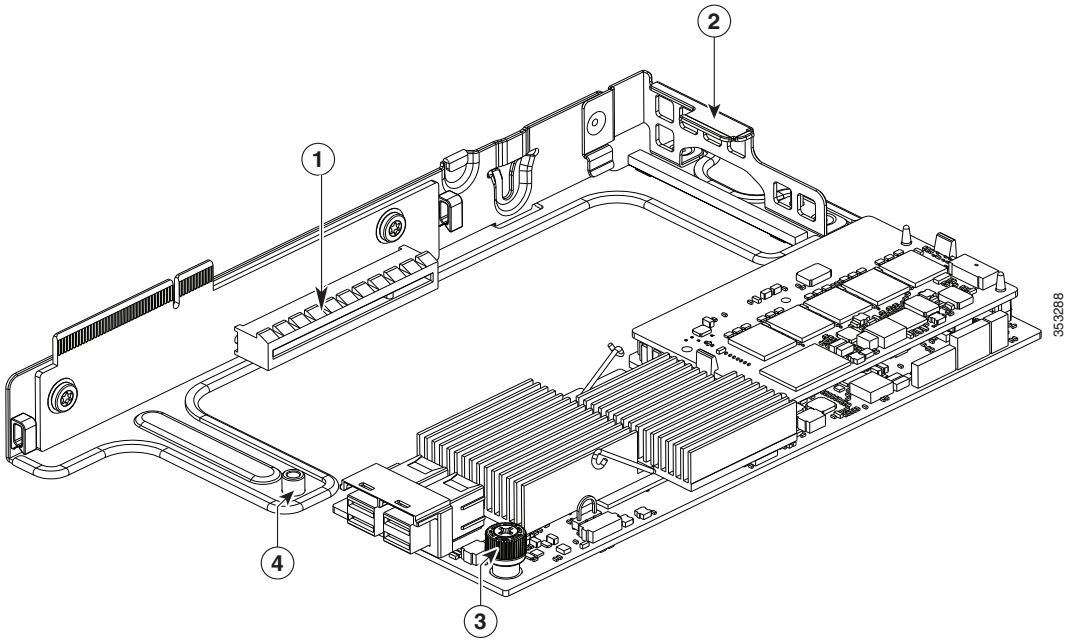
b. Push down gently to engage the riser connector with the motherboard socket. The metal riser bracket must also engage the two pegs that secure it to the chassis wall.

Step 6 Reconnect the SAS cable to its connector on the RAID controller card.

Step 7 Replace the top cover.

Step 8 Replace the Cisco CSP 2100 in the rack, replace cables, and then power on the Cisco CSP 2100 by pressing the **Power** button.

Figure 3-18 Cisco Modular RAID Controller Card in Riser

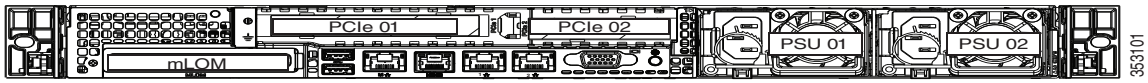


1	Card socket on upside down riser	**3**	Thumbscrew on card
2	Guide channel on riser bracket		

Replacing a PCIe Riser Assembly

Cisco CSP 2100 contains two PCIe risers that are attached to a single riser assembly. Riser 1 provides PCIe slot 1 and riser 2 provides PCIe slot 2, as shown in Figure 3-19. See Table 3-5 for a description of the PCIe slots on each riser.

Figure 3-19 Rear Panel, Showing PCIe Slots



To install or replace a PCIe riser, follow these steps:

Step 1 Remove the PCIe riser assembly that you are replacing:

a. Power off the Cisco CSP 2100 as described in Shutting Down and Powering Off the Cisco CSP 2100, page 3-7.

b. Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

c. Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

d. Use two hands to grasp the metal bracket of the riser assembly and lift straight up to disengage its connectors from the two sockets on the motherboard.

e. If the riser has any cards installed, remove them from the riser.

Step 2 Install a new PCIe riser assembly:

a. If you removed any cards from the old riser assembly, install the cards to the new riser assembly (see Replacing a PCIe Card, page 3-37).

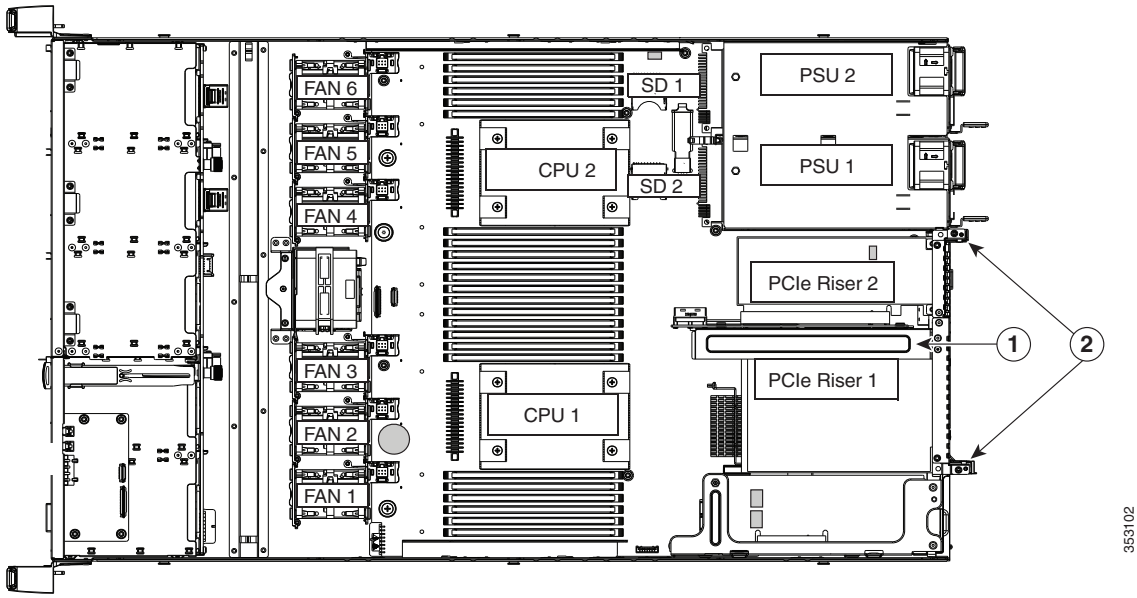
b. Position the riser assembly over its two sockets on the motherboard and over the chassis alignment channels (see Figure 3-20):

c. Carefully push down on both ends of the riser assembly to fully engage its connectors with the two sockets on the motherboard.

Step 3 Replace the top cover.

Step 4 Replace the Cisco CSP 2100 in the rack, replace cables, and then power on the Cisco CSP 2100 by pressing the **Power** button.

Figure 3-20 PCIe Riser Assembly Location and Alignment Channels



1	PCIe riser assembly bracket	**3**	Chassis alignment channels

Replacing a PCIe Card

Caution Cisco supports all PCIe cards qualified and sold by Cisco. PCIe cards not qualified or sold by Cisco are the responsibility of the customer. Although Cisco will always stand behind and support the Cisco CSP 2100, customers using standard, off-the-shelf, third-party cards must go to the third-party card vendor for support if any issue with that particular third-party card occurs.

This section includes the following topics:

PCIe Slots

Cisco CSP 2100 contains two toolless PCIe risers for horizontal installation of PCIe cards. See Figure 3-21 and Table 3-5 for a description of the PCIe slots on these risers.

Both slots support the network communications services interface (NCSI) protocol and standby power.

Figure 3-21 Rear Panel, Showing PCIe Slots

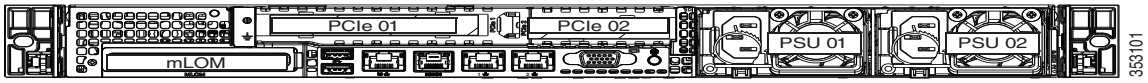


Table 3-5 PCIe Expansion Slots

Slot Number	Electrical Lane Width	Connector Length	Card Length[1]	Card Height [2]	NCSI Support
1 (on riser 1)	Gen-3 x16	x24 connector	3/4 length	Full-height	Yes
2 (on riser version 2A)[3]	Gen-3 x16	x24 connector	1/2 length	1/2 height	Yes

1. This is the supported length because of internal clearance.
2. This is the size of the rear panel opening.
3. Slot 2 is not available in single-CPU configurations.

Replacing a PCIe Card

To install or replace a PCIe card, follow these steps:

Step 1 Remove an existing PCIe card (or a blank filler panel) from the PCIe riser:

a. Shut down and power off the Cisco CSP 2100 as described in Shutting Down and Powering Off the Cisco CSP 2100, page 3-7.

b. Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

c. Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

d. Remove any cables from the ports of the PCIe card that you are replacing.

e. Use two hands to grasp the metal bracket of the riser assembly and lift straight up to disengage its connectors from the two sockets on the motherboard.

f. Open the hinged plastic retainer that secures the rear-panel tab of the card (see Figure 3-22).

g. Pull evenly on both ends of the PCIe card to remove it from the socket on the PCIe riser.

If the riser has no card, remove the blanking panel from the rear opening of the riser.

Step 2 Install a new PCIe card:

a. Open the hinged plastic retainer

b. With the hinged tab retainer open, align the new PCIe card with the empty socket on the PCIe riser.

c. Push down evenly on both ends of the card until it is fully seated in the socket.

d. Ensure that the card's rear panel tab sits flat against the riser rear-panel opening and then close the hinged tab retainer over the card's rear-panel tab (see Figure 3-22).

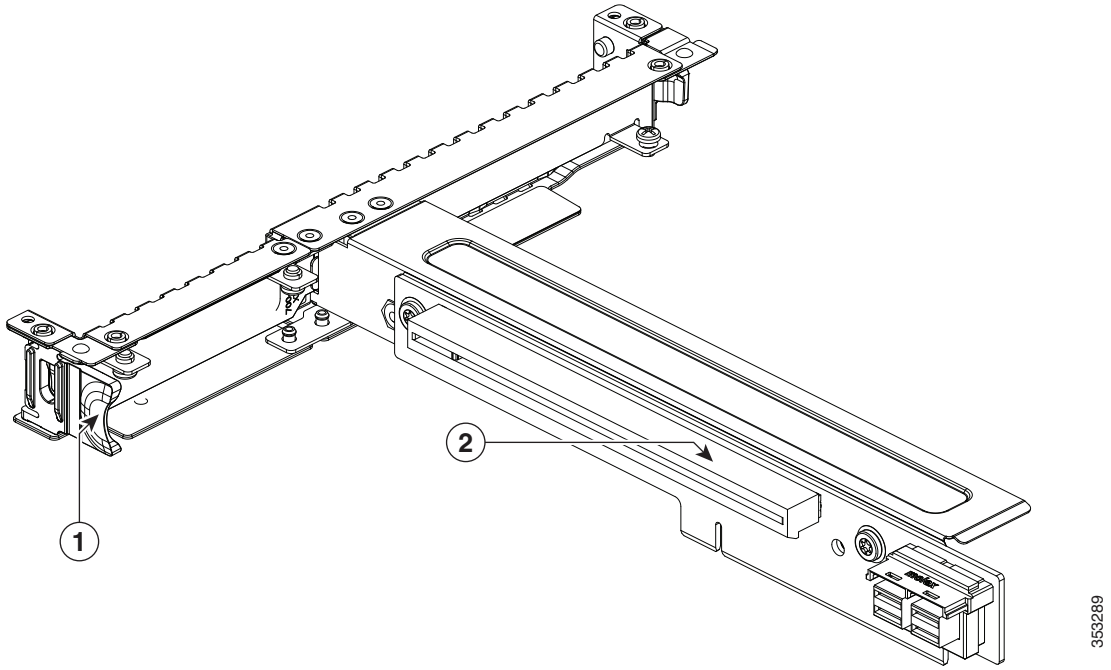
e. Position the PCIe riser over its two sockets on the motherboard and over the chassis alignment channels (see Figure 3-20).

f. Carefully push down on both ends of the PCIe riser to fully engage its connector with the sockets on the motherboard.

g. Replace the top cover.

h. Replace the Cisco CSP 2100 in the rack, replace cables, and then power on the Cisco CSP 2100 by pressing the **Power** button.

Figure 3-22 PCIe Riser Assembly



1	Hinged rear-panel tab retainer	**3**	Card socket on riser (riser 2 socket shown)

Installing Multiple PCIe Cards and Resolving Limited Resources

When a large number of PCIe add-on cards are installed in the Cisco CSP 2100, the system might run out of the following resources required for PCIe devices:

- Option ROM memory space
- 16-bit I/O space

The topics in this section provide guidelines for resolving the issues related to these limited resources:

- Resolving Insufficient Memory Space to Execute Option ROMs, page 3-39
- Resolving Insufficient 16-Bit I/O Space, page 3-40

Resolving Insufficient Memory Space to Execute Option ROMs

The system has very limited memory to execute PCIe legacy option ROMs, so when a large number of PCIe add-on cards are installed in the Cisco CSP 2100, the system BIOS might not able to execute all of the option ROMs. The system BIOS loads and executes the option ROMs in the order that the PCIe cards are enumerated (slot 1, slot 2, slot 3, and so on).

If the system BIOS does not have sufficient memory space to load any PCIe option ROM, it skips loading that option ROM, reports a system event log (SEL) event to the CIMC controller and reports the following error in the Error Manager page of the BIOS Setup utility:

```
ERROR CODE  SEVERITY    INSTANCE    DESCRIPTION
146         Major       N/A         PCI out of resources error.
                                    Major severity requires user
                                    intervention but does not
                                    prevent system boot.
```

To resolve this issue, disable the Option ROMs that are not needed for system booting. The BIOS Setup Utility provides the setup options to enable or disable the Option ROMs at the PCIe slot level for the PCIe expansion slots and at the port level for the onboard NICs. These options can be found in the BIOS Setup Utility **Advanced** > **PCI Configuration** page.

- **Guidelines for RAID controller booting**

  If the Cisco CSP 2100 is configured to boot primarily from RAID storage, make sure that the option ROMs for the slots where your RAID controllers installed are enabled in the BIOS, depending on your RAID controller configuration.

  If the RAID controller does not appear in the system boot order even with the option ROMs for those slots enabled, the RAID controller option ROM might not have sufficient memory space to execute. In that case, disable other option ROMs that are not needed for the system configuration to free up some memory space for the RAID controller option ROM.

- **Guidelines for onboard NIC PXE booting**

  If the system is configured to primarily perform PXE boot from onboard NICs, make sure that the option ROMs for the onboard NICs to be booted from are enabled in the BIOS Setup Utility. Disable other option ROMs that are not needed to create sufficient memory space for the onboard NICs.

Resolving Insufficient 16-Bit I/O Space

The system has only 64 KB of legacy 16-bit I/O resources available. This 64 KB of I/O space is divided between the CPUs in the system because the PCIe controller is integrated into the CPUs. This Cisco CSP 2100 BIOS has the capability to dynamically detect the 16-bit I/O resource requirement for each CPU and then balance the 16-bit I/O resource allocation between the CPUs during the PCI bus enumeration phase of the BIOS POST.

When a large number of PCIe cards are installed in the system, the system BIOS might not have sufficient I/O space for some PCIe devices. If the system BIOS is not able to allocate the required I/O resources for any PCIe devices, the following symptoms have been observed:

- The system might get stuck in an infinite reset loop.
- The BIOS might appear to hang while initializing PCIe devices.
- The PCIe option ROMs might take excessive time to complete, which appears to lock up the system.
- PCIe boot devices might not be accessible from the BIOS.
- PCIe option ROMs might report initialization errors. These errors are seen before the BIOS passes control to the operating system.
- The keyboard might not work.

The work around to this problem is to rebalance the 16-bit I/O load by physically removing any unused PCIe cards.

Replacing an mLOM Card

Cisco CSP 2100 can use a modular LOM (mLOM) card to provide additional rear-panel connectivity. The mLOM card socket remains powered when the Cisco CSP 2100 is in 12 V standby power mode and it supports the network communications services interface (NCSI) protocol.

Step 1 Remove any existing mLOM card (or a blanking panel):

a. Power off the Cisco CSP 2100 as described in Shutting Down and Powering Off the Cisco CSP 2100, page 3-7.

b. Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

c. Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

Step 2 See the location of the mLOM socket in Figure 3-23. You might have to remove PCIe riser 1 and the Cisco modular RAID controller riser to provide clearance.

- If there is no card in PCIe riser 1 or the RAID card riser, you can access the mLOM socket. Continue with Step 3.
- If there is a card in PCIe riser 1 or the RAID card riser, remove those risers to provide clearance. See Replacing a PCIe Riser Assembly, page 3-35 and Replacing a Cisco Modular RAID Controller Card, page 3-33 for instructions.

Step 3 Loosen the single thumbscrew that secures the mLOM card to the chassis floor and then slide the mLOM card horizontally to disengage its connector from the motherboard socket.

Step 4 Install a new mLOM card:

a. Set the mLOM card on the chassis floor so that its connector is aligned with the motherboard socket and its thumbscrew is aligned with the standoff on the chassis floor.

b. Push the card's connector into the motherboard socket horizontally.

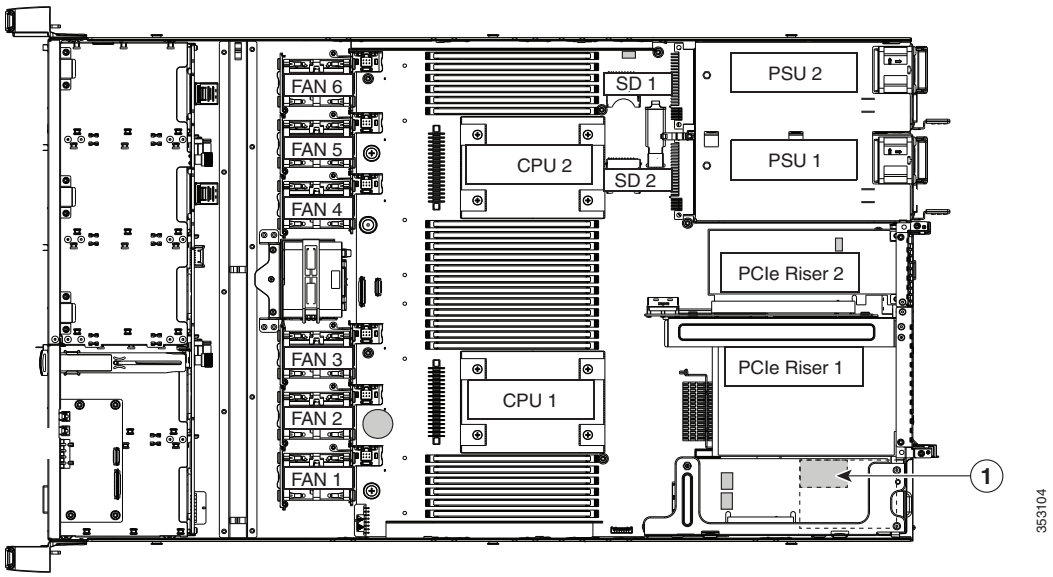
c. Tighten the thumbscrew to secure the card to the chassis floor.

Step 5 If you removed PCIe riser 1 or the RAID card riser, return them to the Cisco CSP 2100. See Replacing a PCIe Riser Assembly, page 3-35 or Replacing a Cisco Modular RAID Controller Card, page 3-33 for instructions.

Step 6 Replace the top cover.

Step 7 Replace the Cisco CSP 2100 in the rack, replace cables, and then power on the Cisco CSP 2100 by pressing the **Power** button.

Figure 3-23 mLOM Card Socket Location



1	mLOM card socket location on motherboard (under a PCIe riser 1 card and the RAID controller card)		

Replacing Power Supplies

Cisco CSP 2100 can have one or two power supplies. The two power supply setup functions as a redundant configuration. Cisco CSP 2100 also supports cold redundancy. Depending on the power being drawn by the Cisco CSP 2100, one power supply might actively provide all power to the system while the remaining power supply is put into a standby state. For example, if you have two supplies connected to AC power, but the power consumption can be satisfied by power supply 1, then power supply 2 is put into a standby state.

- See Power Specifications, page 4-3 for more information about the power supplies.
- See Rear Panel LEDs and Buttons, page 3-4 for information about the power supply LEDs.

Note If you have ordered a Cisco CSP 2100 with power supply redundancy (two power supplies), you do not have to power off the Cisco CSP 2100 to replace power supplies because they are redundant as 1+1.

Note Do not mix power supply types or wattages in the Cisco CSP 2100.

Step 1 Remove the power supply that you are replacing or a blank panel from an empty bay (see Figure 3-24):

a. Perform one of the following actions:
   - If your Cisco CSP 2100 has only one power supply, shut down and power off the Cisco CSP 2100 as described in the "Shutting Down and Powering Off the Cisco CSP 2100" section on page 3-7.
   - If your Cisco CSP 2100 has two power supplies, you do not have to shut down the Cisco CSP 2100.

b. Remove the power cord from the power supply that you are replacing.

c. Grasp the power supply handle while pinching the release lever toward the handle.

d. Pull the power supply out of the bay.

Step 2 Install a new power supply:

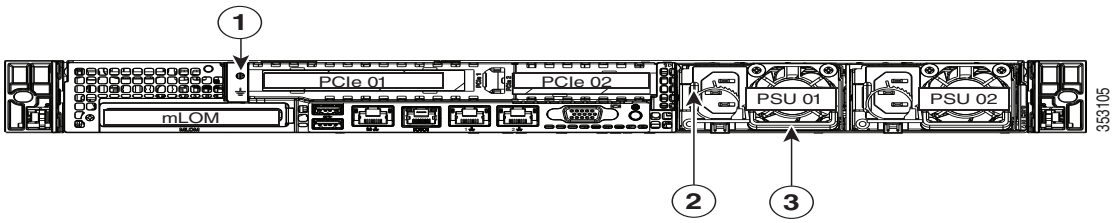
a. Grasp the power supply handle and insert the new power supply into the empty bay.

b. Push the power supply into the bay until the release lever locks.

c. Connect the power cord to the new power supply.

d. If you shut down the Cisco CSP 2100, press the **Power** button to return the Cisco CSP 2100 to main power mode.

Figure 3-24 Removing and Replacing Power Supplies



1	Power supply release lever	2	Power supply handle

Service DIP Switches

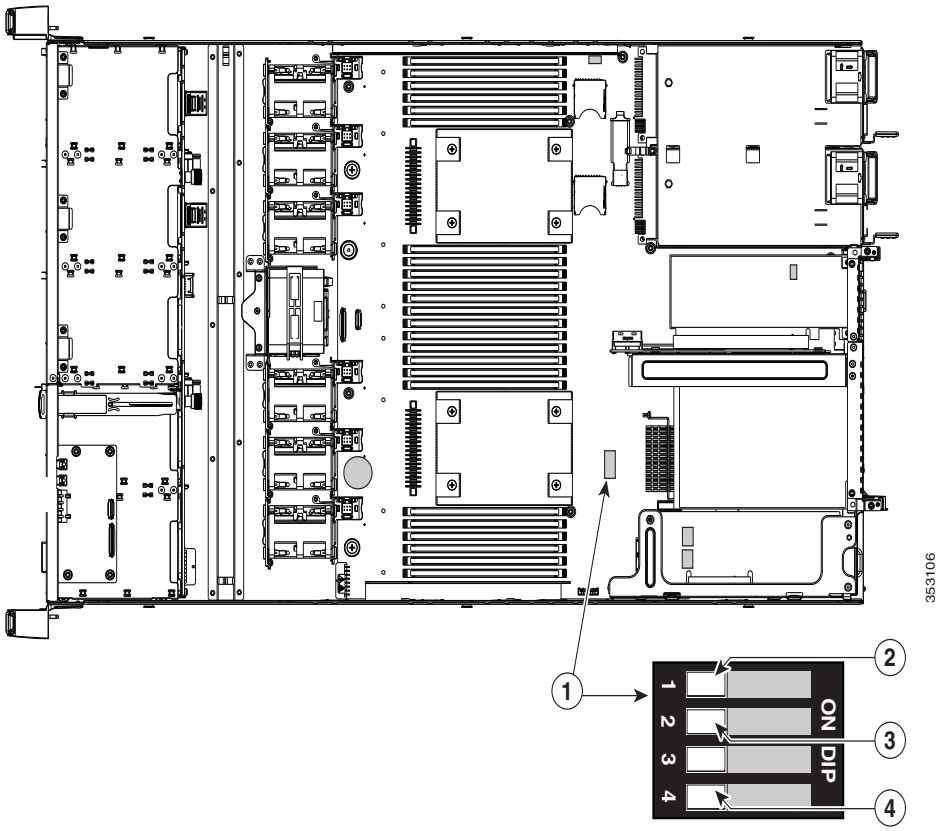
This section includes the following topics:

DIP Switch Location on the Motherboard

See Figure 3-25. The position of the block of DIP switches (SW6) is shown in red. In the magnified view, all switches are shown in the default position.

- BIOS recovery—Switch 1.
- Clear password—Switch 2.
- Not used—Switch 3.
- Clear CMOS—Switch 4.

Figure 3-25 Service DIP Switches (SW6)



1	DIP switch block SW6	**3**	Clear password switch 2
2	BIOS recovery switch 1	**4**	Clear CMOS switch 4

Using the BIOS Recovery DIP Switch

Depending on which stage the BIOS becomes corrupted, you might see different behavior.

- If the BIOS BootBlock is corrupted, you might see the system get stuck on the following message:

```
Initializing and configuring memory/hardware
```

- If it is a non-BootBlock corruption, the following message is displayed:

```
****BIOS FLASH IMAGE CORRUPTED****
Flash a valid BIOS capsule file using Cisco IMC WebGUI or CLI interface.
IF Cisco IMC INTERFACE IS NOT AVAILABLE, FOLLOW THE STEPS MENTIONED BELOW.
1. Connect the USB stick with recovery.cap file in root folder.
2. Reset the host.
IF THESE STEPS DO NOT RECOVER THE BIOS
1. Power off the system.
2. Mount recovery jumper.
3. Connect the USB stick with recovery.cap file in root folder.
4. Power on the system.
Wait for a few seconds if already plugged in the USB stick.
REFER TO SYSTEM MANUAL FOR ANY ISSUES.
```

Note As indicated by the message shown above, there are two procedures for recovering the BIOS. Try procedure 1 first. If that procedure does not recover the BIOS, use procedure 2.

Procedure 1: Reboot with recovery.cap File

Step 1 Download the BIOS update package and extract it to a temporary location.

Step 2 Copy the contents of the extracted recovery folder to the root directory of a USB thumb drive. The recovery folder contains the recovery.cap file that is required in this procedure.

Note The recovery.cap file must be in the root directory of the USB thumb drive. Do not rename this file. The USB thumb drive must be formatted with either FAT16 or FAT32 file systems.

Step 3 Insert the USB thumb drive into a USB port on the Cisco CSP 2100.

Step 4 Reboot the Cisco CSP 2100.

Step 5 Return the Cisco CSP 2100 to main power mode by pressing the **Power** button on the front panel.

The Cisco CSP 2100 boots with the updated BIOS boot block. When the BIOS detects a valid recovery.cap file on the USB thumb drive, it displays this message:

```
Found a valid recovery file...Transferring to Cisco IMC
System would flash the BIOS image now...
System would restart with recovered image after a few seconds...
```

Step 6 Wait for the Cisco CSP 2100 to complete the BIOS update, and then remove the USB thumb drive from the Cisco CSP 2100.

Note During the BIOS update, CIMC shuts down the Cisco CSP 2100 and the screen goes blank for about 10 minutes. Do not unplug the power cords during this update. CIMC powers on the Cisco CSP 2100 after the update is complete.

Procedure 2: Use BIOS Recovery DIP switch and recovery.cap File

See Figure 3-25 for the location of the SW8 block of DIP switches.

Step 1 Download the BIOS update package and extract it to a temporary location.

Step 2 Copy the contents of the extracted recovery folder to the root directory of a USB thumb drive. The recovery folder contains the recovery.cap file that is required in this procedure.

Note The recovery.cap file must be in the root directory of the USB thumb drive. Do not rename this file. The USB thumb drive must be formatted with either FAT16 or FAT32 file systems.

Step 3 Power off the Cisco CSP 2100 as described in Shutting Down and Powering Off the Cisco CSP 2100, page 3-7.

Step 4 Disconnect all power cords from the power supplies.

Step 5 Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

Step 6 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

Step 7 Slide the BIOS recovery DIP switch from position 1 to the closed position (see Figure 3-25).

Step 8 Reconnect AC power cords to the Cisco CSP 2100. The Cisco CSP 2100 powers up to standby power mode.

Step 9 Insert the USB thumb drive that you prepared in Step 2 into a USB port on the Cisco CSP 2100.

Step 10 Return the Cisco CSP 2100 to main power mode by pressing the **Power** button on the front panel.

The Cisco CSP 2100 boots with the updated BIOS boot block. When the BIOS detects a valid recovery.cap file on the USB thumb drive, it displays this message:

```
Found a valid recovery file...Transferring to Cisco IMC
System would flash the BIOS image now...
System would restart with recovered image after a few seconds...
```

Step 11 Wait for the Cisco CSP 2100 to complete the BIOS update, and then remove the USB thumb drive from the Cisco CSP 2100.

Note During the BIOS update, CIMC shuts down the Cisco CSP 2100 and the screen goes blank for about 10 minutes. Do not unplug the power cords during this update. CIMC powers on the Cisco CSP 2100 after the update is complete.

Step 12 After the Cisco CSP 2100 has fully booted, power off the Cisco CSP 2100 again and disconnect all power cords.

Step 13 Slide the BIOS recovery DIP switch from the closed position back to the default position 1 (see Figure 3-25).

Note If you do not move the jumper, after recovery completion you see the prompt, "Please remove the recovery jumper."

Step 14 Replace the top cover, replace the Cisco CSP 2100 in the rack, replace power cords and any other cables, and then power on the Cisco CSP 2100 by pressing the **Power** button.

Using the Clear Password DIP Switch

See Figure 3-25 for the location of this DIP switch. You can use this switch to clear the administrator password.

Step 1 Power off the Cisco CSP 2100 as described in Shutting Down and Powering Off the Cisco CSP 2100, page 3-7.

Step 2 Disconnect all power cords from the power supplies.

Step 3 Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

Step 4 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

Step 5 Slide the clear password DIP switch from position 2 to the closed position (see Figure 3-25).

Step 6 Reinstall the top cover and reconnect AC power cords to the Cisco CSP 2100. The Cisco CSP 2100 powers up to standby power mode, indicated when the Power LED on the front panel is amber.

Step 7 Return the Cisco CSP 2100 to main power mode by pressing the **Power** button on the front panel. The Cisco CSP 2100 is in main power mode when the Power LED is green.

Note You must allow the entire Cisco CSP 2100, not just the service processor, to reboot to main power mode to complete the reset. The state of the jumper cannot be determined without the host CPU running.

Step 8 Press the **Power** button to shut down the Cisco CSP 2100 to standby power mode, and then remove AC power cords from the Cisco CSP 2100 to remove all power.

Step 9 Remove the top cover from the Cisco CSP 2100.

Step 10 Slide the clear CMOS DIP switch from the closed position back to default position 2 (see Figure 3-25).

Note If you do not move the jumper, the CMOS settings are reset to the default every time that you power-cycle the Cisco CSP 2100.

Step 11 Replace the top cover, replace the Cisco CSP 2100 in the rack, replace power cords and any other cables, and then power on the Cisco CSP 2100 by pressing the **Power** button.

Using the Clear CMOS DIP Switch

See Figure 3-25 for the location of this DIP switch. You can use this switch to clear the Cisco CSP 2100's CMOS settings in the case of a system hang. For example, if the Cisco CSP 2100 hangs because of incorrect settings and does not boot, use this jumper to invalidate the settings and reboot with defaults.

Caution Clearing the CMOS removes any customized settings and might result in data loss. Make a note of any necessary customized settings in the BIOS before you use this clear CMOS procedure.

Step 1 Power off the Cisco CSP 2100 as described in Shutting Down and Powering Off the Cisco CSP 2100, page 3-7.

Step 2 Disconnect all power cords from the power supplies.

Step 3 Slide the Cisco CSP 2100 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 from the rack.

Step 4 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 Top Cover, page 3-8.

Step 5 Slide the clear CMOS DIP switch from position 4 to the closed position (see Figure 3-25).

Step 6 Reinstall the top cover and reconnect AC power cords to the Cisco CSP 2100. The Cisco CSP 2100 powers up to standby power mode, indicated when the Power LED on the front panel is amber.

Step 7 Return the Cisco CSP 2100 to main power mode by pressing the **Power** button on the front panel. The Cisco CSP 2100 is in main power mode when the Power LED is green.

Note You must allow the entire Cisco CSP 2100, not just the service processor, to reboot to main power mode to complete the reset. The state of the jumper cannot be determined without the host CPU running.

Step 8 Press the **Power** button to shut down the Cisco CSP 2100 to standby power mode, and then remove AC power cords from the Cisco CSP 2100 to remove all power.

Step 9 Remove the top cover from the Cisco CSP 2100.

Step 10 Slide the clear CMOS DIP switch from the closed position back to default position 4 (see Figure 3-25).

Note If you do not move the jumper, the CMOS settings are reset to the default every time that you power-cycle the Cisco CSP 2100.

Step 11 Replace the top cover, replace the Cisco CSP 2100 in the rack, replace power cords and any other cables, and then power on the Cisco CSP 2100 by pressing the **Power** button.

Cisco CSP 2100 Specifications

This chapter lists the technical specifications for the Cisco CSP 2100 and includes the following sections:

Physical Specifications

Table 4-1 lists the physical specifications for Cisco CSP 2100.

Table 4-1 Physical Specifications

Description	Specification
Height	1.7 in. (4.3 cm)
Width	16.9 in. (42.9 cm)
Depth	29.8 in. (75.8 cm)
Maximum weight (fully loaded chassis)	SFF 8-drive: 37.9 lb. (17.2 Kg)

Environmental Specifications

Table 4-2 lists the environmental specifications for the Cisco CSP 2100.

Table 4-2 Environmental Specifications

Description	Specification
Temperature, operating	41 to 95°F (5 to 35°C) Derate the maximum temperature by 1°C per every 305 meters of altitude above sea level.
Temperature, non-operating (when the Cisco CSP 2100 is stored or transported)	–40 to 149°F (–40 to 65°C)
Humidity (RH), noncondensing	10 to 90%
Altitude, operating	0 to 10,000 feet
Altitude, non-operating (when the Cisco CSP 2100 is stored or transported)	0 to 40,000 feet
Sound power level Measure A-weighted per ISO7779 LwAd (Bels) Operation at 73°F (23°C)	5.4
Sound pressure level Measure A-weighted per ISO7779 LpAm (dBA) Operation at 73°F (23°C)	37

Power Specifications

The power requirement for Cisco CSP 2100 is similar to the Cisco UCS server. You can get more specific power information for your exact server configuration by using the Cisco UCS Power Calculator:

http://www.cisco.com/assets/cdc_content_elements/flash/dataCenter/cisco_ucs_power_calculator/

Note Do not mix power supply types in the Cisco CSP 2100. Both power supplies must be identical.

770 W AC Power Supply

Table 4-3 lists the specifications for each 770 W AC power supply (Cisco part number UCSC-PSU1-770W).

Table 4-3 Power Supply Specifications

Description	Specification
AC input voltage range	90 to 264 VAC (self-ranging, 100 to 264 VAC nominal)
AC input frequency	Range: 47 to 63 Hz (single phase, 50 to 60Hz nominal)
AC line input current (steady state)	9.5 A peak at 100 VAC 4.5 A peak at 208 VAC
Maximum output power for each power supply	770 W
Power supply output voltage	Main power: 12 VDC Standby power: 12 VDC

Cisco CSP 2100 Power Cord Specifications

This chapter provides supported power cable specifications.

Supported Power Cords and Plugs

Each power supply has a separate power cord. Standard power cords or jumper power cords are available for connection to the Cisco CSP 2100. The jumper power cords, for use in racks, are available as an optional alternative to the standard power cords.

Note Only the approved power cords or jumper power cords provided with the Cisco CSP 2100 are supported.

Table 5-1 lists the power cords for the Cisco CSP 2100 power supplies.

Table 5-1 Supported Power Cords for the Cisco CSP 2100

Description	Length		Power Cord Reference Illustration
	Feet	Meters	
SFS-250V-10A-AR Power Cord, 250 VAC 10 A IRAM 2073 Plug Argentina	8.2	2.5	Figure 5-1
CAB-9K10A-AU 250 VAC 10 A 3112 Plug, Australia	8.2	2.5	Figure 5-2
SFS-250V-10A-CN Power Cord, 250 VAC 10 A GB 2009 Plug China	8.2	2.5	Figure 5-3
CAB-9K10A-EU Power Cord, 250 VAC 10 A M 2511 Plug Europe	8.2	2.5	Figure 5-4
SFS-250V-10A-ID Power Cord, 250 VAC 16A EL-208 Plug South Africa, United Arab Emirates, India	8.2	2.5	Figure 5-5
SFS-250V-10A-IS Power Cord, 250 VAC 10 A SI32 Plug Israel	8.2	2.5	Figure 5-6

Table 5-1 Supported Power Cords for the Cisco CSP 2100 (continued)

Description	Length		Power Cord Reference Illustration
	Feet	Meters	
CAB-9K10A-IT Power Cord, 250 VAC 10 A CEI 23-16 Plug Italy	8.2	2.5	Figure 5-7
CAB-9K10A-SW Power Cord, 250 VAC 10 A MP232 Plug Switzerland	8.2	2.5	Figure 5-8
CAB-9K10A-UK Power Cord, 250 VAC 10 A BS1363 Plug (13 A fuse) United Kingdom	8.2	2.5	Figure 5-9
CAB-AC-250V/13A Power Cord, 250 VAC 13 A IEC60320 Plug North America	6.6	2.0	Figure 5-10
CAB-N5K6A-NA Power Cord, 250 VAC 13 A NEMA 6-15 Plug, North America	8.2	2.5	Figure 5-11
CAB-9K12A-NA Power cord, 125 VAC, 13 A, NEMA 5-15 Plug North America	8.2	2.5	Figure 5-12
CAB-C13-CBN Cabinet Jumper Power Cord, 250 VAC 10 A, C13-C14 Connectors	2.2	0.68	Figure 5-13
CAB-C13-C14-2M Cabinet Jumper Power Cord, 250 VAC 10 A, C13-C14 Connectors	6.6	2.0	Figure 5-14
CAB-C13-C14-AC Cabinet Jumper Power Cord, 250 VAC 10 A, C13-C14 Connectors	9.8	3.0	Figure 5-15

AC Power Cord Illustrations

This section includes the AC power cord illustrations.

Figure 5-1 SFS-250V-10A-AR

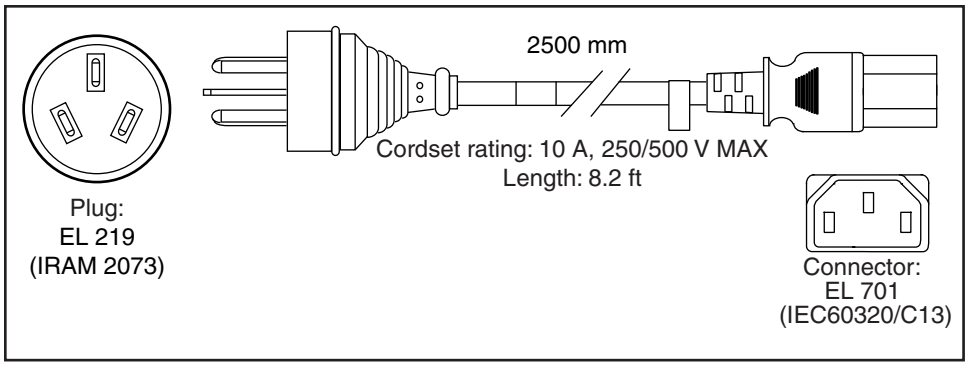


Figure 5-2 CAB-9K10A-AU

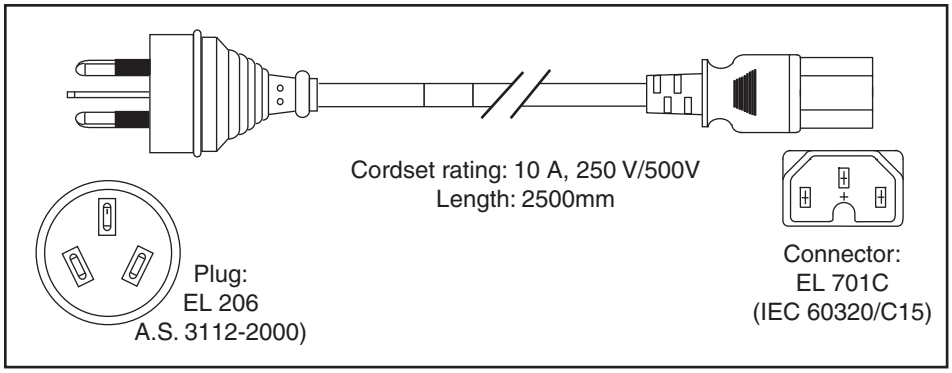


Figure 5-3 SFS-250V-10A-CN

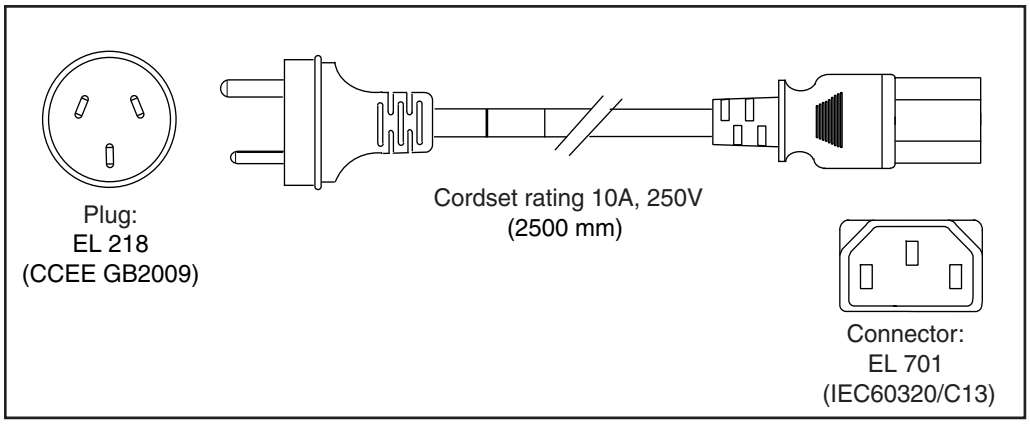


Figure 5-4 CAB-9K10A-EU

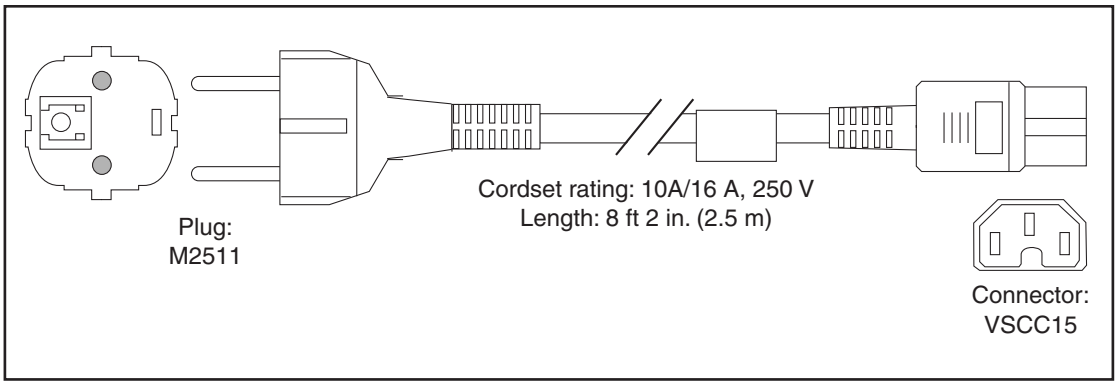


Figure 5-5 SFS-250V-10A-ID

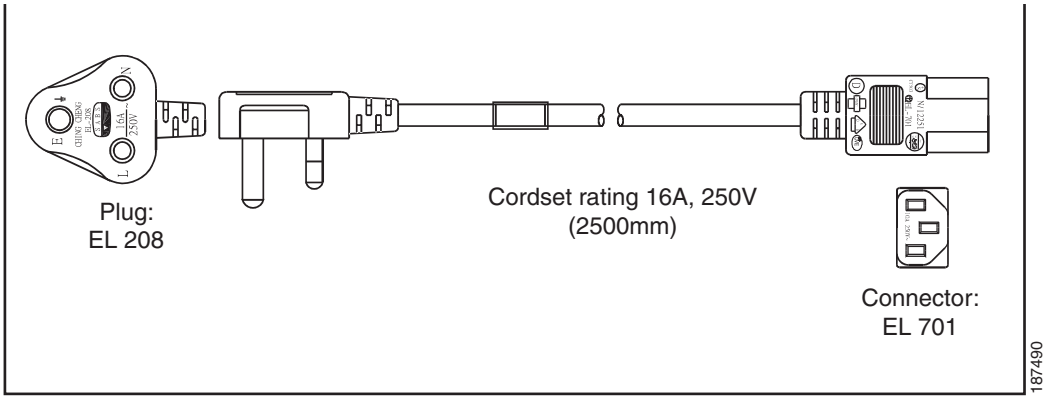


Figure 5-6 SFS-250V-10A-IS

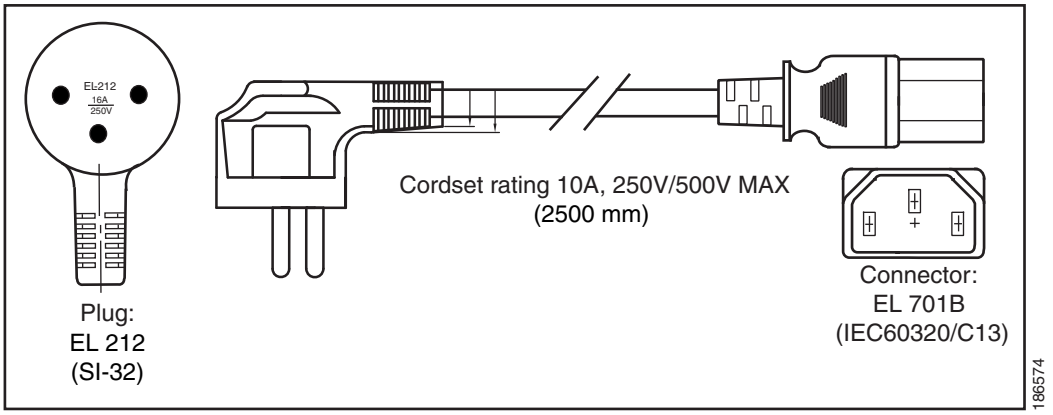


Figure 5-7 CAB-9K10A-IT

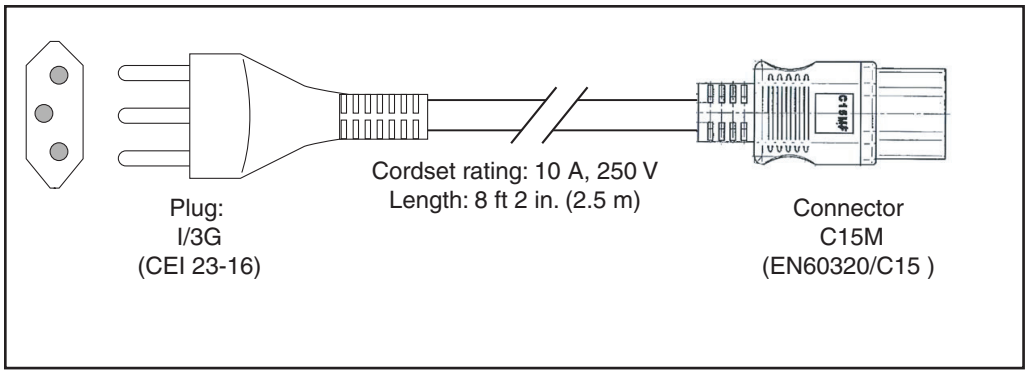


Figure 5-8 CAB-9K10A-SW

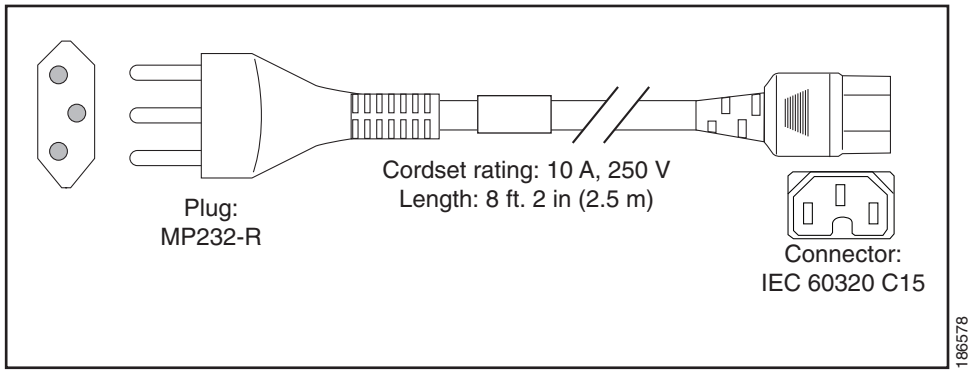


Figure 5-9 CAB-9K10A-UK

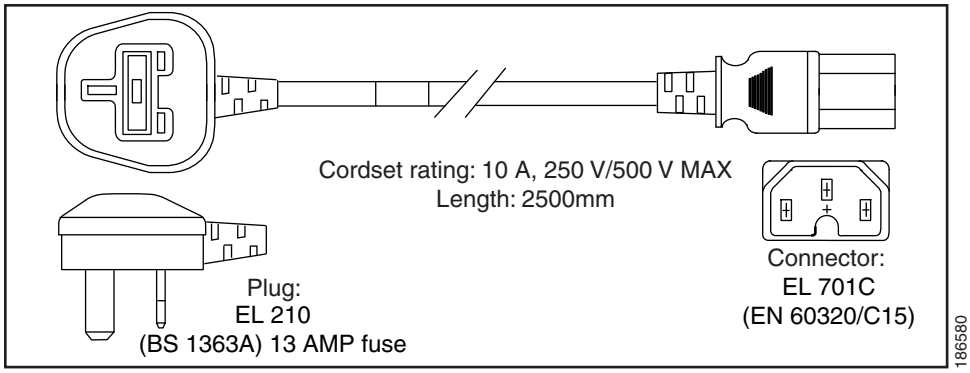


Figure 5-10 CAB-AC-250V/13A

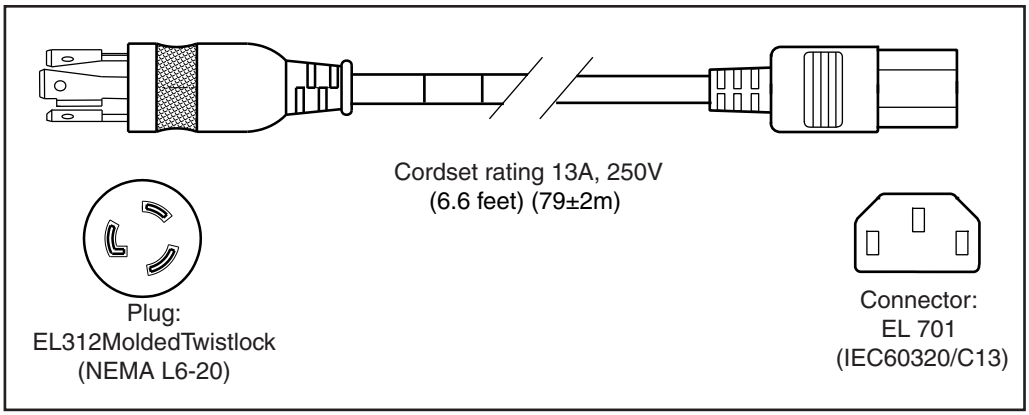


Figure 5-11 CAB-N5K6A-NA

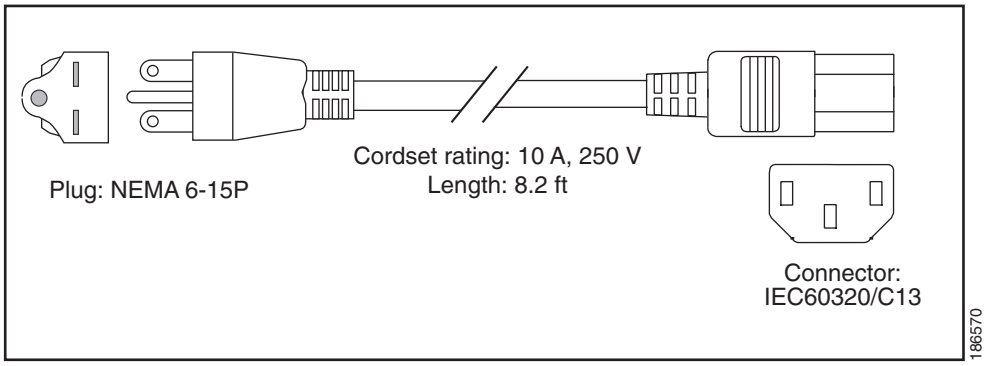


Figure 5-12 CAB-9K12A-NA

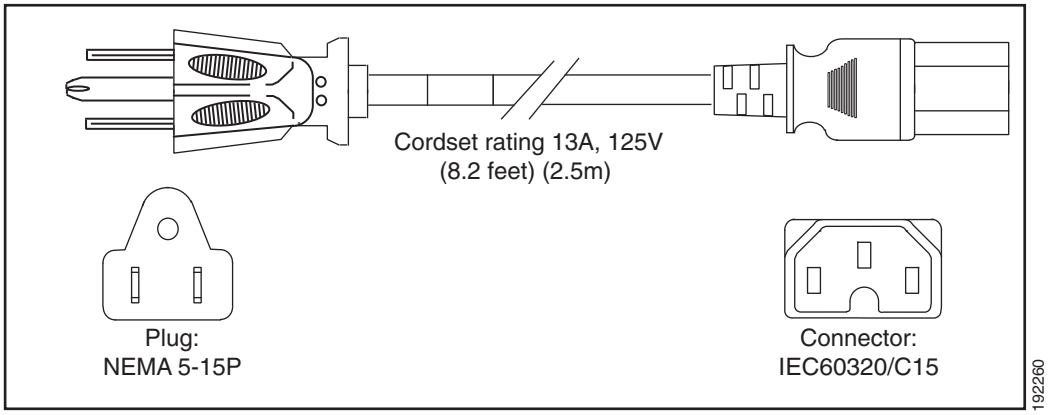


Figure 5-13 CAB-C13-CBN, Jumper Power Cord (0.68 m)

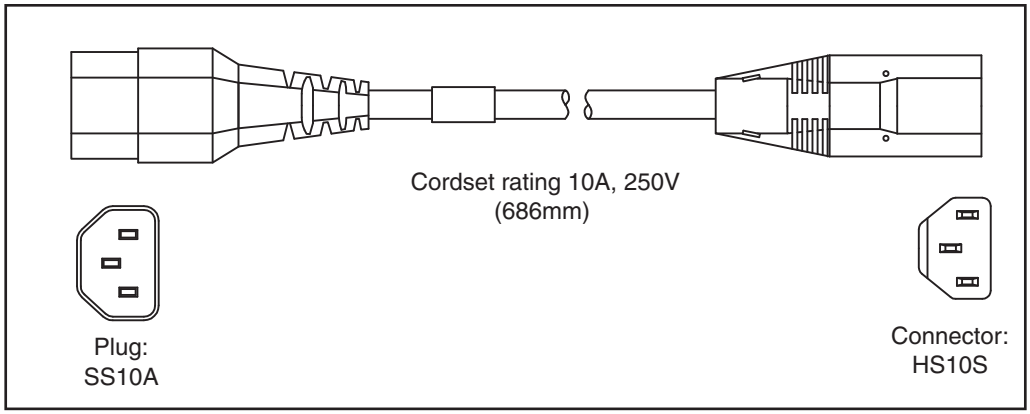


Figure 5-14 CAB-C13-C14-2M, Jumper Power Cord (2 m)

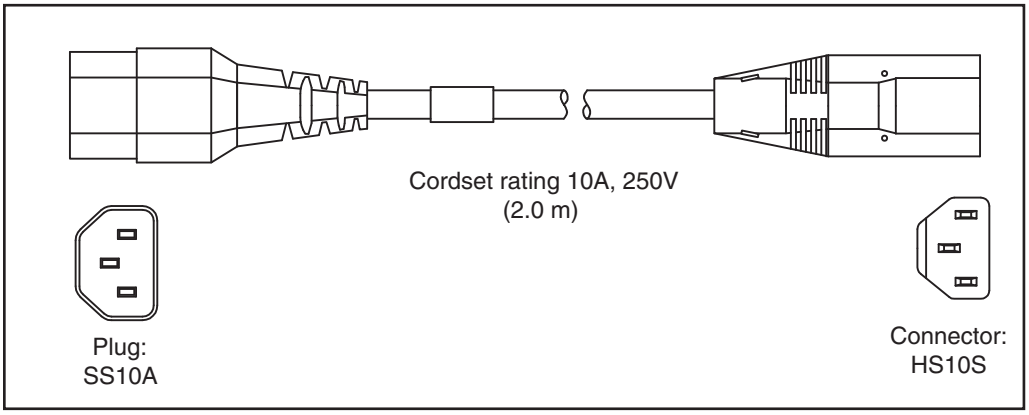
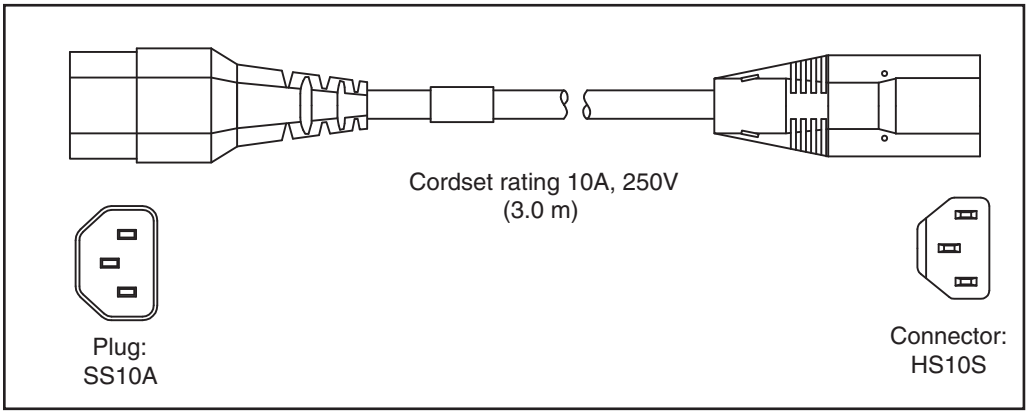


Figure 5-15 CAB-C13-C14-AC, Jumper Power Cord (3 m)



PART 2

Cisco CSP 2100 X2 (CSP-2100-X2)

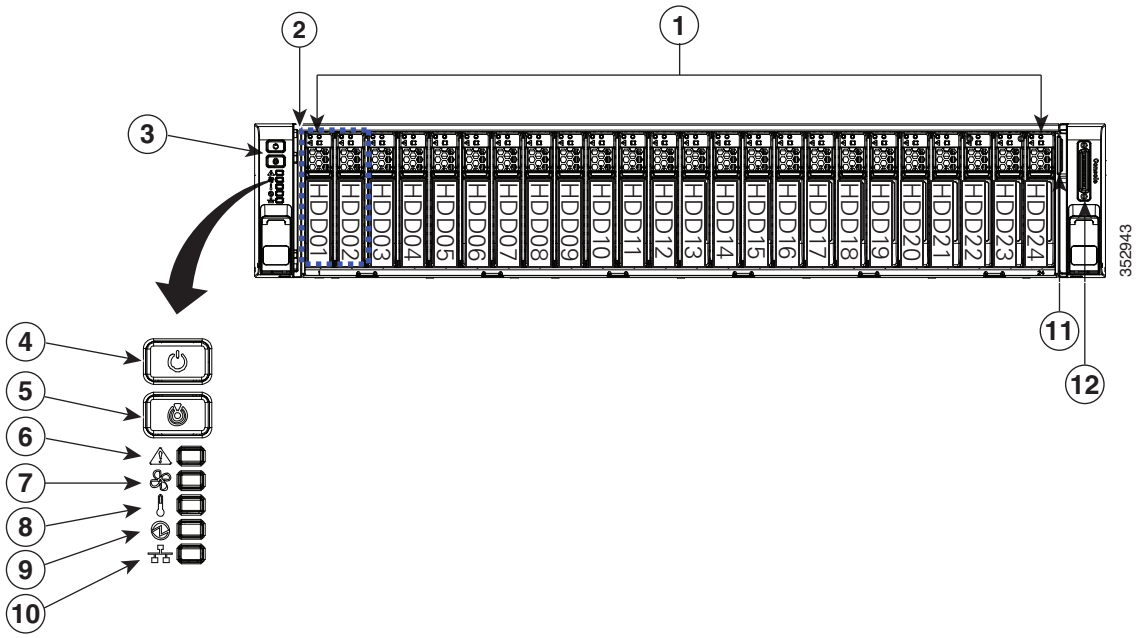
Overview of Cisco CSP 2100 X2

This chapter provides an overview of Cisco CSP 2100 X2 (Cisco CSP-2100-X2) features:

External Features Overview

Figure 6-1 shows the front panel features of the SFF drives, 24-drive version of Cisco CSP 2100 X2. Cisco CSP 2100 X2 has small form-factor (SFF) drives with 24-drive backplane and expander. Cisco CSP 2100 X2 holds up to 24 2.5-inch SAS/SATA hard drives or solid state drives (SSDs) and it has a 24-drive backplane and an integrated expander. The rear panel features are shown in Figure 6-2.

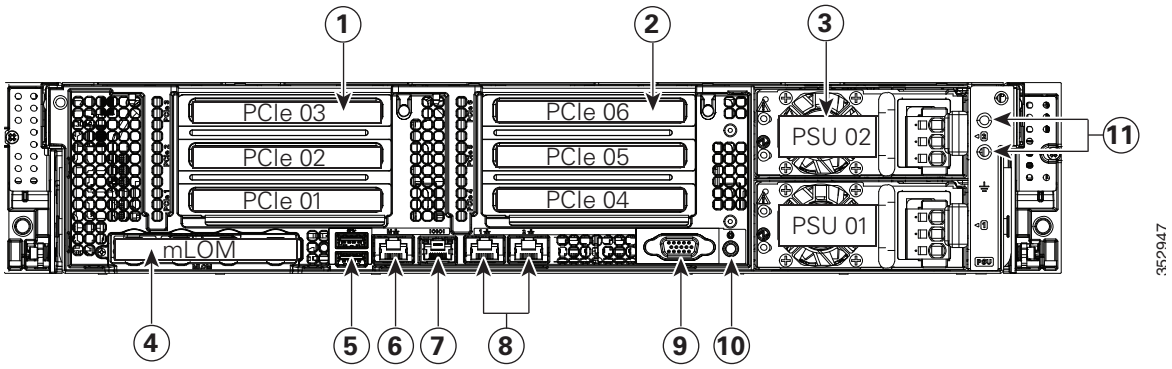
Figure 6-1 Cisco Cisco CSP 2100 X2 (SFF Drives, 24-Drive) Front Panel Features



1	Drive bays 1–24 support SAS/SATA drives.	**7**	Fan status LED
2	Drive bays 1 and 2 support NVMe PCIe SSDs and SAS/SATA drives.	**8**	Temperature status LED
3	Operations panel buttons and LEDs	**9**	Power supply status LED
4	Power button/LED	**10**	Network link activity LED
5	Unit Identification button/LED	**11**	Pull-out asset tag
6	System status LED	**12**	KVM connector (used with KVM cable that provides two USB 2.0, one VGA, and one serial connector)

Figure 6-2 shows the rear panel features of Cisco CSP 2100 X2.

Figure 6-2 Cisco CSP 2100 X2 Rear Panel Features

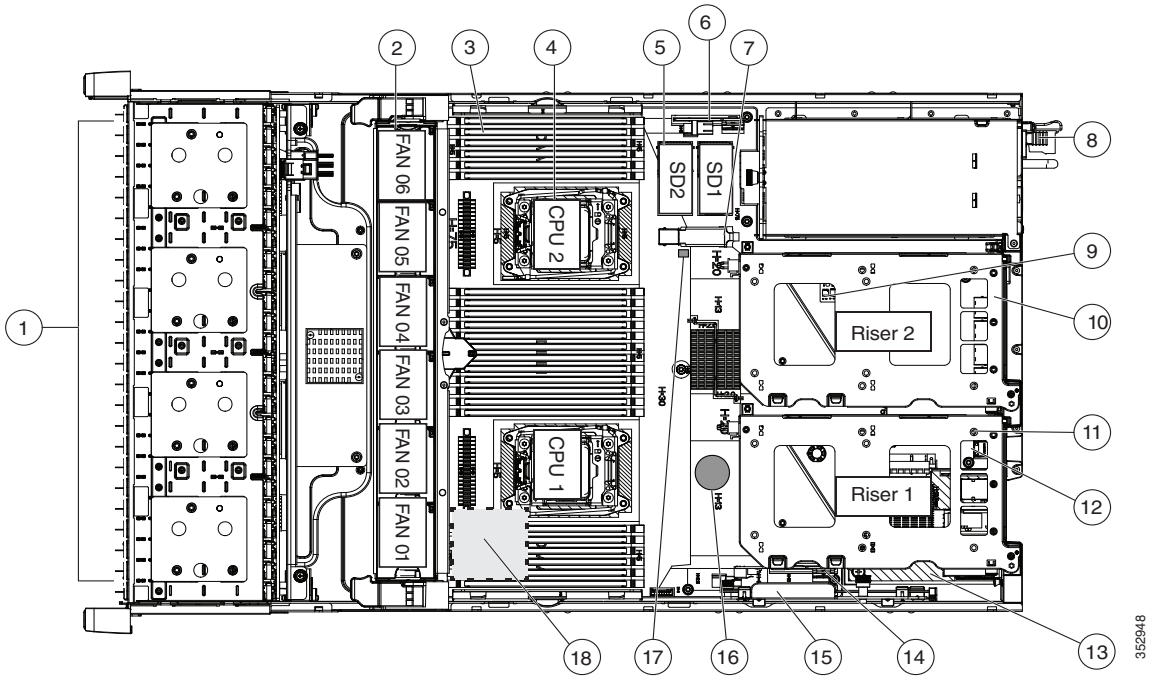


1	PCIe riser 1 (slots 1, 2, 3*)	**7**	Serial port (RJ-45 connector)
2	PCIe riser 2 (slots 4, 5, 6)	**8**	Dual 1-Gb Ethernet ports (LAN1, LAN2)
3	Power supplies (DC power supplies shown)	**9**	VGA video port (DB-15 connector)
4	Modular LAN-on-motherboard (mLOM) card slot; Intel i350 4 x 1G NIC	**10**	Rear Unit Identification button/LED
5	USB 3.0 ports (two)	**11**	Grounding-lug holes (for DC power supplies)
6	1-Gb dedicated management port		

Replaceable Component Locations

Figure 6-3 shows the locations of the field-replaceable components. The view shown is from the top down with the top covers and air baffle removed.

Figure 6-3 Replaceable Component Locations



1	Drives bays. All drive bays support SAS/SATA drives.	**10**	PCIe riser 2 (PCIe slots 4, 5, 6)
2	Fan modules (six, hot-swappable)	**11**	PCIe riser 1 (PCIe slots 1, 2, 3*)
3	DIMM sockets on motherboard (up to 24 DIMMs)	**12**	SATA boot drives (two sockets available only on PCIe riser 1 option 1C)
4	CPUs and heatsinks (two)	**13**	mLOM card socket on motherboard under PCIe riser 1
5	Cisco SD card slots on motherboard (two)	**14**	Socket for embedded RAID interposer board
6	PCIe interposer board socket	**15**	Cisco modular RAID controller PCIe slot (dedicated slot and bracket)
7	USB 3.0 slot on motherboard	**16**	RTC battery on motherboard
8	Power supplies (hot-swappable, accessed through rear panel)	**17**	Embedded RAID header for RAID 5 key
9	Trusted platform module (TPM) socket on motherboard, under PCIe riser 2	**18**	Supercap power module (RAID backup) mounting location on air baffle (not shown)

Summary of Cisco CSP 2100 X2 Features

Table 6-1 lists a summary of Cisco CSP 2100 X2 features.

Table 6-1 Cisco CSP 2100 X2 Features

Chassis	Two rack-unit (2RU) chassis.
Processors	Up to two Intel Xeon E5-2600 v4 Series processors (Broadwell).
Memory	24 DDR4 DIMM[1] sockets on the motherboard (12 each CPU).
Multi-bit error protection	Multi-bit error protection is supported.
Baseboard management	BMC, running Cisco Integrated Management Controller (Cisco IMC) firmware. Depending on your Cisco IMC settings, Cisco IMC can be accessed through the 1-Gb dedicated management port, the 1-Gb Ethernet LOM ports, or a Cisco virtual interface card.
Network and management I/O	Cisco CSP 2100 X2 provides these connectors: • One 1-Gb Ethernet dedicated management port • Two 1-Gb BASE-T Ethernet LAN ports • One RS-232 serial port (RJ-45 connector) • One 15-pin VGA[2] connector • Two USB[3] 3.0 connectors • One front-panel KVM connector that is used with the KVM cable, which provides two USB 2.0, one VGA, and one serial (DB-9) connector.
Modular I/O	A dedicated socket can be used to add an mLOM card for additional rear-panel connectivity (up to four 1-Gb or 10-Gb Ethernet ports).
WoL	1-Gb BASE-T Ethernet LAN ports support the wake-on-LAN (WoL) standard.
Power	Two power supplies: • AC power supplies 1200 W AC each. • DC power supplies 930 W DC each. Do not mix power supply types or wattages in Cisco CSP 2100 X2.
ACPI	The advanced configuration and power interface (ACPI) 4.0 standard is supported.
Cooling	Six hot-swappable fan modules for front-to-rear cooling.
PCIe I/O	Up to six horizontal PCIe[4] expansion slots on two risers.
InfiniBand	The InfiniBand architecture is supported by the bus slots.
Storage	Drives are installed into front-panel drive bays that provide hot-swappable access for SAS/SATA drives. Small form-factor (SFF) drives with 24-drive backplane and expander. This version holds up to 24 2.5-inch SAS/SATA hard drives or solid state drives (SSDs).
Internal USB	One internal USB 3.0 port on the motherboard that you can use with a USB thumb drive for additional storage.
SD cards	Two internal bays on the motherboard for up to two SD cards. The two flash drives can be configured in a RAID 1 configuration.

Table 6-1 Cisco CSP 2100 X2 Features (continued)

Disk Management (RAID)	Dedicated internal socket for a PCIe-style RAID controller card. Cisco 12G SAS Modular Raid Controller Cisco 12Gbps SAS 4GB FBWC Cache module RAID 10
RAID Backup	Mounting point on the air baffle for the supercap power module that is used with the Cisco modular RAID controller card.
Video	VGA video resolution up to 1920 x 1200, 16 bpp at 60 Hz, and up to 256 MB of video memory.

1. DIMM = dual inline memory module
2. VGA = video graphics array
3. USB = universal serial bus
4. PCIe = peripheral component interconnect express

Installing Cisco CSP 2100 X2

This chapter describes how to install Cisco CSP 2100 X2, and it includes the following sections:

Note Before you install, operate, or service Cisco CSP 2100 X2, review the *Regulatory Compliance and Safety Information for Cisco Cloud Services Platform 2100* 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

Unpacking and Inspecting Cisco CSP 2100 X2

Caution When handling internal Cisco CSP 2100 X2 components, wear an ESD strap and handle modules by the carrier edges only.

Tip Keep the shipping container in case Cisco CSP 2100 X2 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.

Step 1 Remove Cisco CSP 2100 X2 from its cardboard container and save all packaging material.

Step 2 Compare the shipment to the equipment list provided by your customer service representative. Verify that you have all items.

Step 3 Check for damage and report any discrepancies or damage to your customer service representative. Have the following information ready:

- Invoice number of shipper (see the packing slip)
- Model and serial number of the damaged unit
- Description of damage
- Effect of damage on the installation

Preparing for Cisco CSP 2100 X2 Installation

This section provides information about preparing for Cisco CSP 2100 X2 installation, and it includes the following topics:

Installation Guidelines

Warning **To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of: 35° C (95° F).**
Statement 1047

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

Warning **This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 250 V, 15 A.**
Statement 1005

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

Caution To ensure proper airflow it is necessary to rack Cisco CSP 2100 X2s using rail kits. Physically placing the units on top of one another or "stacking" without the use of the rail kits blocks the air vents on top of Cisco CSP 2100 X2, which could result in overheating, higher fan speeds, and higher power consumption. We recommend that you mount your Cisco CSP 2100 X2s on rail kits when you are installing them into the rack because these rails provide the minimal spacing required between Cisco CSP 2100 X2s. No additional spacing between Cisco CSP 2100 X2s is required when you mount the units using rail kits.

Caution Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with systems such as Cisco CSP 2100, which can have substantial current draw fluctuations from fluctuating data traffic patterns.

When you are installing a Cisco CSP 2100 X2, use the following guidelines:

- Plan your site configuration and prepare the site before installing Cisco CSP 2100 X2. The site planning for Cisco CSP 2100 is similar to that for Cisco UCS server. See the *Cisco UCS Site Preparation Guide* for the recommended site planning tasks.
- Ensure that there is adequate space around Cisco CSP 2100 X2 to allow for servicing Cisco CSP 2100 X2 and for adequate airflow. The airflow in Cisco CSP 2100 X2 is from front to back.
- Ensure that the air-conditioning meets the thermal requirements listed in the Cisco CSP 2100 X2 Specifications, page 9-1.
- Ensure that the cabinet or rack meets the requirements listed in the "Rack Requirements" section on page 7-4.
- Ensure that the site power meets the power requirements listed in the Cisco CSP 2100 X2 Specifications, page 9-1. If available, you can use an uninterruptible power supply (UPS) to protect against power failures.

Rack Requirements

This section provides the requirements for the standard open racks.

The rack must be of the following type:

- A standard 19-in. (48.3-cm) wide, four-post EIA rack, with mounting posts that conform to English universal hole spacing, per section 1 of ANSI/EIA-310-D-1992.
- The rack post holes can be square 0.38-inch (9.6 mm), round 0.28-inch (7.1 mm), #12-24 UNC, or #10-32 UNC when you use the supplied slide rails.
- The minimum vertical rack space per Cisco CSP 2100 X2 must be two RUs, equal to 3.5 in. (88.9 mm).

Equipment Requirements

The slide rails supplied by Cisco Systems for Cisco CSP 2100 X2 do not require tools for installation if you install them in a rack that has square 0.38-inch (9.6 mm), round 0.28-inch (7.1 mm), or #12-24 UNC threaded holes.

Supported Slide Rail Kits

Cisco CSP 2100 X2 supports one rail kit option: Cisco part UCSC-RAILB-M4= (ball-bearing rail kit).

Slide Rail Adjustment Range and Cable Management Arm Dimensions

The slide rails for Cisco CSP 2100 X2 have an adjustment range of 26 to 36 inches (660 to 914 mm).

Installing Cisco CSP 2100 X2 In a Rack

Installing the Slide Rails

This section describes how to install Cisco CSP 2100 X2 in a rack using the rack kits that are sold by Cisco.

Warning **To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**
This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
Statement 1006

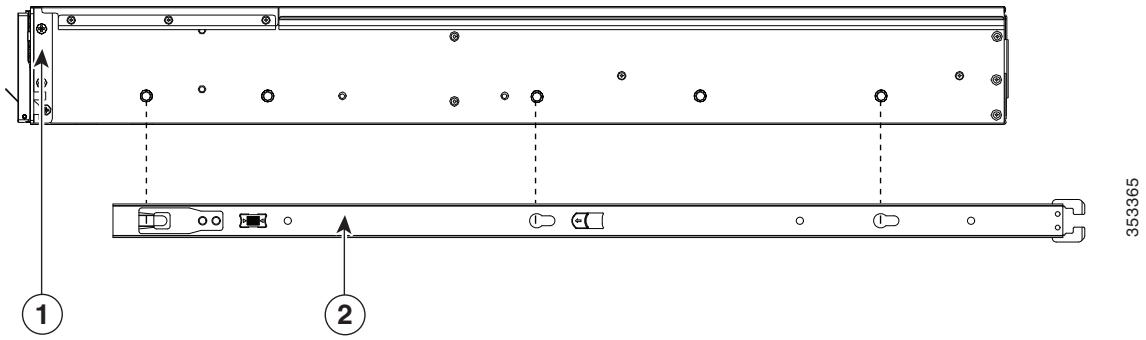
Step 1 Attach the inner rails to the sides of Cisco CSP 2100 X2:

a. Align an inner rail with one side of Cisco CSP 2100 X2 so that the three keyed slots in the rail align with the three pegs on the side of Cisco CSP 2100 X2 (see Figure 7-1).

b. Set the keyed slots over the pegs, and then slide the rail toward the front to lock it in place on the pegs. The front slot has a metal clip that locks over the front peg.

c. Install the second inner rail to the opposite side of Cisco CSP 2100 X2.

Figure 7-1 Attaching Inner Rail to Side of Cisco CSP 2100 X2

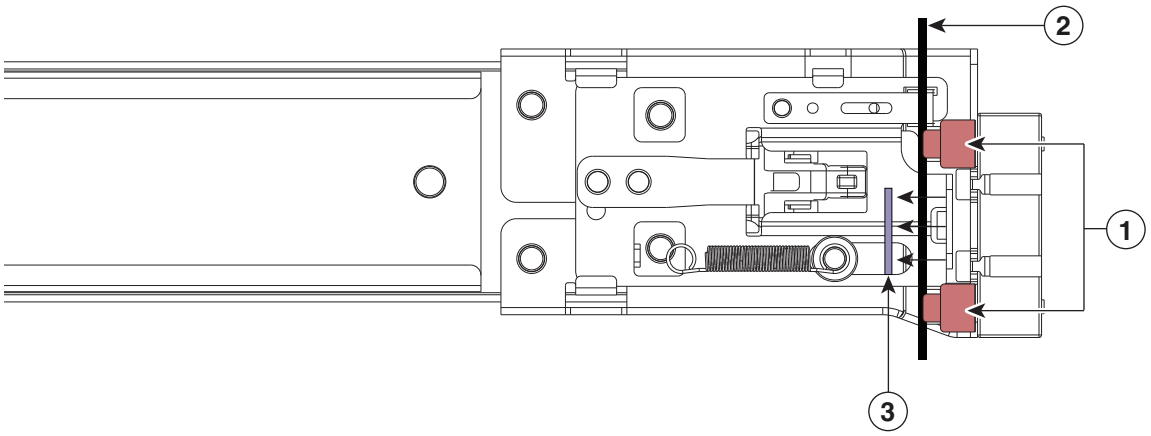


1	Front of Cisco CSP 2100 X2	2	Locking clip on inner rail

Step 2 Open the front securing plate on both slide-rail assemblies. The front end of the slide-rail assembly has a spring-loaded securing plate that must be open before you can insert the mounting pegs into the rack-post holes (see Figure 7-2).

On the outside of the assembly, push the green arrow button toward the rear to open the securing plate.

Figure 7-2 Front Securing Mechanism, Inside of Front End



1	Front mounting pegs	**3**	Securing plate shown pulled back to open position
2	Rack post		

Step 3 Install the slide rails into the rack:

a. Align one slide-rail assembly front end with the front rack-post holes that you want to use.

The slide rail front-end wraps around the outside of the rack post and the mounting pegs enter the rack-post holes from the outside-front (see Figure 7-2).

Note The rack post must be between the mounting pegs and the open securing plate.

b. Push the mounting pegs into the rack-post holes from the outside-front.

c. Press the securing plate release button, marked “PUSH.” The spring-loaded securing plate closes to lock the pegs in place.

d. Adjust the slide-rail length, and then push the rear mounting pegs into the corresponding rear rack-post holes. The slide rail must be level front-to-rear.

The rear mounting pegs enter the rear rack-post holes from the inside of the rack post.

e. Attach the second slide-rail assembly to the opposite side of the rack. Ensure that the two slide-rail assemblies are at the same height with each other and are level front-to-back.

f. Pull the inner slide rails on each assembly out toward the rack front until they hit the internal stops and lock in place.

Step 4 Insert Cisco CSP 2100 X2 into the slide rails:

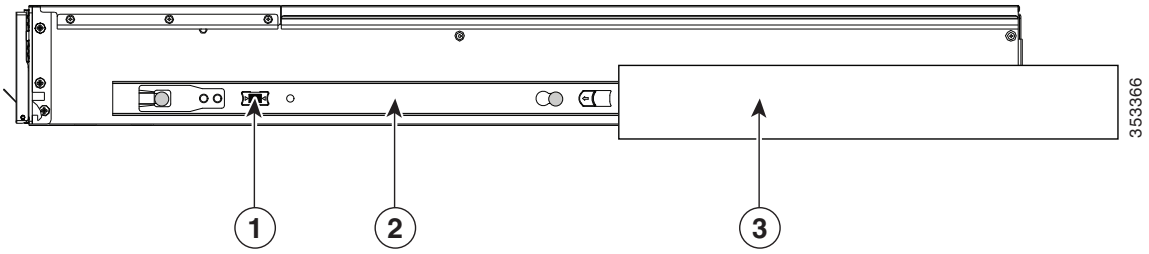
Caution Cisco CSP 2100 X2 can weigh up to 67 pounds (30 kilograms) when fully loaded with components. We recommend that you use a minimum of two people or a mechanical lift when lifting Cisco CSP 2100 X2. Attempting this procedure alone could result in personal injury or equipment damage.

a. Align the rear of the inner rails that are attached to Cisco CSP 2100 X2 sides with the front ends of the empty slide rails on the rack.

b. Push the inner rails into the slide rails on the rack until they stop at the internal stops.

c. Slide the release clip toward the rear on both inner rails (Figure 7-3), and then continue pushing Cisco CSP 2100 X2 into the rack until its front slam latches engage with the rack posts.

Figure 7-3 Inner Rail Release Clip



1	Inner rail release clip	**3**	Outer rail attached to rack post
2	Inner rail attached to Cisco CSP 2100 X2		

Step 5 (Optional) Secure Cisco CSP 2100 X2 in the rack more permanently by using the two screws that are provided with the slide rails. Perform this step if you plan to move the rack with Cisco CSP 2100 X2 installed.

With Cisco CSP 2100 X2 fully pushed into the slide rails, open a hinged slam latch lever on the front of Cisco CSP 2100 X2 and insert the screw through the hole that is under the lever. The screw threads into the static part of the rail on the rack post and prevents Cisco CSP 2100 X2 from being pulled out. Repeat for the opposite slam latch.

Maintaining Cisco CSP 2100 X2

This chapter describes how to diagnose Cisco CSP 2100 X2 system problems using LEDs. It also provides information about how to install or replace hardware components, and it includes the following sections:

Cisco CSP 2100 X2 Monitoring and Management Tools

Cisco Integrated Management Interface

You can monitor the Cisco CSP 2100 X2 inventory, health, and system event logs by using the built-in Cisco Integrated Management Controller (Cisco IMC) GUI or CLI interfaces. See the user documentation for your firmware release at the following URL:

http://www.cisco.com/en/US/products/ps10739/products_installation_and_configuration_guides_list.html

Cisco CSP 2100 X2 Configuration Utility

The Configuration Utility for Cisco CSP 2100 X2 can aid and simplify the following tasks:

- Monitoring Cisco CSP 2100 X2 inventory and health
- Diagnosing common Cisco CSP 2100 X2 problems with diagnostic tools and logs
- Setting the BIOS booting order
- Configuring some RAID configurations
- Installing operating systems

You can also download the ISO image from Cisco.com. See the user documentation for your version of the utility at the following URL:

http://www.cisco.com/en/US/products/ps10493/products_user_guide_list.html

Status LEDs and Buttons

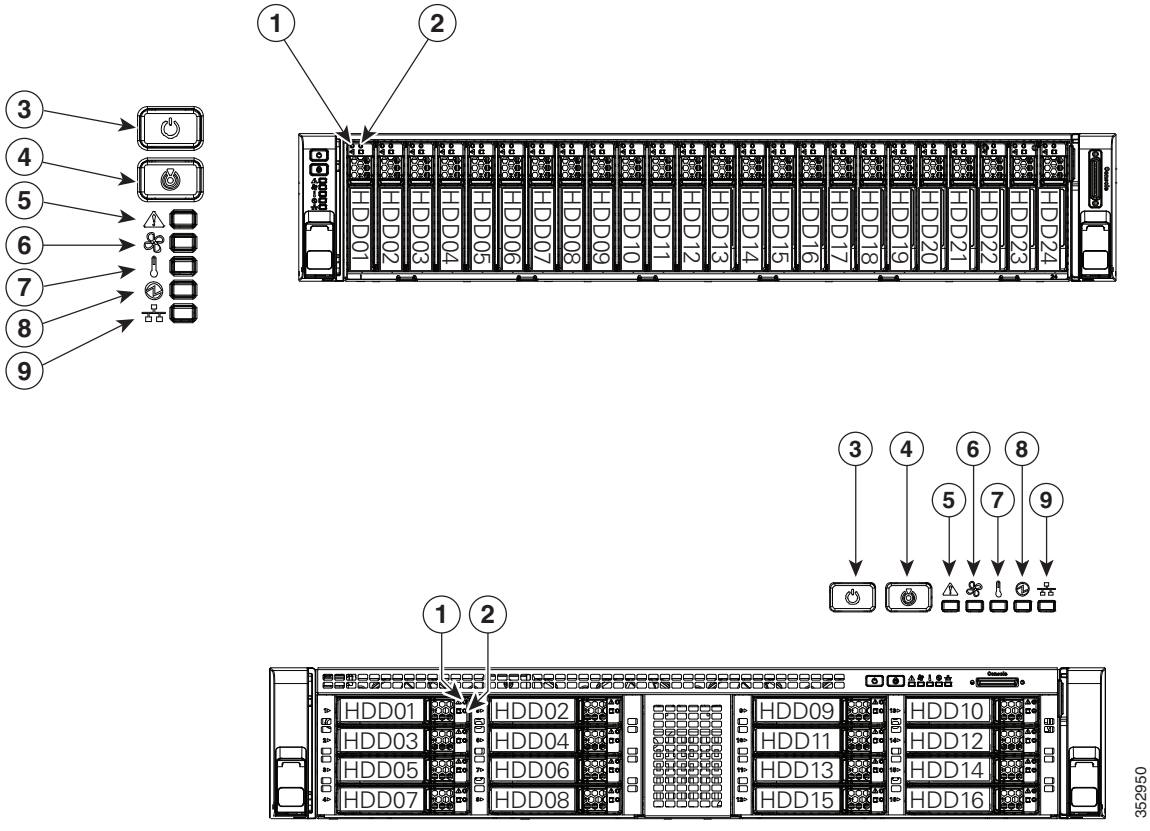
This section describes the location and meaning of LEDs and buttons and includes the following topics

Front Panel LEDs

Figure 8-1 shows the front panel LEDs. Table 8-1 defines the LED states.

The small form factor (SFF) drives, 24-drive version and the SFF drives, 16-drive version are shown.

Figure 8-1 Front Panel LEDs



1	Hard drive fault LED (on each drive tray)	**6**	Fan status LED
2	Hard drive activity LED (on each drive tray)	**7**	Temperature status LED
3	Power button/power status LED	**8**	Power supply status LED
4	Unit Identification button/LED	**9**	Network link activity LED
5	System status LED		

Table 8-1 Front Panel LEDs, Definitions of States

	LED Name	State
1 **SAS**	Hard drive fault	• Off—The hard drive is operating properly. • Amber—Drive fault detected. • Amber, blinking—The device is rebuilding. • Amber, blinking with one-second interval—Drive locate function activated.
2 **SAS**	Hard drive activity	• Off—There is no hard drive in the hard drive tray (no access, no fault). • Green—The hard drive is ready. • Green, blinking—The hard drive is reading or writing data.
1 **PCIe**	PCIe activity	• Off—The drive is not in use and can be safely removed. • Green—The drive is in use and functioning properly. • Green, blinking—the driver is initializing following insertion or the driver is unloading following an eject command. • Amber—The drive has failed. • Amber, blinking—A drive Locate command has been issued in the software.
2 **PCIe**	PCIe activity	• Off—No drive activity. • Green, blinking—There is drive activity.
3	Power button/LED	• Off—There is no AC power to Cisco CSP 2100 X2. • Amber—Cisco CSP 2100 X2 is in standby power mode. Power is supplied only to the Cisco IMC and some motherboard functions. • Green—Cisco CSP 2100 X2 is in main power mode. Power is supplied to all Cisco CSP 2100 X2 components.
4	Unit Identification	• Off—The unit identification function is not in use. • Blue—The unit identification function is activated.
5	System status	• Green—Cisco CSP 2100 X2 is running in a normal operating condition. • Green, blinking—Cisco CSP 2100 X2 is performing system initialization and memory check. • Amber, steady—Cisco CSP 2100 X2 is in a degraded operational state. For example: – Power supply redundancy is lost. – CPUs are mismatched. – At least one CPU is faulty. – At least one DIMM is faulty. – At least one drive in a RAID configuration failed. • Amber, blinking—Cisco CSP 2100 X2 is in a critical fault state. For example: – Boot failed. – Fatal CPU and/or bus error is detected. – Cisco CSP 2100 X2 is in an over-temperature condition.

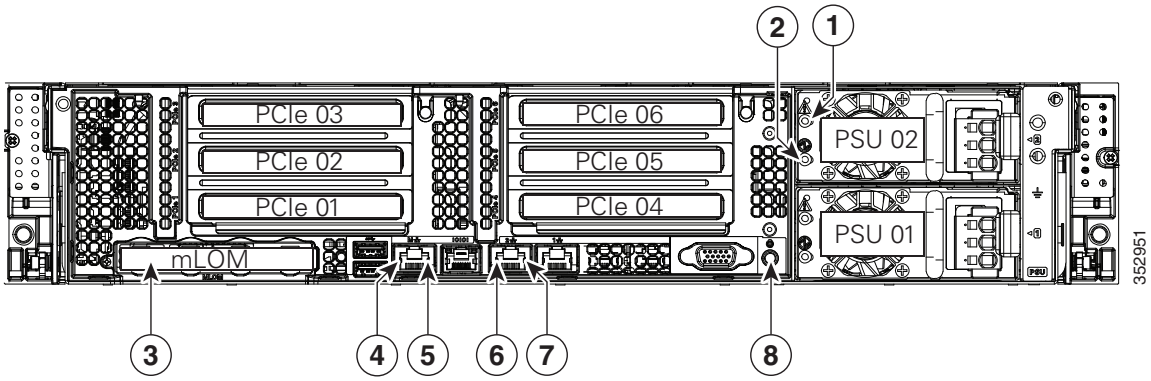
Table 8-1 Front Panel LEDs, Definitions of States (continued)

	LED Name	State
6	Fan status	• Green—All fan modules are operating properly. • Amber, steady—One or more fan modules breached the critical threshold. • Amber, blinking—One or more fan modules breached the non-recoverable threshold.
7	Temperature status	• Green—Cisco CSP 2100 X2 is operating at normal temperature. • Amber, steady—One or more temperature sensors breached the critical threshold. • Amber, blinking—One or more temperature sensors breached the non-recoverable threshold.
8	Power supply status	• Green—All power supplies are operating normally. • Amber, steady—One or more power supplies are in a degraded operational state. • Amber, blinking—One or more power supplies are in a critical fault state.
9	Network link activity	• Off—The Ethernet link is idle. • Green—One or more Ethernet LOM ports are link-active, but there is no activity. • Green, blinking—One or more Ethernet LOM ports are link-active, with activity.

Rear Panel LEDs and Buttons

Figure 8-2 shows the rear panel LEDs and buttons. Table 8-2 defines the LED states.

Figure 8-2 Rear Panel LEDs and Buttons



1	Power supply fault LED	**5**	1-Gb Ethernet dedicated management link status LED
2	Power supply AC status LED	**6**	1-Gb Ethernet link speed LED
3	Optional mLOM card LEDs (not shown)	**7**	1-Gb Ethernet link status LED
4	1-Gb Ethernet dedicated management link speed LED	**8**	Unit Identification button/LED

Table 8-2 Rear Panel LEDs, Definitions of States

	LED Name	State
1	Power supply fault This is a summary; for advanced power supply LED information, see Table 8-3.	• Off—The power supply is operating normally. • Amber, blinking—An event warning threshold has been reached, but the power supply continues to operate. • Amber, solid—A critical fault threshold has been reached, causing the power supply to shut down (for example, a fan failure or an over-temperature condition).
2	Power supply status This is a summary; for advanced power supply LED information, see Table 8-3.	AC power supplies: • Off—There is no AC power to the power supply. • Green, blinking—AC power OK; DC output not enabled. • Green, solid—AC power OK; DC outputs OK. DC power supplies: • Off—There is no DC power to the power supply. • Green, blinking—DC power OK; DC output not enabled. • Green, solid—DC power OK; DC outputs OK.

Table 8-2 Rear Panel LEDs, Definitions of States (continued)

	LED Name	State
4	1-Gb Ethernet dedicated management link speed	• Off—Link speed is 10 Mbps. • Amber—Link speed is 100 Mbps. • Green—Link speed is 1 Gbps.
5	1-Gb Ethernet dedicated management link status	• Off—No Link is present. • Green—Link is active. • Green, blinking—Traffic is present on the active link.
6	1-Gb Ethernet link speed	• Off—Link speed is 10 Mbps. • Amber—Link speed is 100 Mbps. • Green—Link speed is 1 Gbps.
7	1-Gb Ethernet link status	• Off—No link is present. • Green—Link is active. • Green, blinking—Traffic is present on the active link.
8	Unit Identification	• Off—The unit identification function is not in use. • Blue—The unit identification function is activated.

In Table 8-3, read the status and fault LED states together in each row to determine the event that cause this combination.

Table 8-3 Rear Power Supply LED States

Green PSU Status LED State	Amber PSU Fault LED State	Event
• Solid on	• Off	12V main on (main power mode)
• Blinking	• Off	12Vmain off (standby power mode)
• Off	• Off	No AC power input (all PSUs present)
• Off	• On	No AC power input (redundant supply active)
• Blinking	• Solid on	12V over-voltage protection (OVP)
• Blinking	• Solid on	12V under-voltage protection (UVP)
• Blinking	• Solid on	12V over-current protection (OCP)
• Blinking	• Solid on	12V short-circuit protection (SCP)
• Solid on	• Solid on	PSU fan fault/Lock (before OTP)
• Blinking	• Solid on	PSU fan fault/Lock (after OTP)
• Blinking	• Solid on	Over-temperature protection (OTP)
• Solid on	• Blinking	OTP warning
• Solid on	• Blinking	OCP warning
• Blinking	• Off	12V main off (CR slave PSU is in sleep mode)

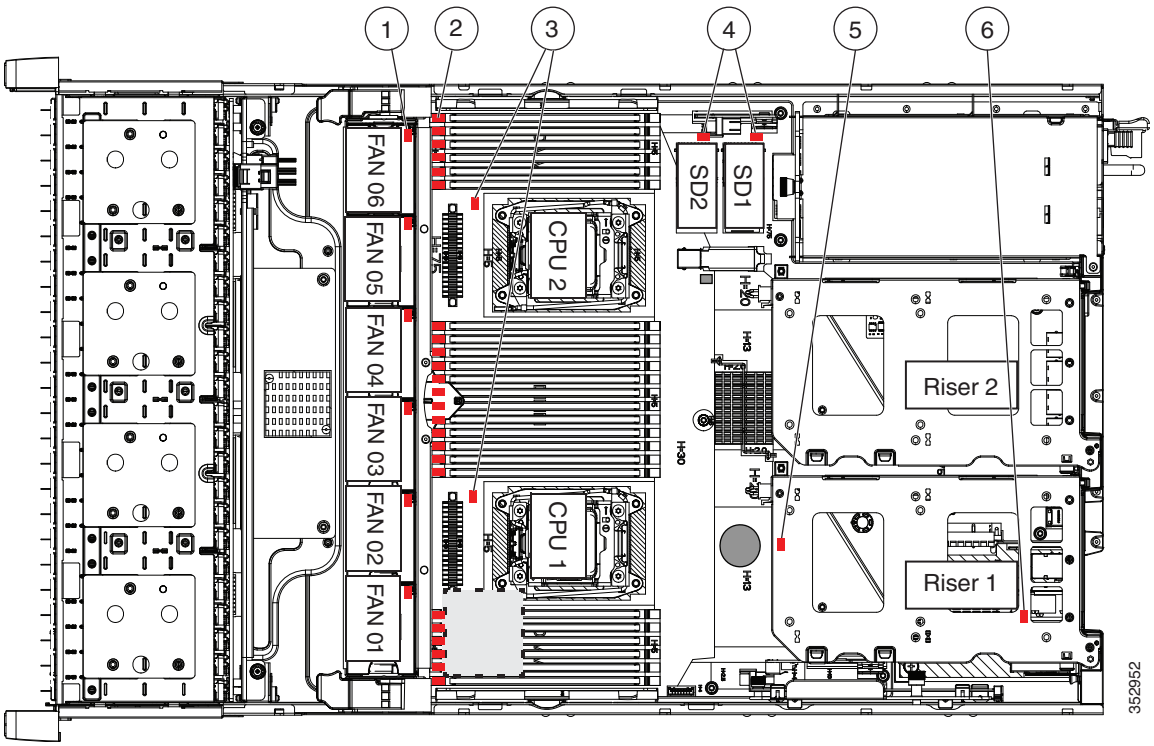
Internal Diagnostic LEDs

Cisco CSP 2100 X2 is equipped with a supercap voltage source that can activate internal component fault LEDs up to 30 minutes after AC power is removed. Cisco CSP 2100 X2 has internal fault LEDs for CPUs, DIMMs, fan modules, SD cards, the RTC battery, and the mLOM card.

To use these LEDs to identify a failed component, press the front or rear Unit Identification button (see Figure 8-1 or Figure 8-2) with AC power removed. An LED lights amber to indicate a faulty component.

See Figure 8-3 for the locations of these internal LEDs.

Figure 8-3 Internal Diagnostic LED Locations



1	Fan module fault LEDs (one on each fan module)	**4**	SD card fault LEDs
2	DIMM fault LEDs (one directly in front of each DIMM socket on the motherboard)	**5**	RTC battery fault LED (under PCIe riser 1)
3	CPU fault LEDs	**6**	mLOM card fault LED (under PCIe riser 1)

Table 8-4 Internal Diagnostic LEDs, Definition of States

LED Name	State
Internal diagnostic LEDs (all)	• Off—Component is functioning normally. • Amber—Component has a fault.

Preparing for Cisco CSP 2100 X2 Component Installation

This section describes how to prepare for component installation, and it includes the following topics:

Required Equipment

The following equipment is used to perform the procedures in this chapter:

- Number 2 Phillips-head screwdriver
- Electrostatic discharge (ESD) strap or other grounding equipment such as a grounded mat

Shutting Down and Powering Off the Cisco CSP 2100 X2

Cisco CSP 2100 X2 can run in two power modes:

- Main power mode—Power is supplied to all Cisco CSP 2100 X2 components and any operating system on your drives can run.
- Standby power mode—Power is supplied only to the service processor and the cooling fans and it is safe to power off the Cisco CSP 2100 X2 from this mode.

You can invoke a graceful shutdown or a hard shutdown by using either of the following methods:

- Use the Cisco IMC management interface.
- Use the **Power** button on the Cisco CSP 2100 X2 front panel. To use the **Power** button, follow these steps:

Step 1 Check the color of the Power Status LED (see the "Front Panel LEDs" section on page 8-2).

- Green—Cisco CSP 2100 X2 is in main power mode and must be shut down before it can be safely powered off. Go to Step 2.
- Amber—Cisco CSP 2100 X2 is already in standby mode and can be safely powered off. Go to Step 3.

Step 2 Invoke either a graceful shutdown or a hard shutdown:

Caution To avoid data loss or damage to your operating system, you should always invoke a graceful shutdown of the operating system.

- Graceful shutdown—Press and release the **Power** button. The operating system performs a graceful shutdown and the Cisco CSP 2100 X2 goes to standby mode, which is indicated by an amber Power Status LED.
- Emergency shutdown—Press and hold the **Power** button for 4 seconds to force the main power off and immediately enter standby mode.

Step 3 Disconnect the power cords from the power supplies in your Cisco CSP 2100 X2 to completely power off the Cisco CSP 2100 X2.

Removing and Replacing the Cisco CSP 2100 X2 Top Cover

Step 1 Remove the top cover (see Figure 8-4).

a. If the cover latch is locked, use a screwdriver to turn the lock 90-degrees counterclockwise to unlock it. See Figure 8-4.

b. Lift on the end of the latch that has the green finger grip. The cover is pushed back to the open position as you lift the latch.

c. Lift the top cover straight up from the Cisco CSP 2100 X2 and set it aside.

Step 2 Replace the top cover:

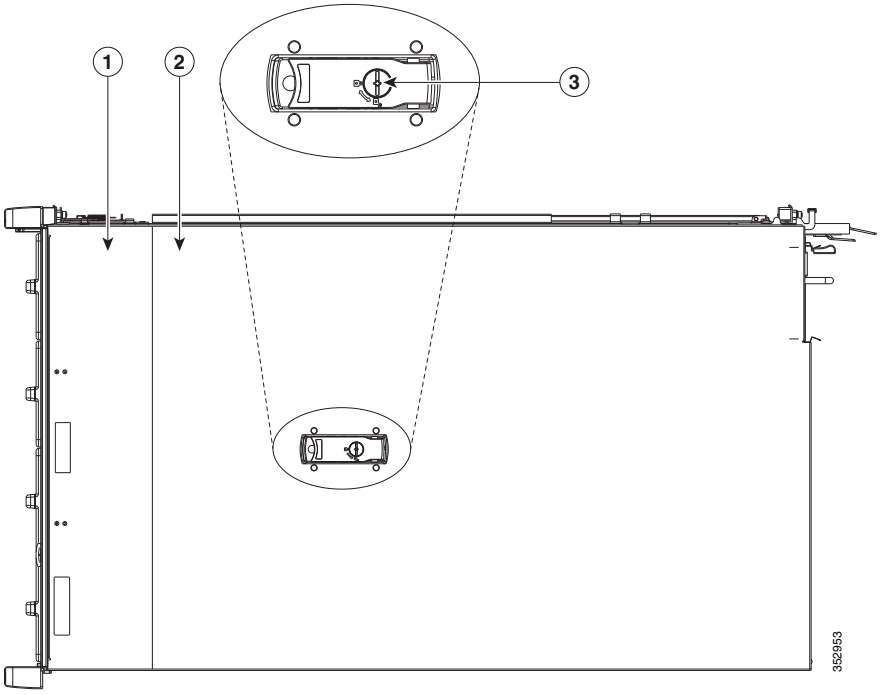
Note The latch must be in the fully open position when you set the cover back in place, which allows the opening in the latch to sit over a peg that is on the fan tray.

a. With the latch in the fully open position, place the cover on top of the Cisco CSP 2100 X2 about one-half inch (1.27 cm) behind the lip of the front cover panel. The opening in the latch should fit over the peg that sticks up from the fan tray.

b. Press the cover latch down to the closed position. The cover is pushed forward to the closed position as you push down the latch.

c. If desired, lock the latch by using a screwdriver to turn the lock 90-degrees clockwise.

Figure 8-4 Removing the Top Cover



1	Front cover panel	**3**	Locking cover latch
2	Top cover		

Serial Number Location

The serial number (SN) for Cisco CSP 2100 X2 is printed on a label on the top of the Cisco CSP 2100 X2, near the front.

Hot-Swap Replacement

Some components can be removed and replaced without powering off and removing AC power from the Cisco CSP 2100 X2. For hot-swap replacement, you do not have to precondition or shut down the component in the software before you remove it for the following components:

- SAS/SATA hard drives or SSDs
- Cooling fan modules
- Power supplies (when 1+1 redundant)

Installing or Replacing Cisco CSP 2100 X2 Components

Warning **Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.** Statement 1029

Caution When handling Cisco CSP 2100 X2 components, wear an ESD strap to avoid damage.

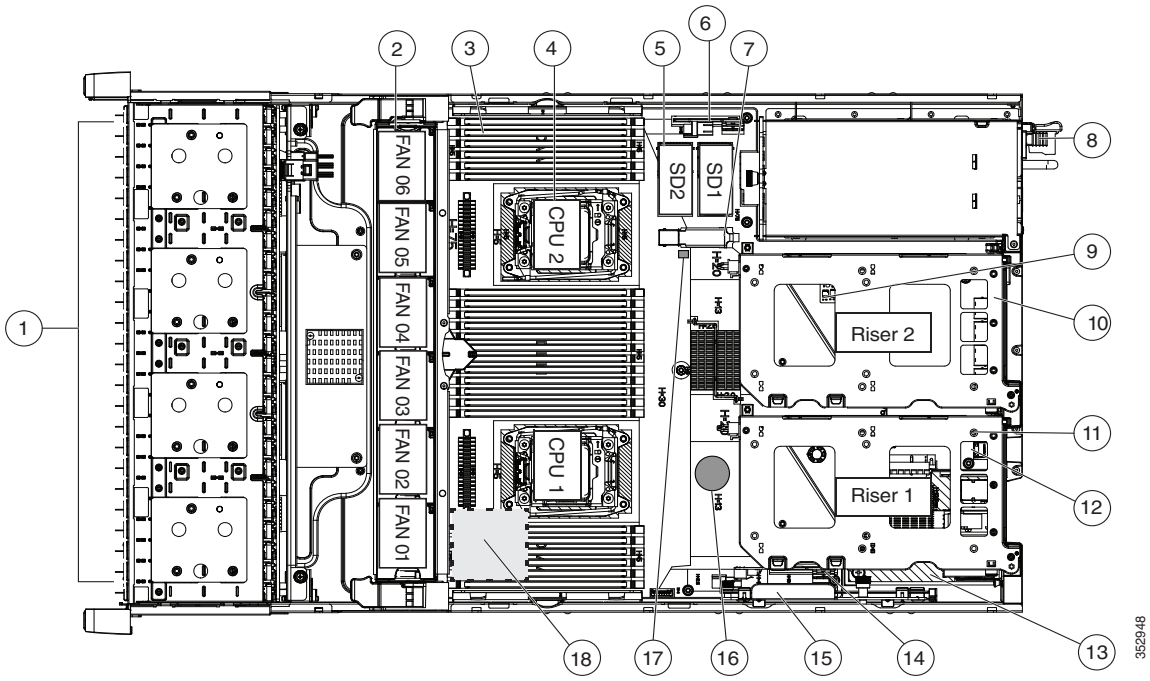
Tip You can press the Unit Identification button on the front panel or rear panel to turn on a flashing Unit Identification LED on the front and rear panels of the Cisco CSP 2100 X2. This button allows you to locate the specific Cisco CSP 2100 X2 that you are servicing when you go to the opposite side of the rack. You can also activate these LEDs remotely by using the Cisco IMC interface. See the "Status LEDs and Buttons" section on page 8-2 for locations of these LEDs.

This section describes how to install and replace Cisco CSP 2100 X2 components, and it includes the following topics:

Replaceable Component Locations

Figure 8-5 shows the locations of the components that are supported as field-replaceable. The view shown is from the top down, with the top covers and air baffle removed.

Figure 8-5 Replaceable Component Locations



1	Drives bays. All drive bays support SAS/SATA drives.	**10**	PCIe riser 2 (PCIe slots 4, 5, 6)
2	Fan modules (six, hot-swappable)	**11**	PCIe riser 1 (PCIe slots 1, 2, 3)
3	DIMM sockets on motherboard (up to 24 DIMMs)	**12**	SATA boot drives (two sockets available only on PCIe riser 1 option 1C)
4	CPUs and heatsinks (two)	**13**	mLOM card socket on motherboard under PCIe riser 1
5	Cisco SD card slots on motherboard (two)	**14**	Socket for embedded RAID interposer board
6	PCIe interposer board socket	**15**	Cisco modular RAID controller PCIe slot (dedicated slot and bracket)
7	USB 3.0 slot on motherboard	**16**	RTC battery on motherboard
8	Power supplies (hot-swappable, accessed through rear panel)	**17**	Embedded RAID header for RAID 5 key
9	Trusted platform module (TPM) socket on motherboard, under PCIe riser 2	**18**	Supercap power module (RAID backup) mounting location on air baffle (not shown)

Replacing SAS/SATA Hard Drives or Solid State Drives

This section includes the following information:

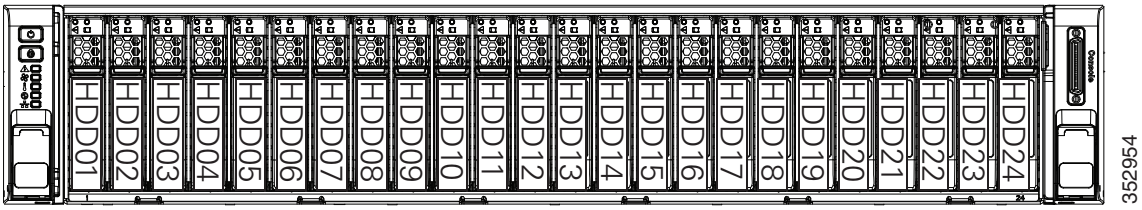
SAS/SATA Drive Population Guidelines

Cisco CSP 2100 X2 supports the small form-factor (SFF) drives with 24-drive backplane and expander. Cisco CSP 2100 X2 holds up to 24 2.5-inch SAS/SATA hard drives or solid state drives (SSDs). SAS/SATA drives are hot-swappable.

Note You cannot change the backplane type after-factory. To change a front panel/backplane configuration, a chassis replacement is required.

The drive-bay numbering is shown in Figure 8-6.

Figure 8-6 Drive Numbering, SFF Drives, 24-Drive Version



Observe these drive population guidelines for optimal performance:

- When populating drives, add drives in the lowest numbered bays first.
- Keep an empty drive blanking tray in any unused bays to ensure optimal airflow and cooling.
- You can mix hard drives and solid state drives in the same Cisco CSP 2100 X2. However, you cannot configure a logical volume (virtual drive) that contains a mix of hard drives and SSDs. That is, when you create a logical volume, it must contain all hard drives or all SSDs.

4K Sector Format Drives Considerations

- You must boot 4K sector format drives in UEFI mode, not legacy mode. See Setting Up Booting in UEFI Mode in the BIOS Setup Utility, page 8-16 or Setting Up Booting in UEFI Mode in the Cisco IMC GUI, page 8-16.
- Do not configure 4K sector format and 512-byte sector format drives as part of the same RAID volume.
- Operating system support on 4K sector drives is as follows: Windows: Win2012 and Win2012R2; Linux: RHEL 6.5, 6.6, 6.7, 7.0, 7.2; SLES 11 SP3, and SLES 12. ESXi/Vmware is not supported.

Setting Up Booting in UEFI Mode in the BIOS Setup Utility

Step 1 Enter the BIOS setup utility by pressing the **F2** key when prompted during bootup.

Step 2 Go to the **Boot Options** tab.

Step 3 Set **UEFI Boot Options** to **Enabled**.

Step 4 Under **Boot Option Priorities**, set your OS installation media (such as a virtual DVD) as your **Boot Option #1**.

Step 5 Go to the **Advanced** tab.

Step 6 Select **LOM and PCIe Slot Configuration**.

Step 7 Set the **PCIe Slot ID: HBA Option ROM** to **UEFI Only**.

Step 8 Press **F10** to save changes and exit the BIOS setup utility. Allow the Cisco CSP 2100 X2 to reboot.

Step 9 After the OS installs, verify the installation:

a. Enter the BIOS setup utility by pressing the **F2** key when prompted during bootup.

b. Go to the **Boot Options** tab.

c. Under **Boot Option Priorities**, verify that the OS you installed is listed as your **Boot Option #1**.

Setting Up Booting in UEFI Mode in the Cisco IMC GUI

Step 1 Use a web browser and the IP address of the Cisco CSP 2100 X2 to log into the Cisco IMC GUI management interface.

Step 2 Navigate to **Server > BIOS**.

Step 3 Under **Actions**, click **Configure BIOS**.

Step 4 In the Configure BIOS Parameters dialog box, select the **Advanced** tab.

Step 5 Go to the **LOM and PCIe Slot Configuration** section.

Step 6 Set the **PCIe Slot: HBA Option ROM** to **UEFI Only**.

Step 7 Click **Save Changes**. The dialog box closes.

Step 8 Under **BIOS Properties**, set **Configured Boot Order** to **UEFI**.

Step 9 Under **Actions**, click **Configure Boot Order**.

Step 10 In the Configure Boot Order dialog box, click **Add Local HDD**.

Step 11 In the Add Local HDD dialog box, enter the information for the 4K sector format drive and make it first in the boot order.

Step 12 Save changes and reboot the Cisco CSP 2100 X2. The changes you made will be visible after the system reboots.

Replacing SAS/SATA Drives

Tip You do not have to shut down or power off the Cisco CSP 2100 X2 to replace SAS/SATA hard drives or solid state drives (SSDs) because they are hot-swappable.

Step 1 Remove the drive that you are replacing or remove a blank drive tray from an empty bay:

a. Press the release button on the face of the drive tray. See Figure 8-7.

b. Grasp and open the ejector lever and then pull the drive tray out of the slot.

c. If you are replacing an existing drive, remove the four drive-tray screws that secure the drive to the tray and then lift the drive out of the tray.

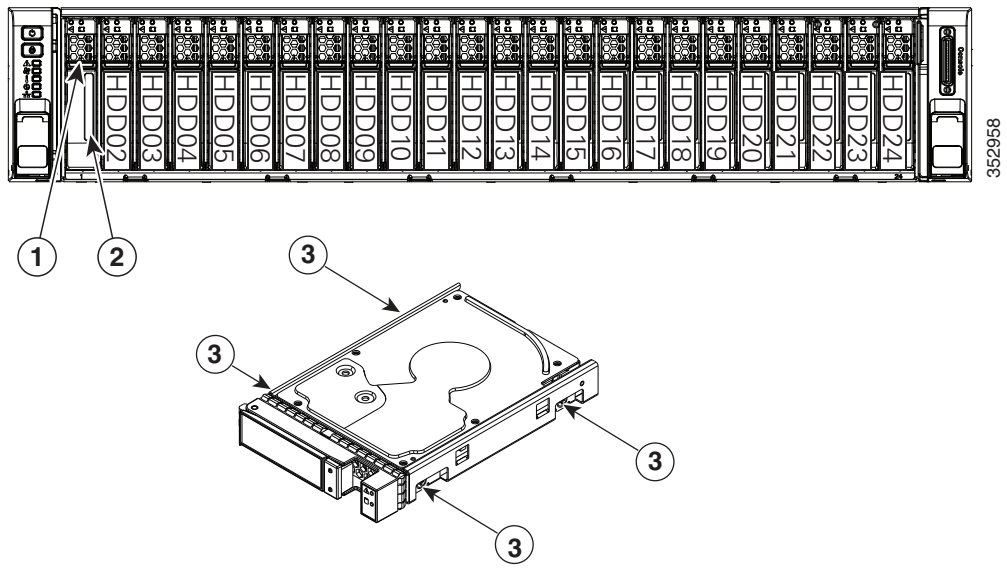
Step 2 Install a new drive:

a. Place a new drive in the empty drive tray and replace the four drive-tray screws.

b. With the ejector lever on the drive tray open, insert the drive tray into the empty drive bay.

c. Push the tray into the slot until it touches the backplane, and then close the ejector lever to lock the drive in place.

Figure 8-7 Replacing Drives



1	Release button	**3**	Drive tray securing screws (four)
2	Ejector lever		–

Replacing Fan Modules

The six hot-swappable fan modules in the Cisco CSP 2100 X2 are numbered as follows when you are facing the front of the Cisco CSP 2100 X2.

Figure 8-8 Fan Module Numbering

FAN 6	FAN 5	FAN 4	FAN 3	FAN 2	FAN 1

Tip A fault LED is on the top of each fan module that lights amber if the fan module fails. To operate these LEDs from the SuperCap power source, remove AC power cords and then press the Unit Identification button. See also Internal Diagnostic LEDs, page 8-8.

Caution You do not have to shut down or power off the Cisco CSP 2100 X2 to replace fan modules because they are hot- swappable. However, to maintain proper cooling, do not operate the Cisco CSP 2100 X2 for more than one minute with any fan module removed.

Step 1 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

Step 2 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 3 Identify a faulty fan module by looking for a fan fault LED that is lit amber (see Figure 8-9).

Step 4 Remove a fan module that you are replacing (see Figure 8-9):

a. Grasp the top of the fan and pinch the green plastic latch toward the center.

b. Lift straight up to remove the fan module from Cisco CSP 2100 X2.

Step 5 Install a new fan module:

a. Set the new fan module in place, aligning the connector on the bottom of the fan module with the connector on the motherboard.

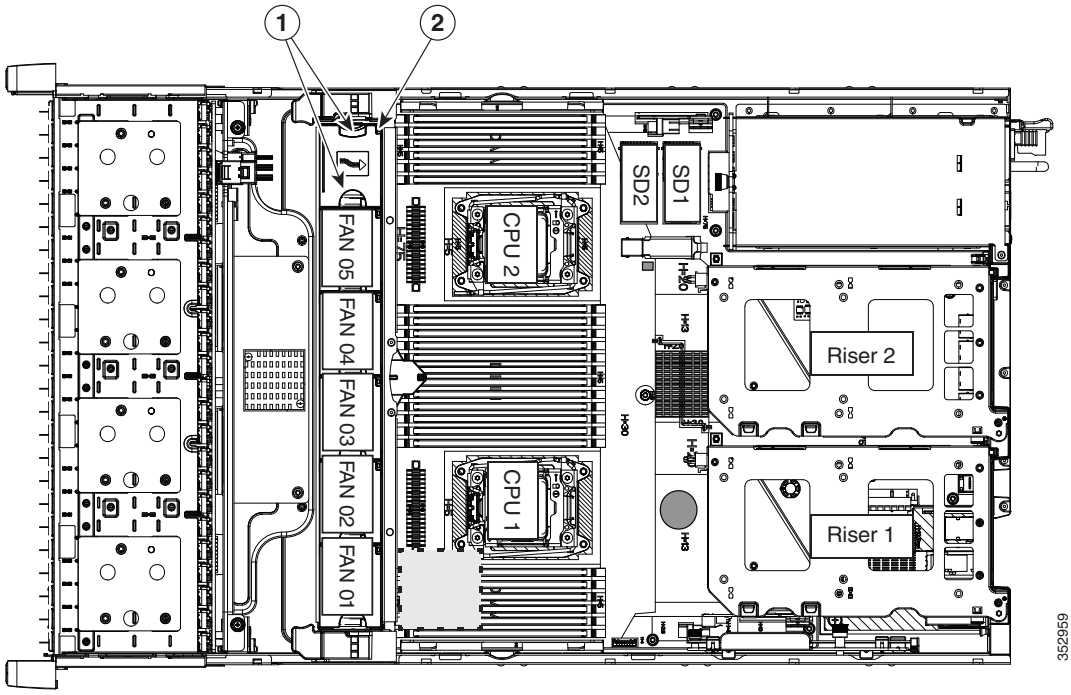
Note The arrow label on the top of the fan module, which indicates the direction of airflow, should point toward the rear of the Cisco CSP 2100 X2.

b. Press down gently on the fan module until the latch clicks and locks in place.

Step 6 Replace the top cover.

Step 7 Replace the Cisco CSP 2100 X2 in the rack.

Figure 8-9 Fan Modules Latch and Fault LED



1	Finger latch (on each fan module)	**2**	Fan module fault LED (on each fan module)

Replacing DIMMs

This section includes the following topics:

Caution DIMMs and their sockets are fragile and must be handled with care to avoid damage during installation.

Caution Cisco does not support third-party DIMMs. Using non-Cisco DIMMs in Cisco CSP 2100 X2 might result in system problems or damage to the motherboard.

Note To ensure the best performance, it is important that you are familiar with memory performance guidelines and population rules before you install or replace the memory.

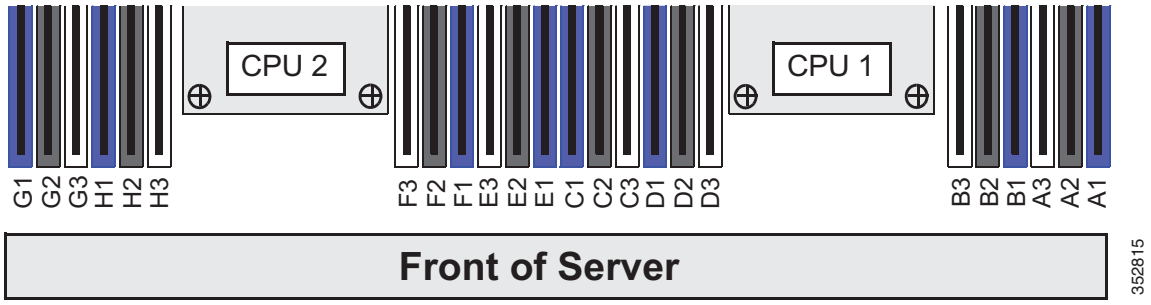
Memory Performance Guidelines and Population Rules

This section describes the type of memory that Cisco CSP 2100 X2 requires and its effect on performance. The section includes the following topics:

DIMM Socket Numbering

Figure 8-10 shows the numbering of the DIMM sockets and CPUs.

Figure 8-10 CPUs and DIMM Socket Numbering on Motherboard



DIMM Population Rules

Observe the following guidelines when installing or replacing DIMMs:

- Each CPU supports four memory channels.
  - CPU1 supports channels A, B, C, and D.
  - CPU2 supports channels E, F, G, and H.
- Each channel has three DIMM sockets (for example, channel A = slots A1, A2, and A3).
  - A channel can operate with one, two, or three DIMMs installed.
  - If a channel has only one DIMM, populate slot 1 first (the blue slot).
- When both CPUs are installed, populate the DIMM sockets of each CPU identically.
  - Fill blue #1 slots in the channels first: A1, E1, B1, F1, C1, G1, D1, H1
  - Fill black #2 slots in the channels second: A2, E2, B2, F2, C2, G2, D2, H2
  - Fill white #3 slots in the channels third: A3, E3, B3, F3, C3, G3, D3, H3
- Any DIMM installed in a DIMM socket for which the CPU is absent is not recognized. In a single-CPU configuration, populate the channels for CPU1 only (A, B, C, D).
- Memory mirroring reduces the amount of memory available by 50 percent because only one of the two populated channels provides data. When memory mirroring is enabled, you must install DIMMs in sets of 4, 6, 8, or 12 as described in Memory Mirroring and RAS, page 8-22.
- The Tesla P100 GPU can support more than 1 TB of memory in Cisco CSP 2100 X2. All other NVIDIA GPUs can support only 1 TB or less of memory in Cisco CSP 2100 X2. Therefore, do not install more than fourteen 64-GB DIMMs when using an NVIDIA GPU card (other than Tesla P100) in Cisco CSP 2100 X2.
- Observe the DIMM mixing rules shown in Table 8-5.

Table 8-5 DIMM Mixing Rules for Cisco CSP 2100 X2

DIMM Parameter	DIMMs in the Same Channel	DIMMs in the Same Bank
DIMM Capacity: RDIMM = 8 or 16 GB LRDIMM = 32 or 64 GB	You can mix different capacity DIMMs in the same channel (for example, A1, A2, A3).	You can mix different capacity DIMMs in the same bank. However, for optimal performance DIMMs in the same bank (for example, A1, B1, C1, D1) should have the same capacity.
DIMM Speed: 2133 or 2400 MHz	You can mix speeds, but DIMMs will run at the speed of the slowest DIMMs/CPUs installed in the channel.	You can mix speeds, but DIMMs will run at the speed of the slowest DIMMs/CPUs installed in the bank.
DIMM Type: RDIMMs or LRDIMMs	You cannot mix DIMM types in a channel.	You cannot mix DIMM types in a bank.

Memory Mirroring and RAS

The Intel E5-2600 CPUs within the Cisco CSP 2100 X2 support memory mirroring only when an even number of channels are populated with DIMMs. If one or three channels are populated with DIMMs, memory mirroring is automatically disabled. Furthermore, if memory mirroring is used, DRAM size is reduced by 50 percent for reasons of reliability.

The memory mirroring configuration for Cisco CSP 2100 is similar to that of Cisco UCS C-Series servers. You can refer to Cisco UCS C-Series Rack Server specification sheet for details on populating recommended memory mirroring configurations:

- Cisco UCS C240 M4 High Density Rack Server (Small Form-Factor Disk Drive Model) Specification Sheet

Lockstep Channel Mode

When you enable lockstep channel mode, each memory access is a 128-bit data access that spans four channels.

Lockstep channel mode requires that all four memory channels on a CPU must be populated identically with regard to size and organization. DIMM socket populations within a channel (for example, A1, A2, A3) do not have to be identical but the same DIMM slot location across all four channels must be populated the same.

For example, DIMMs in sockets A1, B1, C1, and D1 must be identical. DIMMs in sockets A2, B2, C2, and D2 must be identical. However, the A1-B1-C1-D1 DIMMs do not have to be identical with the A2-B2-C2-D2 DIMMs.

DIMM Replacement Procedure

This section includes the following topics:

Identifying a Faulty DIMM

Each DIMM socket has a corresponding DIMM fault LED, directly in front of the DIMM socket. See Figure 8-3 for the locations of these LEDs. The LEDs light amber to indicate a faulty DIMM. To operate these LEDs from the SuperCap power source, remove AC power cords and then press the Unit Identification button.

Replacing DIMMs

Step 1 Power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.

Step 2 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

Step 3 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 4 Remove the air baffle that sits over the DIMM sockets and set it aside.

Step 5 Identify the faulty DIMM by observing the DIMM socket fault LEDs on the motherboard (see Figure 8-3).

Step 6 Remove the DIMMs that you are replacing. Open the ejector levers at both ends of the DIMM socket, and then lift the DIMM out of the socket.

Step 7 Install a new DIMM:

Note Before installing DIMMs, see the population guidelines. See Memory Performance Guidelines and Population Rules, page 8-20.

a. Align the new DIMM with the empty socket on the motherboard. Use the alignment key in the DIMM socket to correctly orient the DIMM.

b. Push down evenly on the top corners of the DIMM until it is fully seated and the ejector levers on both ends lock into place.

Step 8 Replace the air baffle.

Step 9 Replace the top cover.

Step 10 Replace the Cisco CSP 2100 X2 in the rack, replace cables, and then power on the Cisco CSP 2100 X2 by pressing the **Power** button.

Replacing CPUs and Heatsinks

This section contains the following topics:

Special Information For *Upgrades* to Intel Xeon v4 CPUs

Caution You must upgrade your firmware to the required minimum level *before* you upgrade to Intel v4 CPUs. Older firmware versions cannot recognize the new CPUs and this results in a non-bootable server.

The minimum software and firmware versions required for the Cisco CSP 2100 X2 to support Intel v4 CPUs are as follows:

Table 8-6 Minimum Requirements For Intel Xeon v4 CPUs

Software or Firmware	Minimum Version
Server CIMC	2.0(10)
Server BIOS	2.0(10)
Cisco UCS Manager (UCSM-managed system only)	2.2(7) or 3.1(1)

Note Cisco UCS Manager Release 2.2(4) introduced a server pack feature that allows Intel v4 CPUs to run with Cisco UCS Manager Release 2.2(4) or later.
The UCS Manager Capability Catalog must be updated to 2.2(7c) or later.
The server Cisco IMC/BIOS must be running the minimum version or later as described in Table 8-6.

Do one of the following actions:

- If your Cisco CSP 2100 X2's firmware and/or Cisco UCS Manager software are already at the required levels shown in Table 8-6, you can replace the CPU hardware by using the procedure in this section.
- If your Cisco CSP 2100 X2's firmware and/or Cisco UCS Manager software is earlier than the required levels, use the instructions in the Cisco UCS C-Series Servers Upgrade Guide for Intel Xeon v4 CPUs to upgrade your software. After you upgrade the software, return to the procedure in this section as directed to replace the CPU hardware.

CPU Configuration Rules

Cisco CSP 2100 X2 has two CPU sockets. Each CPU supports four DIMM channels (12 DIMM sockets). See Figure 8-10.

- Cisco CSP 2100 X2 can operate with one CPU or with two identical CPUs installed.
- The minimum configuration is that Cisco CSP 2100 X2 must have at least CPU1 installed. Install CPU1 first, and then CPU2.
- The following restrictions apply when using a single-CPU configuration:
  - The maximum number of DIMMs is 12 (only CPU1 channels A, B, C, and D).
  - PCIe riser 2, which contains PCIe slots 4, 5, and 6 is unavailable.
  - The PCIe SSD interposer board is unavailable.

Replacing a CPU and Heatsink

Caution CPUs and their motherboard sockets are fragile and must be handled with care to avoid damaging pins during installation. The CPUs must be installed with heatsinks and their thermal grease to ensure proper cooling. Failure to install a CPU correctly might result in damage to the Cisco CSP 2100 X2.

Note Cisco CSP 2100 X2 uses the new independent loading mechanism (ILM) CPU sockets, so no Pick-and-Place tools are required for CPU handling or installation. Always grasp the plastic frame on the CPU when handling.

Step 1 Power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.

Step 2 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

Step 3 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 4 Remove the plastic air baffle that sits over the CPUs.

Step 5 Remove the heatsink that you are replacing:

a. Use a Number 2 Phillips-head screwdriver to loosen the four captive screws that secure the heatsink.

Note Alternate loosening each screw evenly to avoid damaging the heatsink or CPU.

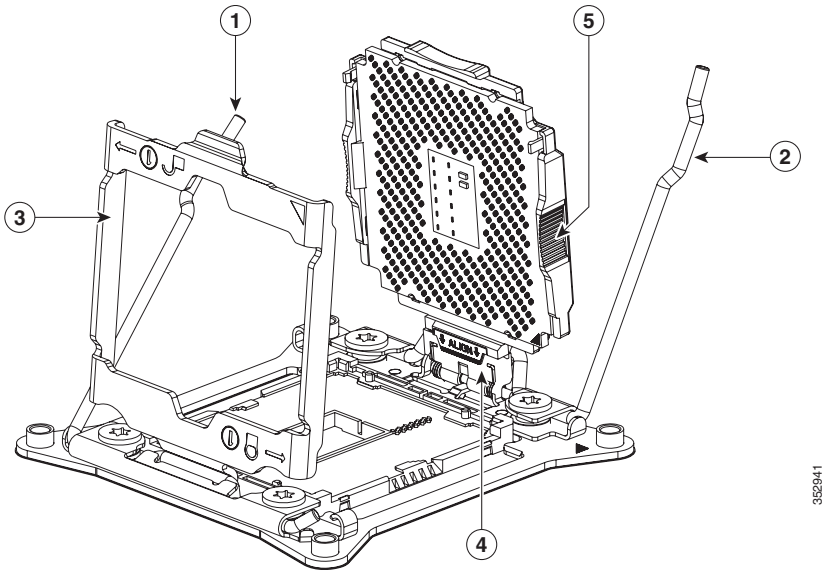
b. Lift the heatsink off of the CPU.

Step 6 Open the CPU retaining mechanism:

a. Unclip the first retaining latch labeled with the icon, and then unclip the second retaining latch labeled with the icon. See Figure 8-11.

b. Open the hinged CPU cover plate.

Figure 8-11 CPU Socket



1	CPU retaining latch	**4**	Hinged CPU seat
2	CPU retaining latch	**5**	Finger-grips on plastic CPU frame
3	Hinged CPU cover plate		

Step 7 Remove any existing CPU:

a. With the latches and hinged CPU cover plate open, swing the CPU in its hinged seat up to the open position, as shown in Figure 8-11.

b. Grasp the CPU by the finger-grips on its plastic frame and lift it up and out of the hinged CPU seat.

c. Set the CPU aside on an antistatic surface.

Step 8 Install a new CPU:

a. Grasp the new CPU by the finger-grips on its plastic frame and align the tab on the frame that is labeled “ALIGN” with the hinged seat, as shown in Figure 8-12.

b. Insert the tab on the CPU frame into the seat until it stops and is held firmly.

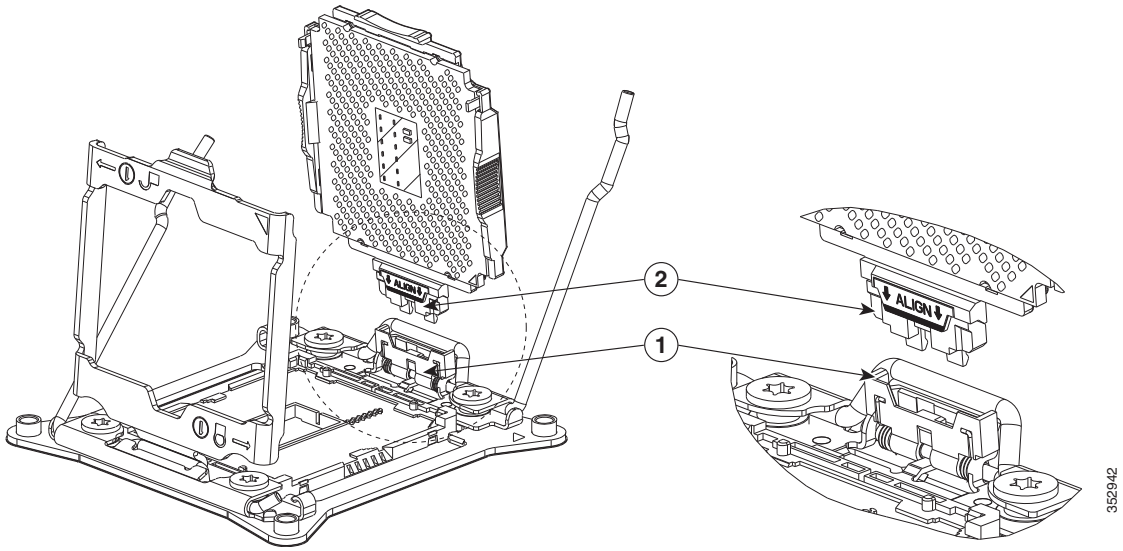
The line below the word “ALIGN” should be level with the edge of the seat, as shown in Figure 8-12.

c. Swing the hinged seat with the CPU down until the CPU frame clicks in place and holds flat in the socket.

d. Close the hinged CPU cover plate.

e. Clip down the CPU retaining latch with the icon, and then clip down the CPU retaining latch with the icon. See Figure 8-11.

Figure 8-12 CPU and Socket Alignment Features



1	SLS mechanism on socket	**2**	Tab on CPU frame (labeled ALIGN)

Step 9 Install a heat sink:

Caution The heat sink must have new thermal grease on the heat sink-to-CPU surface to ensure proper cooling. If you are reusing a heat sink, you must remove the old thermal grease from the heatsink and the CPU surface. If you are installing a new heat sink, skip to Step c.

a. Apply the cleaning solution, which is included with the heatsink cleaning kit (UCSX-HSCK=, shipped with spare CPUs), to the old thermal grease on the heatsink and CPU and let it soak for a least 15 seconds.

b. Wipe all of the old thermal grease off the old heat sink and CPU using the soft cloth that is included with the heatsink cleaning kit. Be careful to not scratch the heat sink surface.

Note New heatsinks come with a pre-applied pad of thermal grease. If you are reusing a heatsink, you must apply thermal grease from a syringe (UCS-CPU-GREASE3=).

c. Align the four heatsink captive screws with the motherboard standoffs, and then use a Number 2 Phillips-head screwdriver to tighten the captive screws evenly.

Note Alternate tightening each screw evenly to avoid damaging the heatsink or CPU.

Step 10 Replace the air baffle.

Step 11 Replace the top cover.

Step 12 Replace the Cisco CSP 2100 X2 in the rack, replace cables, and then power on the Cisco CSP 2100 X2 by pressing the **Power** button.

Additional CPU-Related Parts to Order with RMA Replacement Motherboards

When a return material authorization (RMA) of the motherboard or CPU is done on a Cisco CSP 2100 X2, additional parts might not be included with the CPU or motherboard spare bill of materials (BOM). The TAC engineer might need to add the additional parts to the RMA to help ensure a successful replacement.

Note Cisco CSP 2100 X2 uses the new independent loading mechanism (ILM) CPU sockets, so no Pick-and-Place tools are required for CPU handling or installation. Always grasp the plastic frame on the CPU when handling.

- Scenario 1—You are reusing the existing heatsinks:
  - Heat sink cleaning kit (UCSX-HSCK=)
  - Thermal grease kit for C240 M4 (UCS-CPU-GREASE3=)
- Scenario 2—You are replacing the existing heatsinks:
  - Heat sink (UCSC-HS-C240M4=)
  - Heat sink cleaning kit (UCSX-HSCK=)

A CPU heatsink cleaning kit is good for up to four CPU and heatsink cleanings. The cleaning kit contains two bottles of solution, one to clean the CPU and heatsink of old thermal interface material and the other to prepare the surface of the heatsink.

New heatsink spares come with a pre-applied pad of thermal grease. It is important to clean the old thermal grease off of the CPU prior to installing the heatsinks. Therefore, when you are ordering new heatsinks, you must order the heatsink cleaning kit.

Replacing a Cisco Modular RAID Controller Card

Cisco CSP 2100 X2 has an internal, dedicated PCIe slot on the motherboard for a Cisco modular RAID controller card (see Figure 8-13).

See also:

- Replacing a Modular RAID Controller Transportable Memory Module (TMM), page 8-31
- Replacing the Supercap Power Module (RAID Backup Battery), page 8-33

Note You cannot use a hardware RAID controller card and the embedded RAID controller at the same time.

RAID Card Firmware Compatibility

If the PCIe card that you are installing is a RAID controller card, firmware on the RAID controller must be verified for compatibility with the current Cisco IMC and BIOS versions that are installed on the Cisco CSP 2100 X2. If not compatible, upgrade or downgrade the RAID controller firmware accordingly using the Host Upgrade Utility (HUU) for your firmware release to bring it to a compatible level.

See the HUU guide for your Cisco IMC release for instructions on downloading and using the utility to bring Cisco CSP 2100 X2 components to compatible levels: HUU Guides

Replacement Procedure

Step 1 Power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.

Step 2 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

Step 3 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 4 Remove an existing RAID controller card:

a. Disconnect the data cable from the card. Depress the tab on the cable connector and pull.

b. Disconnect the supercap power module cable from the transportable memory module (TMM), if present.

c. Lift straight up on the metal bracket that holds the card. The bracket lifts off of two pegs on the chassis wall.

d. Loosen the two thumbscrews that hold the card to the metal bracket and then lift the card from the bracket.

Step 5 Install a new RAID controller card:

Caution When installing the card to the bracket, be careful so that you do not scrape and damage electronic components on the underside of the card on features of the bracket. Also avoid scraping the card when you install the bracket to the pegs on the chassis wall.

a. Set the new card on the metal bracket, aligned so that the thumbscrews on the card enter the threaded standoffs on the bracket. Tighten the thumbscrews to secure the card to the bracket.

b. Align the two slots on the back of the bracket with the two pegs on the chassis wall.

The two slots on the bracket must slide down over the pegs at the same time that you push the card into the motherboard socket.

c. Gently press down on both top corners of the metal bracket to seat the card into the socket on the motherboard.

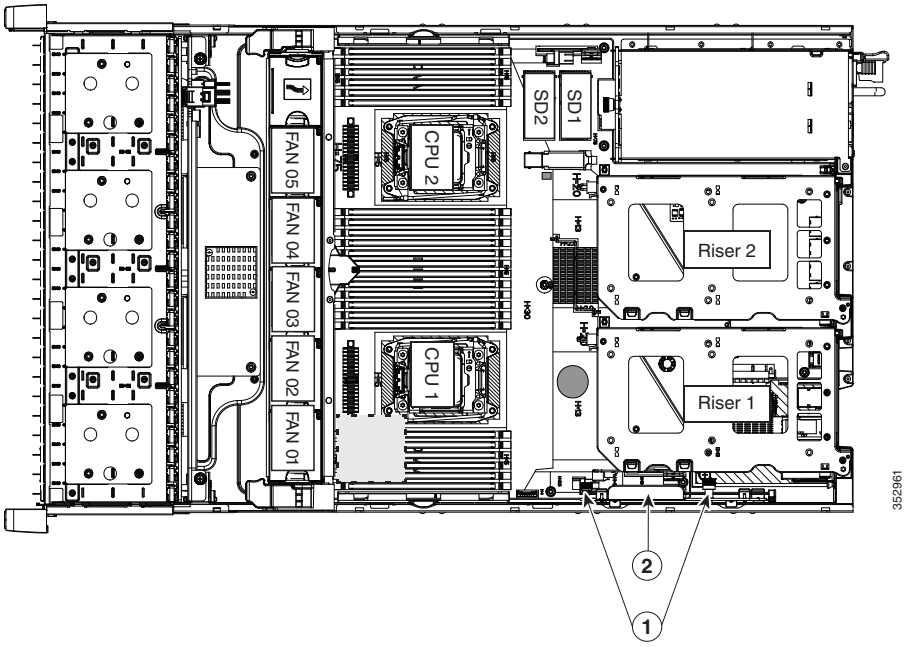
d. Connect the supercap power module cable to its connector on the TMM, if present.

e. Connect the single data cable to the card.

Step 6 Replace the top cover.

Step 7 Replace the Cisco CSP 2100 X2 in the rack, replace cables, and then power on the Cisco CSP 2100 X2 by pressing the **Power** button.

Figure 8-13 Modular RAID Controller Card Location



1	Thumbscrews on card	**2**	Cisco modular RAID controller bracket

Replacing a Modular RAID Controller Transportable Memory Module (TMM)

The transportable memory module (TMM) that attaches to the modular RAID controller card can be installed or replaced after-factory.

See also:

- Replacing a Cisco Modular RAID Controller Card, page 8-29
- Replacing the Supercap Power Module (RAID Backup Battery), page 8-33

Step 1 Power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.

Step 2 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

Step 3 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 4 Remove the modular RAID controller card from the Cisco CSP 2100 X2:

a. Lift straight up on the metal bracket that holds the card. The bracket lifts off of two pegs on the chassis wall (see Figure 8-13).

b. Disconnect the supercap power module cable from the TMM that is attached to the card.

Step 5 Remove the TMM from the modular RAID controller card (see Figure 8-14):

a. The plastic bracket on the card has a securing plastic clip at each end of the TMM. Gently spread each clip away from the TMM.

b. Pull straight up on the TMM to lift it off the two plastic guide pegs and the socket on the card.

Step 6 Install a TMM to the modular RAID controller card (see Figure 8-14):

a. Align the TMM over the bracket on the card. Align the connector on the underside of the TMM with the socket on the card. Align the two guide holes on the TMM over the two guide pegs on the card.

Caution In the next step, keep the TMM level and parallel with the surface of the card to avoid damaging the connector or socket.

b. Gently lower the TMM so that the guide holes on the TMM go over the guide pegs on the card.

c. Press down on the TMM until the plastic clips on the bracket close over each end of the TMM.

d. Press down on the TMM to fully seat its connector with the socket on the card.

Step 7 Install the modular RAID controller card back into the Cisco CSP 2100 X2:

Note If this is a first-time installation of your TMM, you must also install a supercap power module (SCPM). The SCPM cable attaches to a connector on the TMM. See Replacing the Supercap Power Module (RAID Backup Battery), page 8-33.

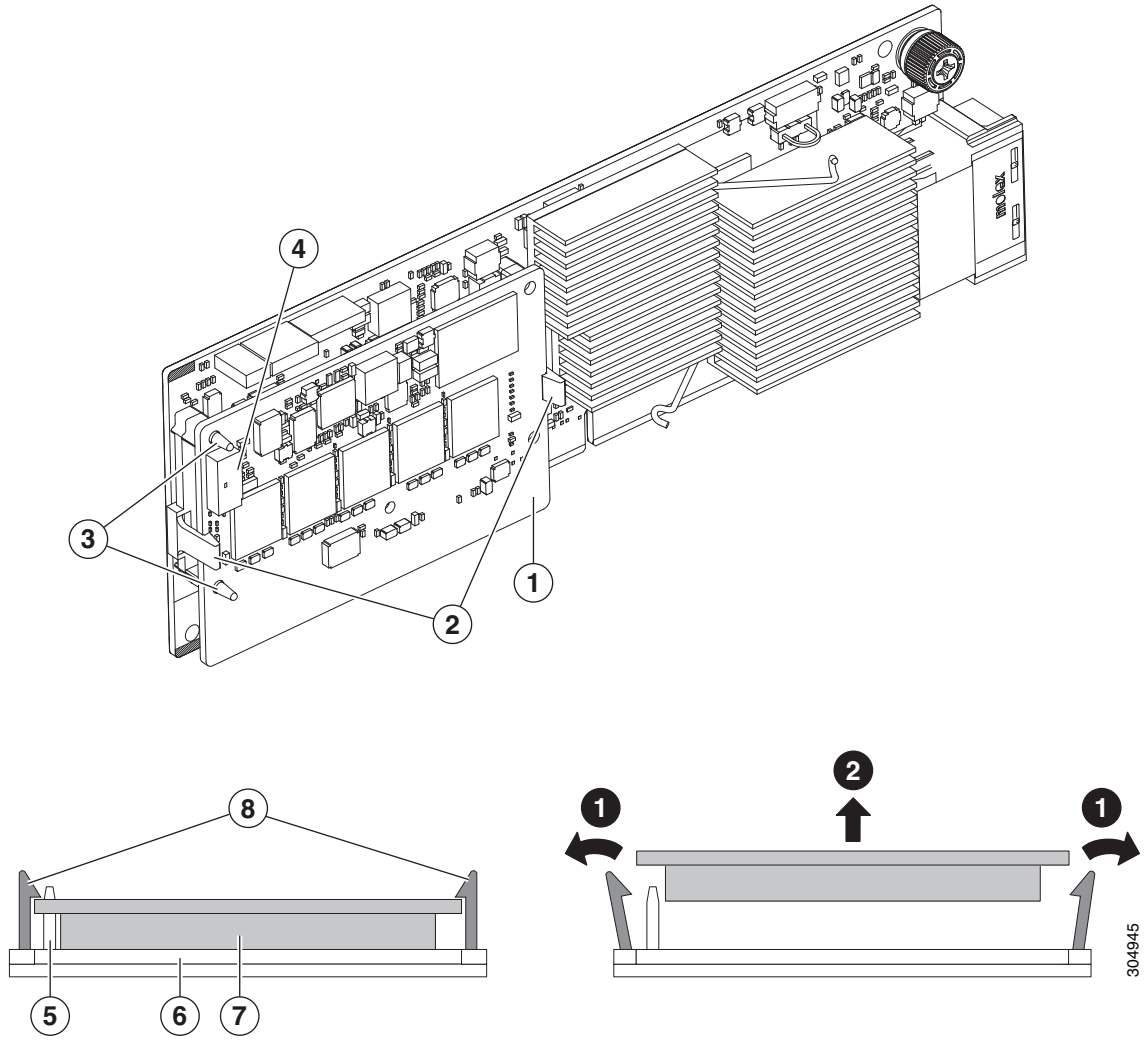
a. Connect the cable from the supercap power module (RAID battery) to the connector on the TMM (see Figure 8-14).

b. Align the two slots on the back of the RAID card bracket with the two pegs on the chassis wall.

The two slots on the bracket must slide down over the pegs at the same time that you push the card into the motherboard socket.

c. Gently press down on both top corners of the metal bracket to seat the card into the socket on the motherboard.

Figure 8-14 TMM on Modular RAID Controller Card



1	TMM on modular RAID card	**5**	Side view, guide peg
2	Securing bracket clips	**6**	Side view, socket on modular RAID card
3	Guide pegs on bracket protruding through guide holes on TMM	**7**	Side view, connector on underside of TMM
4	SCPM cable connector on TMM	**8**	Side view, securing clips

Replacing the Supercap Power Module (RAID Backup Battery)

Cisco CSP 2100 X2 supports installation of one supercap power module (SCPM). The unit mounts to a clip on the removable air baffle (see Figure 8-15). The SCPM requires that you have a transportable memory module (TMM) attached to your RAID controller card because the connector for the SCPM cable is on the TMM.

See also:

- Replacing a Cisco Modular RAID Controller Card, page 8-29
- Replacing a Modular RAID Controller Transportable Memory Module (TMM), page 8-31

The SCPM provides approximately three years of backup for the disk write-back cache DRAM in the case of a sudden power loss by offloading the cache to the NAND flash.

Warning **There is danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.**
Statement 1015

Step 1 Power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.

Step 2 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

Step 3 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 4 Remove an existing SCPM:

a. Disconnect the existing SCPM cable from the transportable memory module (TMM) that is attached to the modular RAID controller card.

b. Pull back the plastic clip that closes over the SCPM slightly, and then slide the SCPM free of the clips on the air baffle mounting point (see Figure 8-15).

Step 5 Install a new SCPM:

a. Slide the new backup unit into the holder on the air baffle mounting point until the clip clicks over the top edge of the SCPM.

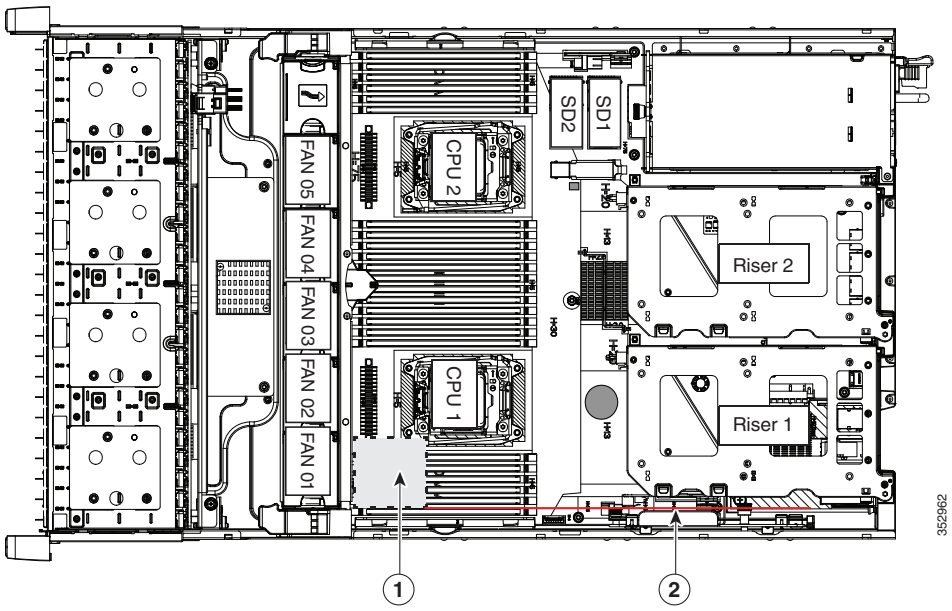
b. Connect the cable from the SCPM to the TMM that is attached to the modular RAID controller card.

Note Put the cable through the opening on the rear of the air baffle (rather than over the air baffle) to keep the cable from interfering with the top cover of the Cisco CSP 2100 X2.

Step 6 Replace the top cover.

Step 7 Replace the Cisco CSP 2100 X2 in the rack, replace cables, and then power on the Cisco CSP 2100 X2 by pressing the **Power** button.

Figure 8-15 SCPM (RAID Backup Unit) Mounting Point and Cable Path



1	SCPM mounting point on removable air baffle (air baffle not shown)	**2**	SCPM cable routing path (the red line)

Replacing a Software RAID 5 Key Module

Cisco CSP 2100 X2 has a two-pin header on the motherboard for a RAID 5 key module.

Step 1 Power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.

Step 2 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

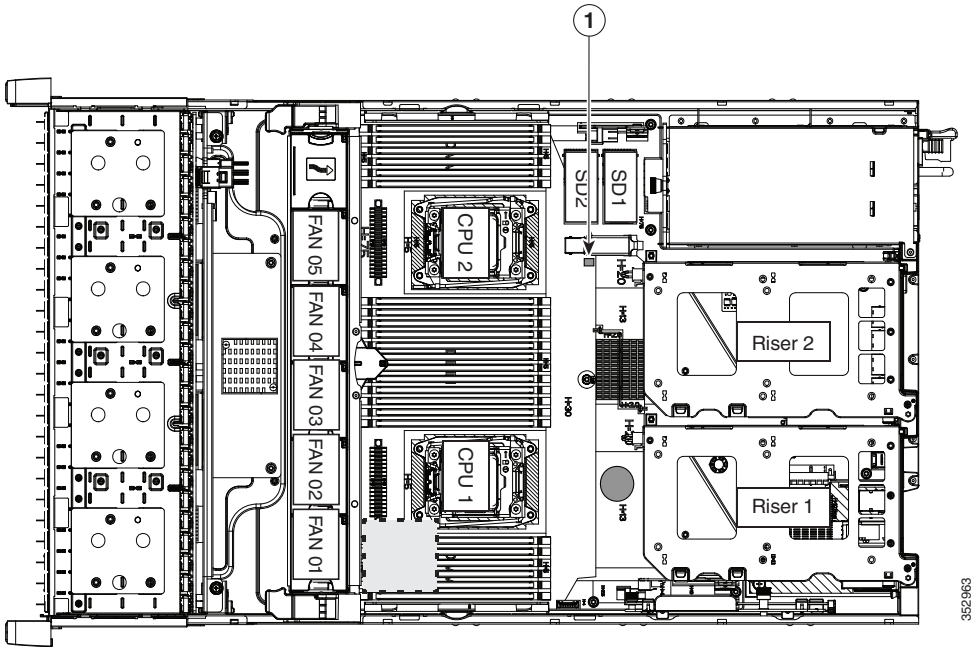
Step 3 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 4 Remove any existing software RAID key module:

a. Locate the module on the motherboard (see Figure 8-16).

b. Hold the retention clips on the header open while you grasp the RAID key board and pull straight up (see Figure 8-17).

Figure 8-16 RAID 5 Key Header Location on Motherboard



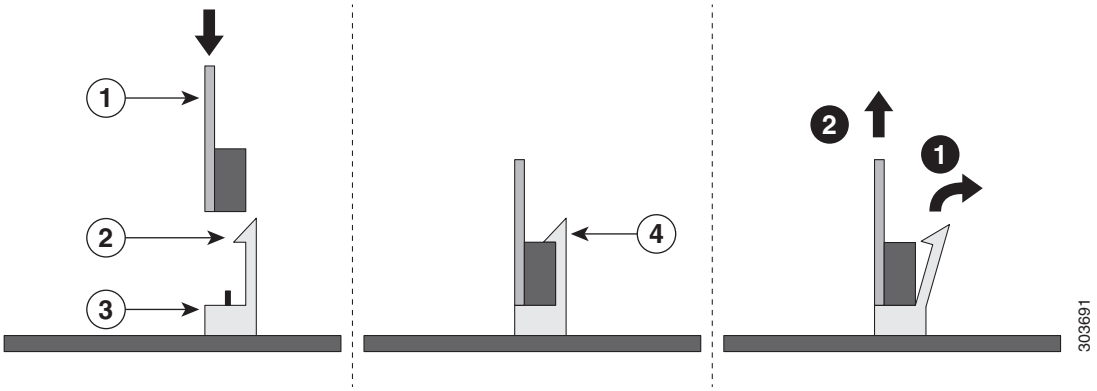
1	Software RAID 5 key header (adds RAID 5 support)		

Step 5 Install a new software RAID key module:

a. Align the module with the pins in the motherboard header.

b. Gently press down on the module until it is seated and the retention clip locks over the module (see Figure 8-17).

Figure 8-17 Software RAID 5 Key Module Retention Clip



1	Printed circuit board on module	**3**	Motherboard header
2	Retention clip on motherboard header	**4**	Retention clip in installed position

Replacing the Motherboard RTC Battery

Warning **There is danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.** [Statement 1015]

The real-time clock (RTC) battery retains system settings when the Cisco CSP 2100 X2 is disconnected from power. The battery type is CR2032. Cisco supports the industry-standard CR2032 battery, which can be purchased from most electronic stores.

Step 1 Power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.

Step 2 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

Step 3 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 4 Remove the battery from its holder on the motherboard (see Figure 8-18):

a. Use a small screwdriver or pointed object to press inward on the battery at the prying point (see Figure 8-18).

b. Lift up on the battery and remove it from the holder.

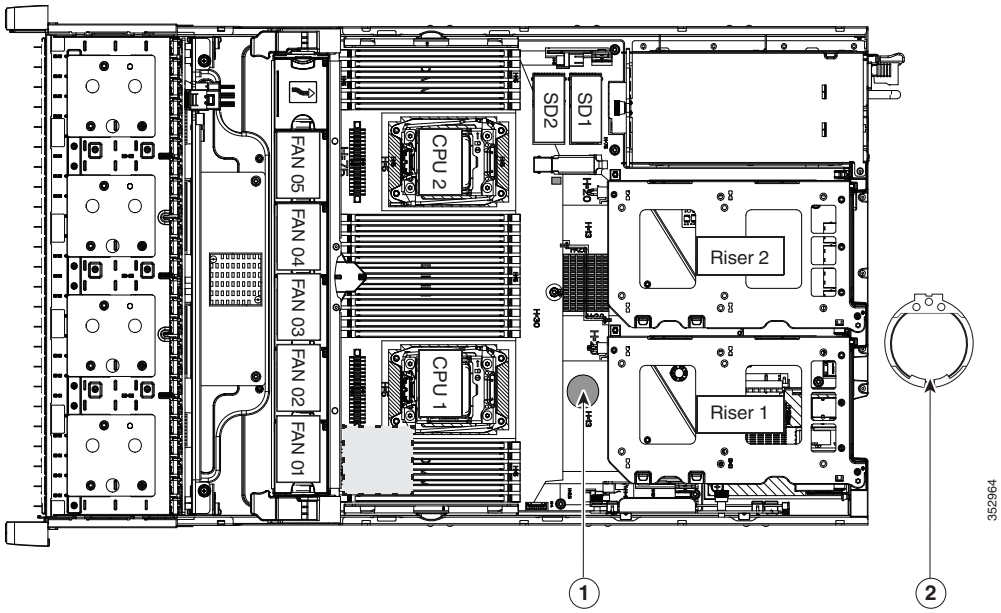
Step 5 Install an RTC battery. Insert the battery into its holder and press down until it clicks in place.

Note The positive side of the battery marked "3V+" should face upward.

Step 6 Replace the top cover.

Step 7 Replace the Cisco CSP 2100 X2 in the rack, replace cables, and power on the Cisco CSP 2100 X2 by pressing the **Power** button.

Figure 8-18 RTC Battery Location and Prying Point



1	RTC battery holder on motherboard	2	Prying point

Replacing an Internal SD Card

Cisco CSP 2100 X2 has two internal SD card bays on the motherboard.

Dual SD cards are supported. RAID 1 support can be configured through the Cisco IMC interface.

Step 1 Power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.

Step 2 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

Step 3 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 4 Remove an SD card (see Figure 8-19).

a. Push on the top of the SD card, and then release it to allow it to spring out from the slot.

b. Remove the SD card from the slot.

Step 5 Install an SD card:

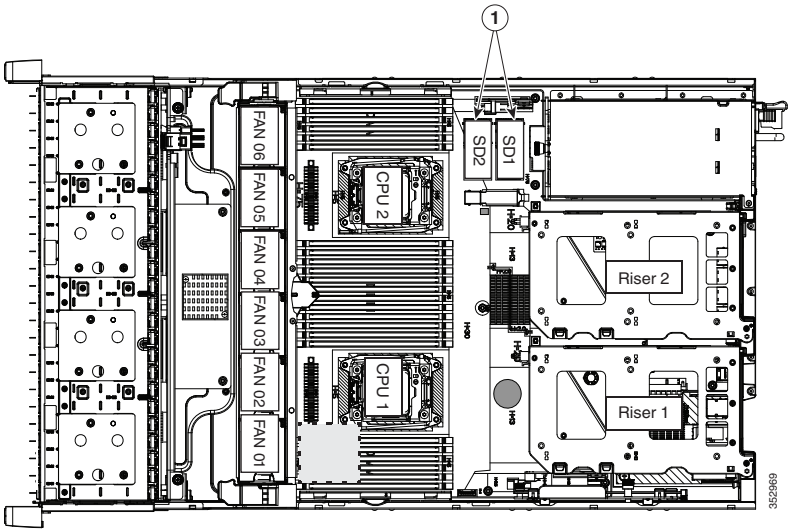
a. Insert the SD card into the slot with the label side facing up.

b. Press on the top of the card until it clicks in the slot and stays in place.

Step 6 Replace the top cover.

Step 7 Replace the Cisco CSP 2100 X2 in the rack, replace cables, and then power on the Cisco CSP 2100 X2 by pressing the **Power** button.

Figure 8-19 SD Card Bay Location and Numbering on the Motherboard



1	SD card bays SD1 and SD2		

Enabling or Disabling the Internal USB Port

Caution We do not recommend that you hot-swap the internal USB drive while the Cisco CSP 2100 X2 is powered on.

The factory default is for all USB ports on the Cisco CSP 2100 X2 to be enabled. However, the internal USB port can be enabled or disabled in the BIOS. See Figure 8-5 for the location of the internal USB 3.0 slot on the motherboard.

Step 1 Enter the BIOS Setup Utility by pressing the **F2** key when prompted during bootup.

Step 2 Navigate to the **Advanced** tab.

Step 3 On the Advanced tab, select **USB Configuration**.

Step 4 On the USB Configuration page, choose **USB Ports Configuration**.

Step 5 Scroll to **USB Port: Internal**, press **Enter**, and then choose either **Enabled** or **Disabled** from the dialog box.

Step 6 Press **F10** to save and exit the utility.

Replacing a PCIe Riser

Cisco CSP 2100 X2 contains two toolless PCIe risers for horizontal installation of PCIe cards. See Replacing a PCIe Card, page 8-42 for the specifications of the PCIe slots on the risers.

Step 1 Power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.

Step 2 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

Step 3 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 4 Remove the PCIe riser that you are replacing (see Figure 8-20):

a. Grasp the top of the riser and lift straight up on both ends to disengage its circuit board from the socket on the motherboard. Set the riser on an antistatic mat.

b. If the riser has a card installed, remove the card from the riser. See Replacing a PCIe Card, page 8-42.

Step 5 Install a new PCIe riser:

a. If you removed a card from the old PCIe riser, install the card to the new riser (see Replacing a PCIe Card, page 8-42).

b. Position the PCIe riser over its socket on the motherboard and over its alignment slots in the chassis (see Figure 8-20). There are also two alignment pegs on the motherboard for each riser.

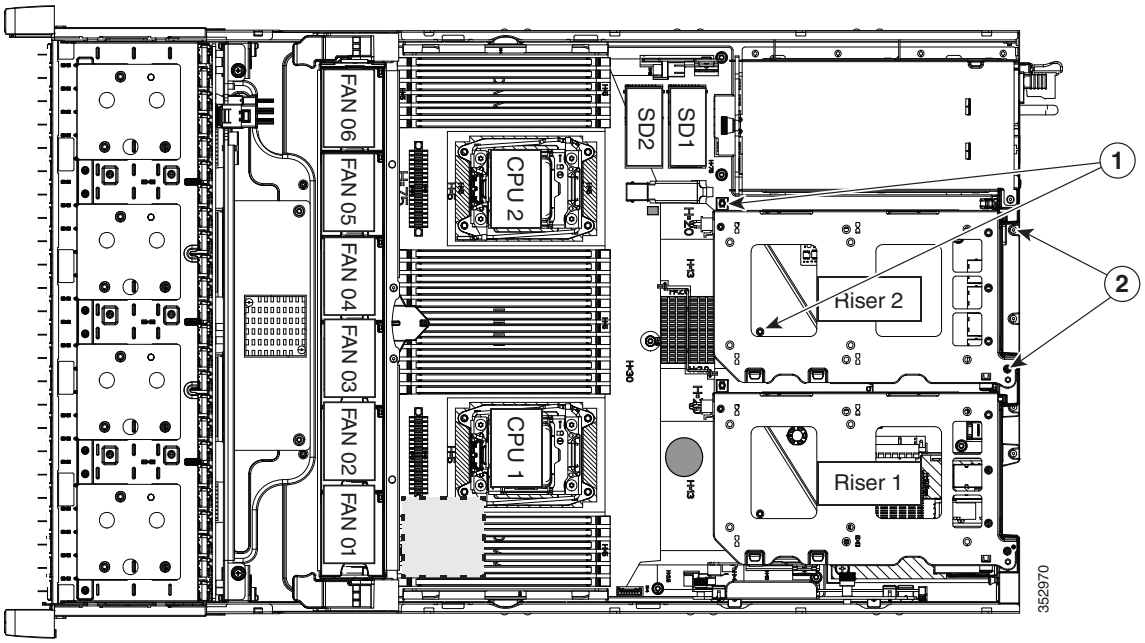
Note The PCIe risers are not interchangeable. If you plug a PCIe riser into the wrong socket, the Cisco CSP 2100 X2 will not boot. Riser 1 must plug into the motherboard socket labeled “RISER1.” Riser 2 must plug into the motherboard socket labeled “RISER2.”

c. Carefully push down on both ends of the PCIe riser to fully engage its circuit board connector with the socket on the motherboard.

Step 6 Replace the top cover.

Step 7 Replace the Cisco CSP 2100 X2 in the rack, replace cables, and then power on the Cisco CSP 2100 X2 by pressing the **Power** button.

Figure 8-20 PCIe Riser Alignment Features



1	Alignment peg locations on motherboard (two for each riser)	**2**	Alignment channel locations on chassis (two for each riser)

Replacing a PCIe Card

Caution Cisco supports all PCIe cards qualified and sold by Cisco. PCIe cards not qualified or sold by Cisco are the responsibility of the customer. Although Cisco will always stand behind and support the Cisco CSP 2100, customers using standard, off-the-shelf, third-party cards must go to the third-party card vendor for support if any issue with that particular third-party card occurs.

This section includes the following topics:

PCIe Slots

Cisco CSP 2100 X2 contains two toolless PCIe risers for horizontal installation of PCIe cards (see Figure 8-21).

- Riser 1 B’
- Riser 2

Figure 8-21 Rear Panel, Showing PCIe Slots

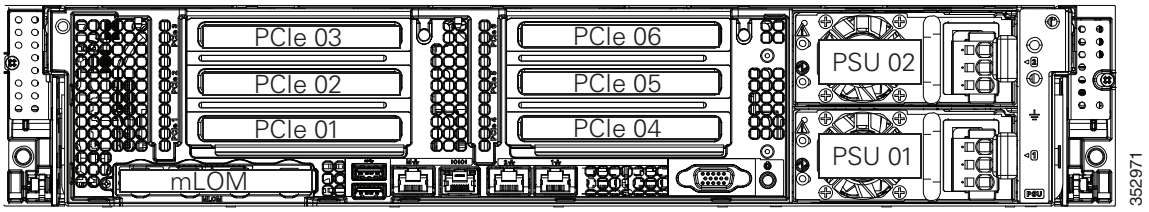


Table 8-7 Riser 1B[1] (UCSC-PCI-1B-240M4) PCIe Expansion Slots

Slot Number	Electrical Lane Width	Connector Length	Card Length	Card Height	NCSI Support
1	Gen-3 x8	x16 connector	3/4 length	Full height	No
2	Gen-3 x8	x24 connector	Full length	Full height	Yes
3	Gen-3 x8	x16 connector	Full length	Full height	No

1. GPU cards are not supported in this riser 1B version. There is no GPU power connector in this version. Use riser version 1A or 1C for GPU cards.

Table 8-8 Riser 2 (UCSC-PCI-2-240M4) PCIe Expansion Slots

Slot Number	Electrical Lane Width	Connector Length	Card Length	Card Height	NCSI Support
4	Gen-3 x8	x24 connector	3/4 length	Full height	Yes
5	Gen-3 x16	x24 connector	Full length	Full height	Yes[1]
6	Gen-3 x8	x16 connector	Full length	Full height	No

1. NCSI is supported in only one slot at a time in this riser version. If a GPU card is present in slot 5, NCSI support automatically moves to slot 4.

Replacing a PCIe Card

To install or replace a PCIe card, follow these steps:

Step 1 Shut down and power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.

Step 2 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

Step 3 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 4 Remove a PCIe card (or a blanking panel) from the PCIe riser:

a. Lift straight up on both ends of the riser to disengage its circuit board from the socket on the motherboard. Set the riser on an antistatic mat.

b. On the bottom of the riser, loosen the single thumbscrew that holds the securing plate (see Figure 8-22).

c. Swing open the securing plate and remove it from the riser to provide access.

d. Swing open the card-tab retainer that secures the back-panel tab of the card (see Figure 8-22).

e. Pull evenly on both ends of the PCIe card to disengage it from the socket on the PCIe riser (or remove a blanking panel) and then set the card aside.

Step 5 Install a PCIe card:

a. Align the new PCIe card with the empty socket on the PCIe riser.

b. Push down evenly on both ends of the card until it is fully seated in the socket.

Ensure that the card rear panel tab sits flat against the PCIe riser rear panel opening.

c. Close the card-tab retainer (see Figure 8-22).

d. Return the securing plate to the riser. Insert the two hinge-tabs into the two slots on the riser, and then swing the securing plate closed.

e. Tighten the single thumbscrew on the bottom of the securing plate.

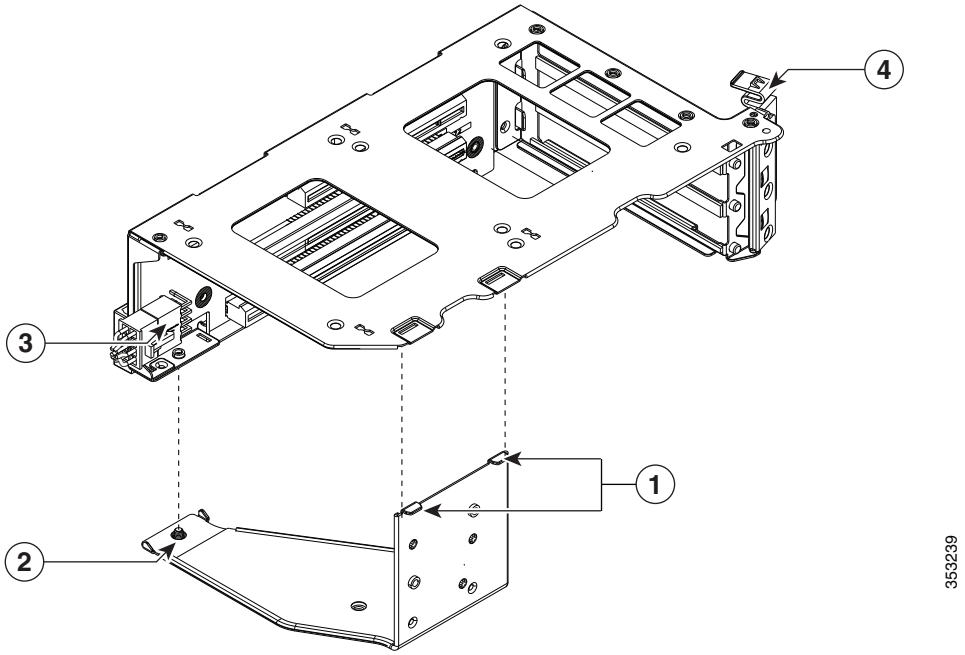
f. Position the PCIe riser over its socket on the motherboard and over its alignment features in the chassis (see Figure 8-20).

g. Carefully push down on both ends of the PCIe riser to fully engage its circuit board connector with the socket on the motherboard.

Step 6 Replace the top cover.

Step 7 Replace the Cisco CSP 2100 X2 in the rack, replace cables, and then power on the Cisco CSP 2100 X2 by pressing the **Power** button.

Figure 8-22 PCIe Riser Securing Features (Three-Slot Riser Shown)



1	Securing plate hinge-tabs	**3**	GPU card power connector
2	Securing plate thumbscrew (knob not visible on underside of plate)	**4**	Card-tab retainer in open position

Installing Multiple PCIe Cards and Resolving Limited Resources

When a large number of PCIe add-on cards are installed in the Cisco CSP 2100 X2, the system might run out of the following resources required for PCIe devices:

- Option ROM memory space
- 16-bit I/O space

The topics in this section provide guidelines for resolving the issues related to these limited resources:

- Resolving Insufficient Memory Space to Execute Option ROMs, page 8-45
- Resolving Insufficient 16-Bit I/O Space, page 8-46

Resolving Insufficient Memory Space to Execute Option ROMs

The system has very limited memory to execute PCIe legacy option ROMs, so when a large number of PCIe add-on cards are installed in the Cisco CSP 2100 X2, the system BIOS might not able to execute all of the option ROMs. The system BIOS loads and executes the option ROMs in the order that the PCIe cards are enumerated (slot 1, slot 2, slot 3, and so on).

If the system BIOS does not have sufficient memory space to load any PCIe option ROM, it skips loading that option ROM, reports a system event log (SEL) event to the Cisco IMC controller and reports the following error in the Error Manager page of the BIOS Setup utility:

```
ERROR CODE  SEVERITY    INSTANCE    DESCRIPTION
146         Major       N/A         PCI out of resources error.
                                    Major severity requires user
                                    intervention but does not
                                    prevent system boot.
```

To resolve this issue, disable the Option ROMs that are not needed for system booting. The BIOS Setup Utility provides the setup options to enable or disable the Option ROMs at the PCIe slot level for the PCIe expansion slots and at the port level for the onboard NICs. These options can be found in the BIOS Setup Utility **Advanced** > **PCI Configuration** page.

- **Guidelines for RAID controller booting**

  If the Cisco CSP 2100 X2 is configured to boot primarily from RAID storage, make sure that the option ROMs for the slots where your RAID controllers installed are enabled in the BIOS, depending on your RAID controller configuration.

  If the RAID controller does not appear in the system boot order even with the option ROMs for those slots are enabled, the RAID controller option ROM might not have sufficient memory space to execute. In that case, disable other option ROMs that are not needed for the system configuration to free up some memory space for the RAID controller option ROM.

- **Guidelines for onboard NIC PXE booting**

  If the system is configured to primarily perform PXE boot from onboard NICs, make sure that the option ROMs for the onboard NICs to be booted from are enabled in the BIOS Setup Utility. Disable other option ROMs that are not needed to create sufficient memory space for the onboard NICs.

Resolving Insufficient 16-Bit I/O Space

The system has only 64 KB of legacy 16-bit I/O resources available. This 64 KB of I/O space is divided between the CPUs in the system because the PCIe controller is integrated into the CPUs. Cisco CSP 2100 X2 BIOS has the capability to dynamically detect the 16-bit I/O resource requirement for each CPU and then balance the 16-bit I/O resource allocation between the CPUs during the PCI bus enumeration phase of the BIOS POST.

When a large number of PCIe cards are installed in the system, the system BIOS might not have sufficient I/O space for some PCIe devices. If the system BIOS is not able to allocate the required I/O resources for any PCIe devices, the following symptoms have been observed:

- The system might get stuck in an infinite reset loop.
- The BIOS might appear to hang while initializing PCIe devices.
- The PCIe option ROMs might take excessive time to complete, which appears to lock up the system.
- PCIe boot devices might not be accessible from the BIOS.
- PCIe option ROMs might report initialization errors. These errors are seen before the BIOS passes control to the operating system.
- The keyboard might not work.

To work around this problem, rebalance the 16-bit I/O load using the following methods:

1. Physically remove any unused PCIe cards.
2. If the system has one or more Cisco virtual interface cards (VICs) installed, disable the PXE boot on the VICs that are not required for the system boot configuration by using the Network Adapters page in Cisco IMC Web UI to free up some 16-bit I/O resources. Each VIC uses a minimum 16 KB of 16-bit I/O resource, so disabling PXE boot on Cisco VICs would free up some 16-bit I/O resources that can be used for other PCIe cards that are installed in the system.

Installing a Trusted Platform Module (TPM)

The trusted platform module (TPM) is a small circuit board that connects to a motherboard socket and is secured by a one-way screw.

TPM 2.0 Considerations

Trusted platform module (TPM) version 2.0 is supported on Intel v3- or Intel v4-based platforms.

If there is an existing TPM 1.2 installed in the Cisco CSP 2100 X2, you cannot upgrade to TPM 2.0.

If there is no existing TPM in the Cisco CSP 2100 X2, you can install TPM 2.0. You must first upgrade to Intel v4 code, regardless of whether the installed CPU is Intel v3 or v4. TPM 2.0 requires Intel v4 code or later.

Caution If your Intel v3 or Intel v4 system is currently supported and protected by TPM version 2.0, a potential security exposure might occur if you downgrade the system software and BIOS to a version earlier than those shown in Table 8-9.

Note If the TPM 2.0 becomes unresponsive, reboot the Cisco CSP 2100 X2.

Table 8-9 TPM Matrix by Intel CPU Version

Intel CPU	TPM Version Supported	Minimum Cisco IMC Version	Minimum UCS Manager (UCSM) Version
Intel v3	TPM 1.2	2.0(3)	2.2(3)
	TPM 2.0	2.0(10)	2.2(7) or 3.1(1)
Intel v4	TPM 1.2	2.0(10)	2.2(7) or 3.1(1)
	TPM 2.0	2.0(10)	2.2(7) or 3.1(1)

Installing the TPM Hardware

This section contains the following procedures, which must be followed in this order when installing and enabling a TPM:

1. Installing the TPM Hardware, page 8-48
2. Enabling TPM Support in the BIOS, page 8-50
3. Enabling the Intel TXT Feature in the BIOS, page 8-51

Note For security purposes, the TPM is installed with a one-way screw. It cannot be removed with a standard screwdriver.

Step 1 Prepare the Cisco CSP 2100 X2 for component installation:

Step 2 Power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.

Step 3 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

Step 4 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 5 Remove PCIe riser 2 to provide clearance. See Replacing a PCIe Riser, page 8-40 for instructions.

Step 6 Install a TPM:

a. Locate the TPM socket on the motherboard, as shown in Figure 8-23.

b. Align the connector that is on the bottom of the TPM circuit board with the motherboard TPM socket. Align the screw hole and standoff on the TPM board with the screw hole that is adjacent to the TPM socket.

c. Push down evenly on the TPM to seat it in the motherboard socket.

d. Install the single one-way screw that secures the TPM to the motherboard.

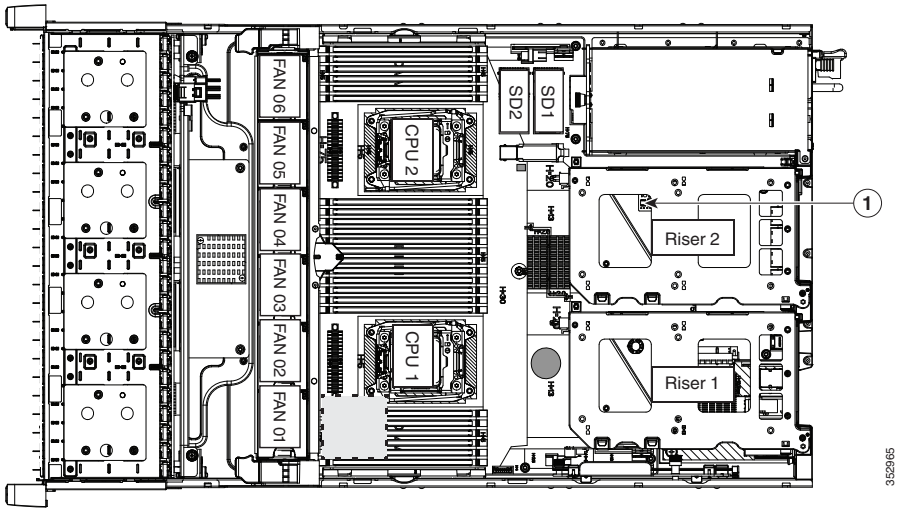
Step 7 Replace PCIe riser 2 to the Cisco CSP 2100 X2. See Replacing a PCIe Riser, page 8-40 for instructions.

Step 8 Replace the top cover.

Step 9 Replace the Cisco CSP 2100 X2 in the rack, replace cables, and then power on the Cisco CSP 2100 X2 by pressing the **Power** button.

Step 10 Continue with Enabling TPM Support in the BIOS, page 8-50.

Figure 8-23 TPM Socket Location on Motherboard



1	TPM socket location on the motherboard (under PCIe riser 2)		–

Enabling TPM Support in the BIOS

Note After hardware installation, you must enable TPM support in the BIOS:

Step 1 Enable TPM support:

a. Watch during bootup for the F2 prompt, and then press **F2** to enter BIOS setup.

b. Log in to the BIOS Setup Utility with your BIOS Administrator password.

c. On the BIOS Setup Utility window, choose the **Advanced** tab.

d. Choose **Trusted Computing** to open the TPM Security Device Configuration window.

e. Change TPM SUPPORT to **Enabled**.

f. Press **F10** to save your settings and reboot the Cisco CSP 2100 X2.

Step 2 Verify that TPM support is now enabled:

a. Watch during bootup for the F2 prompt, and then press **F2** to enter BIOS setup.

b. Log into the BIOS Setup utility with your BIOS Administrator password.

c. Choose the **Advanced** tab.

d. Choose **Trusted Computing** to open the TPM Security Device Configuration window.

e. Verify that TPM SUPPORT and TPM State are Enabled.

Step 3 Continue with Enabling the Intel TXT Feature in the BIOS, page 8-51.

Enabling the Intel TXT Feature in the BIOS

Intel Trusted Execution Technology (TXT) provides greater protection for information that is used and stored on the business server. A key aspect of that protection is the provision of an isolated execution environment and associated sections of memory where operations can be conducted on sensitive data, invisibly to the rest of the system. Intel TXT provides for a sealed portion of storage where sensitive data such as encryption keys can be kept, helping to shield them from being compromised during an attack by malicious code.

Step 1 Reboot the Cisco CSP 2100 X2 and watch for the prompt to press F2.

Step 2 When prompted, press **F2** to enter the BIOS Setup utility.

Step 3 Verify that the prerequisite BIOS values are enabled:

a. Choose the **Advanced** tab.

b. Choose **Intel TXT(LT-SX) Configuration** to open the Intel TXT(LT-SX) Hardware Support window.

c. Verify that the following items are listed as Enabled:

- VT-d Support (default is Enabled)
- VT Support (default is Enabled)
- TPM Support
- TPM State

- If VT-d Support and VT Support are already enabled, skip to Step 4.
- If VT-d Support and VT Support are not enabled, continue with the next steps to enable them.

d. Press **Escape** to return to the BIOS Setup utility **Advanced** tab.

e. On the Advanced tab, choose **Processor Configuration** to open the Processor Configuration window.

f. Set Intel (R) VT and Intel (R) VT-d to **Enabled**.

Step 4 Enable the Intel Trusted Execution Technology (TXT) feature:

a. Return to the Intel TXT(LT-SX) Hardware Support window if you are not already there.

b. Set TXT Support to **Enabled**.

Step 5 Press **F10** to save your changes and exit the BIOS Setup utility.

Replacing Power Supplies

Cisco CSP 2100 X2 can have one or two power supplies. When two power supplies are installed they are redundant as 1+1 and hot-swappable.

- Replacing an AC Power Supply, page 8-52
- Replacing a DC Power Supply, page 8-53
- Installation Grounding, page 8-54
- See Power Specifications, page 9-2 for more information about the supported power supplies.
- See Rear Panel LEDs and Buttons, page 8-5 for information about the power supply LEDs.
- See Replacing a DC Power Supply, page 8-53 for information about wiring a DC power supply.

Replacing an AC Power Supply

Note If you have ordered a Cisco CSP 2100 X2 with power supply redundancy (two power supplies), you do not have to power off the Cisco CSP 2100 X2 to replace power supplies because they are redundant as 1+1 and hot-swappable.

Note Do not mix power supply types in the Cisco CSP 2100 X2. Both power supplies must be the same wattage and Cisco product ID (PID).

Step 1 Remove the power supply that you are replacing or a blank panel from an empty bay:

a. Perform one of the following actions:
   - If your Cisco CSP 2100 X2 has only one power supply, shut down and power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.
   - If your Cisco CSP 2100 X2 has two power supplies, you do not have to shut down the Cisco CSP 2100 X2.

b. Remove the power cord from the power supply that you are replacing.

   For a DC power supply, release the electrical connector block from the power supply by pushing the orange plastic button on the top of the connector inward toward the power supply. Pull the connector block from the power supply.

c. Grasp the power supply handle while pinching the green release lever towards the handle.

d. Pull the power supply out of the bay.

Step 2 Install a new power supply:

a. Grasp the power supply handle and insert the new power supply into the empty bay.

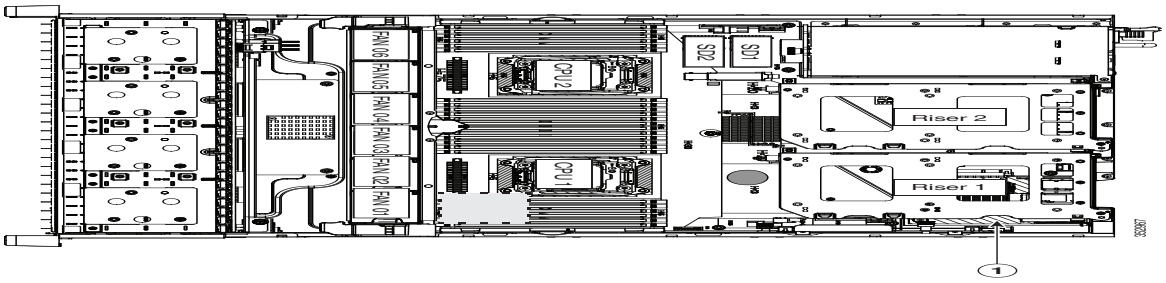
b. Push the power supply into the bay until the release lever locks.

c. Connect the power cord to the new power supply.

   For a DC power supply, push the electrical connector block into the power supply.

d. If you shut down the Cisco CSP 2100 X2, press the **Power** button to return the Cisco CSP 2100 X2 to main power mode.

Figure 8-24 Power Supplies



1	Power supply handle	**3**	Screw holes for grounding lug
2	Power supply release lever		

Replacing a DC Power Supply

- Installing a Version 2 930W DC Power Supply, UCSC-PSU2V2-930DC, page 8-54
- Installation Grounding, page 8-54

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

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**

Installing a Version 2 930W DC Power Supply, UCSC-PSU2V2-930DC

If you are using the Version 2 930W DC power supply, you connect power using a 3-wire cable with a keyed connector that plugs into a fixed power input socket on the power supply. .

Caution Before beginning this wiring procedure, turn off the DC power source from your facility's circuit breaker to avoid electric shock hazard.

Step 1 Turn off the DC power source from your facility's circuit breaker to avoid electric shock hazard.

Step 2 Wire the supplied 3-wire connector cable to your facility's DC power source.

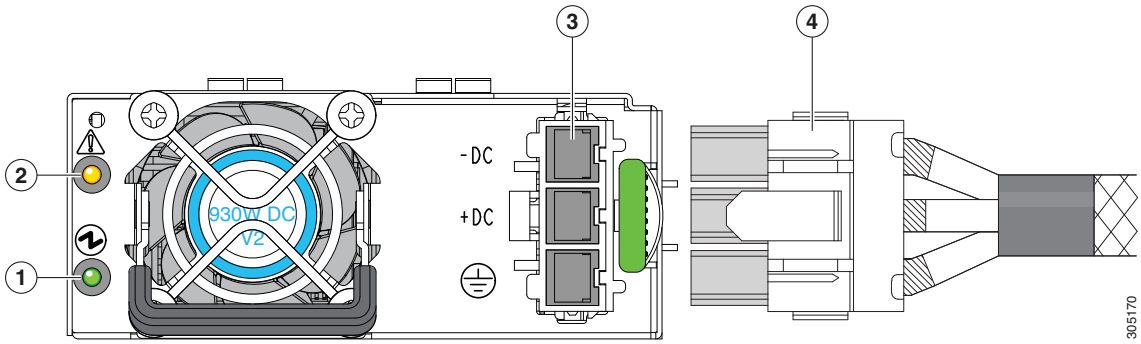
Note The supplied connector cable contains 8 AWG gauge wires. The recommended facility wire gauge is 8 AWG. The minimum facility wire gauge is 10 AWG.

Step 3 Plug the supplied connector cable into the power input socket on the power supply. The connector is keyed to the socket so that the polarity is aligned correctly.

Step 4 Return power from your facility's DC power source at the circuit breaker.

Step 5 See Installation Grounding, page 8-54 for additional information about chassis grounding.

Figure 8-25 Version 2 930 W, –48 VDC Power Supply Connector Block



1	Power supply status LED	**3**	Fixed power input socket
2	Power supply fault LED	**4**	Supplied connector cable

Installation Grounding

The AC power supplies have internal grounding and so no additional grounding is required when the supported AC power cords are used.

When using a DC power supply, additional grounding of Cisco CSP 2100 X2 chassis to the earth ground of the rack is available. Screw holes for use with your grounding lugs and grounding wires are supplied on the chassis rear panel.

Note The grounding points on the chassis are sized for M5 screws. The grounding points are spaced at 0.625 inches (15.86 mm). You must provide your own screws, grounding lug, and grounding wire. The grounding lug required is a Panduit LCD10-14AF-L or equivalent. The grounding cable that you provide must be 14 AWG (2 mm), minimum 60° C wire, or as permitted by the local code.

See Figure 8-24 for the location of the grounding lug screw-holes on the chassis rear panel.

Replacing an mLOM Card

Cisco CSP 2100 X2 can use an mLOM card to provide additional connectivity. The mLOM card socket remains powered when the Cisco CSP 2100 X2 is in 12 V standby power mode and it supports the network communications services (NCSI) protocol.

Step 1 Power off the Cisco CSP 2100 X2 as described in Shutting Down and Powering Off the Cisco CSP 2100 X2, page 8-9.

Step 2 Slide the Cisco CSP 2100 X2 out the front of the rack far enough so that you can remove the top cover. You might have to detach cables from the rear panel to provide clearance.

Caution If you cannot safely view and access the component, remove the Cisco CSP 2100 X2 from the rack.

Step 3 Remove the top cover as described in Removing and Replacing the Cisco CSP 2100 X2 Top Cover, page 8-10.

Step 4 Remove PCIe riser 1 to provide clearance. See Replacing a PCIe Riser, page 8-40 for instructions.

Step 5 Remove any existing mLOM card or a blanking panel (see Figure 8-26):

- **a.** Loosen the single thumbscrew that secures the mLOM card to the chassis floor.
- **b.** Slide the mLOM card horizontally to disengage its connector from the motherboard socket.

Step 6 Install a new mLOM card:

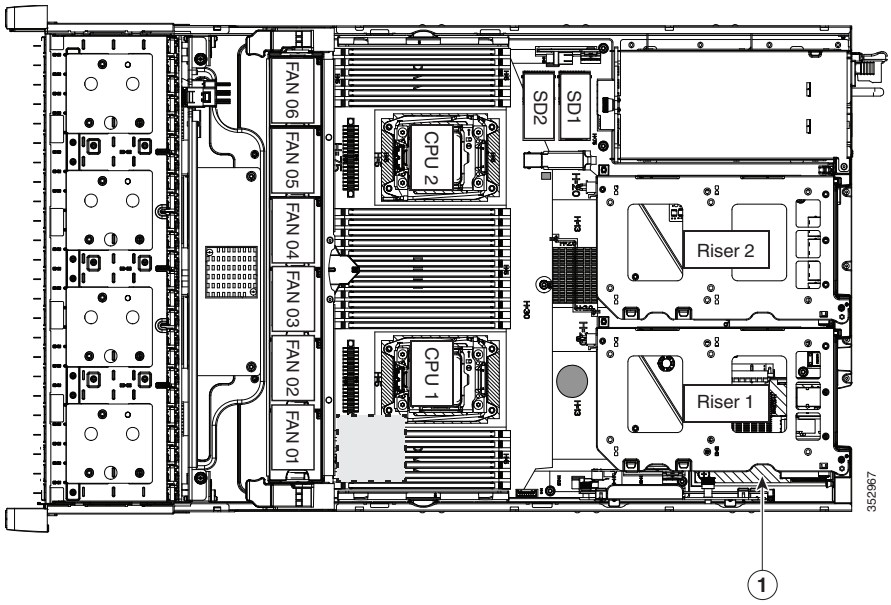
- **a.** Set the mLOM card on the chassis floor so that its connector is aligned with the motherboard socket and its thumbscrew is aligned with the standoff on the chassis floor.
- **b.** Push the card's connector into the motherboard socket horizontally.
- **c.** Tighten the thumbscrew to secure the card to the chassis floor.

Step 7 Return PCIe riser 1 to the Cisco CSP 2100 X2. See Replacing a PCIe Riser, page 8-40 for instructions.

Step 8 Replace the top cover.

Step 9 Replace the Cisco CSP 2100 X2 in the rack, replace cables, and then power on the Cisco CSP 2100 X2 by pressing the **Power** button.

Figure 8-26 mLOM Card Location



1	mLOM card socket location on motherboard (under PCIe riser 1)		

Cisco CSP 2100 X2 Specifications

This appendix lists the technical specifications for Cisco CSP 2100 X2 and includes the following sections:

Physical Specifications

Table 9-1 lists the physical specifications for Cisco CSP 2100 X2.

Table 9-1 Physical Specifications

Description	Specification
Height	3.4 in. (8.70 cm)
Width (including slam latches)	19.0 in. (48.26 cm)
Depth (length)	29.0 in. (73.70 cm)
Depth, including slam latches and power supply handles	31.5 in. (80.00 cm)
Maximum Weight (fully loaded)	SFF 24-drive: 62.7 lb. (28.4 Kg)

Power Specifications

The power specifications for the four power supply options are listed in the following sections:

1200 W AC Power Supply

Table 9-2 lists the specifications for each 1200 W AC power supply (Cisco part number UCSC-PSU2V2-1200W=).

Table 9-2 Power Supply Specifications

Description	Specification
AC input voltage	Nominal range: 100–120 VAC, 200–240 VAC (Range: 90–132 VAC, 180–264 VAC)
AC input frequency	Nominal range: 50 to 60Hz (Range: 47–63 Hz)
Maximum AC input current	11 A at 100 VAC 7 A at 200 VAC
Maximum input volt-amperes	1456 VA
Maximum output power per PSU	800 W at 100–120 VAC 1200 W at 200–240 VAC
Maximum inrush current	35 A (sub-cycle duration)
Maximum hold-up time	12 ms at 1200 W
Power supply output voltage	12 VDC
Power supply standby voltage	12 VDC
Efficiency rating	Climate Savers Platinum Efficiency (80Plus Platinum certified)
Form factor	RSP1
Input connector	IEC320 C14

930 W DC (Version 2) Power Supply

Table 9-3 lists the specifications for each 930 W DC power supply (Cisco part number UCSC-PSU2V2-930DC=).

Table 9-3 930 W DC Power Supply Specifications

Description	Specification
DC input voltage range	Nominal range: –48 to –60 VDC nominal (Range: –40 to –60 VDC)
Maximum DC input current	28 A at –40 VDC
Maximum input W	1104 W
Maximum output power per PSU	930 W
Maximum inrush current	35 A (sub-cycle duration)
Maximum hold-up time	5 ms at 930 W
Power supply output voltage	12 VDC
Power supply standby voltage	12 VDC
Efficiency rating	> 92% at 50% load
Form factor	RSP1 (C-Series 2U and 4U servers)
Input connector	Fixed 3-wire block

Environmental Specifications

Table 9-4 lists the environmental specifications for the Cisco CSP 2100 X2.

Table 9-4 Environmental Specifications

Description	Specification
Temperature, operating	41 to 95°F (5 to 35°C) Derate the maximum temperature by 1°C per every 305 meters of altitude above sea level.
Temperature, nonoperating (when the Cisco CSP 2100 X2 is in storage or is transported)	–40 to 149°F (–40 to 65°C)
Humidity (RH), operating	10 to 90%
Humidity, non-operating	5 to 93%
Altitude, operating	0 to 10,000 feet
Altitude, nonoperating (when the Cisco CSP 2100 X2 is in storage or is transported)	0 to 40,000 feet
Sound power level Measure A-weighted per ISO7779 LwAd (Bels) Operation at 73°F (23°C)	5.8
Sound pressure level Measure A-weighted per ISO7779 LpAm (dBA) Operation at 73°F (23°C)	43

Cisco CSP 2100 X2 Power Cord Specifications

This appendix provides supported power cable specifications for Cisco CSP 2100 X2.

Supported Power Cords and Plugs

Each power supply has a separate power cord. Standard power cords or jumper power cords are available for connection to the Cisco CSP 2100 X2. The jumper power cords, for use in racks, are available as an optional alternative to the standard power cords.

Note Only the approved power cords or jumper power cords provided with the Cisco CSP 2100 X2 are supported.

Table 10-1 lists the power cords for the Cisco CSP 2100 X2 power supplies.

Table 10-1 Supported Power Cords for the Cisco CSP 2100 X2

	Length	
Description	**Feet**	**Meters**
CAB-9K10A-AU AC power cord, 250 V, 10 A, 3112 plug, Australia	8.2	2.5
CAB-JPN-3PIN AC Power Cord, 3-pin Japan	6.6	2.0
CAB-C13-C14-2M AC cabinet jumper power cord, 250 V, 10 A, C13 to C14	6.6	2.0
CAB-9K10A-EU AC Power Cord, 250 V, 10 A; CEE 7/7 Plug Europe	8.2	2.5
CAB-N5K6A-NA AC power cord, 200/240 V, 6 A, North America	8.2	2.5

Table 10-1 Supported Power Cords for the Cisco CSP 2100 X2

Description	Length	
	Feet	Meters
CAB-250V-10A-ID AC power Cord, 250 V, 10 A, India	8.2	2.5
CAB-250V-10A-BR AC power Cord, 250 V, 10 A Brazil	8.2	2.5
CAB-9K10A-UK AC power cord, 250 V, 10 A (13 A fuse), BS1363 plug United Kingdom	8.2	2.5
CAB-C13-CBN AC cabinet jumper power cord, 250, 10 A, C13 to C14	2.2	0.68
CAB-9K10A-SW AC power cord, 250 V, 10 A, MP232 plug Switzerland	8.2	2.5
CAB-250V-10A-CN AC power cord, 250 V, 10 A PR China	8.2	2.5
CAB-250V-10A-AR AC power cord, 250 V, 10 A Argentina	8.2	2.5
CAB-C13-C14-AC AC power cord, 10 A; C13 to C14, recessed receptacle	9.8	3.0
R2XX-DMYMPWRCORD No power cord; PID option for ordering Cisco CSP 2100 X2 with no power cord	NA	NA
CAB-AC-L620-C13 AC power cord, NEMA L6-20 to C13 connectors	6.6	2.0
CAB-48DC-40A-8AWG DC power cord, -48 VDC, 40 A, 8 AWG Three-socket Mini-Fit connector to three-wire	11.7	3.5
CAB-9K10A-IT AC power cord, 250 V, 10 A, CEI 23-16/VII plug Italy	8.2	2.5
CAB-9K12A-NA AC power cord, 125 V, 13 A, NEMA 5-15 plug North America	8.2	2.5

Table 10-1 Supported Power Cords for the Cisco CSP 2100 X2

Description	Length	
	Feet	Meters
CAB-C13-C14-2M-JP AC Power Cord, C13 to C14 Japan PSE Mark	6.6	2.0
CAB-250V-10A-IS AC Power Cord, 250 V, 10 A Israel	8.2	2.5