Maintaining the Server

Status LEDs and Buttons

This section contains information for interpreting front, rear, and internal LED states.

Front-Panel LEDs

Figure 1: Front Panel LEDs
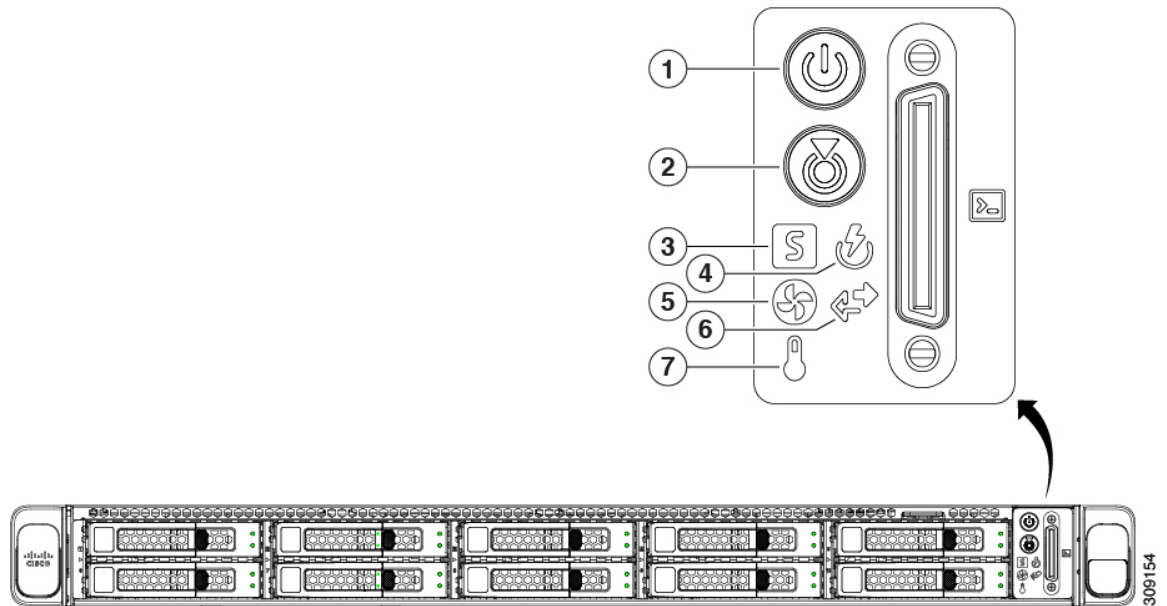
Table 1: Front Panel LEDs, Definition of States

LED Name	States
1 Power button/LED ( )	• Off—There is no AC power to the server. • Amber—The server is in standby power mode. Power is supplied only to the Cisco IMC and some motherboard functions. • Green—The server is in main power mode. Power is supplied to all server components.
2 Unit identification (	• Off—The unit identification function is not in use. • Blue, blinking—The unit identification function is activated.

3
System health (S)
	• Green—The server is running in normal operating condition.
	
	• Green, blinking—The server is performing system initialization and memory check.
	
	• Amber, steady—The server is in a degraded operational state (minor fault). 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, 2 blinks—There is a major fault with the system board.
	
	• Amber, 3 blinks—There is a major fault with the memory DIMMs.
	
	• Amber, 4 blinks—There is a major fault with the CPUs.

4 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.
5 Fan status ( )	• Green—All fan modules are operating properly. • Amber, blinking—One or more fan modules breached the non-recoverable threshold.
6 Network link activity ( )	• Off—The Ethernet LOM port 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.
7 Temperature status ( )	• Green—The server 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.

Rear-Panel LEDs

Figure 2: Rear Panel LEDs
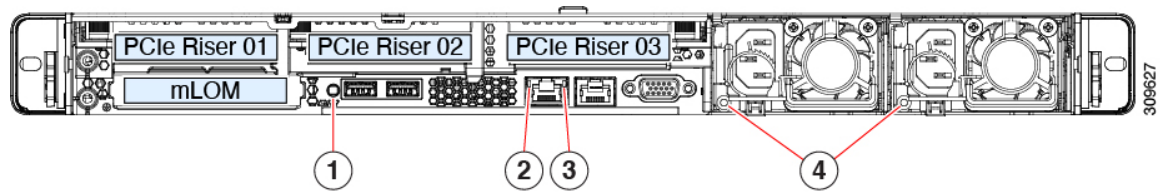
Table 2: Rear Panel LEDs, Definition of States

LED Name	States
1 Rear unit identification	• Off—The unit identification function is not in use. • Blue, blinking—The unit identification function is activated.
2-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-Gb Ethernet dedicated management link status	• Off—No link is present. • Green—Link is active. • Green, blinking—Traffic is present on the active link.

Power supply status (one LED each power supply unit)	**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 threshold detected but 12 V main power on. • Amber, solid—Critical error detected; 12 V main power off (for example, over-current, over-voltage, or over-temperature failure). **DC power supplies:** • Off—No DC 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 threshold detected but 12 V main power on. • Amber, solid—Critical error detected; 12 V main power off (for example, over-current, over-voltage, or over-temperature failure).

Internal Diagnostic LEDs

The server has internal fault LEDs for CPUs, DIMMs, and fan modules.

Figure 3: Internal Diagnostic LED Locations
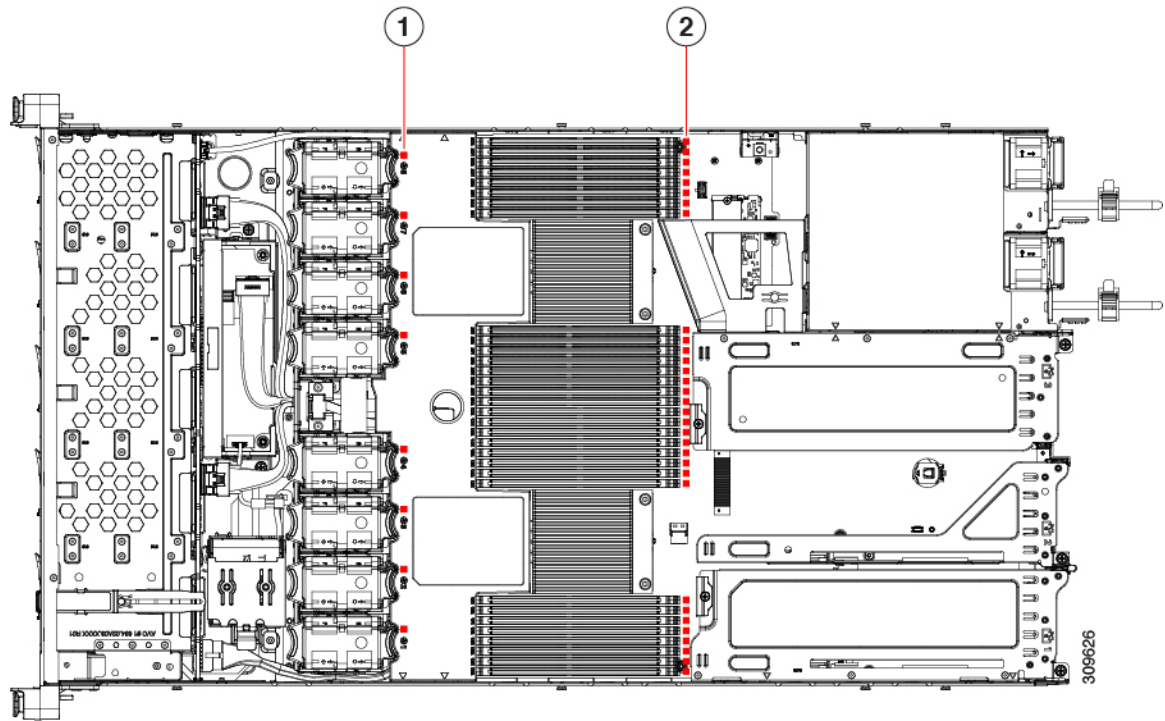
Fan module fault LEDs (one behind each fan connector on the motherboard)
 	
  • Amber—Fan has a fault or is not fully seated.
 	
  • Green—Fan is OK.
	DIMM fault LEDs (one behind each DIMM socket on the motherboard)
	
	These LEDs operate only when the server is in standby power mode.
	
	  • Amber—DIMM has a fault.
	
	  • Off—DIMM is OK.

CPU fault LEDs (one behind each CPU socket on the motherboard).
 	
These LEDs operate only when the server is in standby power mode.
 	
  • Amber—CPU has a fault.
 	
  • Off—CPU is OK.
	-

Preparing For Component Installation

This section includes information and tasks that help prepare the server for component installation.

Required Equipment For Service Procedures

The following tools and equipment are used to perform the procedures in this chapter:

- T-30 Torx driver (supplied with replacement CPUs for heatsink removal)

- #1 flat-head screwdriver (supplied with replacement CPUs for heatsink removal)

- #1 Phillips-head screwdriver (for M.2 SSD and intrusion switch replacement)

- Electrostatic discharge (ESD) strap or other grounding equipment such as a grounded mat

Shutting Down and Removing Power From the Server

The server can run in either of two power modes:

- Main power mode—Power is supplied to all server components and any operating system on your drives can run.

- Standby power mode—Power is supplied only to the service processor and certain components. It is safe for the operating system and data to remove power cords from the server in this mode.

⚠️

Caution   After a server is shut down to standby power, electric current is still present in the server. To completely remove power as directed in some service procedures, you must disconnect all power cords from all power supplies in the server.

You can shut down the server by using the front-panel power button or the software management interfaces.

Shutting Down Using the Power Button

Procedure

Step 1   Check the color of the Power button/LED:

- Amber—The server is already in standby mode and you can safely remove power.

- Green—The server is in main power mode and must be shut down before you can safely remove power.

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 server goes to standby mode, which is indicated by an amber Power button/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 If a service procedure instructs you to completely remove power from the server, disconnect all power cords from the power supplies in the server.

Shutting Down Using The Cisco IMC GUI

You must log in with user or admin privileges to perform this task.

Procedure

Step 1 In the Navigation pane, click the **Server** tab.

Step 2 On the Server tab, click **Summary**.

Step 3 In the Actions area, click **Power Off Server**.

Step 4 Click **OK**.

The operating system performs a graceful shutdown and the server goes to standby mode, which is indicated by an amber Power button/LED.

Step 5 If a service procedure instructs you to completely remove power from the server, disconnect all power cords from the power supplies in the server.

Shutting Down Using The Cisco IMC CLI

You must log in with user or admin privileges to perform this task.

Procedure

Step 1 At the server prompt, enter:

Example:

server# **scope chassis**

Step 2 At the chassis prompt, enter:

Example:

server/chassis# **power shutdown**

The operating system performs a graceful shutdown and the server goes to standby mode, which is indicated by an amber Power button/LED.

Step 3 If a service procedure instructs you to completely remove power from the server, disconnect all power cords from the power supplies in the server.

Removing the Server Top Cover

Procedure

Step 1 Remove the top cover:

a) If the cover latch is locked, slide the lock sideways to unlock it.

When the latch is unlocked, the handle pops up so that you can grasp it.

b) Lift on the end of the latch so that it pivots vertically to 90 degrees.

c) Simultaneously, slide the cover back and lift the top cover straight up from the server and set it aside.

Step 2 Replace the top cover:

a) With the latch in the fully open position, place the cover on top of the server a few inches behind the lip of the front cover panel.

b) Slide the cover forward until the latch makes contact.

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

d) Lock the latch by sliding the lock button to sideways to the left.

Locking the latch ensures that the server latch handle does not protrude when you install the blade.

Figure 4: Removing the Top Cover
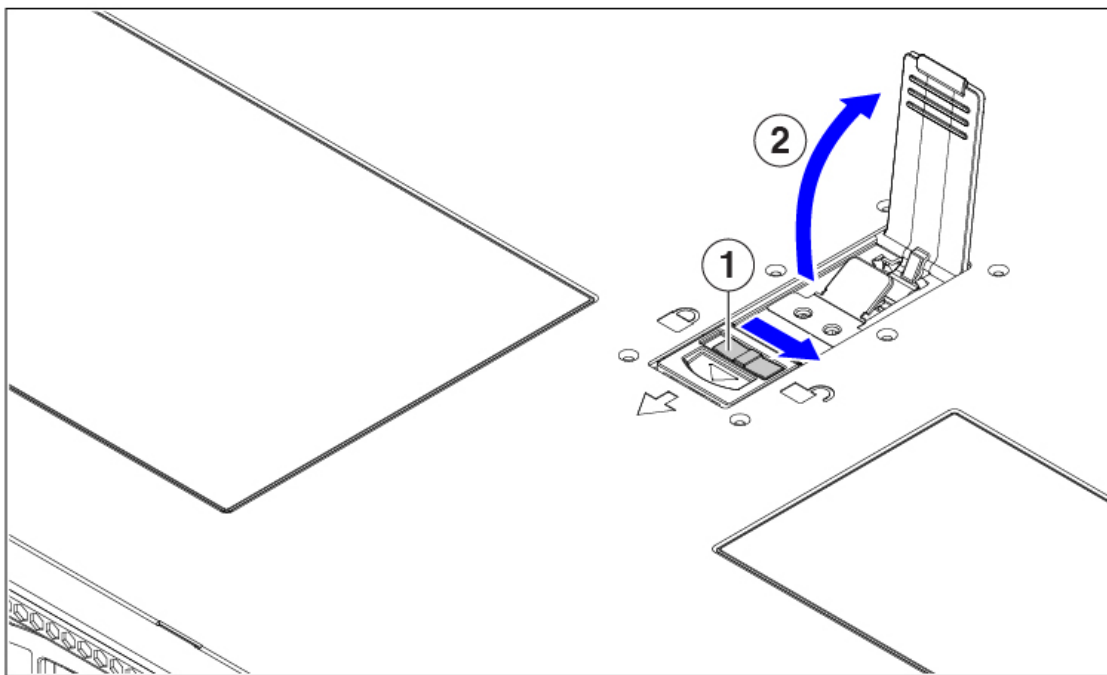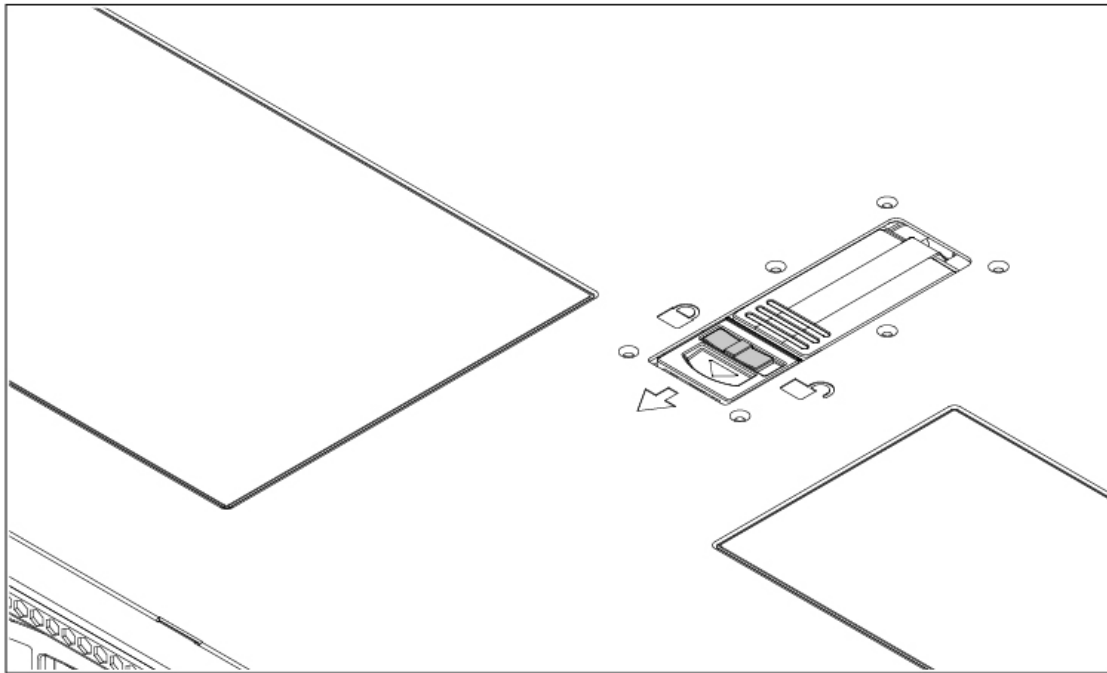
Cover lock	Cover latch handle

Hot Swap vs Hot Plug

Some components can be removed and replaced without shutting down and removing power from the server. This type of replacement has two varieties: hot-swap and hot-plug.

- Hot-swap replacement—You do not have to shut down the component in the software or operating system. This applies to the following components:

  - SAS/SATA hard drives

  - SAS/SATA solid state drives

  - Cooling fan modules

  - Power supplies (when redundant as 1+1)

- Hot-plug replacement—You must take the component offline before removing it for the following component:

  - NVMe PCIe solid state drives

Removing and Replacing 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 server components, handle them only by carrier edges and use an electrostatic discharge (ESD) wrist-strap or other grounding device to avoid damage.

Tip   You can press the unit identification button on the front panel or rear panel to turn on a flashing, blue unit identification LED on both the front and rear panels of the server. This button allows you to locate the specific server 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.

This section describes how to install and replace server components.

Component Location

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

Figure 5: ND-NODE-L4 , Serviceable Component Locations
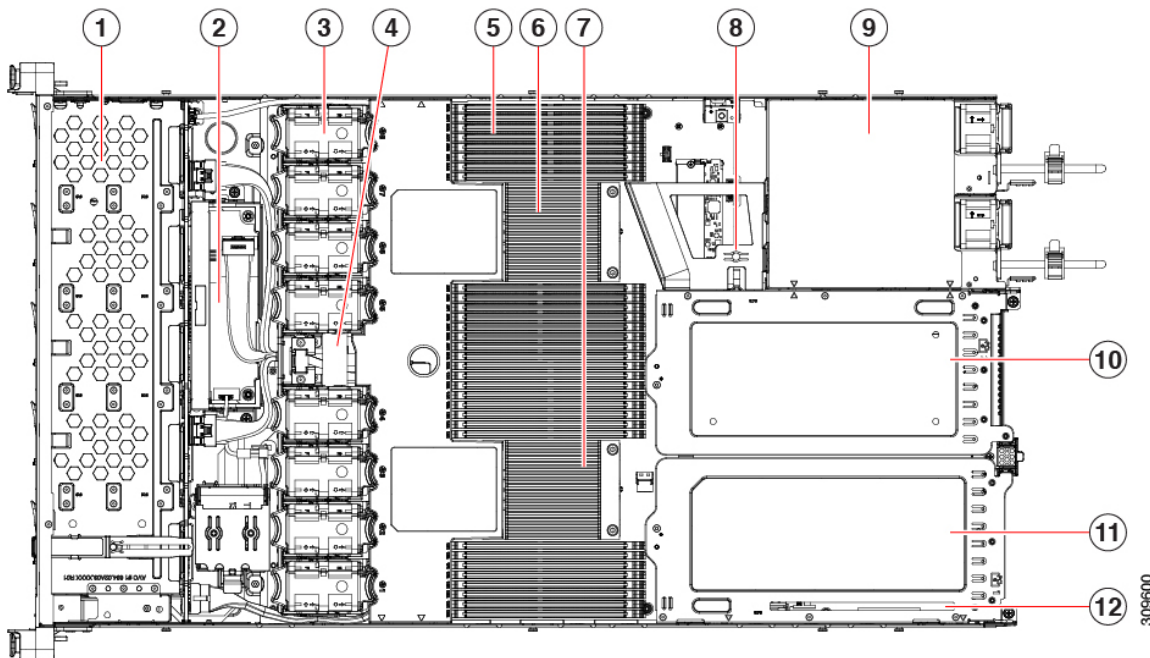
1	Front-loading drive bays 1–10 support SAS/SATA/NVMe drives	2	Cisco M6 12G SAS RAID card or Cisco M6 12G SAS HBA Controller
3	8 hot-swappable cooling fan modules	4	SuperCap module mounting bracket The SuperCap module (not shown) that mounts into this location provides RAID write-cache backup.
5	DIMM sockets on motherboard, 32 total, 16 per CPU CPUs are arranged in groups of eight sockets above the top CPU and below the bottom CPU, and 16 sockets between the CPUs.	6	Motherboard CPU socket two (CPU2)
7	Motherboard CPU socket one (CPU1)	8	M.2 module connector Supports a boot-optimized RAID controller with connectors for up to two SATA M.2 SSDs
9	2 Power Supply Units (PSUs)	10	PCIe riser slot 2
11	PCIe riser slot 1	12	Modular LOM (mLOM) card bay on chassis floor (x16 PCIe lane)

Replacing SAS/SATA Hard Drives or Solid State Drives

Note   You do not have to shut down the server or drive to replace SAS/SATA hard drives or SSDs because they are hot-swappable. To replace an NVMe PCIe SSD drive, which must be shut down before removal, see Replacing a Front-Loading NVMe SSD, on page 15.

SAS/SATA Drive Population Guidelines

The server is orderable in the following version:

- ND-NODE-L4 — Small form-factor (SFF) drives, with 10-drive backplane. Supports up to 10 2.5-inch SAS/SATA drives. Drive bays 1 and 2 support NVMe SSDs.

Drive bay numbering is shown in the following figures.

Figure 6: Drive Bay Numbering
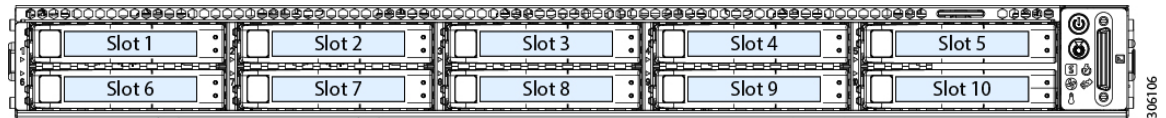
Observe these drive population guidelines for optimum performance:

- 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 SAS/SATA hard drives and SAS/SATA SSDs in the same server. 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 SAS/SATA hard drives or all SAS/SATA SSDs.

4K Sector Format SAS/SATA Drives Considerations

- You must boot 4K sector format drives in UEFI mode, not legacy mode. UEFI mode is the system default. Only if the mode has been changed and must be changed back to UEFI mode, see the following procedure.

- Do not configure 4K sector format and 512-byte sector format drives as part of the same RAID volume.

- For operating system support on 4K sector drives, see the interoperability matrix tool for your server: Hardware and Software Interoperability Matrix Tools

Procedure

Replacing a SAS/SATA Drive

Procedure

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.

   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 7: Replacing a Drive in a Drive Tray
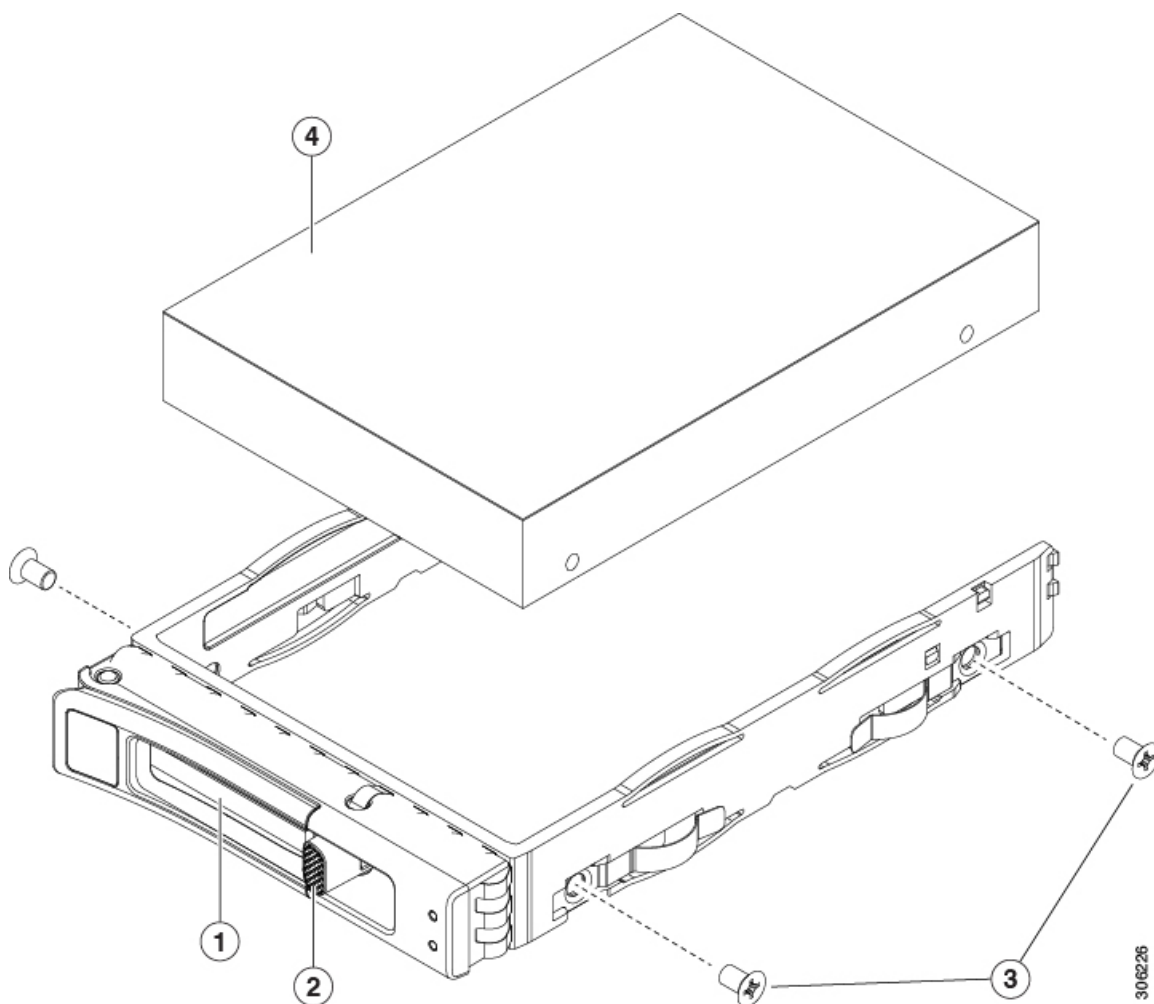
Ejector lever	Drive tray screws (two on each side)
Release button	Drive removed from drive tray

Replacing a Front-Loading NVMe SSD

This section is for replacing 2.5-inch form-factor NVMe solid-state drives (SSDs) in front-panel drive bays.

Front-Loading NVMe SSD Population Guidelines

The server supports the following front drive bay configurations with 2.5 inch NVMe SSDs:

- Cisco UCS C220 M6 SAS/SATA (UCSC-C225-M6S)—Optional, front-loading drive bays 1 to 4 support 2.5-inch NVMe SSDs (with optional front NVMe cables).

- Cisco UCS C220 M6 NVMe (UCSC-C225-M6N)—10-drive backplane. Supports up to 10 2.5-inch NVMe-only SSDs.

Figure 8: Drive Bay Numbering
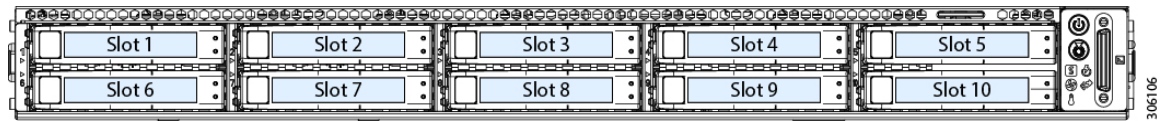
Front-Loading NVME SSD Requirements and Restrictions

Observe these requirements:

- Hot-plug support must be enabled in the system BIOS. If you ordered the system with NVMe drives, hot-plug support is enabled at the factory.

- The NVMe-optimized, SFF 10-drive version, supports NVMe drives only.

Observe these restrictions:

- NVMe SFF 2.5-inch SSDs support booting only in UEFI mode. Legacy boot is not supported. For instructions on setting up UEFI boot, see 4K Sector Format SAS/SATA Drives Considerations, on page 13.

- You cannot control NVMe PCIe SSDs with a SAS RAID controller because NVMe SSDs interface with the server via the PCIe bus.

- UEFI boot is supported in all supported operating systems. Hot-insertion and hot-removal are supported in all supported operating systems except VMWare ESXi.

Enabling Hot-Plug Support in the System BIOS

Hot-plug (OS-informed hot-insertion and hot-removal) is disabled in the system BIOS by default.

- If the system was ordered with NVMe PCIe SSDs, the setting was enabled at the factory. No action is required.

- If you are adding NVMe PCIe SSDs after-factory, you must enable hot-plug support in the BIOS. See the following procedures.

Enabling Hot-Plug Support Using the BIOS Setup Utility

Procedure

Step 1	Enter the BIOS setup utility by pressing the **F2** key when prompted during bootup.
Step 2	Navigate to **Advanced > PCI Subsystem Settings > NVMe SSD Hot-Plug Support**.
Step 3	Set the value to **Enabled**.
Step 4	Save your changes and exit the utility.

Replacing a Front-Loading NVMe SSD

This topic describes how to replace 2.5-inch form-factor NVMe SSDs in the front-panel drive bays.

Note OS-surprise removal is not supported. OS-informed hot-insertion and hot-removal are supported on all supported operating systems except VMware ESXi.

Note OS-informed hot-insertion and hot-removal must be enabled in the system BIOS. See Enabling Hot-Plug Support in the System BIOS, on page 16.

Procedure

Step 1 Remove an existing front-loading NVMe SSD:

a) Shut down the NVMe SSD to initiate an OS-informed removal. Use your operating system interface to shut down the drive, and then observe the drive-tray LED:

- Green—The drive is in use and functioning properly. Do not remove.

- Green, blinking—the driver is unloading following a shutdown command. Do not remove.

- Off—The drive is not in use and can be safely removed.

b) Press the release button on the face of the drive tray.

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

d) Remove the four drive tray screws that secure the SSD to the tray and then lift the SSD out of the tray.

Step 2   Install a new front-loading NVMe SSD:

a) Place a new SSD 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.

Step 3   Observe the drive-tray LED and wait until it returns to solid green before accessing the drive:

   • Off—The drive is not in use.

   • Green, blinking—the driver is initializing following hot-plug insertion.

   • Green—The drive is in use and functioning properly.

Figure 9: Replacing a Drive in a Drive Tray

| Ejector lever | Drive tray screws (two on each side) |

2 Release button	**4** Drive removed from drive tray

Replacing Fan Modules

⚲

Tip   Each fan module has a fault LED next to the fan connector on the motherboard. This LED lights green when the fan is correctly seated and is operating OK. The LED lights amber when the fan has a fault or is not correctly seated.

⚠

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

Procedure

Step 1   Remove an existing fan module:

    a) Slide the server 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 server from the rack.

    b) Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

    c) Grasp the fan module at its front and rear finger-grips. Lift straight up to disengage its connector from the motherboard.

Step 2   Install a new fan module:

    a) Set the new fan module in place. The arrow printed on the top of the fan module should point toward the rear of the server.

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

    c) Replace the top cover to the server.

    d) Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.

Figure 10: Top View of Fan Module
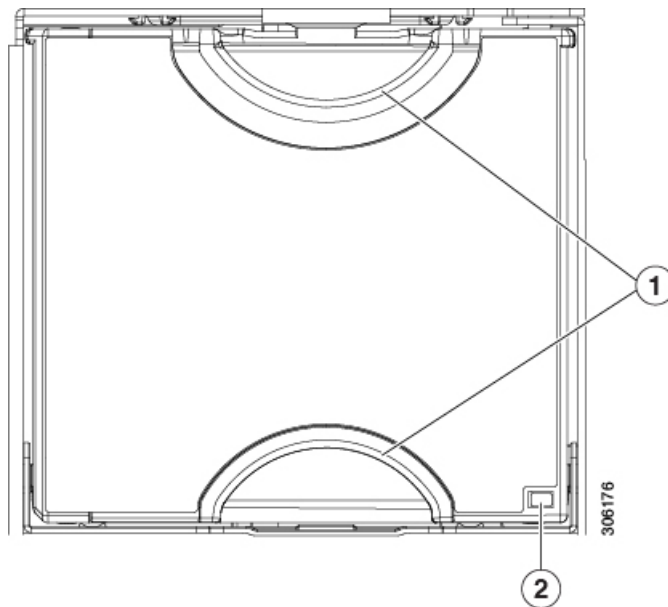
Replacing CPUs and Heatsinks

This section contains CPU configuration rules and the procedure for replacing CPUs and heatsinks:

CPU Configuration Rules

This server has two CPU sockets on the motherboard. Each CPU supports eight DIM channels (16 DIMM slots). See DIMM Slot Numbering, on page 30.

- The server can operate with one CPU or two identical CPUs installed.

- The minimum configuration is that the server must have at least CPU 1 installed. Install CPU 1 first, and then CPU 2.

- The following restrictions apply when using a single-CPU configuration:

  - Any unused CPU socket must have the protective dust cover from the factory in place.

  - The maximum number of DIMMs is 16 (only CPU 1 channels A, B, C, D, E, F, G, and H).

Tools Required For CPU Replacement

You need the following tools and equipment for this procedure:

- T-20 Torx driver (for heatsink and CPU socket screws)

- Heatsink cleaning kit—Supplied with replacement CPU. Orderable separately as Cisco PID UCSX-HSCK=.

  One cleaning kit can clean up to four CPUs.

- Thermal interface material (TIM)—Syringe supplied with replacement CPU. Use only if you are reusing your existing heatsink (new heatsinks have a pre-applied pad of TIM). Orderable separately as Cisco PID UCS-CPU-TIM=.

  One TIM kit covers one CPU.

See also Additional CPU-Related Parts to Order with RMA Replacement CPUs, on page 29.

Replacing a CPU and Heatsink

⚠️

Caution CPUs and their sockets are fragile and must be handled with extreme care to avoid damaging pins. The CPUs must be installed with heatsinks and thermal interface material to ensure cooling. Failure to install a CPU correctly might result in damage to the server.

Procedure

Step 1 Remove the existing CPU/heatsink assembly from the server:

a) Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

b) Slide the server 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 server from the rack.

c) Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

d) Use the T-20 Torx driver that is supplied with the replacement CPU to loosen the four captive nuts that secure the assembly to the motherboard standoffs.

> **Note** Alternate loosening the heatsink nuts evenly so that the heatsink remains level as it is raised. Loosen the heatsink nuts in the order shown on the heatsink label: 4, 3, 2, 1, 6, 5.
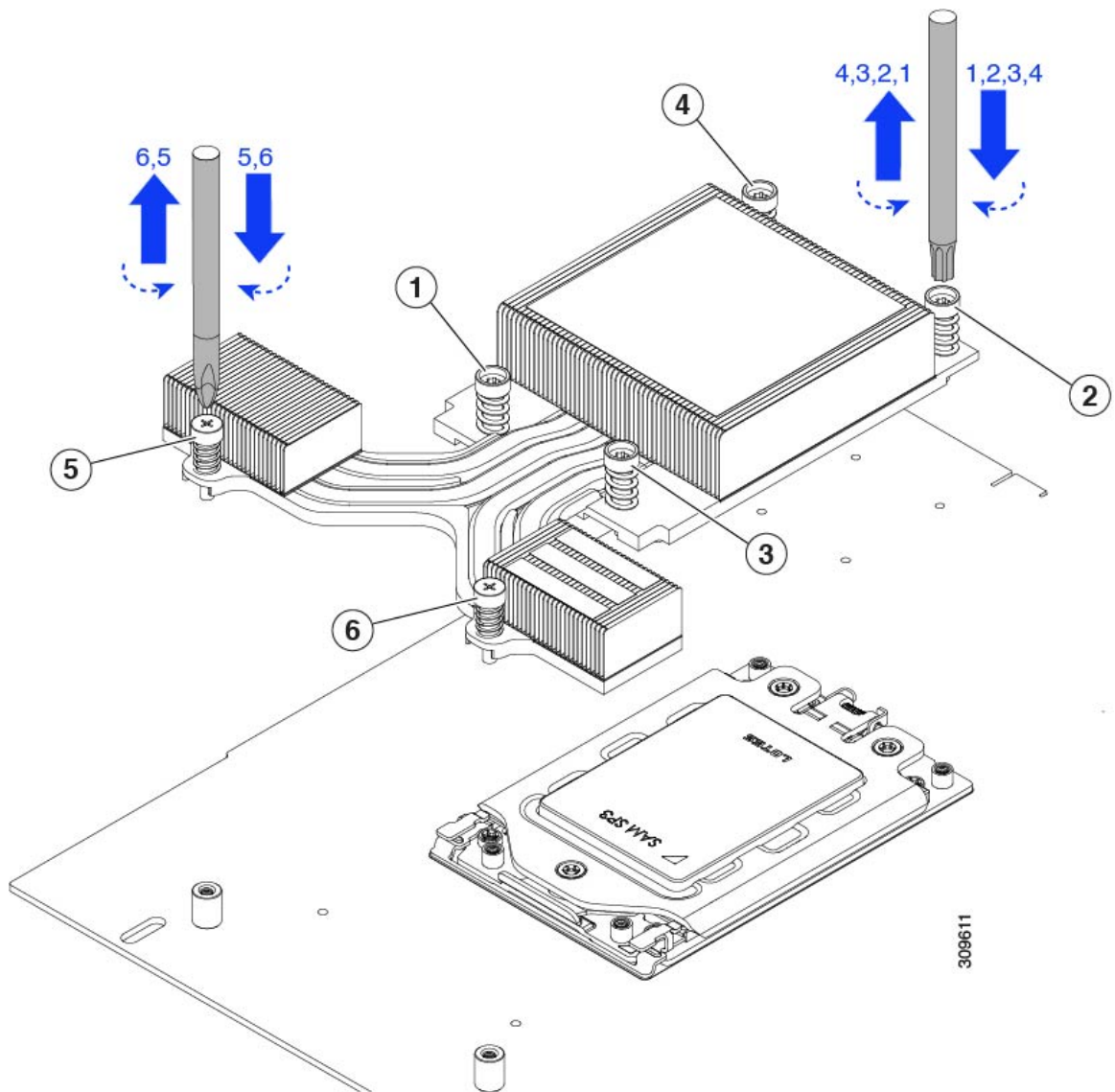
e) Remove the heatsink.
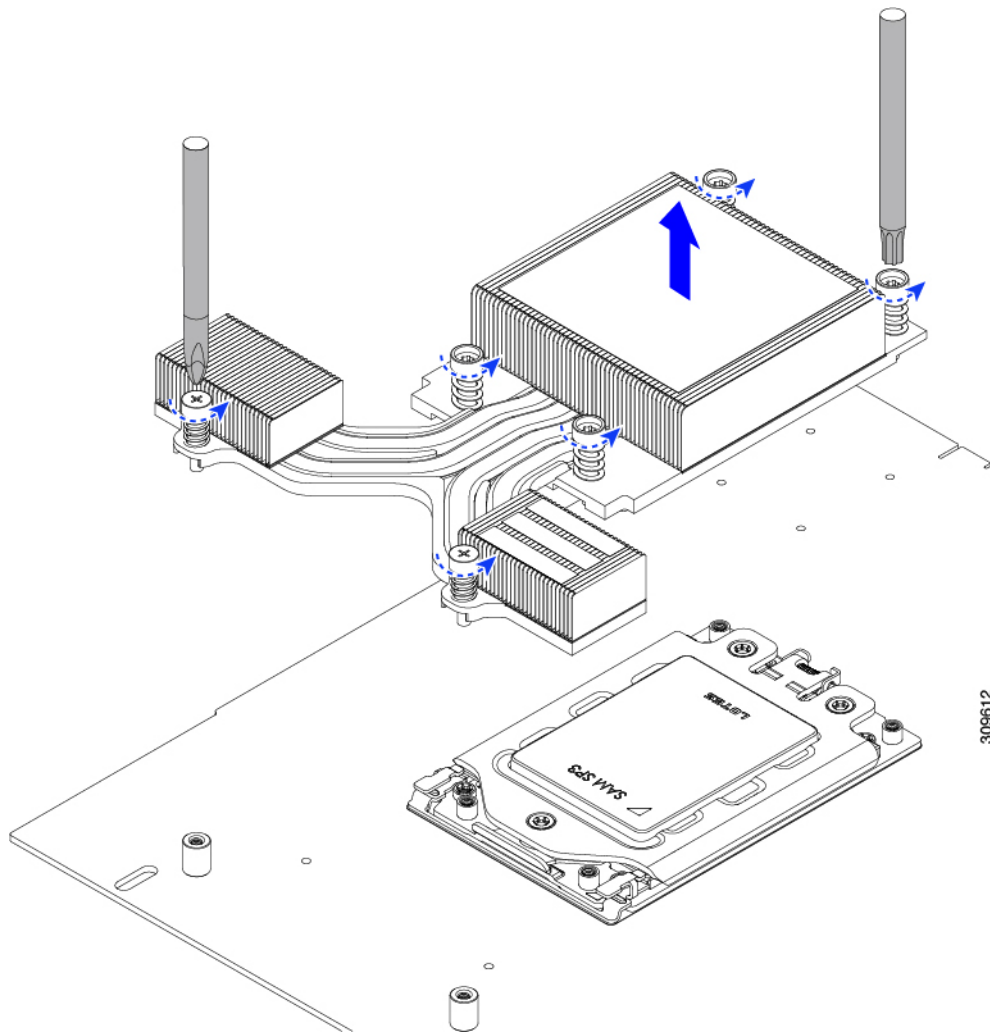
f)   Loosening the three socket frame screws.
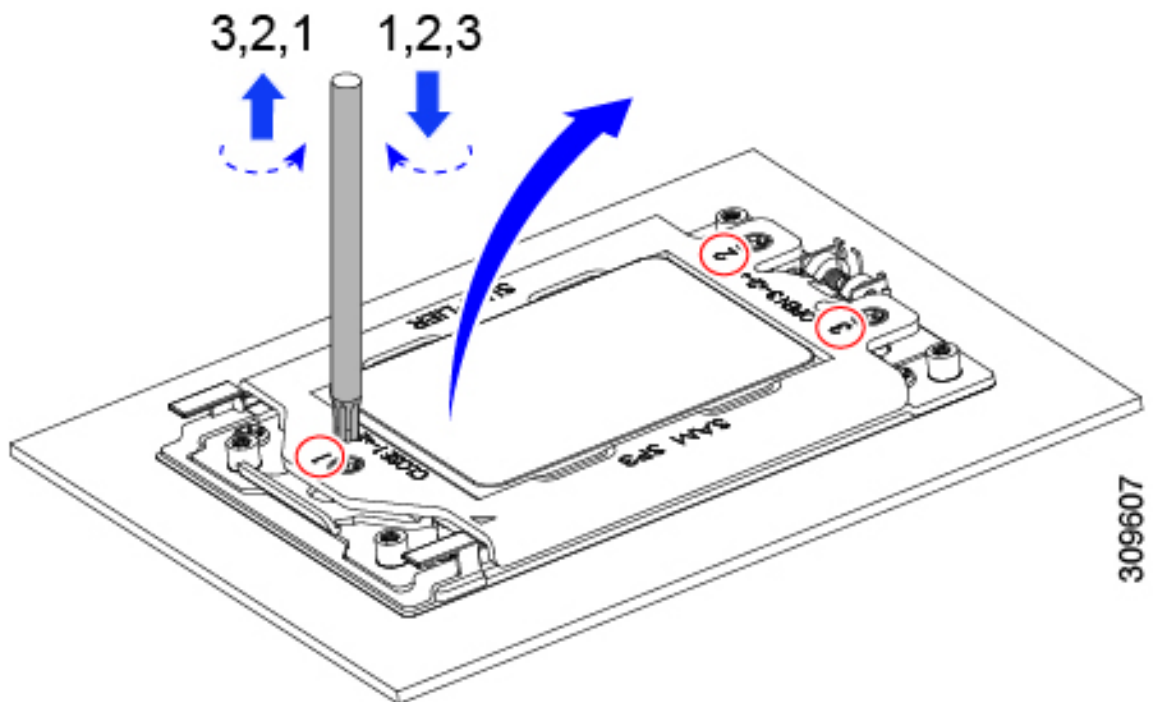
g) Open the socket frame.

309608
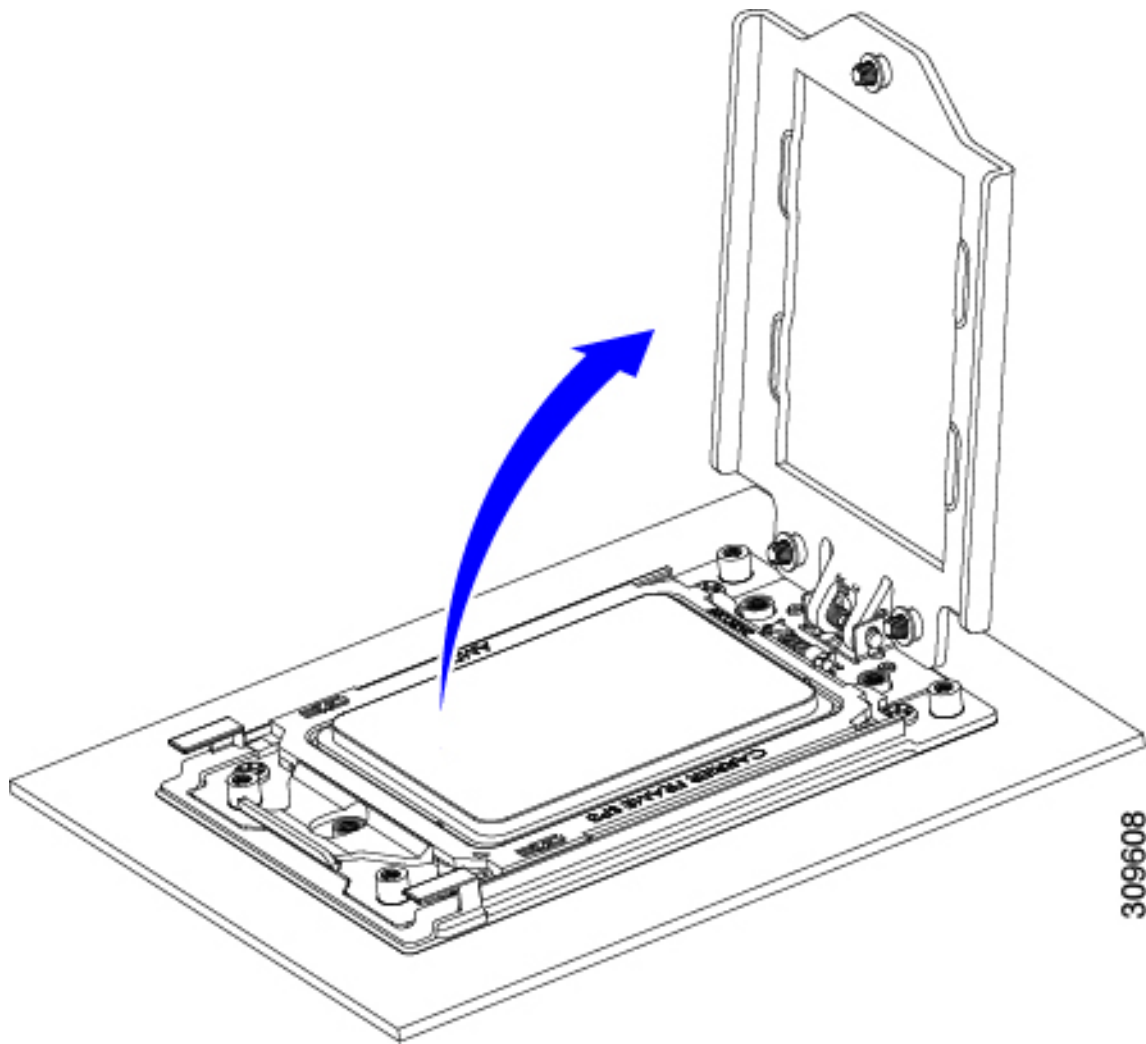
h) Open the rail frame.

309609
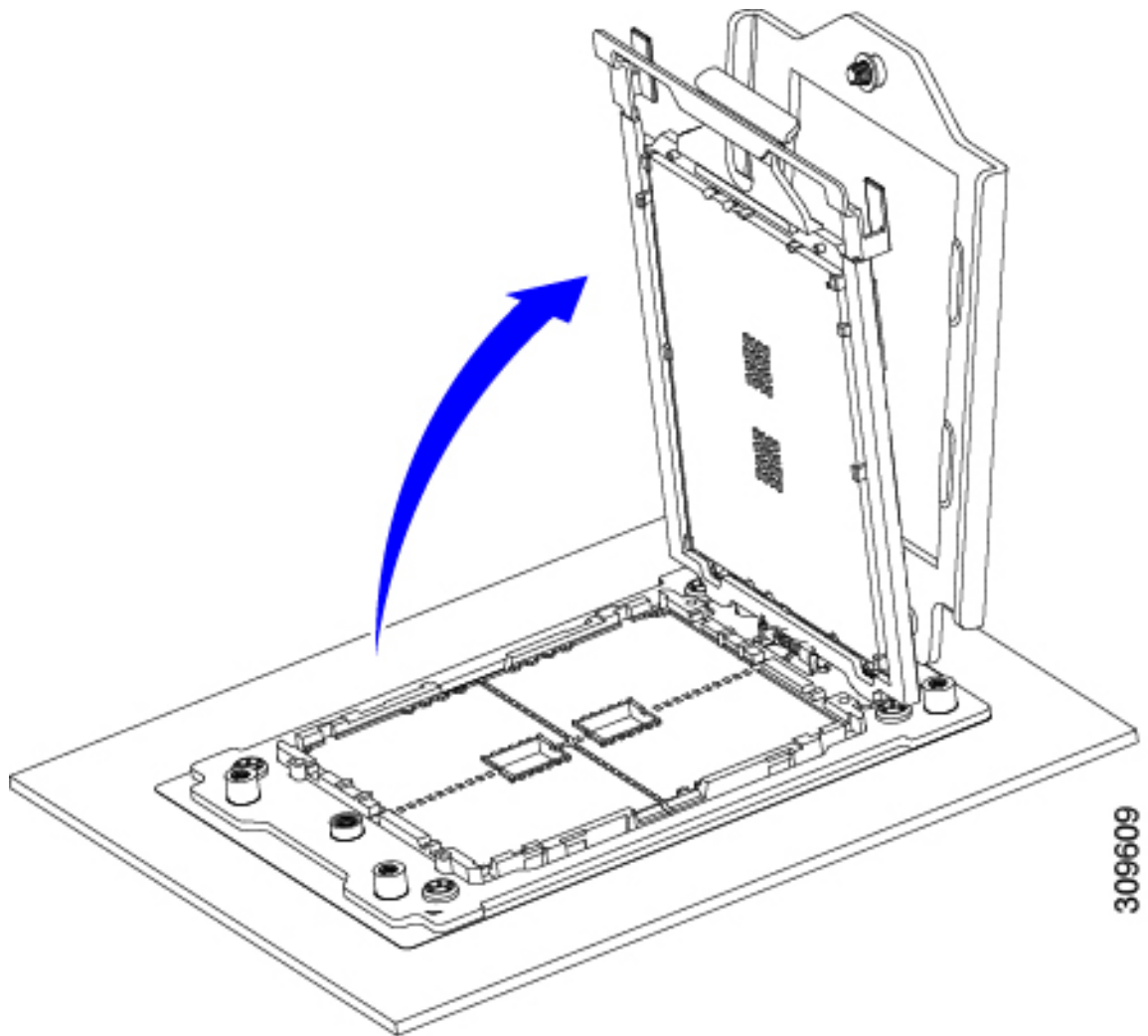
i) Take out the CPU with carrier frame.

309610
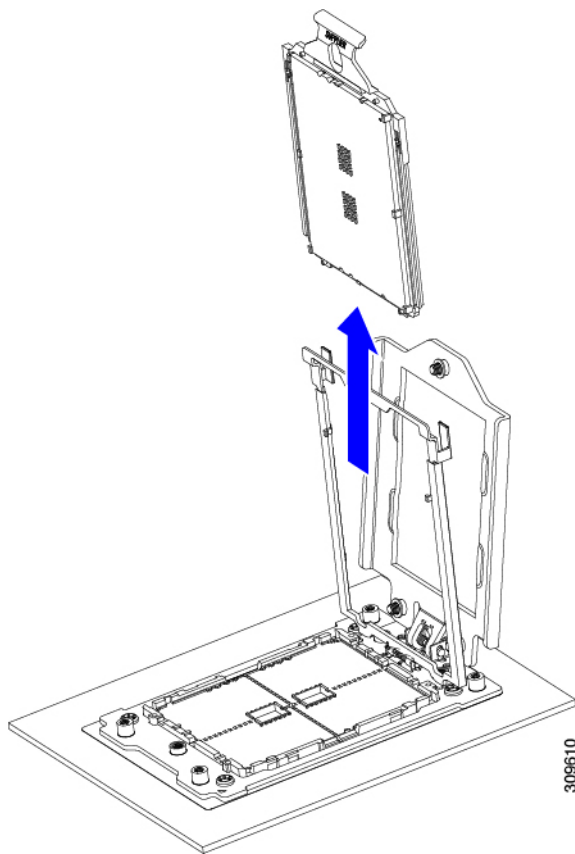
Step 2   Install the new CPU:

Caution   The CPU contacts and pins are extremely fragile. In this step, use extreme care to avoid touching or damaging the CPU contacts or the CPU socket pins.

a)   Grasping the CPU only by the handling tab on its carrier frame, carefully slide it down into the open rail frame.
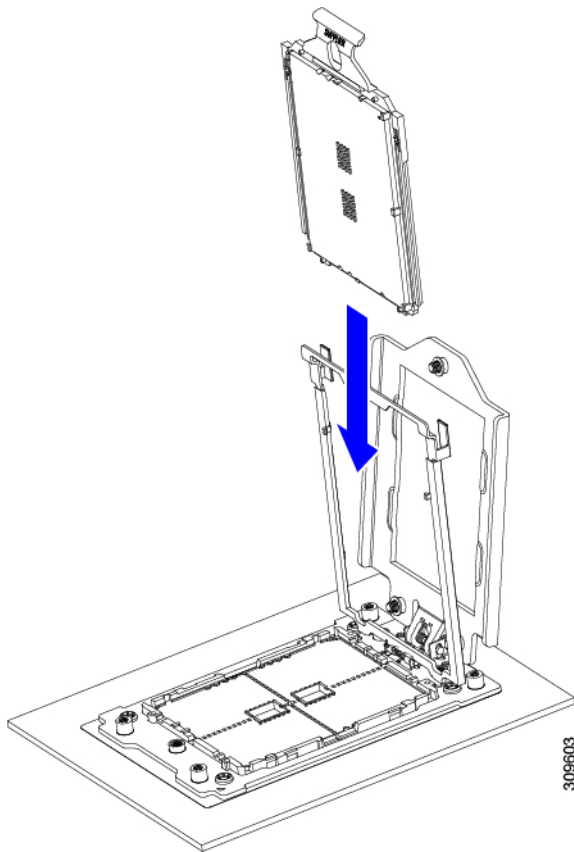
b) Gently close the rail frame down to the flat, closed position.
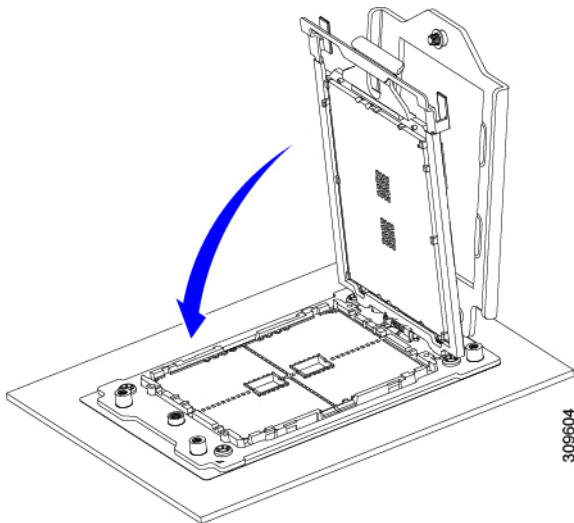
c) Gently close the socket frame down to the flat, closed position.
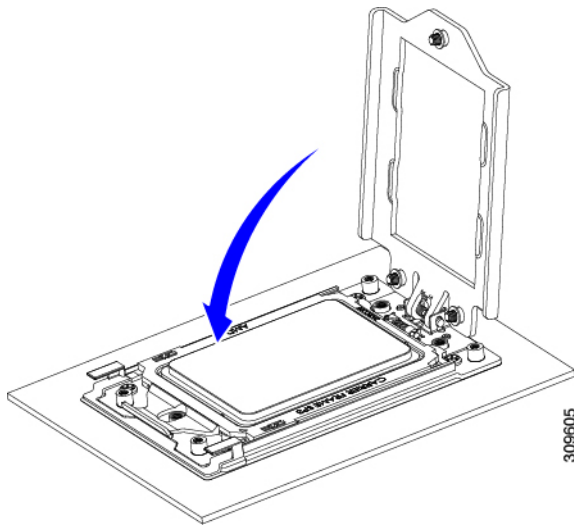
d) Tighten the three screws on the socket frame in this order: 1, 2, 3.
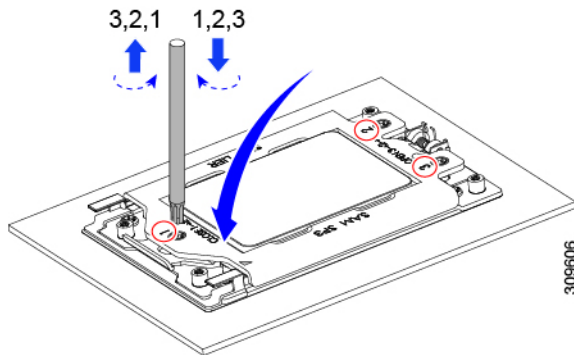
Step 3   Apply new TIM to the heatsink:

| Note | The heatsink must have new TIM on the heatsink-to-CPU surface to ensure proper cooling and performance. |

- If you are installing a new heatsink, it is shipped with a pre-applied pad of TIM. Go to step 5.

- If you are reusing a heatsink, you must remove the old TIM from the heatsink and then apply new TIM to the CPU surface from the supplied syringe. Continue with step a below.

a) Apply the cleaning solution that is included with the heatsink cleaning kit (UCSX-HSCK=) to the old TIM on the heatsink and let it soak for a least 15 seconds.
b) Wipe all of the TIM off the heatsink using the soft cloth that is included with the heatsink cleaning kit. Be careful to avoid scratching the heatsink surface.
c) Using the syringe of TIM provided with the new CPU (UCS-CPU-TIM=), apply 4 cubic centimeters of thermal interface material to the top of the CPU. Use the pattern shown below to ensure even coverage.

Figure 11: Thermal Interface Material Application Pattern
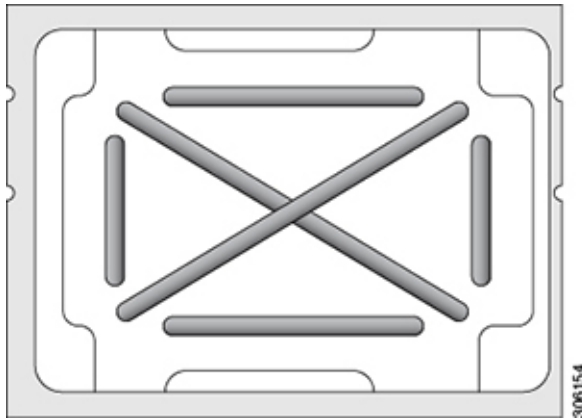
Caution	Use only the correct heatsink for your CPUs to ensure proper cooling.

Step 4   Install the heatsink to the CPU:

a) Align the heatsink over the CPU socket. Align the triangle-mark on the heatsink with the triangle-mark on the socket frame.

b) Use a T-20 Torx driver to tighten the six captive screws that secure the heatsink.

Caution	Alternate tightening the heatsink screws evenly so that the heatsink remains level while it is lowered. Tighten the heatsink screws in the order shown on the heatsink label (1, 2, 3, 4, 5, 6).

Step 5   Reconnect any cables that you removed.

Step 6   Power on the server.

Additional CPU-Related Parts to Order with RMA Replacement CPUs

When a return material authorization (RMA) of the CPU is done on a Cisco UCS C-Series server, additional parts might not be included with the CPU spare. The TAC engineer might need to add the additional parts to the RMA to help ensure a successful replacement.

Note	The following items apply to CPU *replacement* scenarios. If you are replacing a system chassis and *moving* existing CPUs to the new motherboard, you do not have to separate the heatsink from the CPU.

Scenario 1—You are reusing the existing heatsinks or moving CPUs and heatsinks to a new node:

- Heatsink cleaning kit (UCSX-HSCK=)

  One cleaning kit can clean up to four CPUs.

- Thermal interface material (TIM) kit (UCS-CPU-TIM=)

  One TIM kit covers one CPU.

Scenario 2—You are replacing the existing heatsinks:

• Heatsink: UCSC-HSHP-225M6=

New heatsinks have a pre-applied pad of TIM.

• Heatsink cleaning kit (UCSX-HSCK=)

One cleaning kit can clean up to four CPUs.

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 TIM and the other to prepare the surface of the heatsink.

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

Replacing Memory DIMMs

⚠

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 server might result in system problems or damage to the motherboard.

✎

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

DIMM Population Rules and Memory Performance Guidelines

This topic describes the rules and guidelines for maximum memory performance.

DIMM Slot Numbering

The following figure shows the numbering of the DIMM slots on the motherboard.

Figure 12: DIMM Slot Numbering
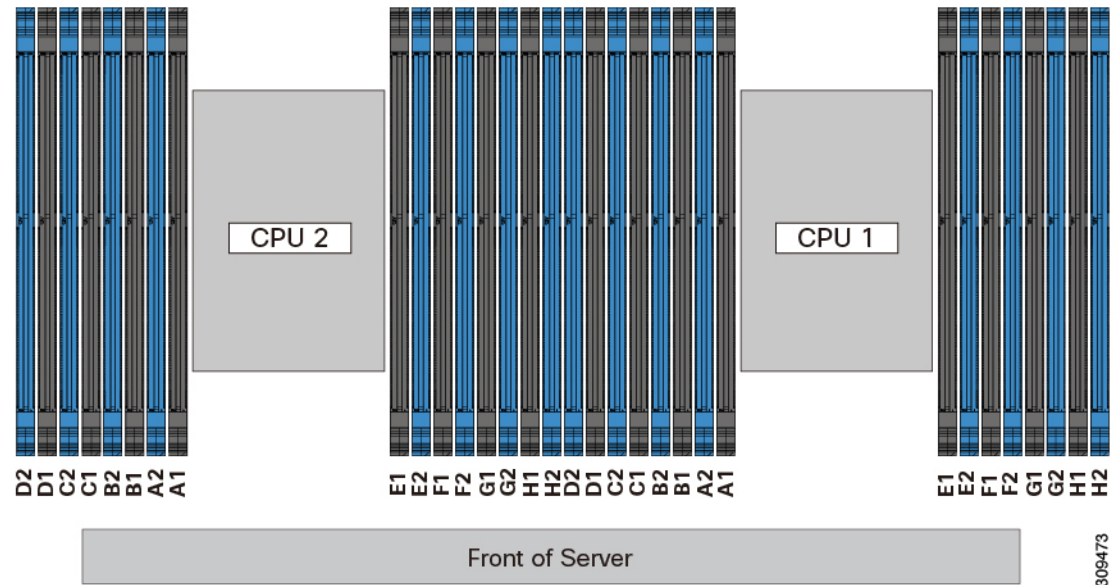
DIMM Population Rules

Observe the following guidelines when installing or replacing DIMMs for maximum performance:

- Each CPU supports eight memory channels, A through H.

    - CPU 1 supports channels P1 A1, P1 A2, P1 B1, P1 B2, P1 C1, P1 C2, P1 D1, P1 D2, P1 E1, P1 E2, P1 F1, P1 F2, P1 G1, P1 G2, P1 H1, and P1 H2.

    - CPU 2 supports channels P2 A1, P2 A2, P2 B1, P2 B2, P2 C1, P2 C2, P2 D1, P2 D2, P2 E1, P2 E2, P2 F1, P2 F2, P2 G1, P2 G2, P2 H1, and P2 H2.

- Each channel has two DIMM sockets (for example, channel A = slots A1, A2).

- When both CPUs are installed, populate the DIMM slots of each CPU identically.

- In a single-CPU configuration, populate the channels for CPU1 only (P1 A1 through P1 H2).

- For optimal performance, populate DIMMs in the order shown in the following table, depending on the number of CPUs and the number of DIMMs per CPU. If your server has two CPUs, balance DIMMs evenly across the two CPUs as shown in the table.

Note   The sections below list recommended configurations. Using 5, 7, 9, 10, or 11 DIMMs per CPU is not recommended.

Memory Population Order

Memory slots are color coded, blue and black. The color coded channel population order is blue slots first, then black.

The following tables show the memory population order for each memory option.

Table 3: DIMMs Population Order for 2 CPU Configuration

Number of DDR4 DIMMs per CPU (Recommended Configurations)	Populate CPU 1 Slot	Populate CPU2 Slots
1	P1_C2	P2_C2
2	P1_C2 P1_D2	P2_C2 P2_D2
4	P1_C2 P1_D2 P1_G2 P1_H2	P2_C2 P2_D2 P2_G2 P2_H2
6	P1_C2 P1_D2 P1_G2 P1_H2 P1_A2 P1_E2	P2_C2 P2_D2 P2_G2 P2_H2 P2_A2 P2_E2
8	P1_C2 P1_D2 P1_G2 P1_H2 P1_A2 P1_E2 P1_B2 P1_F2	P2_C2 P2_D2 P2_G2 P2_H2 P2_A2 P2_E2 P2_B2 P2_F2

10	P1_C2	P2_C2
	P1_D2	P2_D2
	P1_G2	P2_G2
	P1_H2	P2_H2
	P1_A2	P2_A2
	P1_E2	P2_E2
	P1_B2	P2_B2
	P1_F2	P2_F2
	P1_D1	P2_D1
	P1_E1	P2_E1
12	P1_C2	P2_C2
	P1_D2	P2_D2
	P1_G2	P2_G2
	P1_H2	P2_H2
	P1_A2	P2_A2
	P1_E2	P2_E2
	P1_B2	P2_B2
	P1_F2	P2_F2
	P1_D1	P2_D1
	P1_E1	P2_E1
	P1_B1	P2_B1
	P1_G1	P2_G1

14	P1_C2	P2_C2
	P1_D2	P2_D2
	P1_G2	P2_G2
	P1_H2	P2_H2
	P1_A2	P2_A2
	P1_E2	P2_E2
	P1_B2	P2_B2
	P1_F2	P2_F2
	P1_D1	P2_D1
	P1_E1	P2_E1
	P1_B1	P2_B1
	P1_G1	P2_G1
	P1_C1	P2_C1
	P1_F1	P2_F1
16	All populated (A1,A2) through (H1, H2)	All populated (A1,A2) through (H1, H2)

Table 4: DIMMs Population Order for 1 CPU Configuration

Number of DDR4 DIMMs per CPU (Recommended Configurations)	Populate CPU 1 Slot
1	P1_C2
2	P1_C2
	P1_D2
4	P1_C2
	P1_D2
	P1_G2
	P1_H2
6	P1_C2
	P1_D2
	P1_G2
	P1_H2
	P1_A2
	P1_E2

Number of DDR4 DIMMs per CPU (Recommended Configurations)	Populate CPU 1 Slot
8	P1_C2
	P1_D2
	P1_G2
	P1_H2
	P1_A2
	P1_E2
	P1_B2
	P1_F2
10	P1_C2
	P1_D2
	P1_G2
	P1_H2
	P1_A2
	P1_E2
	P1_B2
	P1_F2
	P1_D1
	P1_E1
12	P1_C2
	P1_D2
	P1_G2
	P1_H2
	P1_A2
	P1_E2
	P1_B2
	P1_F2
	P1_D1
	P1_E1
	P1_B1
	P1_G1

Number of DDR4 DIMMs per CPU (Recommended Configurations)	Populate CPU 1 Slot
14	P1_C2
	P1_D2
	P1_G2
	P1_H2
	P1_A2
	P1_E2
	P1_B2
	P1_F2
	P1_D1
	P1_E1
	P1_B1
	P1_G1
	P1_C1
	P1_F1
16	All populated (A1,A2) through (H1, H2)

- The maximum combined memory allowed in the 16 DIMM slots controlled by any one CPU is 16 x 256 GB.

- 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 even numbers of channels.

- NVIDIA M-Series GPUs can support only less-than 1 TB memory in the server.

- NVIDIA P-Series GPUs can support 1 TB or more memory in the server.

- AMD FirePro S7150 X2 GPUs can support only less-than 1 TB memory in the server.

- Observe the DIMM mixing rules shown in the following table.

Table 5: DIMM Mixing Rules

DIMM Parameter	DIMMs in the Same Channel	DIMMs in the Same Bank
DIMM Capacity For example, 8GB, 16GB, 32GB, 64GB, 128GB	You can mix different capacity DIMMs in the same channel (for example, A1, A2).	You cannot mix DIMMs with different capacities and Revisions in the same bank (for example A1, B1). The Revision value depends on the manufactures. Two DIMMs with the same PID can have different Revisions.

DIMM speed For example, 2666 GHz	You can mix speeds, but DIMMs will run at the speed of the slowest DIMMs/CPUs installed in the channel.	You cannot mix DIMMs with different speeds and Revisions in the same bank (for example A1, B1). The Revision value depends on the manufactures. Two DIMMs with the same PID can have different Revisions.
DIMM type RDIMMs or LRDIMMs	You cannot mix DIMM types in a channel.	You cannot mix DIMM types in a bank.

Memory Mirroring

The CPUs in the server 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.

Memory mirroring reduces the amount of memory available by 50 percent because only one of the two populated channels provides data. The second, duplicate channel provides redundancy.

Replacing DIMMs

Identifying a Faulty DIMM

Each DIMM socket has a corresponding DIMM fault LED, directly in front of the DIMM socket. See Internal Diagnostic LEDs, on page 5 for the locations of these LEDs. When the server is in standby power mode, these LEDs light amber to indicate a faulty DIMM.

Procedure

Step 1   Remove an existing DIMM:

a) Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

b) Slide the server 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 server from the rack.

c) Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

d) Remove the air baffle that covers the front ends of the DIMM slots to provide clearance.

e) Locate the DIMM that you are removing, and then open the ejector levers at each end of its DIMM slot.

Step 2   Install a new DIMM:

> **Note**   Before installing DIMMs, see the memory population rules for this server: DIMM Population Rules and Memory Performance Guidelines, on page 30.

a) Align the new DIMM with the empty slot on the motherboard. Use the alignment feature in the DIMM slot 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.

c) Replace the top cover to the server.

d) Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.

Replacing a Mini-Storage Module

The mini-storage module plugs into a motherboard socket to provide additional internal storage. The module is available in two different versions:

• M.2 SSD Carrier—provides two M.2 form-factor SSD sockets.

Note   The Cisco IMC firmware does not include an out-of-band management interface for the M.2 drives installed in the M.2 version of this mini-storage module (UCS-MSTOR-M2). The M.2 drives are not listed in Cisco IMC inventory, nor can they be managed by Cisco IMC. This is expected behavior.

Replacing a Mini-Storage Module Carrier

This topic describes how to remove and replace a mini-storage module carrier. The carrier has one media socket on its top and one socket on its underside. Use the following procedure for any type of mini-storage module carrier (SD card or M.2 SSD).

Procedure

Step 1   Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

Step 2   Slide the server 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 server from the rack.

Step 3   Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

Step 4   Remove a carrier from its socket:

a) Locate the mini-storage module carrier in its socket just in front of power supply 1.
b) At each end of the carrier, push outward on the clip that secures the carrier.
c) Lift both ends of the carrier to disengage it from the socket on the motherboard.
d) Set the carrier on an anti-static surface.

Step 5   Install a carrier to its socket:

a) Position the carrier over socket, with the carrier's connector facing down and at the same end as the motherboard socket. Two alignment pegs must match with two holes on the carrier.
b) Gently push down the socket end of the carrier so that the two pegs go through the two holes on the carrier.
c) Push down on the carrier so that the securing clips click over it at both ends.

Step 6   Replace the top cover to the server.

Step 7   Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.
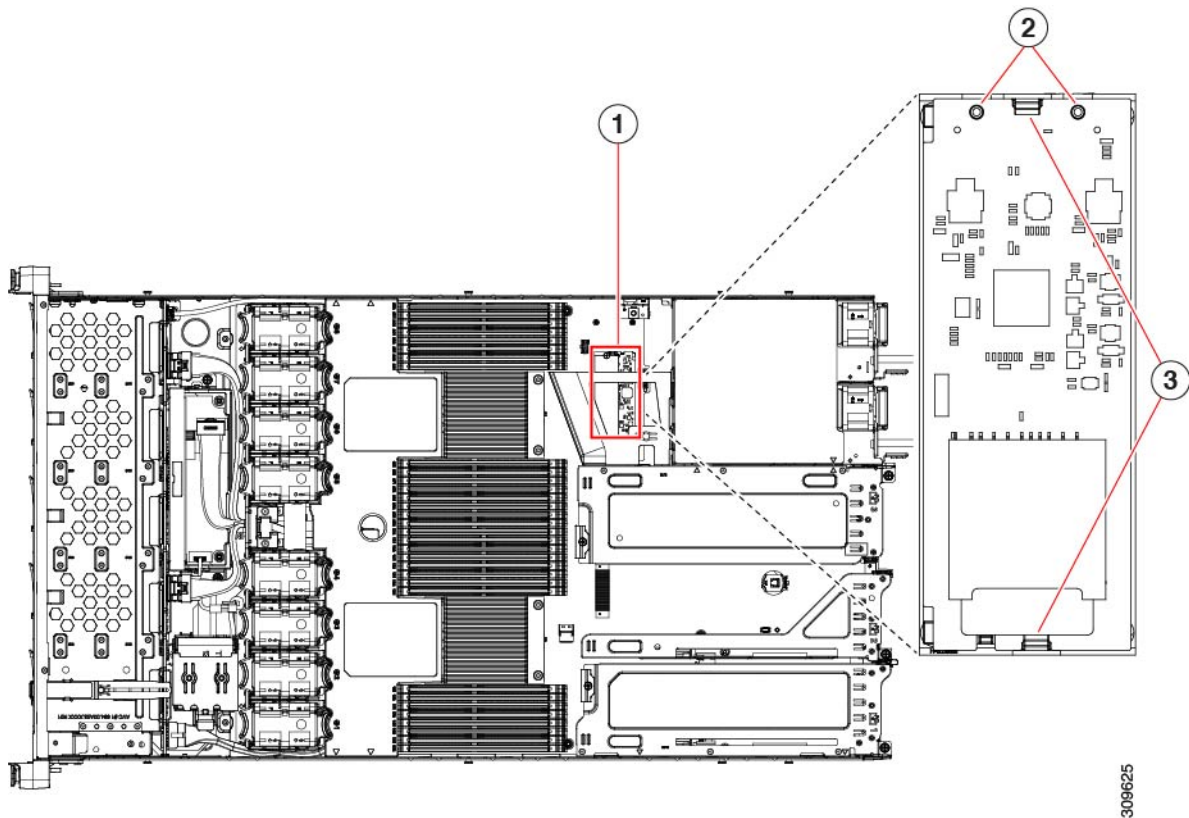
1 Location of socket on motherboard	**3** Securing clips
2 Alignment pegs	-

Replacing an M.2 SSD in a Mini-Storage Carrier For M.2

This topic describes how to remove and replace an M.2 SATA in a mini-storage carrier for M.2 (UCS-MSTOR-M2). The carrier has one M.2 SSD socket on its top and one socket on its underside.

Population Rules For Mini-Storage M.2 SSDs

- Both M.2 SSDs must be SATA.

- You can use one or two M.2 SSDs in the carrier.

- M.2 socket 1 is on the top side of the carrier; M.2 socket 2 is on the underside of the carrier (the same side as the carrier's motherboard connector).

Procedure

Step 1 Power off the server and then remove the mini-storage module carrier from the server as described in Replacing a Mini-Storage Module Carrier, on page 38.

Step 2 Remove an M.2 SSD:

a) Use a #1 Phillips-head screwdriver to remove the single screw that secures the M.2 SSD to the carrier.

b) Remove the M.2 SSD from its socket on the carrier.

Step 3 Install a new M.2 SSD:

a) Angle the M.2 SSD downward and insert the connector-end into the socket on the carrier. The M.2 SSD's label must face up.

b) Press the M.2 SSD flat against the carrier.

c) Install the single screw that secures the end of the M.2 SSD to the carrier.

Step 4 Install the mini-storage module carrier back into the server and then power it on as described in Replacing a Mini-Storage Module Carrier, on page 38.

Replacing a USB Drive

⚠ **Caution**   We do not recommend that you hot-swap the internal USB drive while the server is powered on because of the potential for data loss.

Procedure

Step 1 Remove an existing internal USB drive:

a) Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

b) Slide the server 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 server from the rack.

c) Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

d) Locate the USB socket on the motherboard, directly in front of PCIe riser 2.

e) Grasp the USB drive and pull it horizontally to free it from the socket.

Step 2 Install a new internal USB drive:

a) Align the USB drive with the socket.

b) Push the USB drive horizontally to fully engage it with the socket.

c) Replace the top cover to the server.

d) Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.

Figure 13: Location of Internal USB Port
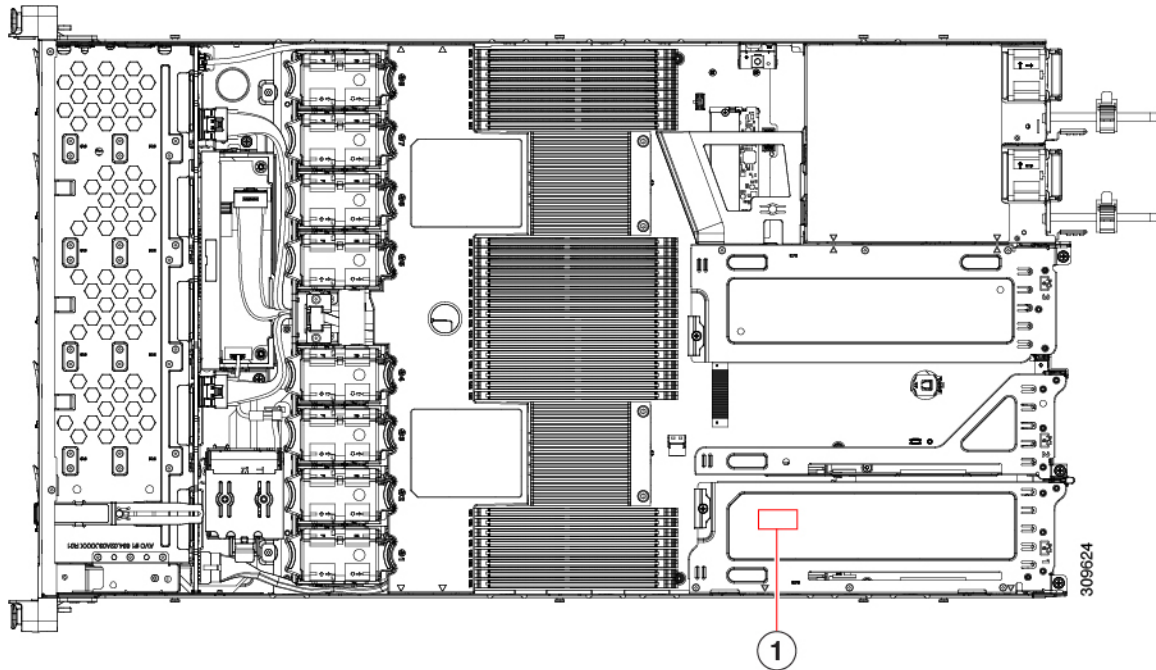
Location of horizontal USB socket on motherboard	-

Enabling or Disabling the Internal USB Port

The factory default is that all USB ports on the server are enabled. However, the internal USB port can be enabled or disabled in the server BIOS.

Procedure

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 the 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]

Warning   **Recyclers:** Do not shred the battery! Make sure you dispose of the battery according to appropriate regulations for your country or locale.

The real-time clock (RTC) battery retains system settings when the server is disconnected from power. The battery type is CR2032. Cisco supports the industry-standard CR2032 battery, which can be ordered from Cisco (PID N20-MBLIBATT) or purchased from most electronic stores.

Procedure

Step 1   Remove the RTC battery:

a) Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

b) Slide the server 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 server from the rack.

c) Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

d) Locate the RTC battery. The vertical socket is directly in front of PCIe riser 2.

e) Remove the battery from the socket on the motherboard. Gently pry the securing clip on one side open to provide clearance, then lift straight up on the battery.

Step 2   Install a new RTC battery:

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

Note   The flat, positive side of the battery marked "3V+" should face left as you face the server front.

b) Replace the top cover to the server.

c) Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.

Figure 14: RTC Battery Location on Motherboard
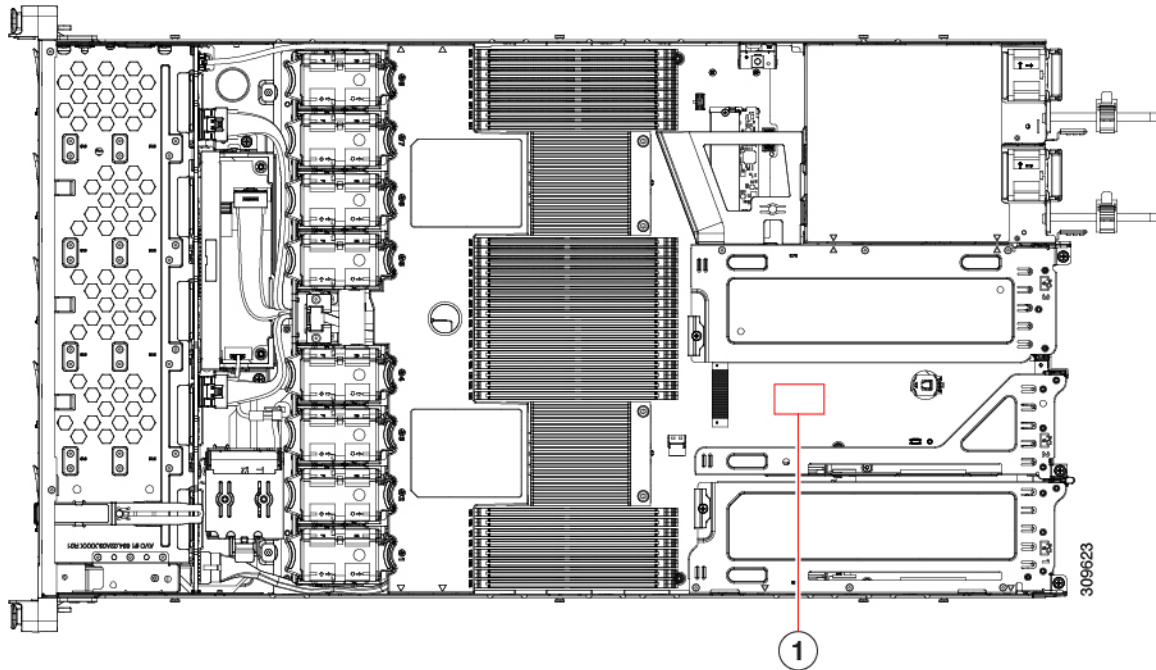
RTC battery in vertical socket	-

Replacing Power Supplies

The server can have one or two Titanium 80PLUS rated power supplies. When two power supplies are installed they are redundant as 1+1 by default, but they also support cold redundancy mode. Cold redundancy (CR) suspends power delivery on one or more power supplies and forces the remainder of the load to be supplied by the active PSU(s). As a result, total power efficiency is improved by best utilizing the PSU efficiency when compared to load characteristics.

- See also Power Specifications for more information about the power supplies.

- See also Rear-Panel LEDs, on page 4 for information about the power supply LEDs.

This section includes procedures for replacing AC and DC power supply units. See Replacing AC Power Supplies, on page 44.

- Replacing DC Power Supplies, on page 45

- Installing DC Power Supplies (First Time Installation), on page 46

- Grounding for DC Power Supplies, on page 48

Replacing AC Power Supplies

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

> **Note** Do not mix power supply types or wattages in the server. Both power supplies must be identical.

Procedure

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 server has only one power supply, shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

- If your server has two power supplies, you do not have to shut down the server.

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) Only if you shut down the server, press the Power button to boot the server to main power mode.

Power Supply location.

Replacing DC Power Supplies

Note This procedure is for replacing DC power supplies in a server that already has DC power supplies installed. If you are installing DC power supplies to the server for the first time, see Installing DC Power Supplies (First Time Installation), on page 46.

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

Statement 1074

Note If you are replacing DC power supplies in a server with power supply redundancy (two power supplies), you do not have to power off the server to replace a power supply because they are redundant as 1+1.

Note Do not mix power supply types or wattages in the server. Both power supplies must be identical.
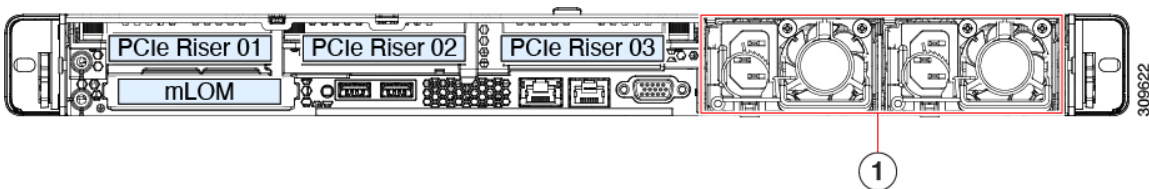
Procedure

Step 1 Remove the DC power supply that you are replacing or a blank panel from an empty bay:

a) Perform one of the following actions:

   • If you are replacing a power supply in a server that has only one DC power supply, shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

   • If you are replacing a power supply in a server that has two DC power supplies, you do not have to shut down the server.

b) Remove the power cord from the power supply that you are replacing. Lift the connector securing clip slightly and then pull the connector from the socket on the power supply.

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 DC 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. Press the connector into the socket until the securing clip clicks into place.

d) Only if you shut down the server, press the Power button to boot the server to main power mode.

Figure 15: Replacing DC Power Supplies
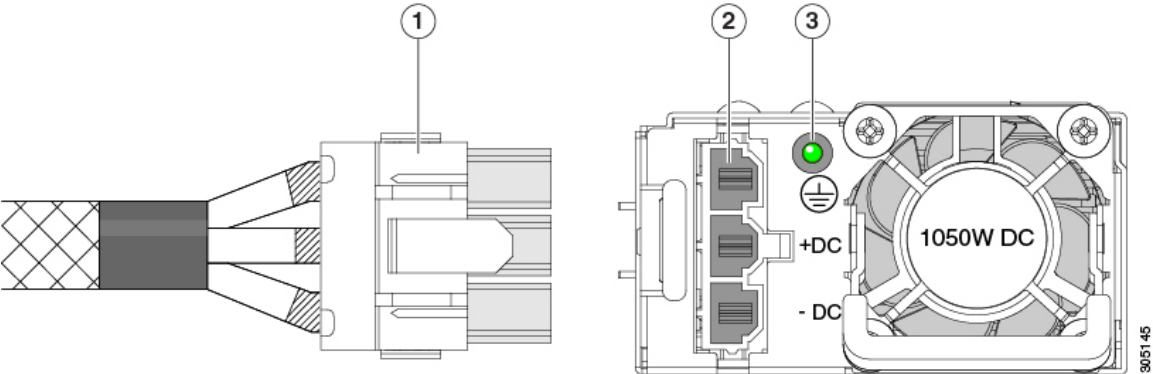
1	Keyed cable connector (CAB-48DC-40A-8AWG)	3	PSU status LED
2	Keyed DC input socket	-	

Installing DC Power Supplies (First Time Installation)

Note This procedure is for installing DC power supplies to the server for the first time. If you are replacing DC power supplies in a server that already has DC power supplies installed, see Replacing DC Power Supplies, on page 45.

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

Statement 1074

✎

Note   Do not mix power supply types or wattages in the server. Both power supplies must be identical.

⚠️

Caution   As instructed in the first step of this wiring procedure, turn off the DC power source from your facility's circuit breaker to avoid electric shock hazard.

Procedure

Step 1   Turn off the DC power source from your facility's circuit breaker to avoid electric shock hazard.

Note   The required DC input cable is Cisco part CAB-48DC-40A-8AWG. This 3-meter cable has a 3-pin connector on one end that is keyed to the DC input socket on the power supply. The other end of the cable has no connector so that you can wire it to your facility's DC power.

Step 2   Wire the non-terminated end of the cable to your facility's DC power input source.

Step 3   Connect the terminated end of the cable to the socket on the power supply. The connector is keyed so that the wires align for correct polarity and ground.

Step 4   Return DC power from your facility's circuit breaker.

Step 5   Press the Power button to boot the server to main power mode.

Figure 16: Installing DC Power Supplies
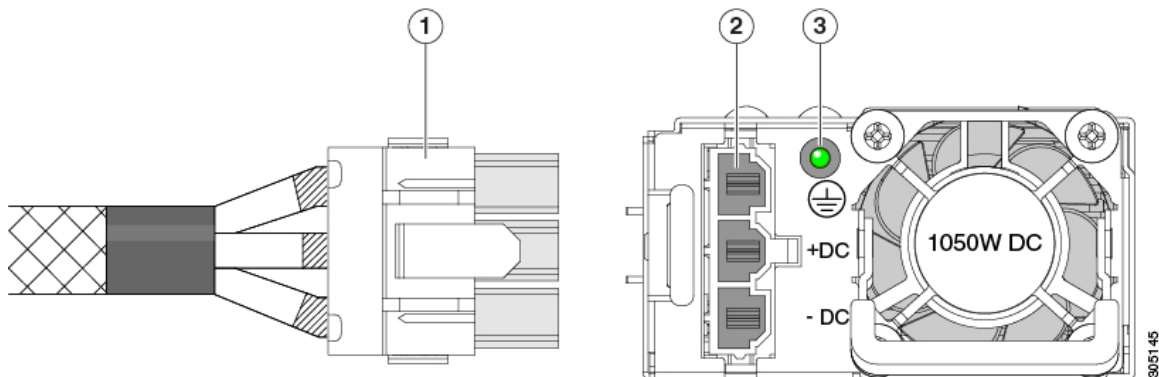
1 Keyed cable connector (CAB-48DC-40A-8AWG)	3 PSU status LED
2 Keyed DC input socket	-

Step 6 See Installation Grounding, page 3-66 for information about additional chassis grounding.

Grounding for DC Power Supplies

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 the server chassis to the earth ground of the rack is available. Two screw holes for use with your dual-hole grounding lug and grounding wire are supplied on the chassis rear panel.

Note	The grounding points on the chassis are sized for 10-32 screws. You must provide your own screws, grounding lug, and grounding wire. The grounding lug must be dual-hole lug that fits 10-32 screws. The grounding cable that you provide must be 14 AWG (2 mm), minimum 60° C wire, or as permitted by the local code.

Replacing a PCIe Riser

This server has two toolless PCIe risers for horizontal installation of PCIe cards. Each riser is available in multiple versions. See PCIe Slot Specifications, on page 50 for detailed descriptions of the slots and features in each riser version.

Procedure

Step 1 Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

Step 2 Slide the server 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 server from the rack.

Step 3 Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

Step 4 Remove the PCIe riser that you are replacing:

a) Grasp the flip-up handle on the riser and the blue forward edge, and then lift up evenly to disengage its circuit board from the socket on the motherboard. Set the riser on an antistatic surface.

b) If the riser has a card installed, remove the card from the riser. See Replacing a PCIe Card, on page 51.

Step 5 Install a new PCIe riser:

Note	The PCIe risers are not interchangeable. If you plug a PCIe riser into the wrong socket, the server will not boot. Riser 1 must plug into the motherboard socket labeled "RISER1." Riser 2 must plug into the motherboard socket labeled "RISER2."

a) If you removed a card from the old PCIe riser, install the card to the new riser. See Replacing a PCIe Card, on page 51.

b) Position the PCIe riser over its socket on the motherboard and over its alignment slots in the chassis.

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 to the server.

Step 7 Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.

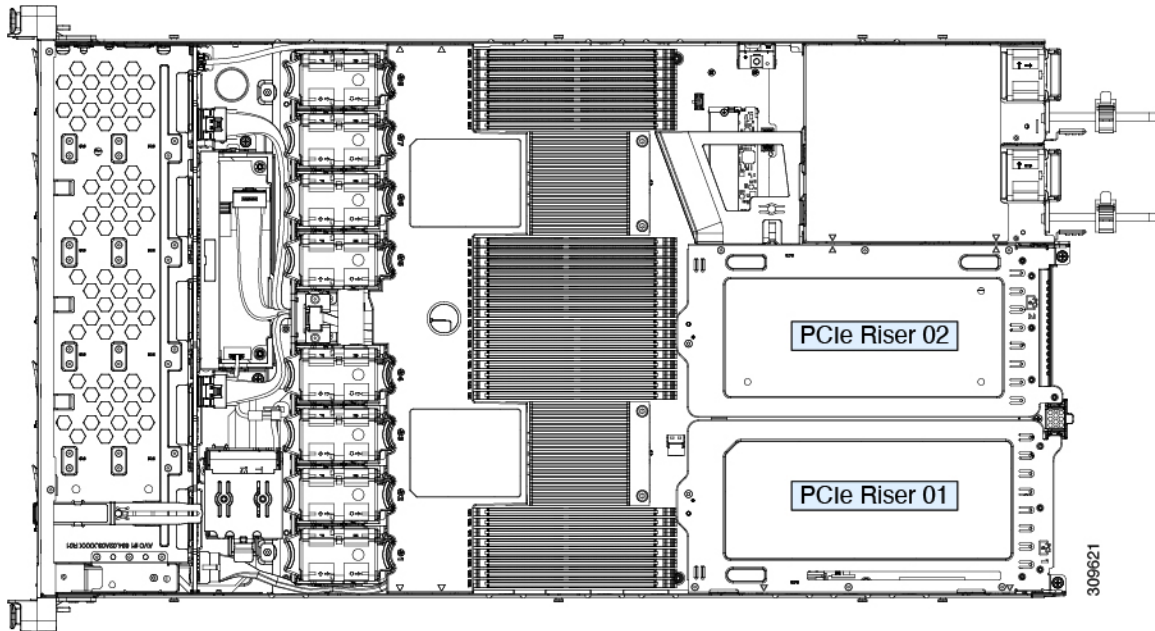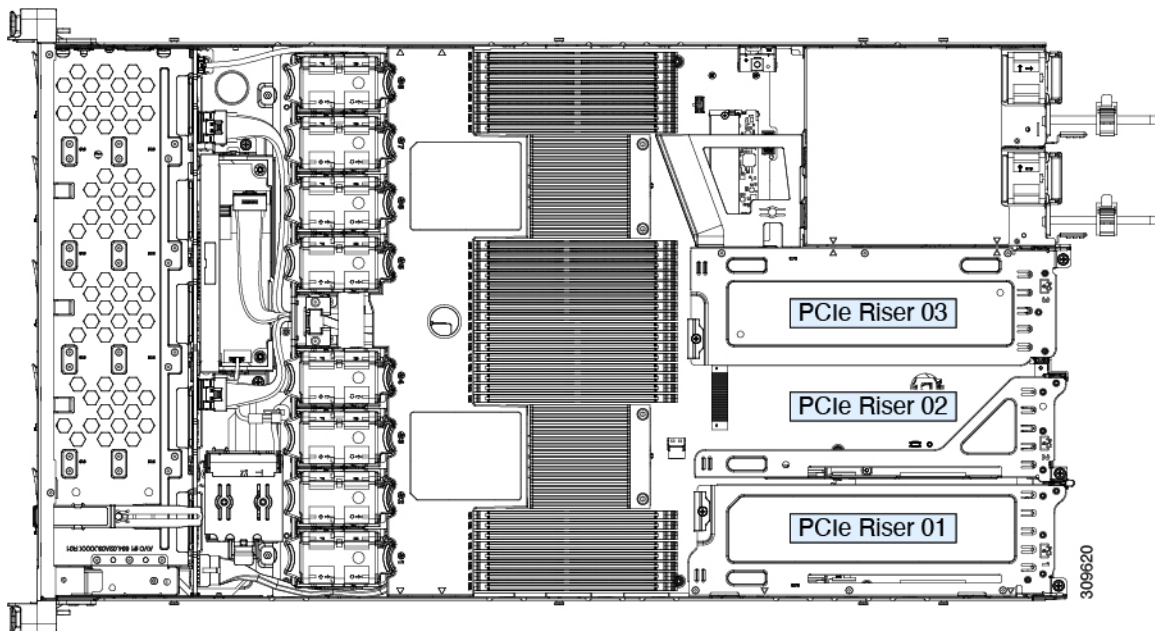*Figure 17: PCIe Riser Alignment - Two Riser Configuration*

Figure 18: PCIe Riser Alignment - Three Riser Configuration

Replacing a PCIe Card

Note	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 C-Series rack-mount servers, 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 card occurs.

PCIe Slot Specifications

The following tables describe the specifications for the slots in three riser combination.

Table 6: PCIe Riser 1

Slot Number	Electrical Lane Width	Connector Length	Maximum Card Length	Card Height (Rear Panel Opening)	NCSI Support
1	Gen-3 and 4 x16	x24 connector	¾ length	Half-height	Yes

Table 7: PCIe Riser 2

Slot Number	Electrical Lane Width	Connector Length	Maximum Card Length	Card Height (Rear Panel Opening)	NCSI Support
2	Gen-3 and 4 x8	x24 connector	¾ length	½ height	No

Table 8: PCIe Riser 3

Slot Number	Electrical Lane Width	Connector Length	Maximum Card Length	Card Height (Rear Panel Opening)	NCSI Support
3	Gen-3 and 4 x16	x24 connector	¾ length	Half-height	Yes

The following tables describe the specifications for the slots in two riser combination.

Table 9: PCIe Riser 1

Slot Number	Electrical Lane Width	Connector Length	Maximum Card Length	Card Height (Rear Panel Opening)	NCSI Support
1	Gen-3 and 4 x16	x24 connector	¾ length	Full-height	Yes

Table 10: PCIe Riser 3

Slot Number	Electrical Lane Width	Connector Length	Maximum Card Length	Card Height (Rear Panel Opening)	NCSI Support

| 3 | Gen-3 and 4 x16 | x24 connector | ¾ length | Full-height | Yes |

Replacing a PCIe Card

Note   If you are installing a Cisco UCS Virtual Interface Card, there are prerequisite considerations. See Cisco Virtual Interface Card (VIC) Considerations, on page 52.

Procedure

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

a) Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

b) Slide the server 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 server from the rack.

c) Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

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

e) Use two hands to grasp the external riser handle and the blue area at the front of the riser.

f) Lift straight up to disengage the riser's connectors from the two sockets on the motherboard. Set the riser upside-down on an antistatic surface.

g) Open the hinged plastic retainer that secures the rear-panel tab of the card.

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

   PCIe riser 1/slot 1 has a long-card guide at the front end of the riser. Use the slot in the long-card guide to help support a full-length card.

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

c) 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.

Figure 19: PCIe Riser Card Securing Mechanisms
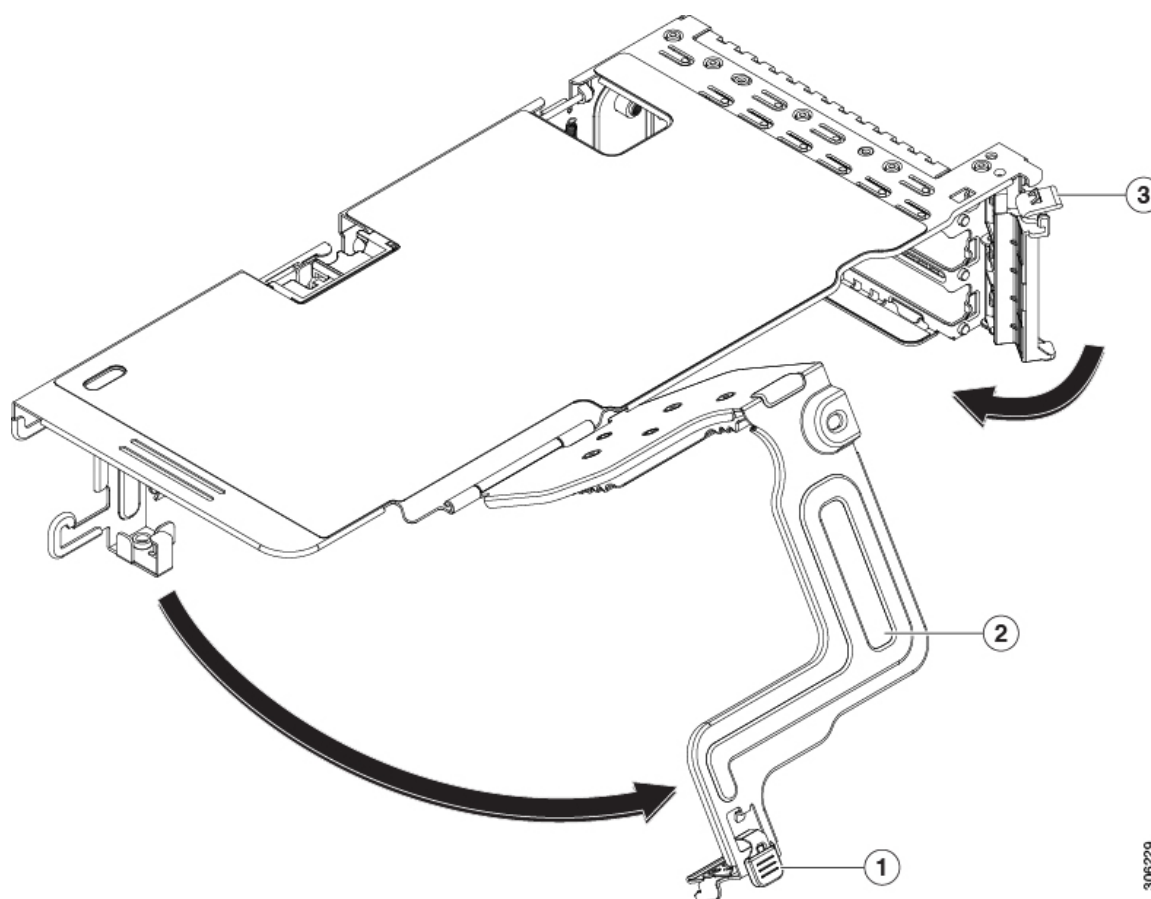
Release latch on hinged securing plate	**3** Hinged card-tab retainer
2 Hinged securing plate	

d) Position the PCIe riser over its two sockets on the motherboard and over the two chassis alignment channels.

e) Carefully push down on both ends of the PCIe riser to fully engage its two connectors with the two sockets on the motherboard.

f) Replace the top cover to the server.

g) Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.

Cisco Virtual Interface Card (VIC) Considerations

This section describes VIC card support and special considerations for this server.

If you want to use the Cisco UCS VIC card for Cisco UCS Manager integration, see also the Cisco UCS C-Series Server Integration with Cisco UCS Manager Guides for details about supported configurations, cabling, and other requirements.

Table 11: VIC Support and Considerations in This Server

VIC	How Many Supported in Server	Slots That Support VICs	Primary Slot For *Cisco Card* NIC Mode	Minimum Cisco IMC Firmware
Cisco UCS VIC 1467 UCSC-M-V25-04	1 mLOM	mLOM	mLOM	4.2(1)
Cisco UCS VIC 1477 UCSC-M-V100-04	1 mLOM	mLOM	mLOM	4.2(1)
Cisco UCS VIC 1455 UCSC-PCIE-C25Q-04	2 PCIe	Riser 1 PCIe slot 1 and 2 Riser 2 PCIe slot 4 and 5	Riser 1 PCIe slot 2 Riser 2 PCIe slot 5 **Note** Cisco PCIe VICs can be installed in slots 1 and 4 if GPUs are installed in slots 2 and 5.	4.2(1)
Cisco UCS VIC 1495 UCSC-PCIE-C100-04	2 PCIe	Riser 1 PCIe slot 1 and 2 Riser 2 PCIe slot 4 and 5	Riser 1 PCIe slot 2 Riser 2 PCIe slot 5 **Note** Cisco PCIe VICs can be installed in slots 1 and 4 if GPUs are installed in slots 2 and 5.	4.2(1)

Cisco VIC mLOM and OCP Card Replacement Considerations

In Cisco UCS C225 M6 and C245 M6 servers, Cisco IMC network connection may be lost in the following situations, while replacing Cisco VIC mLOM and OCP cards:

- If OCP card is replaced by Cisco VIC card in MLOM Slot and the NIC mode is set to **Shared OCP** or **Shared OCP Extended**.

- If Cisco VIC Card in MLOM Slot is replaced by OCP Card and NIC mode is set to **Cisco-card MLOM**.

Follow these recommendations while replacing Cisco VIC mLOM or OCP cards in Cisco UCS C225 M6 or C245 M6 servers to avoid loss of connectivity:

- Before replacing the card, configure any of the NIC modes that has network connected, other than **Cisco card MLOM**, **Shared OCP**, or **Shared OCP Extended**. After replacing the card, configure the appropriate NIC mode.

To set the NIC mode, refer *Server NIC Configuration* section in Configuration Guides for your Cisco IMC release.

- Or, after replacing the card, configure the appropriate NIC mode using Cisco IMC Configuration Utility/F8.

  Refer *Connecting to the Server Locally For Setup* section in Install and Upgrade Guides for your server.

- Or, after replacing the card, perform factory default settings using Cisco IMC Configuration Utility/F8 then perform the following steps:

  1. Once the server is rebooted, boot the system to Cisco IMC Configuration Utility/F8 then change the default password.

  2. Configure the appropriate NIC mode settings.

Table 12: Factory Default Settings

VIC in mLOM slot	Intel OCP 3.0 NIC in mLOM Slot	VIC in Riser Slot	Dedicated Management Port	NIC Mode for CIMC Access
Yes	No	No	Yes	**Cisco Card** mode with the card in mLOM Slot
No	Yes	No	Yes	**Shared OCP Extended**
No	Yes	Yes	Yes	**Shared OCP Extended**
No	No	Yes	Yes	**Cisco Card** with VIC SLOT based on precedence: **For C225 M6:** 1. Riser 1 - Slot 1 2. Riser 3 - Slot 3 **For C245 M6:** 1. Riser 1 - Slot 2 2. Riser 2 - Slot 5 3. Riser 1 - Slot 1 4. Riser 2 - Slot 4
No	No	No	Yes	**Dedicated**

Replacing an mLOM Card

The server supports a modular LOM (mLOM) card to provide additional rear-panel connectivity. The mLOM socket is on the motherboard, under PCIe Riser 1.

The mLOM socket provides a Gen-3 and Gen-4 x16 PCIe lane. The socket remains powered when the server is in 12 V standby power mode and it supports the network communications services interface (NCSI) protocol.

Procedure

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

a) Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

b) Slide the server 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 server from the rack.

c) Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

d) Remove the mRAID riser to provide access to the mLOM socket below the riser.

To remove the mRAID riser, use both hands to grasp the external blue handle on the rear and the blue finger-grip on the front. Lift straight up.

You do not have to disconnect cables from any RAID card or interposer card that is installed in the riser. Carefully move the riser aside only far enough to provide clearance.

e) Loosen the single captive thumbscrew that secures the mLOM card to the threaded standoff on the chassis floor.

f) Slide the mLOM card horizontally to free it from the socket, then lift it out of the server.

Step 2 Install a new mLOM card:

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

b) Push the card horizontally to fully engage the card's edge connector with the socket.

c) Tighten the captive thumbscrew to secure the card to the standoff on the chassis floor.

d) Return the mRAID riser to its socket.

Carefully align the riser's edge connector with the motherboard socket at the same time you align the two channels on the riser with the two pegs on the inner chassis wall. Press down evenly on both ends of the riser to fully engage its connector with the motherboard socket.

e) Replace the top cover to the server.

f) Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.

Figure 20: mLOM Card Location
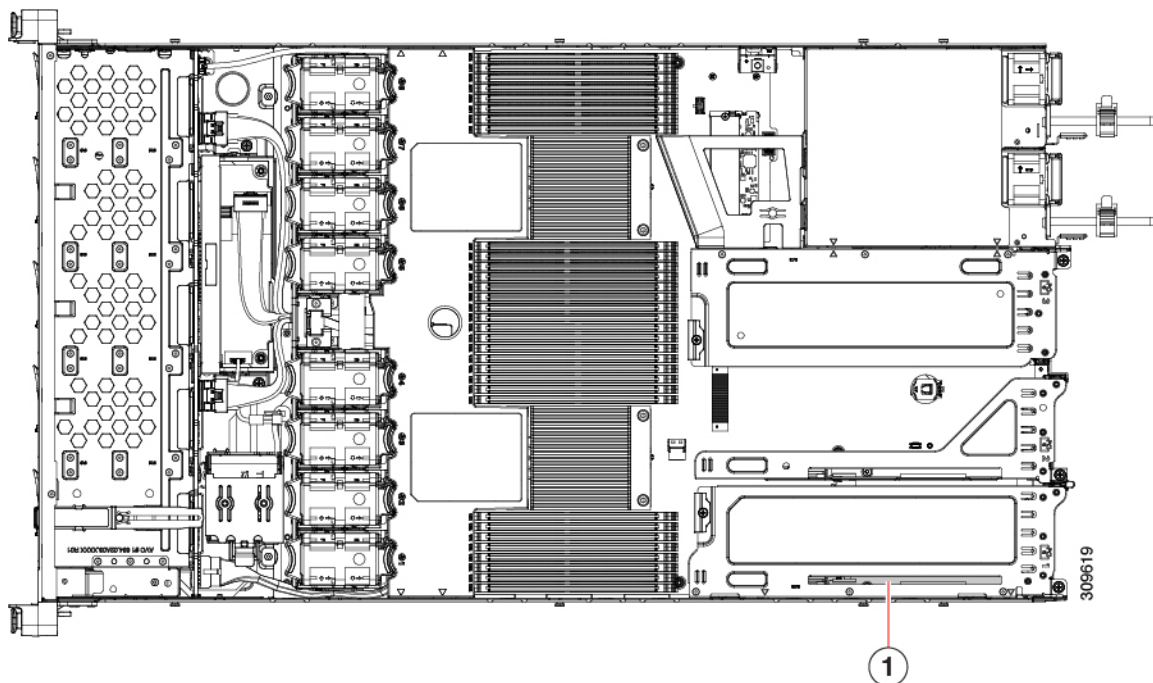
Position of horizontal mLOM card socket

Replacing a SAS Storage Controller Card (RAID or HBA)

For hardware-based storage control, the server can use a Cisco modular SAS RAID controller or SAS HBA that plugs into a dedicated, vertical socket on the motherboard.

Storage Controller Card Firmware Compatibility

Firmware on the storage controller (RAID or HBA) must be verified for compatibility with the current Cisco IMC and BIOS versions that are installed on the server. If not compatible, upgrade or downgrade the storage controller firmware using the Host Upgrade Utility (HUU) for your firmware release to bring it to a compatible level.

Note   For servers running in standalone mode only: After you replace controller hardware (UCSC-RAID-M6, UCSC-RAID-M6HD, UCSC-SAS-M6, or UCSC-SAS-M6HD), you must run the Cisco UCS Host Upgrade Utility (HUU) to update the controller firmware, even if the firmware Current Version is the same as the Update Version. This is necessary to program the controller's suboem-id to the correct value for the server SKU. If you do not do this, drive enumeration might not display correctly in the software. This issue does not affect servers controlled in UCSM mode.

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

Replacing a SAS Storage Controller Card (RAID or HBA)

Procedure

Step 1   Prepare the server for component installation:

a)   Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

b)   Slide the server 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 server from the rack.

c)   Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

Step 2   Remove any existing storage controller card from the server:

> **Note**   The chassis includes a plastic mounting bracket that the card must be attached to before installation. During replacement, you must remove the old card from the bracket and then install the new card to the bracket before installing this assembly to the server.

a)   Disconnect SAS/SATA cables and any Supercap cable from the existing card.

b)   Lift up on the card's blue ejector lever to unseat it from the motherboard socket.

c)   Lift straight up on the card's carrier frame to disengage the card from the motherboard socket and to disengage the frame from two pegs on the chassis wall.

d)   Remove the existing card from its plastic carrier bracket. Carefully push the retainer tabs aside and then lift the card from the bracket.

Step 3   Install a new storage controller card:

a)   Install the new card to the plastic carrier bracket. Make sure that the retainer tabs close over the edges of the card.

b)   Position the assembly over the chassis and align the card edge with the motherboard socket. At the same time, align the two slots on the back of the carrier bracket with the pegs on the chassis inner wall.

c)   Push on both corners of the card to seat its connector in the riser socket. At the same time, ensure that the slots on the carrier frame engage with the pegs on the inner chassis wall.

d)   Fully close the blue ejector lever on the card to lock the card into the socket.

e)   Connect SAS/SATA cables and any Supercap cable to the new card.

If this is a first-time installation, see Storage Controller Cable Connectors and Backplanes for cabling instructions.

Step 4   Replace the top cover to the server.

Step 5   Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.

Step 6   If your server is running in standalone mode, use the Cisco UCS Host Upgrade Utility to update the controller firmware and program the correct suboem-id for the controller.

Note   **For servers running in standalone mode only:** After you replace controller hardware (UCSC-RAID-M6HD and UCSC-SAS-M6HD), you must run the Cisco UCS Host Upgrade Utility (HUU) to update the controller firmware, even if the firmware Current Version is the same as the Update Version. This is necessary to program the controller's suboem-id to the correct value for the server SKU. If you do not do this, drive enumeration might not display correctly in the software. This issue does not affect servers controlled in UCSM mode.

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

Figure 21: Storage Controller Card Location
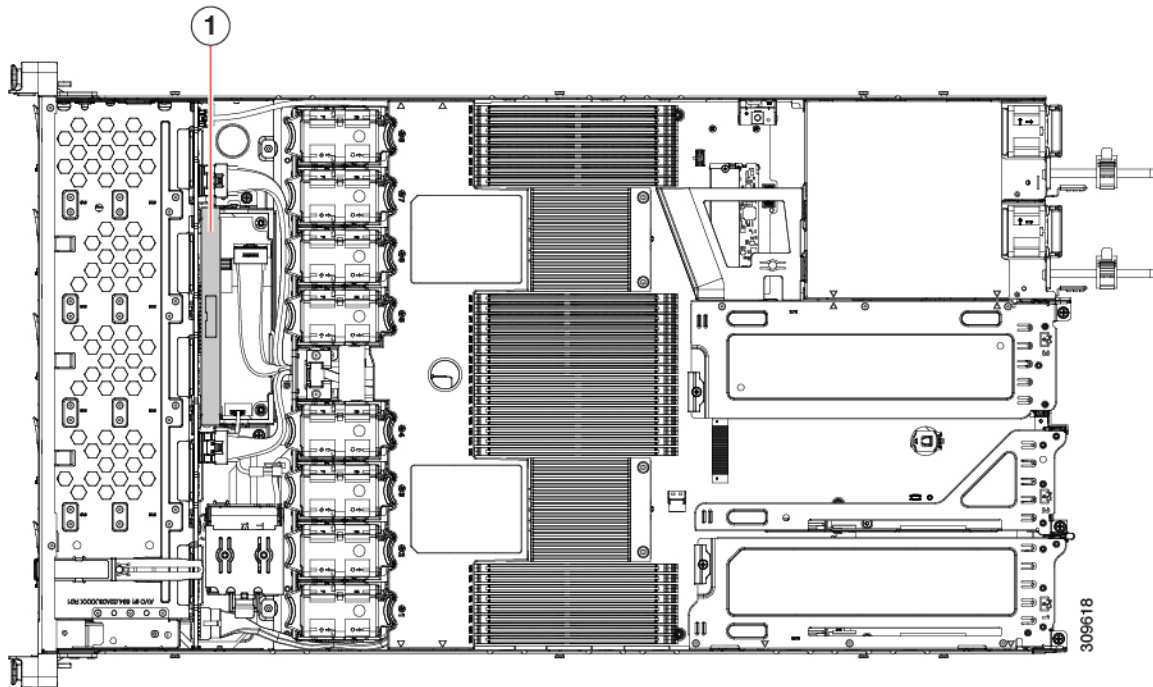
| 1 | Storage controller card location |

Replacing the Supercap (RAID Backup)

This server supports installation of one Supercap unit. The unit mounts to a bracket that is in the middle of the row of cooling fan modules.

The Supercap 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.

Procedure

Step 1   Prepare the server for component installation:

a) Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

b) Slide the server 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 server from the rack.

c) Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

Step 2 Remove an existing Supercap:
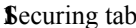
a) Disconnect the Supercap cable from the existing Supercap.

b) Push aside the securing tab to open the hinged latch that secures the Supercap to its bracket on the removable air baffle.

c) Lift the Supercap free of the bracket and set it aside.

Step 3 Install a new Supercap:

a) Set the new Supercap into the mounting bracket.

b) Close the hinged plastic clip over the Supercap. Push down until the securing tab clicks.

c) Connect the Supercap cable from the RAID controller card to the connector on the new Supercap cable.

Step 4 Replace the top cover to the server.

Step 5 Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.

1 Securing tab	2 Hinged latch

Replacing a Boot-Optimized M.2 RAID Controller Module

The Cisco Boot-Optimized M.2 RAID Controller module connects to the mini-storage module socket on the motherboard. It includes slots for two SATA M.2 drives that can control the SATA M.2 drives in a RAID 1 array and JBOD mode.

Replacing a Cisco Boot-Optimized M.2 RAID Controller

This topic describes how to remove and replace a Cisco Boot-Optimized M.2 RAID Controller. The controller board has one M.2 socket on its top (Slot 1) and one M.2 socket on its underside (Slot 2).

Procedure

Step 1 Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

Step 2 Slide the server 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 server from the rack.

Step 3 Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

Step 4   Grasp and remove the air baffle located between CPU 2 and PCIe Riser 3.
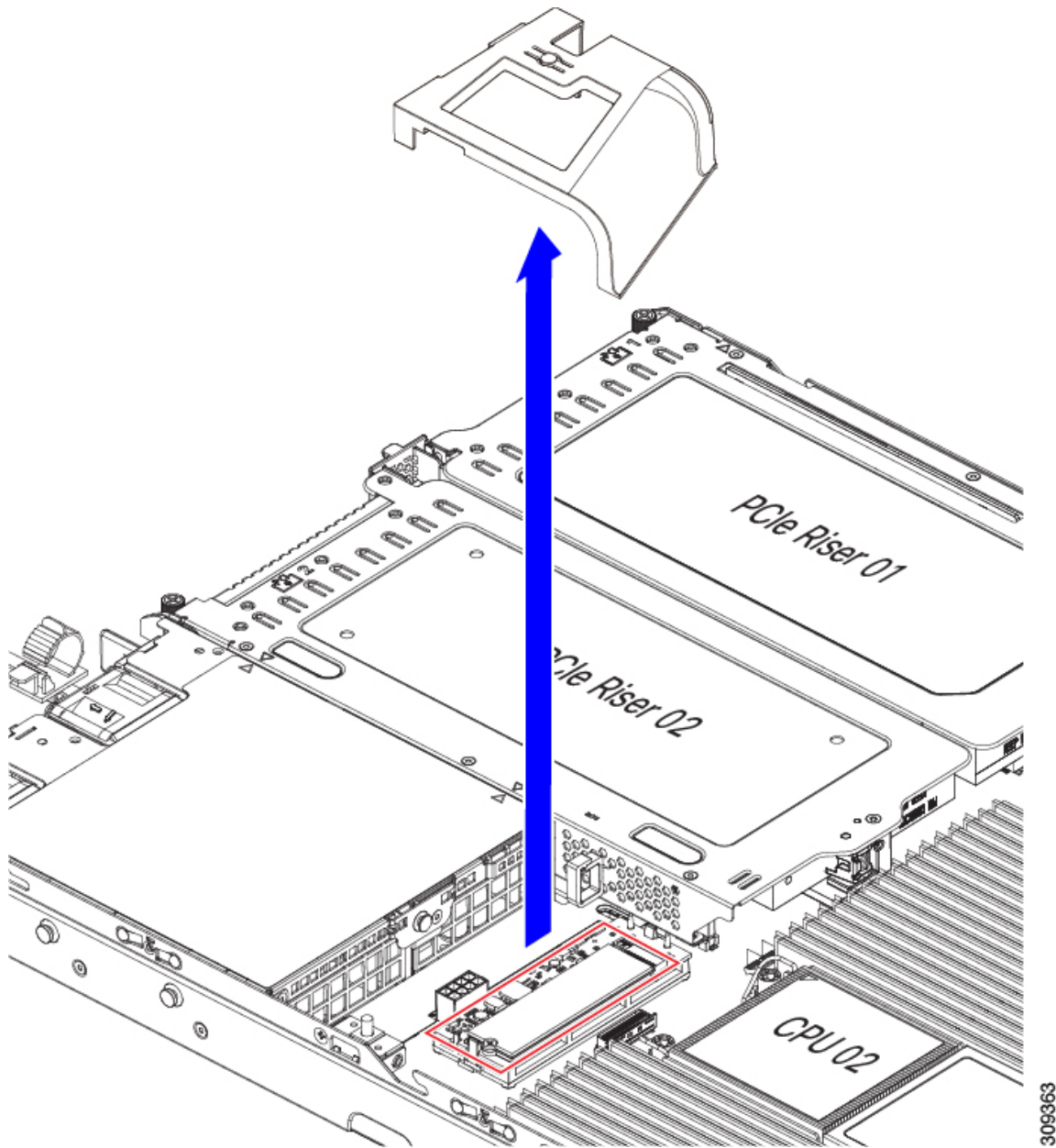
Step 5   Remove a controller from its motherboard socket:

    a) Locate the controller in its socket just behind CPU 2.

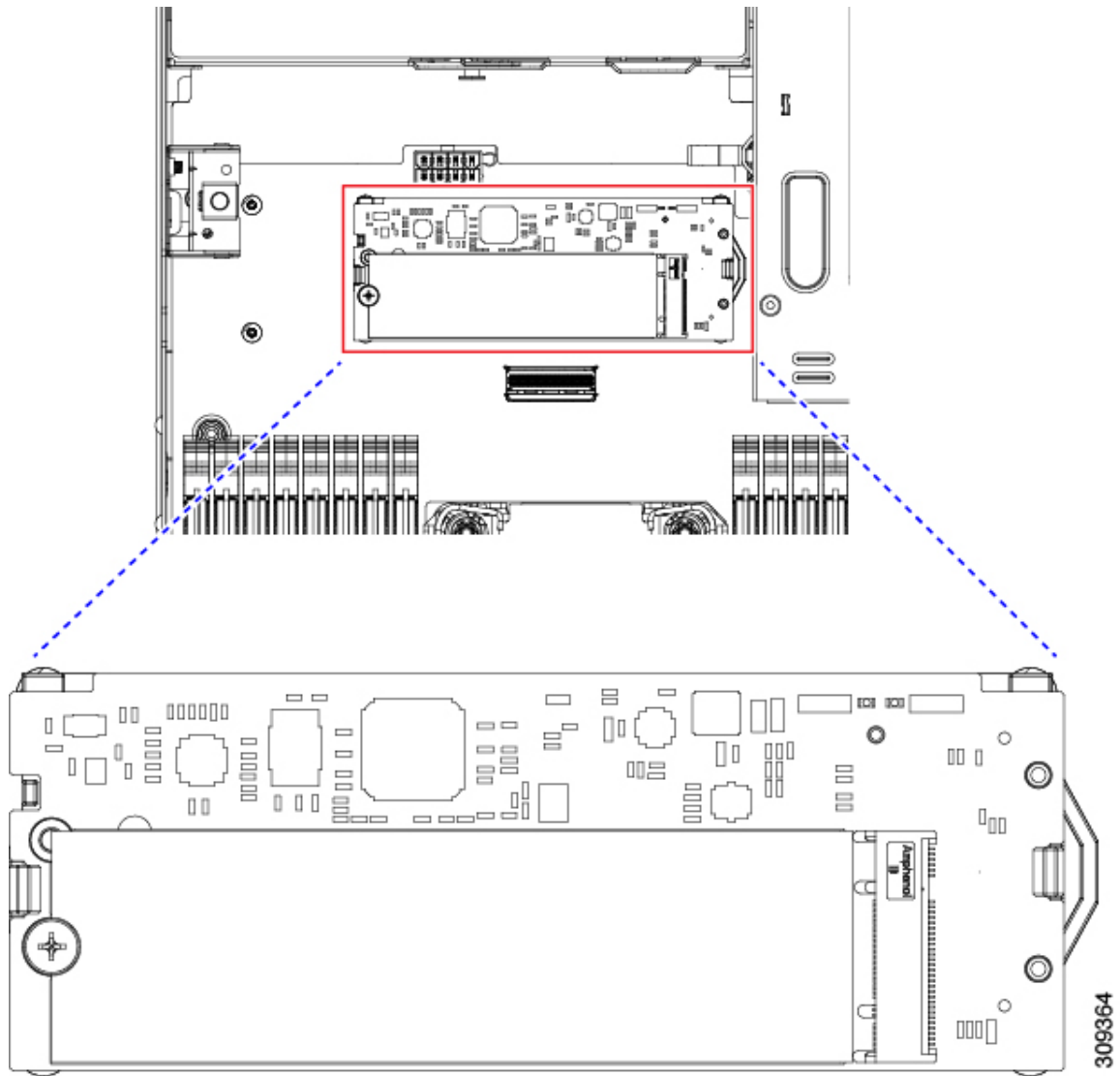b) At each end of the controller board, push outward on the clip that secures the carrier.

c) Lift both ends of the controller to disengage it from the socket on the motherboard.

d) Set the carrier on an anti-static surface.

1 Location of socket on motherboard	**3** Securing clips
2 Alignment pegs	-

Step 6   If you are transferring SATA M.2 drives from the old controller to the replacement controller, do that before installing the replacement controller:

> **Note**   Any previously configured volume and data on the drives are preserved when the M.2 drives are transferred to the new controller. The system will boot the existing OS that is installed on the drives.

a) Use a #1 Phillips-head screwdriver to remove the single screw that secures the M.2 drive to the carrier.

b) Lift the M.2 drive from its socket on the carrier.

c) Position the replacement M.2 drive over the socket on the controller board.

d) Angle the M.2 drive downward and insert the connector-end into the socket on the carrier. The M.2 drive's label must face up.

e) Press the M.2 drive flat against the carrier.

f) Install the single screw that secures the end of the M.2 SSD to the carrier.

g) Turn the controller over and install the second M.2 drive.

Figure 22: Cisco Boot-Optimized M.2 RAID Controller, Showing M.2 Drive Installation
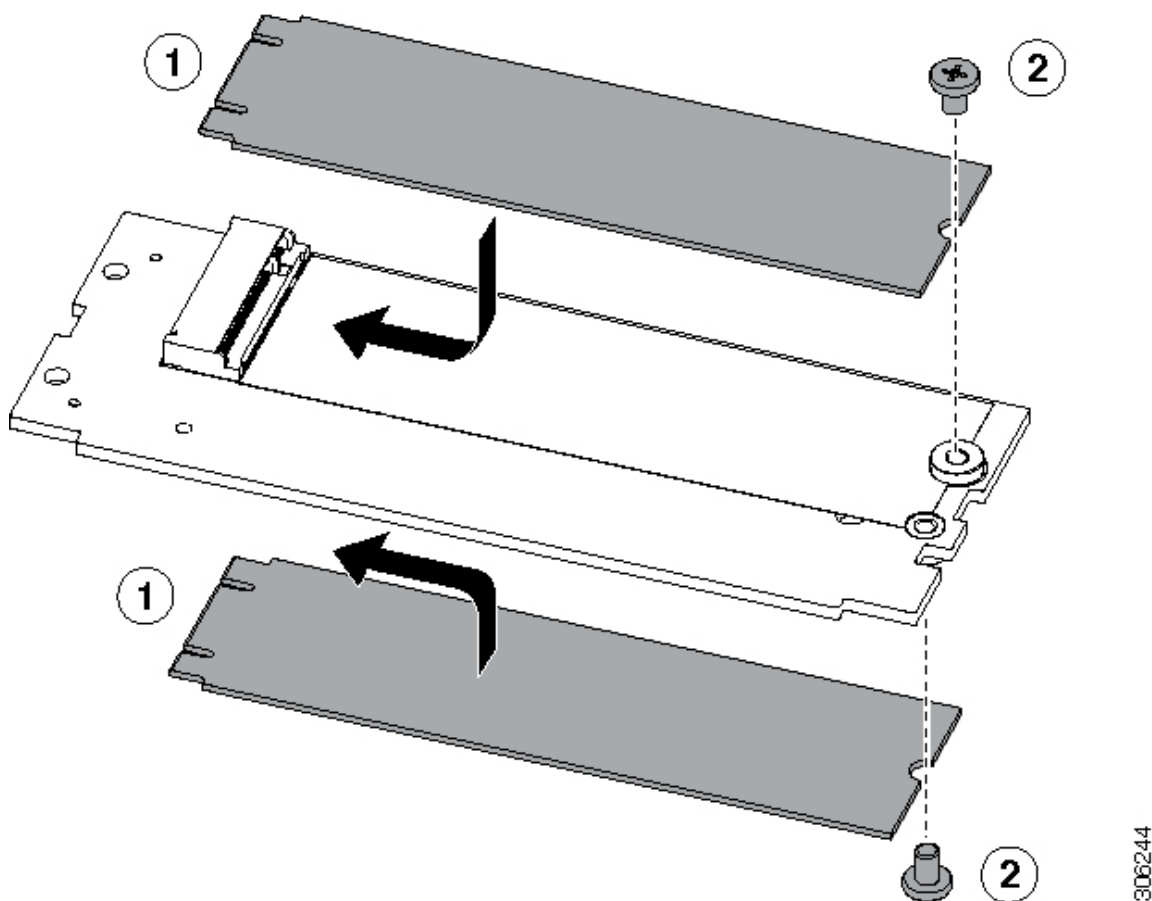
Step 7 Install the controller to its socket on the motherboard:

a) Position the controller over socket, with the controller's connector facing down and at the same end as the motherboard socket. Two alignment pegs must match with two holes on the controller.

b) Gently push down the socket end of the controller so that the two pegs go through the two holes on the controller.

c) Push down on the controller so that the securing clips click over it at both ends.

**Step 8** Replace the top cover to the server.

Step 9 Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.

Replacing a Chassis Intrusion Switch

The chassis intrusion switch in an optional security feature that logs an event in the system event log (SEL) whenever the cover is removed from the chassis.

Procedure

Step 1   Prepare the server for component installation:

a)   Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.

b)   Slide the server 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 server from the rack.

c)   Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

Step 2   Remove an existing intrusion switch:

a)   Disconnect the intrusion switch cable from the socket on the motherboard.

b)   Use a #1 Phillips-head screwdriver to loosen and remove the single screw that holds the switch mechanism to the chassis wall.

c)   Slide the switch mechanism straight up to disengage it from the clips on the chassis.

Step 3   Install a new intrusion switch:

a)   Slide the switch mechanism down into the clips on the chassis wall so that the screwhole lines up.

b)   Use a #1 Phillips-head screwdriver to install the single screw that secures the switch mechanism to the chassis wall.

c)   Connect the switch cable to the socket on the motherboard.

Step 4   Replace the cover to the server.

Step 5   Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.

Figure 23: Intrusion Switch Location
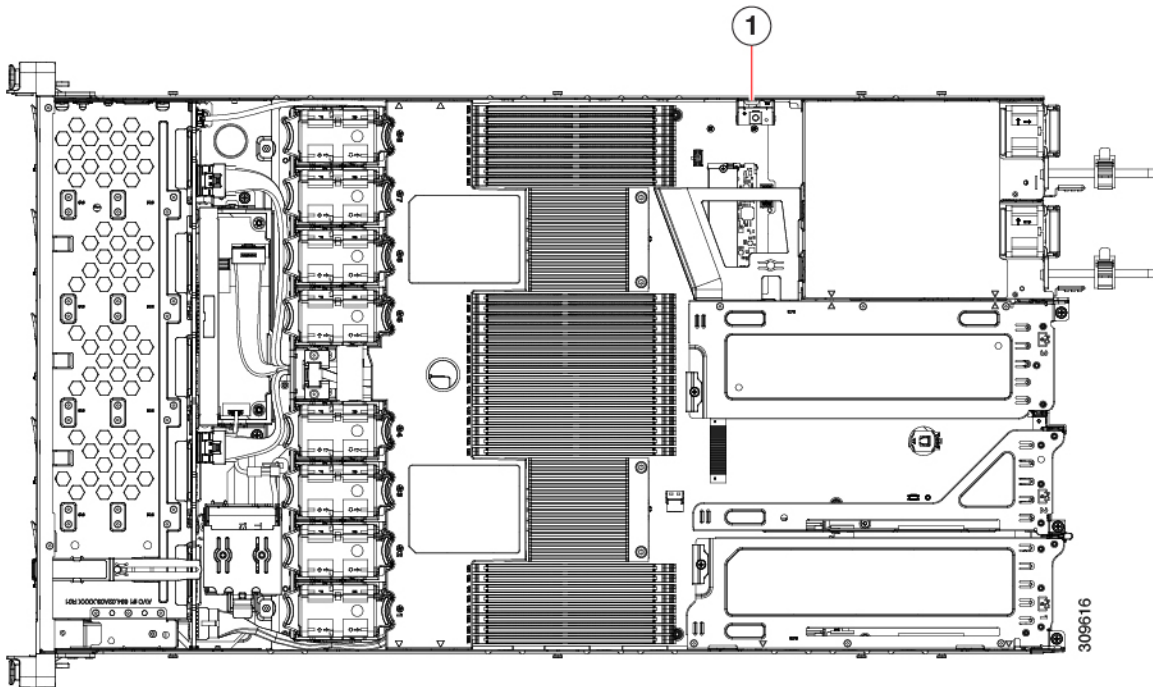
1	Intrusion switch location

Installing a Trusted Platform Module (TPM)

The trusted platform module (TPM) is a small circuit board that plugs into a motherboard socket and is then permanently secured with a one-way screw.

TPM Considerations

- This server supports either TPM version 1.2 or TPM version 2.0.

- Field replacement of a TPM is not supported; you can install a TPM after-factory only if the server does not already have a TPM installed.

- If there is an existing TPM 1.2 installed in the server, you cannot upgrade to TPM 2.0. If there is no existing TPM in the server, you can install TPM 2.0.

- If the TPM 2.0 becomes unresponsive, reboot the server.

Installing and Enabling a TPM

Note Field replacement of a TPM is not supported; you can install a TPM after-factory only if the server does not already have a TPM installed.

This topic contains the following procedures, which must be followed in this order when installing and enabling a TPM:

1. Installing the TPM Hardware
2. Enabling the TPM in the BIOS
3. Enabling the Intel TXT Feature in the BIOS

Installing TPM Hardware

Note For security purposes, the TPM is installed with a one-way screw. It cannot be removed with a standard screwdriver.

Procedure

Step 1 Prepare the server for component installation:
   a) Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7.
   b) Slide the server 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 server from the rack.

   c) Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

Step 2 Check if there is a card installed in PCIe riser 2:

   • If no card is installed in PCIe riser 2, you can access the TPM socket. Go to the next step.

   • If a card is installed in PCIe riser 2, remove the PCIe riser assembly from the chassis to provide clearance before continuing with the next step. See Replacing a PCIe Card, on page 51 for instructions on removing the PCIe riser.

Step 3 Install a TPM:
   a) Locate the TPM socket on the motherboard, as shown below.
   b) Align the connector that is on the bottom of the TPM circuit board with the motherboard TPM socket. Align the screw hole 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.
   e) If you removed the PCIe riser assembly to provide clearance, return it to the server now.

Step 4   Replace the cover to the server.

Step 5   Replace the server in the rack, replace cables, and then fully power on the server by pressing the Power button.

Figure 24: TPM Socket Location on Motherboard
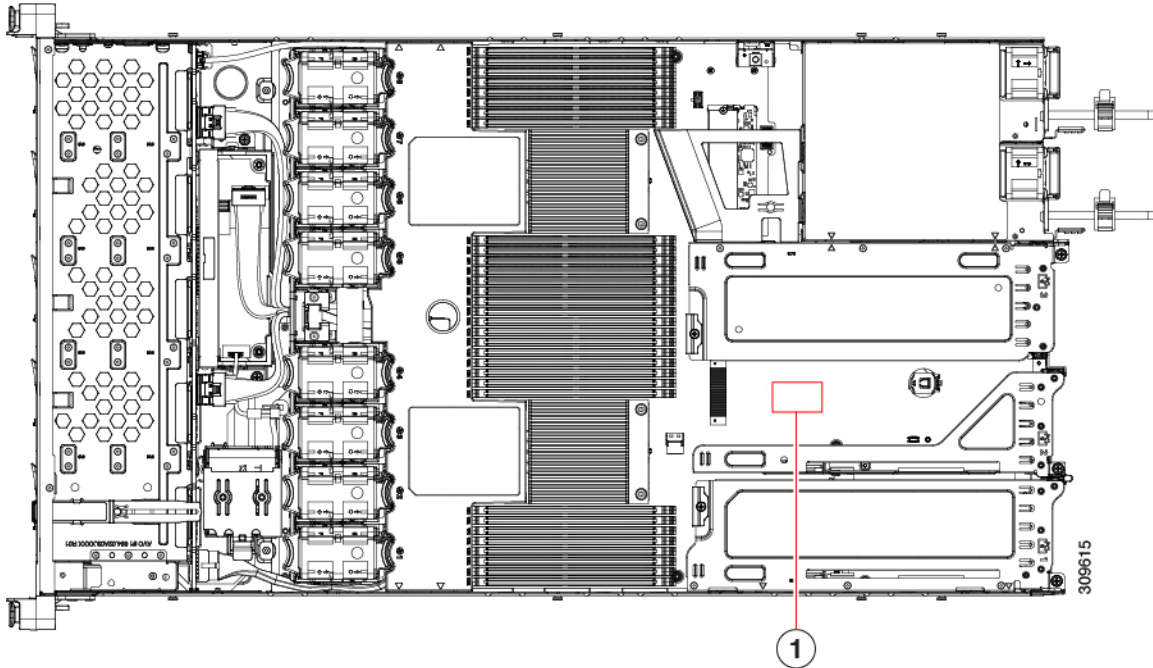
1	TPM socket location on motherboard below any card in PCIe riser 2

Step 6   Continue with .

Enabling the TPM in the BIOS

After hardware installation, you must enable TPM support in the BIOS.

Note   You must set a BIOS Administrator password before performing this procedure. To set this password, press the **F2** key when prompted during system boot to enter the BIOS Setup utility. Then navigate to **Security > Set Administrator Password** and enter the new password twice as prompted.

Procedure

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 server.

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.

Removing the PCB Assembly (PCBA)

The PCBA is secured to the server's sheet metal. You must disconnect the PCBA from the tray before recycling the PCBA. The PCBA is secured by different types of fasteners.

Before you begin

Note   **For Recyclers Only!** This procedure is not a standard field-service option. This procedure is for recyclers who will be reclaiming the electronics for proper disposal to comply with local eco design and e-waste regulations.

To remove the printed circuit board assembly (PCBA), the following requirements must be met:

- The server must be disconnected from facility power.
- The server must be removed from the equipment rack.
- The server's top cover must be removed. See .

Following tools are required:

- Pliers
- T10 Torx screwdriver

Procedure

Step 1   Locate the PCBA's mounting screws.

The following figure shows the location of the mounting screws and fasteners.

Figure 25: Screw Locations for Removing the UCS C225 M6 PCBA
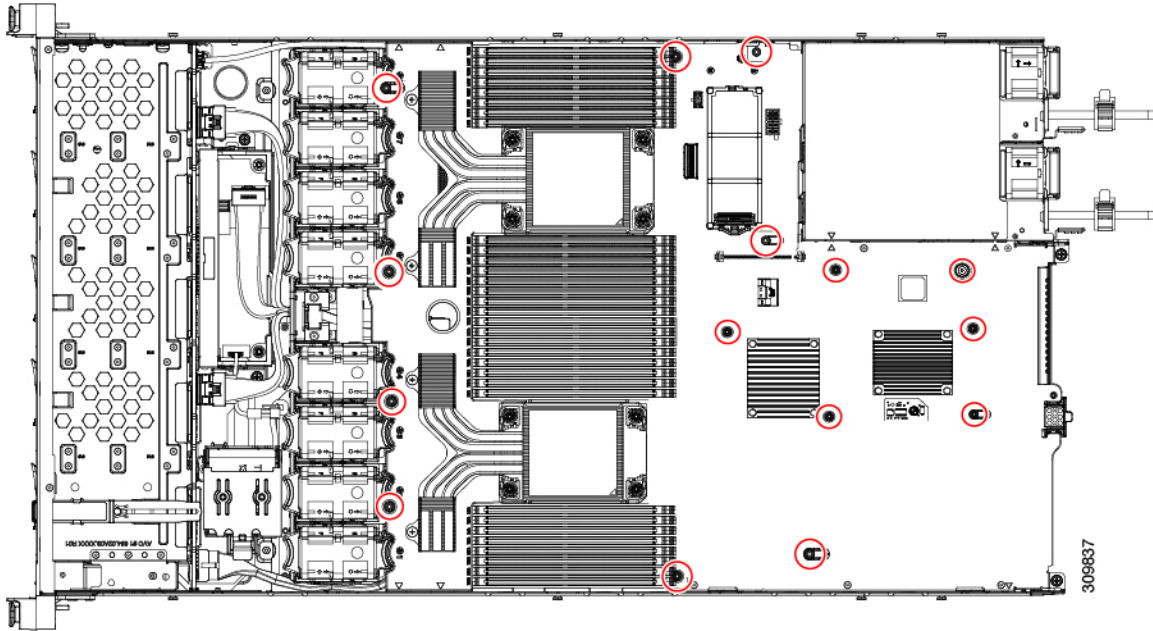
Step 2   Using a T10 Torx driver, remove all of the indicated screws.

Step 3   Remove the PCBA from the sheetmetal and dispose of each in compliance with your local ewaste and recycling regulations.

Service DIP Switch, Headers and Jumpers

This server includes one DIP switch (SW4) and header (CN4) that you can user for certain service and debug functions.

This section contains the following topics:

Figure 26: Location of DIP Switch and Service Header Blocks SW4 and CN4
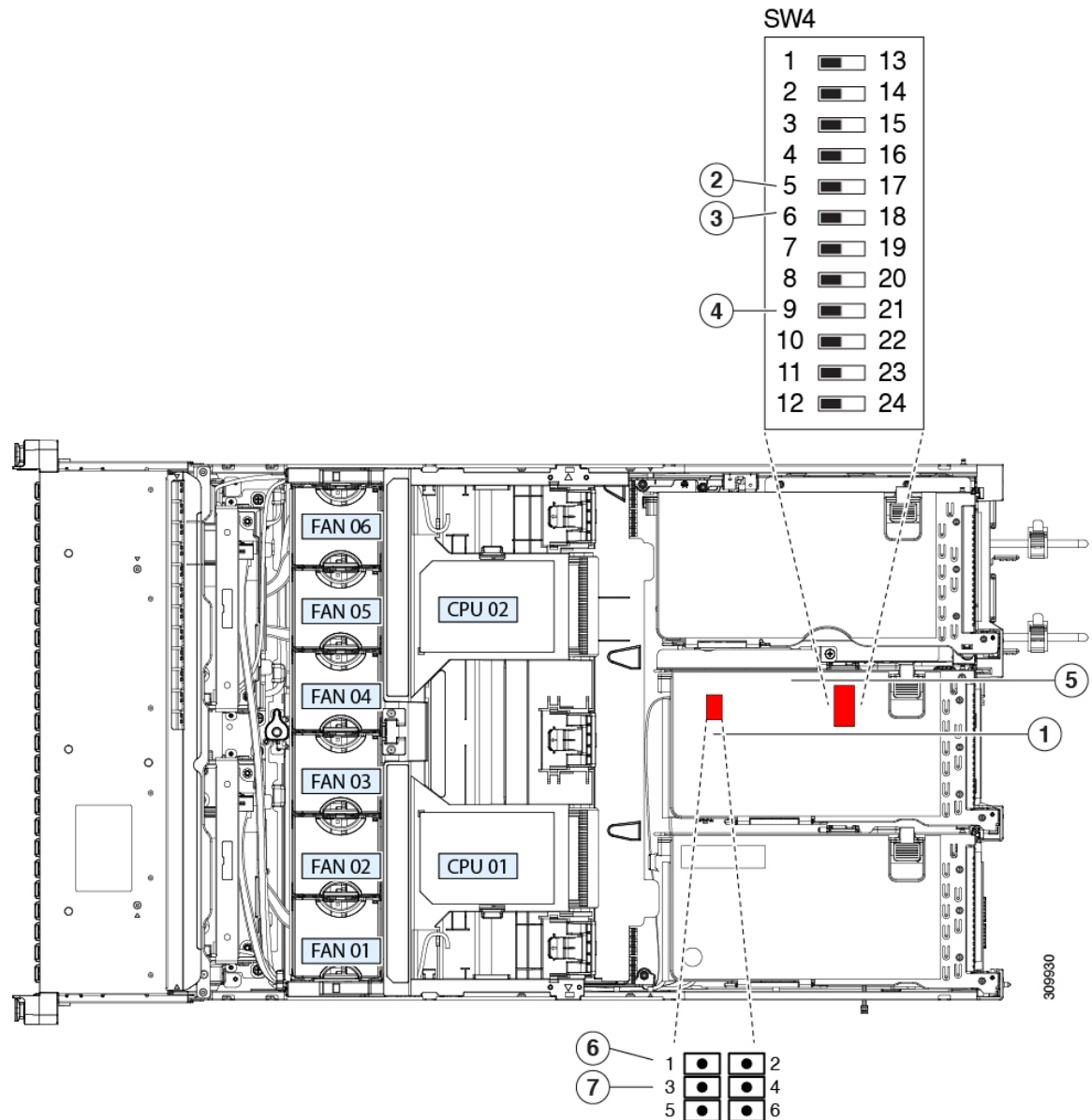
Location of header block CN4	Location of SW4 DIP switches
BIOS Recovery Switch (SW4 Switch 5 - 17) Off (Switch 5): Normal; ON (Switch 17): Recovery Mode	Boot Alternate Cisco IMC Header: CN4 pins 1 - 2
Clear BIOS Password Switch (SW4 Switch 6 - 18) Off (Switch 6): Normal; ON (Switch 18): Clear	System Secure Firmware Erase Header: CN3 pins 3 - 4
Clear CMOS Switch (SW4 Switch 9 - 21) Off (Switch 9): Normal; ON (Switch 21): Clear	

Using the BIOS Recovery Header (SW4, Pins 5 - 17)

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, a message similar to the following 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 bios.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 bios.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 bios.cap Recovery File

Procedure

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 drive. The recovery folder contains the bios.cap file that is required in this procedure.

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

Step 3   Insert the USB drive into a USB port on the server.

Step 4   Reboot the server.

Step 5   Return the server to main power mode by pressing the Power button on the front panel.

The server boots with the updated BIOS boot block. When the BIOS detects a valid bios.cap file on the USB 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 server to complete the BIOS update, and then remove the USB drive from the server.

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

Procedure 2: Use BIOS Recovery DIP Switch and bios.cap Recovery File

Procedure

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 drive. The recovery folder contains the bios.cap file that is required in this procedure.

> **Note**   The bios.cap file must be in the root directory of the USB drive. Do not rename this file. The USB drive must be formatted with either the FAT16 or FAT32 file system.

Step 3   Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7. Disconnect power cords from all power supplies.

Step 4   Slide the server 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 server from the rack.

Step 5   Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

Step 6   Locate the SW4 is DIP Switch shown in Service DIP Switch, Headers and Jumpers, on page 68. Default position is at Switch 5 (Off: normal). To set to BIOS recovery mode, switch to pin 17 position (ON: recovery mode).

Step 7   Reconnect AC power cords to the server. The server powers up to standby power mode.

Step 8   Insert the USB thumb drive that you prepared in Step 2 into a USB port on the server.

Step 9   Return the server to main power mode by pressing the Power button on the front panel.

The server boots with the updated BIOS boot block. When the BIOS detects a valid bios.cap file on the USB 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 10   Wait for server to complete the BIOS update, and then remove the USB drive from the server.

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

Step 11   After the server has fully booted, power off the server.

Step 12   Switch SW4 back to pin 5 position (Off: normal).

Step 13   Replace the top cover, replace the server in the rack, replace power cords and any other cables, and then power on the server by pressing the Power button.

Using the Clear BIOS Password Switch (SW4, Pins 6 - 18)

You can use SW4 DIP switch to clear the administrator password.

Procedure

Step 1   Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7. Disconnect power cords from all power supplies.

Step 2   Slide the server 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 server from the rack. |

Step 3   Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

Step 4   Locate the SW4 DIP Switch and pins 6-18, as shown in Service DIP Switch, Headers and Jumpers, on page 68.

Default position is at pin 6 (Off: normal).

Step 5   To clear BIOS password, switch to pin 18 position (On: clear).

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

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

| **Note** | You must allow the entire server 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 server to standby power mode, and then remove AC power cords from the server to remove all power.

Step 9   Remove the top cover from the server.

Step 10   Switch SW4 back to pin 6 position (Off: normal).

| **Note** | If SW4 is not switched back to pin 6 position, the password is cleared every time you power cycle the server. |

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

Using the Clear CMOS DIP Switch (SW4, Pins 9 - 21)

You can use this procedure to clear the server's CMOS settings in the case of a system hang. For example, if the server 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. |

Procedure

Step 1   Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7. Disconnect power cords from all power supplies.

Step 2   Slide the server 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 server from the rack.

Step 3   Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

Step 4   Locate SW4 DIP Swtich and pins 9-21, as shown in Service DIP Switch, Headers and Jumpers, on page 68.

           Default position is at pin 9 (Off: normal).

Step 5   To clear the CMOS, switch to pin 21 position (On: clear).

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

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

           Note   You must allow the entire server 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 server to standby power mode, and then remove AC power cords from the server to remove all power.

Step 9   Remove the top cover from the server.

Step 10   Switch SW4 back to pin 9 position (Off: normal).

           Note   If SW4 is not switched back to pin 9 position, the CMOS settings are reset to the defaults every time you power cycle the server.

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

Using the Boot Alternate Cisco IMC Image Header (CN4, Pins 1 - 2)

You can use this Cisco IMC debug header to force the system to boot from an alternate Cisco IMC image.

Procedure

Step 1   Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7. Disconnect power cords from all power supplies.

Step 2   Slide the server 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 server from the rack.

Step 3   Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

Step 4   Locate header block CN4, pins 1-2, as shown in Service DIP Switch, Headers and Jumpers, on page 68.

Step 5   Install a two-pin jumper across CN4 pins 1 and 2.

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

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

> **Note**   When you next log in to Cisco IMC, you see a message similar to the following:
>
> ```
> 'Boot from alternate image' debug functionality is enabled.
> CIMC will boot from alternate image on next reboot or input power cycle.
> ```

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

Step 9   Remove the top cover from the server.

Step 10   Remove the jumper that you installed.

> **Note**   If you do not remove the jumper, the server will boot from an alternate Cisco IMC image every time that you power cycle the server or reboot Cisco IMC.

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

Using the Reset Cisco IMC Password to Default Header (CN4, Pins 3 - 4)

You can use this Cisco IMC debug header to force the Cisco IMC password back to the default.

Procedure

Step 1   Shut down and remove power from the server as described in Shutting Down and Removing Power From the Server, on page 7. Disconnect power cords from all power supplies.

Step 2   Slide the server 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 server from the rack.

Step 3   Remove the top cover from the server as described in Removing the Server Top Cover, on page 9.

Step 4   Locate header block CN4, pins 3-4, as shown in Service DIP Switch, Headers and Jumpers, on page 68.

Step 5   Install a two-pin jumper across CN4 pins 3 and 4.

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

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

> **Note**   When you next log in to Cisco IMC, you see a message similar to the following:
>
> ```
> 'Reset to default CIMC password' debug functionality is enabled.
> On input power cycle, CIMC password will be reset to defaults.
> ```

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

Step 9   Remove the top cover from the server.

Step 10   Remove the jumper that you installed.

> **Note**   If you do not remove the jumper, the server will reset the Cisco IMC password to the default every time that you power cycle the server. The jumper has no effect if you reboot Cisco IMC.

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