



Cisco UCS C24 Server Installation and Service Guide

Covers Server Generation M3

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Preface

This preface describes the audience, organization, and conventions of the *Cisco UCS C24 Server Installation and Service Guide*. It also provides information about how to obtain related documentation.

Related Documentation

The documentation set for the Cisco Unified Computing System (UCS) C-Series rack-mount servers is described in the roadmap document at the following link:

[Cisco UCS C-Series Documentation Roadmap](#)

Organization

This guide is organized as follows:

Chapter	Title	Description
Chapter 1	Overview	Provides an overview of the server.
Chapter 2	Installing the Server	Describes how to install the server in a rack, how to cable and power on the server, and how to initially set up the server in standalone mode.
Chapter 3	Maintaining the Server	Describes the server LEDs and buttons, identifies the replaceable components of the server, and describes how to replace them.
Appendix A	Server Specifications	Lists physical, environmental, and power specifications for the server.
Appendix B	Power Cord Specifications	Lists specifications for the supported international power cords.
Appendix C	RAID Controller Considerations	Provides server RAID controller information.
Appendix D	Installation for Cisco UCS Integration	Provides installation and upgrade procedures for installing the server into Unified Computing System (UCS) integration.

Audience

This guide is for experienced network administrators who configure and maintain Cisco servers.

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to ucs-docfeedback@external.cisco.com. We appreciate your feedback.

Conventions

This document uses the following conventions for notes, cautions, and safety warnings. Notes and cautions contain important information that you should know.



Note

Means *reader take note*. Notes contain helpful suggestions or references to material that are not covered in the publication.



Caution

Means *reader be careful*. Cautions contain information about something you might do that could result in equipment damage or loss of data.

Safety warnings appear throughout this guide in procedures that, if performed incorrectly, can cause physical injuries. A warning symbol precedes each warning statement.



Warning

IMPORTANT SAFETY INSTRUCTIONS

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

SAVE THESE INSTRUCTIONS

Waarschuwing

BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van de standaard praktijken om ongelukken te voorkomen. Gebruik het nummer van de verklaring onderaan de waarschuwing als u een vertaling van de waarschuwing die bij het apparaat wordt geleverd, wilt raadplegen.

BEWAAR DEZE INSTRUCTIES

Varoitus TÄRKEITÄ TURVALLISUUSOHJEITA

Tämä varoitusmerkki merkitsee vaaraa. Tilanne voi aiheuttaa ruumiillisia vammoja. Ennen kuin käsittelet laitteistoa, huomioi sähköpiirien käsittelemiseen liittyvät riskit ja tutustu onnettomuuksien yleisiin ehkäisytapoihin. Turvallisuusvaroitusten käännökset löytyvät laitteen mukana toimitettujen käännettyjen turvallisuusvaroitusten joukosta varoitusten lopussa näkyvien lausuntonumeroiden avulla.

SÄILYTÄ NÄMÄ OHJEET**Attention IMPORTANTES INFORMATIONS DE SÉCURITÉ**

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS**Warnung WICHTIGE SICHERHEITSHINWEISE**

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.**Avvertenza IMPORTANTI ISTRUZIONI SULLA SICUREZZA**

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di intervenire su qualsiasi apparecchiatura, occorre essere al corrente dei pericoli relativi ai circuiti elettrici e conoscere le procedure standard per la prevenzione di incidenti. Utilizzare il numero di istruzione presente alla fine di ciascuna avvertenza per individuare le traduzioni delle avvertenze riportate in questo documento.

CONSERVARE QUESTE ISTRUZIONI**Advarsel VIKTIGE SIKKERHETSINSTRUKSJONER**

Dette advarselssymbolet betyr fare. Du er i en situasjon som kan føre til skade på person. Før du begynner å arbeide med noe av utstyret, må du være oppmerksom på farene forbundet med elektriske kretser, og kjenne til standardprosedyrer for å forhindre ulykker. Bruk nummeret i slutten av hver advarsel for å finne oversettelsen i de oversatte sikkerhetsadvarslene som fulgte med denne enheten.

TA VARE PÅ DISSE INSTRUKSJONENE

Aviso INSTRUÇÕES IMPORTANTES DE SEGURANÇA

Este símbolo de aviso significa perigo. Você está em uma situação que poderá ser causadora de lesões corporais. Antes de iniciar a utilização de qualquer equipamento, tenha conhecimento dos perigos envolvidos no manuseio de circuitos elétricos e familiarize-se com as práticas habituais de prevenção de acidentes. Utilize o número da instrução fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham este dispositivo.

GUARDE ESTAS INSTRUÇÕES**¡Advertencia! INSTRUCCIONES IMPORTANTES DE SEGURIDAD**

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES**Varning! VIKTIGA SÄKERHETSANVISNINGAR**

Denna varningssignal signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanliga förfaranden för att förebygga olyckor. Använd det nummer som finns i slutet av varje varning för att hitta dess översättning i de översatta säkerhetsvarningar som medföljer denna anordning.

SPARA DESSA ANVISNINGAR**Figyelem FONTOS BIZTONSÁGI ELOÍRÁSOK**

Ez a figyelmeztető jel veszélyre utal. Sérülésveszélyt rejte helyzetben van. Mielőtt bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplő figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján kereshető meg.

ORIZZE MEG EZEKET AZ UTASÍTÁSOKAT!**Предупреждение ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ**

Этот символ предупреждения обозначает опасность. То есть имеет место ситуация, в которой следует опасаться телесных повреждений. Перед эксплуатацией оборудования выясните, каким опасностям может подвергаться пользователь при использовании электрических цепей, и ознакомьтесь с правилами техники безопасности для предотвращения возможных несчастных случаев. Воспользуйтесь номером заявления, приведенным в конце каждого предупреждения, чтобы найти его переведенный вариант в переводе предупреждений по безопасности, прилагаемом к данному устройству.

СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ

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此警告符号代表危险。您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾提供的声明号码来找到此设备的安全性警告说明的翻译文本。

请保存这些安全性说明

的标准工作程序。请 **安全上の重要な注意事項**

「危険」の意味です。人身事故を予防するための注意事項が記述されています。装置の取り扱い作業を行うときは、電気回路の危険性に注意し、一般的な事故防止策に留意してください。警告の各国語版は、各注意事項の番号を基に、装置に付属の「Translated Safety Warnings」を参照してください。

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Este símbolo de aviso significa perigo. Você se encontra em uma situação em que há risco de lesões corporais. Antes de trabalhar com qualquer equipamento, esteja ciente dos riscos que envolvem os circuitos elétricos e familiarize-se com as práticas padrão de prevenção de acidentes. Use o número da declaração fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham o dispositivo.

GUARDE ESTAS INSTRUÇÕES**Advarsel** **VIGTIGE SIKKERHEDSANVISNINGER**

Dette advarselssymbol betyder fare. Du befinder dig i en situation med risiko for legemeskade. Før du begynder arbejde på udstyr, skal du være opmærksom på de involverede risici, der er ved elektriske kredsløb, og du skal sætte dig ind i standardprocedurer til undgåelse af ulykker. Brug erklæringsnummeret efter hver advarsel for at finde oversættelsen i de oversatte advarsler, der fulgte med denne enhed.

GEM DISSE ANVISNINGER**تحذير****إرشادات الأمان الهامة**

يوضح رمز التحذير هذا وجود خطر. وهذا يعني أنك متواجد في مكان قد ينتج عنه التعرض لإصابات. قبل بدء العمل، احذر مخاطر التعرض للصدمات الكهربائية وكن على علم بالإجراءات القياسية للحيلولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في أحر كل تحذير لتحديد مكان ترجمته داخل تحذيرات الأمان المترجمة التي تأتي مع الجهاز. قم بحفظ هذه الإرشادات

Upozorenje VAŽNE SIGURNOSNE NAPOMENE

Ovaj simbol upozorenja predstavlja opasnost. Nalazite se u situaciji koja može prouzročiti tjelesne ozljede. Prije rada s bilo kojim uređajem, morate razumjeti opasnosti vezane uz električne sklopove, te biti upoznati sa standardnim načinima izbjegavanja nesreća. U prevedenim sigurnosnim upozorenjima, priloženima uz uređaj, možete prema broju koji se nalazi uz pojedino upozorenje pronaći i njegov prijevod.

SAČUVAJTE OVE UPUTE**Upozornění DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY**

Tento upozorňující symbol označuje nebezpečí. Jste v situaci, která by mohla způsobit nebezpečí úrazu. Před prací na jakémkoliv vybavení si uvědomte nebezpečí související s elektrickými obvody a seznamte se se standardními opatřeními pro předcházení úrazům. Podle čísla na konci každého upozornění vyhledejte jeho překlad v přeložených bezpečnostních upozorněních, která jsou přiložena k zařízení.

USCHOVEJTE TYTO POKYNY**Προειδοποίηση ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ**

Αυτό το προειδοποιητικό σύμβολο σημαίνει κίνδυνο. Βρίσκεστε σε κατάσταση που μπορεί να προκαλέσει τραυματισμό. Πριν εργαστείτε σε οποιοδήποτε εξοπλισμό, να έχετε υπόψη σας τους κινδύνους που σχετίζονται με τα ηλεκτρικά κυκλώματα και να έχετε εξοικειωθεί με τις συνήθειες πρακτικές για την αποφυγή ατυχημάτων. Χρησιμοποιήστε τον αριθμό δήλωσης που παρέχεται στο τέλος κάθε προειδοποίησης, για να εντοπίσετε τη μετάφρασή της στις μεταφρασμένες προειδοποιήσεις ασφαλείας που συνοδεύουν τη συσκευή.

ΦΥΛΑΞΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ**אזהרה****הוראות בטיחות חשובות**

סימן אזהרה זה מסמל סכנה. אתה נמצא במצב העלול לגרום לפציעה. לפני שתעבוד עם ציוד כלשהו, עליך להיות מודע לסכנות הכרוכות במעגלים חשמליים ולהכיר את הנהלים המקובלים למניעת תאונות. השתמש במספר ההוראה המסופק בסופה של כל אזהרה כדי לאתר את התרגום באזהרות הבטיחות המתורגמות שמצורפות להתקן.

שמור הוראות אלה**Opomena VAŽNI BEZBEDNOSNI NAPATSTVIJA**

Симболот за предупредување значи опасност. Се наоѓате во ситуација што може да предизвика телесни повреди. Пред да работите со опремата, бидете свесни за ризикот што постои кај електричните кола и треба да ги познавате стандардните постапки за спречување на несреќни случаи. Искористете го бројот на изјавата што се наоѓа на крајот на секое предупредување за да го најдете неговиот период во prevedените безбедносни предупредувања што се испорачани со уредот.

ЧУВАЈТЕ ГИ ОБИЕ НАПАТСТВИЈА

Ostrzeżenie WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA

Ten symbol ostrzeżenia oznacza niebezpieczeństwo. Zachodzi sytuacja, która może powodować obrażenia ciała. Przed przystąpieniem do prac przy urządzeniach należy zapoznać się z zagrożeniami związanymi z układami elektrycznymi oraz ze standardowymi środkami zapobiegania wypadkom. Na końcu każdego ostrzeżenia podano numer, na podstawie którego można odszukać tłumaczenie tego ostrzeżenia w dołączonym do urządzenia dokumencie z tłumaczeniami ostrzeżeń.

NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ**Upozornenie DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY**

Tento varovný symbol označuje nebezpečenstvo. Nachádzate sa v situácii s nebezpečenstvom úrazu. Pred prácou na akomkoľvek vybavení si uvedomte nebezpečenstvo súvisiace s elektrickými obvodmi a oboznámte sa so štandardnými opatreniami na predchádzanie úrazom. Podľa čísla na konci každého upozornenia vyhľadajte jeho preklad v preložených bezpečnostných upozorneniach, ktoré sú priložené k zariadeniu.

USCHOVAJTE SI TENTO NÁVOD**Opozorilo POMEMBNI VARNOSTNI NAPOTKI**

Ta opozorilni simbol pomeni nevarnost. Nahajate se v situaciji, kjer lahko pride do telesnih poškodb. Preden pričnete z delom na napravi, se morate zavedati nevarnosti udara električnega toka, ter tudi poznati preventivne ukrepe za preprečevanje takšnih nevarnosti. Uporabite obrazložitevno številko na koncu posameznega opozorila, da najdete opis nevarnosti v priloženem varnostnem priročniku.

SHRANITE TE NAPOTKE!**警告****重要安全性指示**

此警告符號代表危險，表示可能造成人身傷害。使用任何設備前，請留心電路相關危險，並熟悉避免意外的標準作法。您可以使用每項警告後的聲明編號，查詢本裝置隨附之安全性警告譯文中的翻譯。請妥善保留此指示

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS Version 2.0.



CHAPTER 1

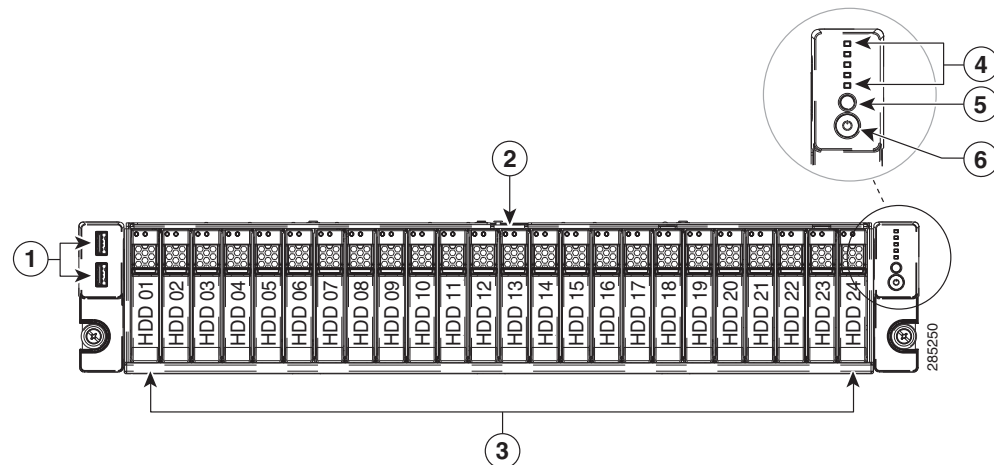
Overview

This chapter provides an overview of the Cisco UCS C24 server features.

The figures in this chapter show an overview of external server features. Internal server features are illustrated in [Figure 3-4 on page 3-9](#).

[Figure 1-1](#) shows the front panel features of the server. For definitions of all LED states, see [Status LEDs and Buttons, page 3-2](#).

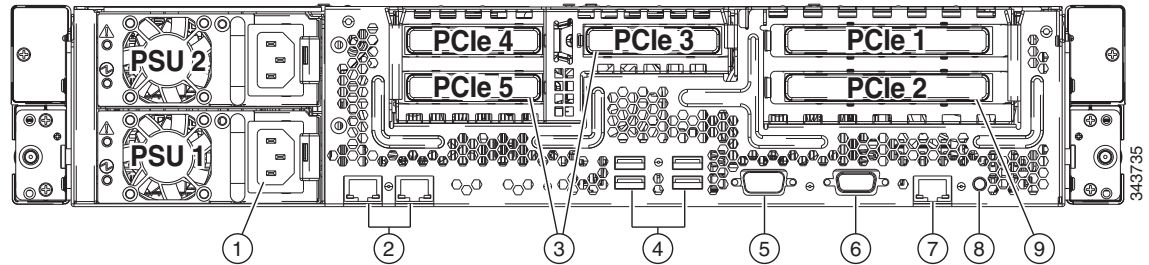
Figure 1-1 Cisco UCS C24 Server (Small Form Factor Drives) Front Panel Features



1	USB 2.0 ports (two)	4	Status LEDs (top to bottom): Network activity LED Power supply status LED Temperature status LED Fan Status LED System status LED
2	Pull-out asset tag	5	Identification button/LED
3	Drives, hot-swappable (up to twenty-four 2.5-inch drives)	6	Power button/Power status LED

Figure 1-2 shows the rear panel features of the server. For definitions of all LED states, see [Status LEDs and Buttons](#), page 3-2.

Figure 1-2 Cisco UCS C24 Server Rear Panel Features



1	Power supplies (two)	6	VGA video port (DB-15 connector)
2	Dual 1 Gb Ethernet ports (LAN1, LAN2)	7	10/100/1000 Ethernet dedicated management port
3	PCIe slots 3, 4, and 5 on riser 2 See PCIe Slots , page 3-31 for slot specifications.	8	Rear Identification button/LED
4	USB 2.0 ports (four)	9	PCIe slots 1 and 2 on riser 1 See PCIe Slots , page 3-31 for slot specifications.
5	Serial port (DB-9 connector)		–

Table 1-1 lists a summary of server features.

Table 1-1 Cisco UCS C24 Server Features

Chassis	Two rack-unit (2RU) chassis.
Processors	Two Intel Xeon E5-2400 Series processors.
Memory	The server provides 12 DIMM ¹ sockets on the motherboard.
Baseboard management	Pilot III BMC, running Cisco Integrated Management Controller (CIMC) firmware. Depending on your CIMC settings, the CIMC can be accessed through the 10/100/1000 Ethernet dedicated management port, the 1-Gb Ethernet LOM ports, or a Cisco P81E virtual interface card.
Network and management I/O	The server provides these connectors: <ul style="list-style-type: none"> • One 1-Gb Ethernet dedicated management port • Two 1-Gb Base-T Ethernet LAN ports • One RS-232 serial port (DB-9 connector) • One 15-pin VGA² connector • Six USB³ 2.0 connectors
Power	Two power supplies: Both either 450 W each or 650 W each. Do not mix power supply types. Redundant as 1+1. See Power Specifications, page A-2 .
Cooling	Four hot-swappable fan modules for front-to-rear cooling.
PCIe I/O	Five horizontal PCIe ⁴ expansion slots on two risers. See PCIe Slots, page 3-31 for specifications of the slots.
Storage	Drives are installed into front-panel drive bays that provide hot-pluggable access. <ul style="list-style-type: none"> • Cisco UCS C24 (small form-factor (SFF) drives, with 24-drive backplane and expander). Holds up to twenty-four 2.5-inch hard drives or solid state drives. •
Internal USB support	The server has one internal USB 2.0 socket on the motherboard that you can use with a USB thumb drive for additional storage. The server can be ordered with an optional blank 8-GB Cisco USB Flash Drive pre-installed in the internal USB port.
Cisco USB Flash Drive with pre-loaded utilities	The server can be ordered with one pre-loaded 16-GB Cisco USB flash drive in the accessory kit. This drive is pre-loaded with Cisco C-series Server utilities. This drive contains four virtual drives. The four virtual drives contain, respectively: <ul style="list-style-type: none"> • Cisco Server Configuration Utility • Cisco Host Upgrade Utility • Cisco C-Series server drivers set • A blank virtual drive on which you can install an OS or a hypervisor See Overview of the Pre-Loaded 16-GB Cisco USB Flash Drive, page 3-36 for more information about enabling and booting the virtual drives.

Table 1-1 Cisco UCS C24 Server Features (continued)

Disk Management (RAID)	For a list of RAID ⁵ controller options and cables, see RAID Controller Considerations, page C-1 .
RAID Backup	There are two mounting points inside the chassis that can be used for the SuperCap power module that is used with LSI MegaRAID-CV card.
Video	Matrox G200e video controller. Resolution up to 1920 x1200, 16bpp at 60 Hz. Up to 256 MB of video memory.

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



CHAPTER 2

Installing the Server

This chapter describes how to install the server, and it includes the following sections:

- [Unpacking and Inspecting the Server, page 2-2](#)
- [Preparing for Server Installation, page 2-3](#)
- [Installing the Server In a Rack, page 2-5](#)
- [Initial Server Setup, page 2-8](#)
- [System BIOS and CIMC Firmware, page 2-11](#)
- [Updating the BIOS and CIMC Firmware, page 2-11](#)
- [Service Headers and Jumpers, page 2-13](#)



Note

Before you install, operate, or service a server, review the [Regulatory Compliance and Safety Information for Cisco UCS C-Series Servers](#) for important safety information.



Warning

IMPORTANT SAFETY INSTRUCTIONS

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

SAVE THESE INSTRUCTIONS

Unpacking and Inspecting the Server


Caution

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


Tip

Keep the shipping container in case the server requires shipping in the future.

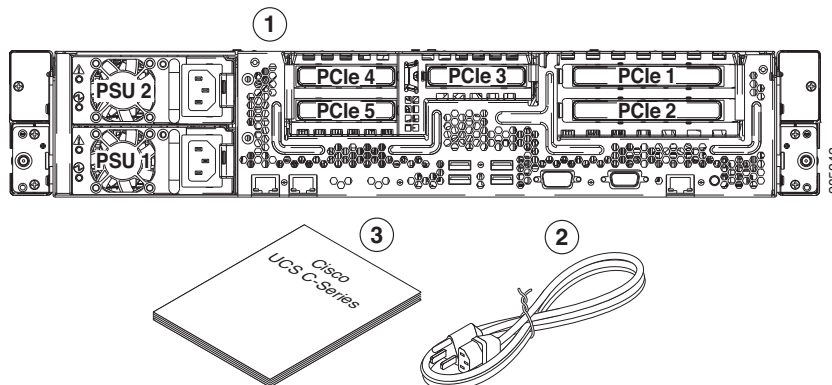

Note

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

To inspect the shipment, follow these steps:

- Step 1** Remove the server from its cardboard container and save all packaging material.
- Step 2** Compare the shipment to the equipment list provided by your customer service representative and [Figure 2-1](#). Verify that you have all items.
- Step 3** Check for damage and report any discrepancies or damage to your customer service representative. Have the following information ready:
- Invoice number of shipper (see the packing slip)
 - Model and serial number of the damaged unit
 - Description of damage
 - Effect of damage on the installation

Figure 2-1 Shipping Box Contents



1	Server	3	Documentation
2	Power cord (optional, up to two)		—

Preparing for Server Installation

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

- [Installation Guidelines, page 2-3](#)
- [Rack Requirements, page 2-4](#)
- [Equipment Requirements, page 2-4](#)
- [Slide Rail Adjustment Range, page 2-4](#)

Installation Guidelines



Warning

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

Statement 1047



Warning

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

Statement 1019



Warning

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

Statement 1005



Warning

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

Statement 1074

When you are installing a server, use the following guidelines:

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



Caution

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

Rack Requirements

This section provides the requirements for the standard open racks.

The rack must be of the following type:

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

Equipment Requirements

The slide rails supplied by Cisco Systems for this server do not require tools for installation. The inner rails (mounting brackets) are pre-attached to the sides of the server.

Slide Rail Adjustment Range

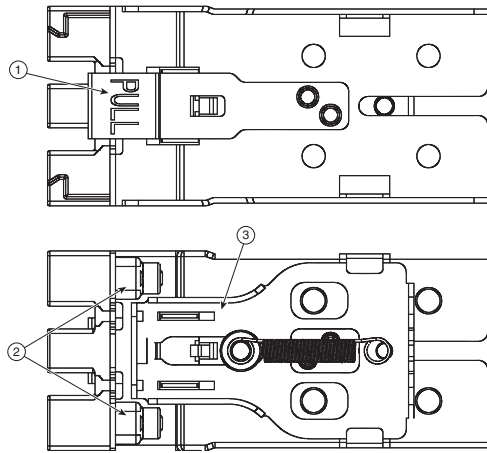
The slide rails for this server have an adjustment range of 24 to 36 inches (610 to 914 mm).

Installing the Server In a Rack

To install the slide rails and the server into a rack, follow these steps:

- Step 1** Open the front securing latch (see [Figure 2-2](#)). The end of the slide-rail assembly marked “FRONT” has a spring-loaded securing latch that must be open before you can insert the mounting pegs into the rack-post holes.
- On the rear side of the securing-latch assembly, hold open the clip marked “PULL.”
 - Slide the spring-loaded securing latch away from the mounting pegs.
 - Release the clip marked “PULL” to lock the securing latch in the open position.

Figure 2-2 Front Securing Latch



1	Clip marked “PULL” on rear of assembly	3	Spring-loaded securing latch on front of assembly
2	Front mounting pegs		

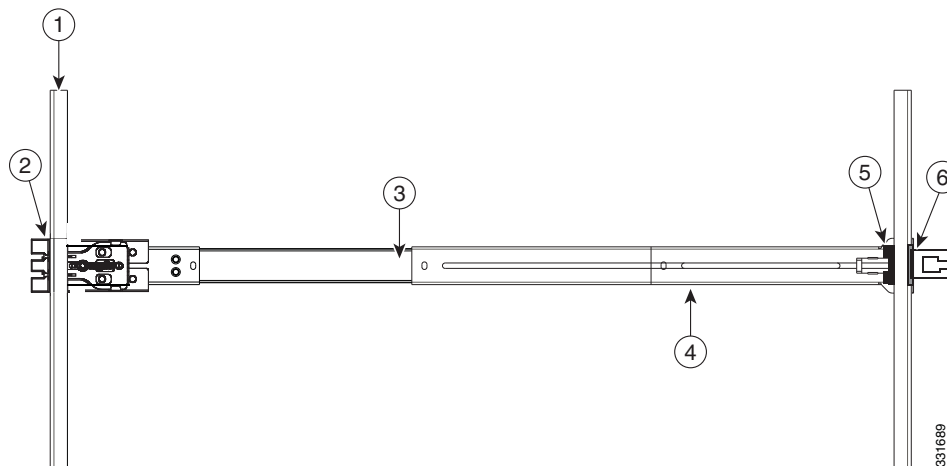
- Step 2** Install the slide rails onto the rack:
- Position a slide-rail assembly inside the two left-side rack posts (see [Figure 2-3](#)).
Use the “FRONT” and “REAR” markings on the slide-rail assembly to orient the assembly correctly with the front and rear rack posts.
 - Position the front mounting pegs so that they enter the desired front rack-post holes from the front.



Note

The mounting pegs that protrude through the rack-post holes are designed to fit round or square holes, or smaller #10-32 round holes when the mounting peg is compressed. If your rack has #10-32 rack-post holes, align the mounting pegs with the holes and then compress the spring-loaded pegs to expose the #10-32 inner peg.

- Expand the length-adjustment bracket until the rear mounting pegs protrude through the desired holes in the rear rack post.
Use your finger to hold the rear securing latch open when you insert the rear mounting pegs to their holes. When you release the latch, it wraps around the rack post and secures the slide-rail assembly.

Figure 2-3 Attaching a Slide-Rail Assembly

1	Front-left rack post	4	Length-adjustment bracket
2	Front mounting pegs	5	Rear mounting pegs
3	Slide-rail assembly	6	Rear securing latch

- d. Attach the second slide-rail assembly to the opposite side of the rack. Ensure that the two slide-rail assemblies are level and at the same height with each other.
- e. Pull the inner slide rails on each assembly out toward the rack front until they hit the internal stops and lock in place.

Step 3 Insert the server into the slide rails:



Note The inner rails are pre-attached to the sides of the server at the factory. You can order replacement inner rails if these are damaged or lost (Cisco PID UCSC-RAIL1-I).

- a. Align the inner rails that are attached to the server sides with the front ends of the empty slide rails.
- b. Push the server into the slide rails until it stops at the internal stops.
- c. Push in the plastic release clip on each inner rail (labelled PUSH), and then continue pushing the server into the rack until its front latches engage the rack posts.

Step 4 Attach the (optional) cable management arm (CMA) to the rear of the slide rails:



Note The CMA is designed for mounting on either the right or left slide rails. These instructions describe an installation to the rear of the right slide rails, as viewed from the rear of server.

- a. Slide the plastic clip on the inner CMA arm over the flange on the mounting bracket that attached to the side of the server. See [Figure 2-4](#).

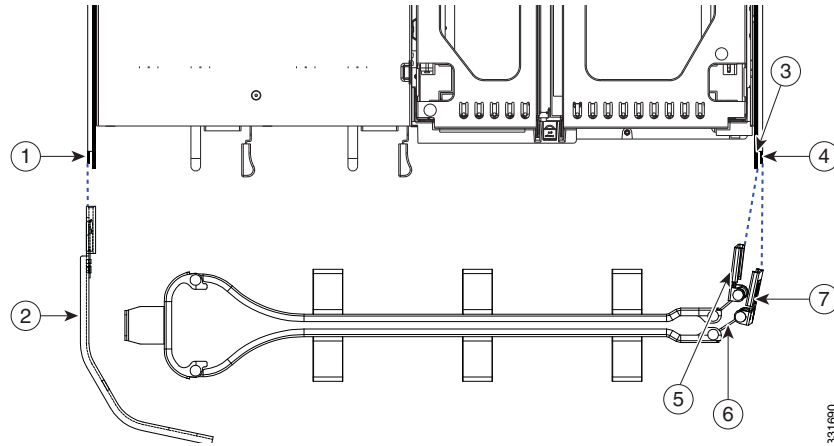


Note Whether you are mounting the CMA to the left or right slide rails, be sure to orient the engraved marking, “UP” so that it is always on the upper side of the CMA. See [Figure 2-4](#).

- b. Slide the plastic clip on the outer CMA arm over the flange on the slide rail. See [Figure 2-4](#).

- c. Attach the CMA retaining bracket to the left slide rail. Slide the plastic clip on the bracket over the flange on the end of the left slide rail. See [Figure 2-4](#).

Figure 2-4 Attaching the Cable Management Arm (Rear of Server Shown)



1	Flange on rear of outer left slide rail	5	Inner CMA arm attachment clip
2	CMA retaining bracket	6	“UP” orientation marking
3	Flange on rear of right mounting bracket	7	Outer CMA arm attachment clip
4	Flange on rear of outer right slide rail		

Step 5 Continue with the [“Initial Server Setup”](#) section on page 2-8.

Initial Server Setup

This section includes the following topics:

- [Connecting and Powering On the Server \(Standalone Mode\)](#), page 2-8
- [NIC Modes and NIC Redundancy Settings](#), page 2-10

Connecting and Powering On the Server (Standalone Mode)



Note

The server is shipped with a default NIC mode called Shared LOM EXT, default NIC redundancy is active-active, and DHCP is enabled. Shared LOM EXT mode enables the 1-Gb Ethernet ports and the ports on any installed Cisco virtual interface card (VIC) to access the Cisco Integrated Management Interface (CIMC). If you want to use the dedicated management ports to access the CIMC, you can connect to the server and change the NIC mode as described in [Step 3](#) of the following procedure. In that step, you can also change the NIC redundancy and set static IP settings.

Use the following procedure to perform initial setup of the server:

- Step 1** Attach a supplied power cord to each power supply in your server, and then attach the power cord to a grounded AC power outlet. See the [Power Specifications, page A-2](#) for power specifications.

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

You can verify power status by looking at the Power Status LED (see [Figure 1-1 on page 1-1](#)):

- Off—There is no AC power present in the server.
- Amber—The server is in standby power mode. Power is supplied only to the CIMC and some motherboard functions.
- Green—The server is in main power mode. Power is supplied to all server components.



Note

During bootup, the server beeps once for each USB device that is attached to the server. Even if there are no external USB devices attached, there is a short beep for each virtual USB device such as a virtual floppy drive, CD/DVD drive, keyboard, or mouse. A beep is also emitted if a USB device is hot-plugged or hot-unplugged during BIOS power-on self test (POST), or while you are accessing the BIOS Setup utility or the EFI shell.

- Step 2** Connect a USB keyboard and VGA monitor to the server.

- Step 3** Set NIC mode, NIC redundancy, and choose whether to enable DHCP or set static network settings:
- Press the **Power** button to boot the server. Watch for the prompt to press F8.
 - During bootup, press **F8** when prompted to open the BIOS CIMC Configuration Utility.
 - Set the NIC mode to your choice for which ports to use to access the CIMC for server management (see [Figure 1-2](#) for identification of the ports):

- Shared LOM EXT (default)—This is shared LOM extended mode. This is the factory-default setting, along with Active-active NIC redundancy and DHCP-enabled. With this mode, the shared LOM and Cisco Card interfaces are both enabled.

In this mode, DHCP replies are returned to both the shared LOM ports and the Cisco card ports. If the system determines that the Cisco card connection is not getting its IP address from a Cisco UCS Manager system because the server is in standalone mode, further DHCP requests from the Cisco card are disabled. Use the Cisco Card NIC mode if you want to connect to the CIMC through a Cisco card in standalone mode.

- Dedicated—The dedicated management port is used to access the CIMC. You must select a NIC redundancy and IP setting.
- Shared LOM—The 1-Gb Ethernet ports are used to access the CIMC. You must select a NIC redundancy and IP setting.
- Cisco Card—The ports on an installed Cisco UCS virtual interface card (VIC) are used to access the CIMC. You must select a NIC redundancy and IP setting.



Note The Cisco Card NIC mode is currently supported only with a Cisco UCS VIC that is installed in PCIe slot 2. See also [Special Considerations for Cisco UCS Virtual Interface Cards, page 3-33](#).

- Use this utility to change the NIC redundancy to your preference. This server has three possible NIC redundancy settings:
 - None—The Ethernet ports operate independently and do not fail over if there is a problem.
 - Active-standby—If an active Ethernet port fails, traffic fails over to a standby port.
 - Active-active—All Ethernet ports are utilized simultaneously.
- Choose whether to enable DHCP for dynamic network settings, or to enter static network settings.



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

- Optional: Use this utility to make VLAN settings, and to set a default CIMC user password.



Note Changes to the settings take effect after approximately 45 seconds. Refresh with **F5** and wait until the new settings appear before you reboot the server in the next step.

- Press **F10** to save your settings and reboot the server.



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

- Step 4** Connect to the CIMC for server management. Connect Ethernet cables from your LAN to the server by using the ports that you selected by your NIC Mode setting in [Step 3](#). The Active-active and Active-passive NIC redundancy settings require you to connect to two ports.
- Step 5** Use a browser and the IP address of the CIMC to connect to the CIMC Setup Utility. The IP address is based upon the settings that you made in [Step 3](#) (either a static address or the address assigned by your DHCP server).



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

To manage the server, see the *Cisco UCS C-Series Rack-Mount Server Configuration Guide* or the *Cisco UCS C-Series Rack-Mount Server CLI Configuration Guide* for instructions on using those interfaces. The links to these documents are in the C-Series documentation roadmap:

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

NIC Modes and NIC Redundancy Settings

This server has the following NIC mode settings that you can choose from:

- **Shared LOM EXT (default)**—This is shared LOM extended mode. This is the factory-default setting, along with Active-active NIC redundancy and DHCP-enabled. With this mode, the shared LOM and Cisco Card interfaces are both enabled.

In this mode, DHCP replies are returned to both the shared LOM ports and the Cisco card ports. If the system determines that the Cisco card connection is not getting its IP address from a Cisco UCS Manager system because the server is in standalone mode, further DHCP requests from the Cisco card are disabled. If the system determines that the Cisco card connection is getting its IP address from a Cisco UCS Manager system, the reply has parameters that automatically move the server to UCSM mode.

- **Dedicated**—The dedicated management port is used to access the CIMC. You must select a NIC redundancy and IP setting.
- **Shared LOM**—The 1-Gb Ethernet ports are used to access the CIMC. You must select a NIC redundancy and IP setting.
- **Cisco Card**—The ports on an installed Cisco UCS virtual interface card (VIC) are used to access the CIMC. You must select a NIC redundancy and IP setting.



Note The Cisco Card NIC mode is currently supported only with a Cisco UCS VIC that is installed in PCIe slot 2. See also [Special Considerations for Cisco UCS Virtual Interface Cards, page 3-33](#).

This server has the following NIC redundancy settings that you can choose from:

- **None**—The Ethernet ports operate independently and do not fail over if there is a problem.
- **Active-standby**—If an active Ethernet port fails, traffic fails over to a standby port.
- **Active-active**—All Ethernet ports are utilized simultaneously.

System BIOS and CIMC Firmware

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

- [Updating the BIOS and CIMC Firmware, page 2-11](#)
- [Accessing the System BIOS, page 2-12](#)

Updating the BIOS and CIMC Firmware



Caution

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

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

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

- **Recommended method for systems running firmware level 1.2 or later:** Use the Cisco Host Upgrade Utility to simultaneously upgrade the CIMC, BIOS, LOM, LSI storage controller, and Cisco UCS P81E VIC firmware to compatible levels.

See the *Cisco Host Upgrade Utility Quick Reference Guide* for your firmware level at the documentation roadmap link below.



Note

Your system firmware must be at minimum level 1.2 to use the Cisco Host Upgrade Utility. If your firmware is prior to level 1.2, you must use the methods below to update the BIOS and CIMC firmware individually.

- You can upgrade the BIOS using the EFI interface, or upgrade from a Windows or Linux platform. See the *Cisco UCS C-Series Rack-Mount Server BIOS Upgrade Guide*.
- You can upgrade the CIMC and BIOS firmware by using the CIMC GUI interface. See the *Cisco UCS C-Series Rack-Mount Server Configuration Guide*.
- You can upgrade the CIMC and BIOS firmware by using the CIMC CLI interface. See the *Cisco UCS C-Series Rack-Mount Server CLI Configuration Guide*.

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

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

Accessing the System BIOS

To change the BIOS settings for your server, follow these steps. Detailed instructions are also printed on the BIOS screens.

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



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

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

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

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

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

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

Service Headers and Jumpers

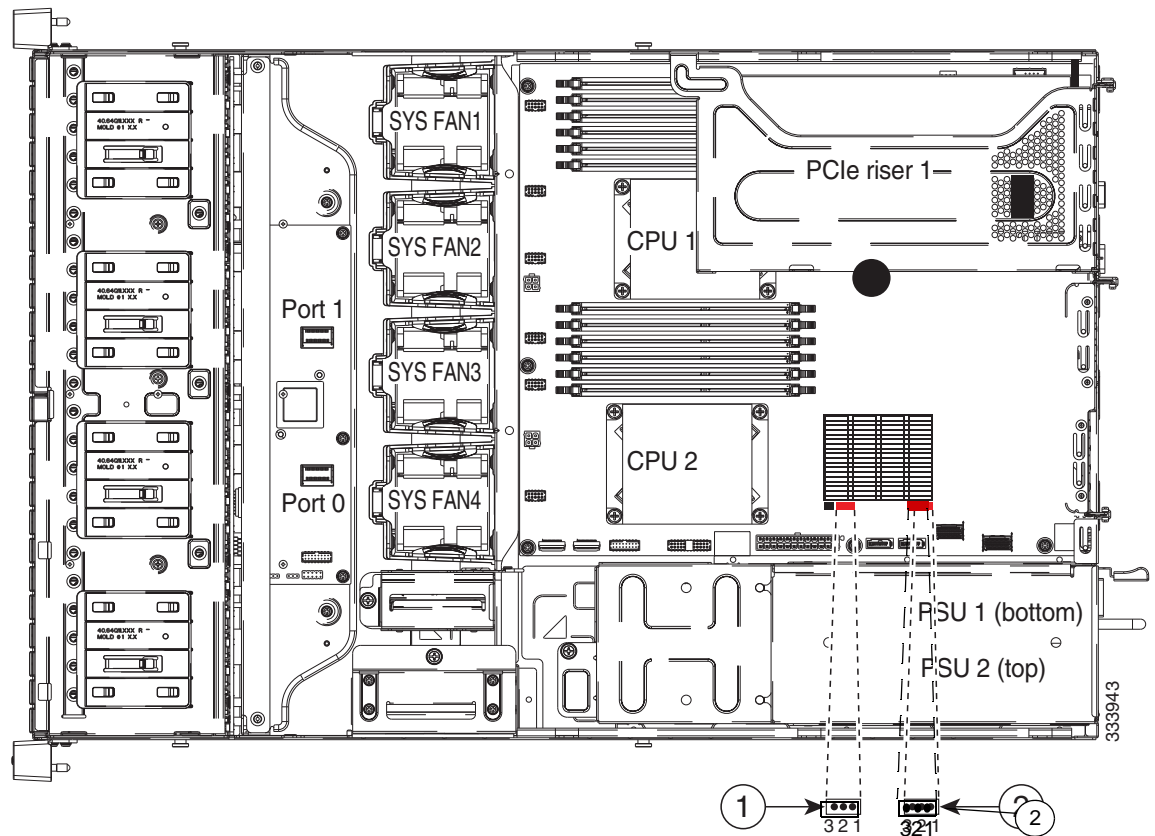
This section includes the following topics:

- [Header Location on the Motherboard](#), page 2-13
- [Using the BIOS Recovery Header CN34](#), page 2-14
- [Using the Clear CMOS Header CN14](#), page 2-17

Header Location on the Motherboard

See [Figure 2-5](#). The headers are shown in red on the motherboard, with PCIe riser 2 removed. The header pins are shown in the magnified view.

Figure 2-5 Service Header Locations



1	CN34 BIOS Recovery	2	CN14 Clear CMOS
---	--------------------	---	-----------------

Using the BIOS Recovery Header CN34

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

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

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

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

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



Note

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



Note

The server must have CIMC version 1.4(6) or later to use these procedures.

Procedure 1: Reboot With recovery.cap File

- Step 1** Download the BIOS update package and extract it to a temporary location.
- Step 2** Copy the contents of the extracted `recovery` folder to the root directory of a USB thumb drive. The `recovery` folder contains the `recovery.cap` file that is required in this procedure.



Note

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

- Step 3** Insert the USB thumb drive into a USB port on the 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 `recovery.cap` file on the USB thumb drive, it displays this message:

```
Found a valid recovery file...Transferring to CIMC
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, then remove the USB thumb drive from the server.

**Note**

During the BIOS update, the CIMC will shut down the server and the screen will be blank for about 10 minutes. Do not unplug the power cords during this update. The CIMC will power on the server after the update is complete.

Procedure 2: Use Recovery Jumper and recovery.cap File

See [Figure 2-5](#) for the location of the CN34 header.

-
- Step 1** Download the BIOS update package and extract it to a temporary location.
- Step 2** Copy the contents of the extracted `recovery` folder to the root directory of a USB thumb drive. The `recovery` folder contains the `recovery.cap` file that is required in this procedure.
-  **Note** The `recovery.cap` file must be in the root directory of the USB thumb drive. Do not rename this file. The USB thumb drive must be formatted with either FAT16 or FAT32 file systems.
-
- Step 3** Power off the server as described in [Shutting Down and Powering Off the Server, page 3-6](#).
- Step 4** Disconnect all power cords from the power supplies.
- Step 5** 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 6** Remove the top cover as described in [Removing and Replacing the Server Top Cover, page 3-7](#).
- Step 7** Move the shorting jumper to pins 2 and 3 of the CN34 header (see [Figure 2-5](#)).
- Step 8** Reconnect AC power cords to the server. The server powers up to standby power mode.
- Step 9** Insert the USB thumb drive that you prepared in [Step 2](#) into a USB port on the server.
- Step 10** 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 `recovery.cap` file on the USB thumb drive, it displays this message:
- ```
Found a valid recovery file...Transferring to CIMC
System would flash the BIOS image now...
System would restart with recovered image after a few seconds...
```
- Step 11** Wait for server to complete the BIOS update, then remove the USB thumb drive from the server.
-  **Note** During the BIOS update, the CIMC will shut down the server and the screen will be blank for about 10 minutes. Do not unplug the power cords during this update. The CIMC will power on the server after the update is complete.
- 
- Step 12** After the server has fully booted, power off the server again and disconnect all power cords.
- Step 13** Move the jumper back to the default pins 1 and 2 of the header.
-  **Note** If you do not move the jumper, after recovery completion you see the prompt, `Please remove the recovery jumper`.
- 
- Step 14** Replace the top cover, replace the server in the rack, replace power cords and any other cables, then power on the server by pressing the **Power** button.

## Using the Clear CMOS Header CN14

See [Figure 2-5](#) for the location of this header. You can jumper this header 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.

- Step 1** Power off the server as described in [Shutting Down and Powering Off the Server, page 3-6](#).
- Step 2** Disconnect all power cords from the power supplies.
- Step 3** 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 4** Remove the top cover as described in [Removing and Replacing the Server Top Cover, page 3-7](#).
- Step 5** Move the shorting jumper to pins 2 and 3 of the CN14 header (see [Figure 2-5](#)).
- 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, not just the service processor, to reboot to main power mode to complete the reset. This is because 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** Move the shorting jumper from header pins 2 and 3, back to its default position on pins 1 and 2.

**Note**

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

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





## CHAPTER 3

# Maintaining the Server

---

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

- [Server Monitoring and Management Tools, page 3-1](#)
- [Status LEDs and Buttons, page 3-2](#)
- [Preparing for Server Component Installation, page 3-6](#)
- [Installing or Replacing Server Components, page 3-11](#)

## Server Monitoring and Management Tools

### Cisco Integrated Management Interface (CIMC)

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

[http://www.cisco.com/en/US/products/ps10739/products\\_installation\\_and\\_configuration\\_guides\\_list.html](http://www.cisco.com/en/US/products/ps10739/products_installation_and_configuration_guides_list.html)

### Server Configuration Utility

Cisco has also developed the Cisco Server Configuration Utility for C-Series servers, which can aid and simplify the following tasks:

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

This utility is available to order on an optional 16-GB USB thumb drive (see [Overview of the Pre-Loaded 16-GB Cisco USB Flash Drive, page 3-36](#)). You can also download the ISO from Cisco.com. See the user documentation for your version of the utility at the following URL:

[http://www.cisco.com/en/US/products/ps10493/products\\_user\\_guide\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_user_guide_list.html)

# Status LEDs and Buttons

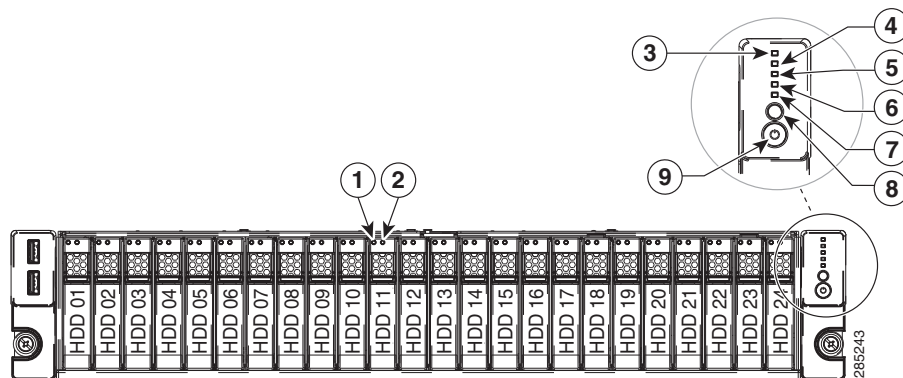
This section describes the location and meaning of LEDs and buttons and includes the following topics

- [Front Panel LEDs, page 3-2](#)
- [Rear Panel LEDs and Buttons, page 3-4](#)

## Front Panel LEDs

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

**Figure 3-1** Front Panel LEDs



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

**Table 3-1** Front Panel LEDs, Definitions of States

| LED Name              | State                                                                                                                                                                                                                                                                   |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hard drive fault      | <ul style="list-style-type: none"> <li>• Off—The hard drive is operating properly.</li> <li>• Amber—This hard drive has failed.</li> <li>• Amber, blinking—The device is rebuilding.</li> </ul>                                                                         |
| Hard drive activity   | <ul style="list-style-type: none"> <li>• Off—There is no hard drive in the hard drive sled (no access, no fault).</li> <li>• Green—The hard drive is ready.</li> <li>• Green, blinking—The hard drive is reading or writing data.</li> </ul>                            |
| Network link activity | <ul style="list-style-type: none"> <li>• Off—The Ethernet link is idle.</li> <li>• Green—One or more Ethernet LOM ports are link-active, but there is no activity.</li> <li>• Green, blinking—One or more Ethernet LOM ports are link-active, with activity.</li> </ul> |

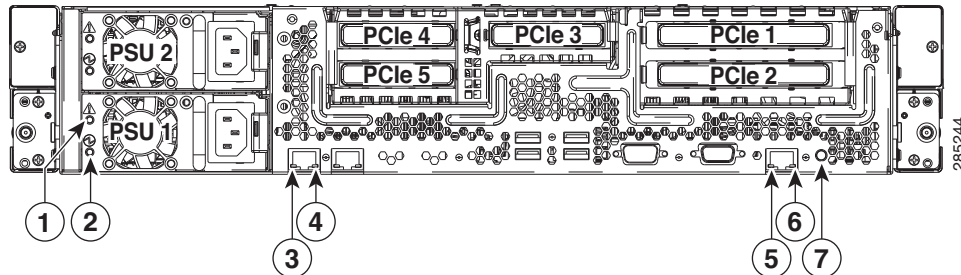
**Table 3-1** Front Panel LEDs, Definitions of States (continued)

| LED Name                      | State                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply status           | <ul style="list-style-type: none"> <li>• Green—All power supplies are operating normally.</li> <li>• Amber, steady—One or more power supplies are in a degraded operational state.</li> <li>• Amber, blinking—One or more power supplies are in a critical fault state.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Temperature status            | <ul style="list-style-type: none"> <li>• Green—The server is operating at normal temperature.</li> <li>• Amber, steady—One or more temperature sensors have exceeded a warning threshold.</li> <li>• Amber, blinking—One or more temperature sensors have exceeded a critical threshold.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Fan status                    | <ul style="list-style-type: none"> <li>• Green—All fan modules are operating properly.</li> <li>• Amber, steady—One fan module has failed.</li> <li>• Amber, blinking—Critical fault, two or more fan modules have failed.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| System status                 | <ul style="list-style-type: none"> <li>• Green—The server is running in normal operating condition.</li> <li>• Green, blinking—The server is performing system initialization and memory check.</li> <li>• Amber, steady—The server is in a degraded operational state. For example: <ul style="list-style-type: none"> <li>– Power supply redundancy is lost.</li> <li>– CPUs are mismatched.</li> <li>– At least one CPU is faulty.</li> <li>– At least one DIMM is faulty.</li> <li>– At least one drive in a RAID configuration failed.</li> </ul> </li> <li>• Amber, blinking—The server is in a critical fault state. For example: <ul style="list-style-type: none"> <li>– Boot failed.</li> <li>– Fatal CPU and/or bus error is detected.</li> <li>– Server is in over-temperature condition.</li> </ul> </li> </ul> |
| Identification                | <ul style="list-style-type: none"> <li>• Off—The Identification LED is not in use.</li> <li>• Blue—The Identification LED is activated.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Power button/Power status LED | <ul style="list-style-type: none"> <li>• Off—There is no AC power to the server.</li> <li>• Amber—The server is in standby power mode. Power is supplied only to the CIMC and some motherboard functions.</li> <li>• Green—The server is in main power mode. Power is supplied to all server components.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## Rear Panel LEDs and Buttons

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

**Figure 3-2** Rear Panel LEDs and Buttons



|   |                               |   |                                                           |
|---|-------------------------------|---|-----------------------------------------------------------|
| 1 | Power supply fault LED        | 5 | 10/100/1000 Ethernet dedicated management link status LED |
| 2 | Power supply AC OK LED        | 6 | 10/100/1000 Ethernet dedicated management link speed LED  |
| 3 | 1-Gb Ethernet link speed LED  | 7 | Identification button/LED                                 |
| 4 | 1-Gb Ethernet link status LED |   | —                                                         |

**Table 3-2** Rear Panel LEDs, Definitions of States

| LED Name                                             | State                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply fault                                   | <ul style="list-style-type: none"> <li>Off—The power supply is operating normally.</li> <li>Amber, blinking—An event warning threshold has been reached, but the power supply continues to operate.</li> <li>Amber, solid—A critical fault threshold has been reached, causing the power supply to shut down (for example, a fan failure or an over-temperature condition).</li> </ul> |
| Power supply AC OK                                   | <ul style="list-style-type: none"> <li>Off—There is no AC power to the power supply.</li> <li>Green, blinking—AC power OK, DC output not enabled.</li> <li>Green, solid—AC power OK, DC outputs OK.</li> </ul>                                                                                                                                                                         |
| 1-Gb Ethernet link speed                             | <ul style="list-style-type: none"> <li>Off—link speed is 10 Mbps.</li> <li>Amber—link speed is 100 Mbps.</li> <li>Green—link speed is 1 Gbps.</li> </ul>                                                                                                                                                                                                                               |
| 1-Gb Ethernet link status                            | <ul style="list-style-type: none"> <li>Off—No link is present.</li> <li>Green—Link is active.</li> <li>Green, blinking—Traffic is present on the active link.</li> </ul>                                                                                                                                                                                                               |
| 10/100/1000 Ethernet dedicated management link speed | <ul style="list-style-type: none"> <li>Off—link speed is 10 Mbps.</li> <li>Amber—link speed is 100 Mbps.</li> <li>Green—link speed is 1 Gbps.</li> </ul>                                                                                                                                                                                                                               |



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

| LED Name                                              | State                                                                                                                                                                      |
|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10/100/1000 Ethernet dedicated management link status | <ul style="list-style-type: none"><li>• Off—No link is present.</li><li>• Green—Link is active.</li><li>• Green, blinking—Traffic is present on the active link.</li></ul> |
| Identification                                        | <ul style="list-style-type: none"><li>• Off—The Identification LED is not in use.</li><li>• Blue—The Identification LED is activated.</li></ul>                            |

# Preparing for Server Component Installation

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

- [Required Equipment, page 3-6](#)
- [Shutting Down and Powering Off the Server, page 3-6](#)
- [Removing and Replacing the Server Top Cover, page 3-7](#)
- [Removing and Replacing the Front Chassis Panel, page 3-8](#)
- [Replaceable Component Locations, page 3-9](#)
- [Serial Number Location, page 3-9](#)

## Required Equipment

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

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

## Shutting Down and Powering Off the Server

The server can run in 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 the cooling fans and it is safe to power off the server from this mode.

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

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

- 
- Step 1** Check the color of the Power Status LED (see the [“Front Panel LEDs” section on page 3-2](#)).
- Green—the server is in main power mode and must be shut down before it can be safely powered off. Go to [Step 2](#).
  - Amber—the server is already in standby mode and can be safely powered off. Go to [Step 3](#).

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



### Caution

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

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

- Step 3** Disconnect the power cords from the power supplies in your server to completely power off the server.
-

## Removing and Replacing the Server Top Cover

To remove or replace the top cover of the server, follow these steps:



**Tip**

You do not have to remove the cover to replace hard drives or power supplies.

### Step 1

Remove the top cover (see [Figure 3-3](#)).

- a. Loosen the two captive thumbscrews that secure the rear edge of the top cover to the chassis.
- b. Push the top cover toward the server rear about one-half inch (1.27 cm), until it stops.
- c. Lift the top cover straight up from the server and set it aside.

### Step 2

Replace the top cover:

- a. Place the cover on top of the server about one-half inch (1.27 cm) behind the lip of the front chassis panel. The cover should sit flat.

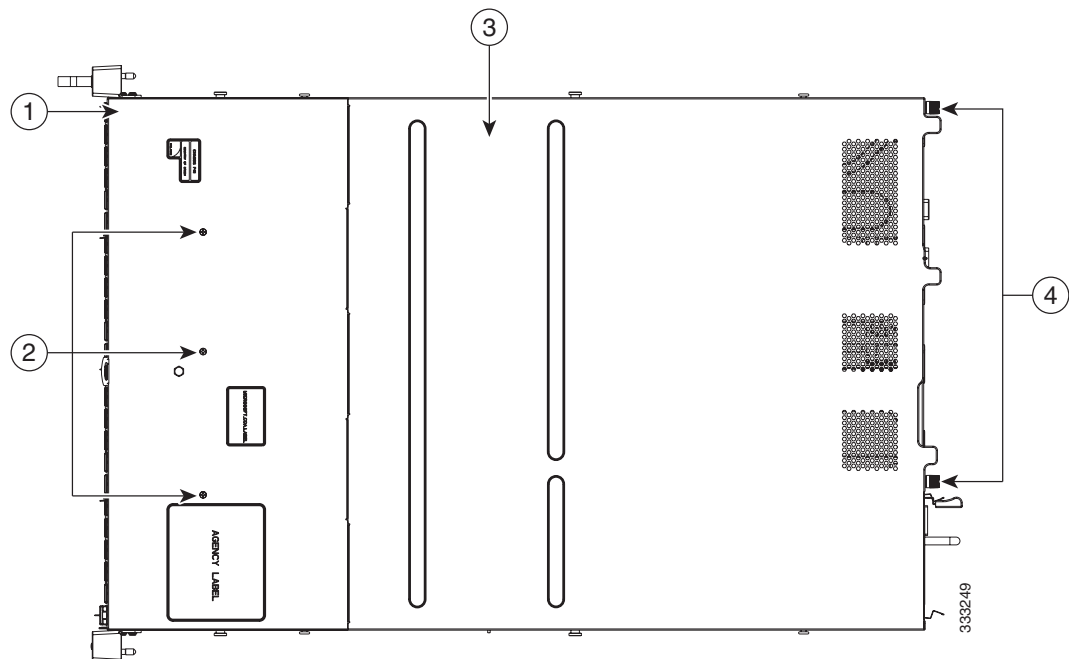


**Note**

The rear of the cover has a wrap-around flanged edge that must be correctly aligned with the chassis rear edge when sliding the cover forward.

- b. Slide the top cover toward the front chassis panel until it stops.
- c. Tighten the two captive thumbscrews that secure the rear edge of the cover to the chassis.

**Figure 3-3** Removing the Top Cover or Front Chassis Panel



|   |                                             |   |                             |
|---|---------------------------------------------|---|-----------------------------|
| 1 | Front chassis panel                         | 3 | Top cover                   |
| 2 | Front chassis panel securing screws (three) | 4 | Top cover thumbscrews (two) |

## Removing and Replacing the Front Chassis Panel

To remove or replace the front chassis panel of the server, follow these steps:

**Tip**

---

Remove this panel only if you are instructed to do so in a procedure in this book.

---

**Step 1** Remove the front chassis panel (see [Figure 3-3](#)):

- a. Remove the top cover from the server as described in [Removing and Replacing the Server Top Cover, page 3-7](#).
- b. Use a #2 Phillips-head screwdriver to remove the three screws that secure the front chassis panel to the chassis (see [Figure 3-3](#)).
- c. Push the panel forward about 1/4-inch, until it stops. The wrap-around front edge of the panel must become free from the front edge of the chassis.
- d. Lift the panel straight up from the server and set it aside.

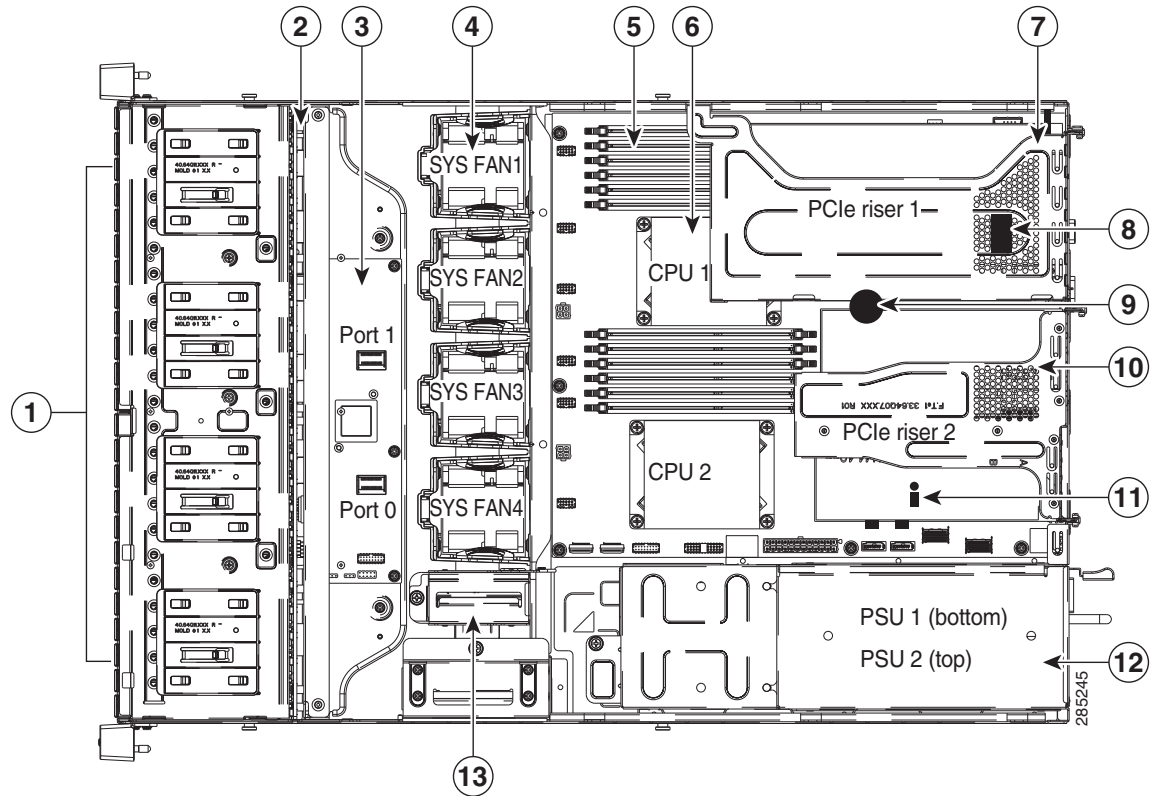
**Step 2** Replace the front chassis panel:

- a. Set the front chassis panel back in place, with its wrap-around front edge about 1/4 inch (1.27 cm) forward of the chassis front edge.
  - b. Slide the front chassis panel toward the server rear to lock it in place. The wrap-around front edge of the panel must wrap around the chassis front edge.
  - c. Replace the three screws that secure the panel to the chassis (see [Figure 3-3](#)).
  - d. Replace the top cover to the server as described in [Removing and Replacing the Server Top Cover, page 3-7](#).
-

## Replaceable Component Locations

This section shows the locations of the components that are discussed in this chapter. The view in [Figure 3-4](#) is from the top down with the top cover, front chassis panel, and air baffle removed.

**Figure 3-4** Replaceable Component Locations



|          |                                                             |           |                                                               |
|----------|-------------------------------------------------------------|-----------|---------------------------------------------------------------|
| <b>1</b> | Drives<br>(hot-swappable, accessed through front panel)     | <b>8</b>  | Internal USB 2.0 port on motherboard                          |
| <b>2</b> | Drive backplane<br>(optionally either 24-drive or 16-drive) | <b>9</b>  | RTC battery on motherboard                                    |
| <b>3</b> | SAS expander (with 24-drive backplane only)                 | <b>10</b> | PCIe riser 2 (three half-height slots)                        |
| <b>4</b> | Fan modules (four)                                          | <b>11</b> | Trusted platform module socket on motherboard                 |
| <b>5</b> | DIMM slots on motherboard (twelve)                          | <b>12</b> | Power supplies (two, hot-swappable access through rear panel) |
| <b>6</b> | CPUs and heatsinks (up to two)                              | <b>13</b> | RAID backup unit mounting cage (holds up to two units)        |
| <b>7</b> | PCIe riser 1 (two full-height slots)                        |           |                                                               |

## Serial Number Location

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

## Color-Coded Touch Points

This server has color-coded touch points that indicate thumbscrews and latches on replaceable and hot-swappable components.

- Hot-swappable components have green plastic touch points. This includes the internal cooling fans and the power supplies. (An exception is the drive trays on the front panel, which are hot-swappable but not green).
- Some replaceable but non-hot-swappable components have light-blue plastic touch-points.

# Installing or Replacing Server 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

**Warning**

**Class 1 laser product.**

Statement 1008

**Caution**

When handling server components, wear an ESD strap to avoid damage.

**Tip**

You can press the Identification button on the front panel or rear panel to turn on a flashing Identification LED on the front and rear panels of the server. This 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 CIMC interface. See the [“Status LEDs and Buttons” section on page 3-2](#) for locations of these LEDs.

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

- [Replacing Hard Drives or Solid State Drives, page 3-12](#)
- [Replacing a Drive Backplane, page 3-13](#)
- [Replacing Fan Modules, page 3-16](#)
- [Replacing DIMMs, page 3-18](#)
- [Replacing CPUs and Heatsinks, page 3-22](#)
- [Replacing the Motherboard RTC Battery, page 3-27](#)
- [Replacing a PCIe Riser, page 3-29](#)
- [Replacing a PCIe Card, page 3-31](#)
- [Replacing a SuperCap Power Module \(RAID Backup Unit\), page 3-34](#)
- [Replacing a Cisco USB Flash Drive, page 3-36](#)
- [Installing a Trusted Platform Module, page 3-40](#)
- [Replacing Power Supplies, page 3-43](#)

## Replacing Hard Drives or Solid State Drives

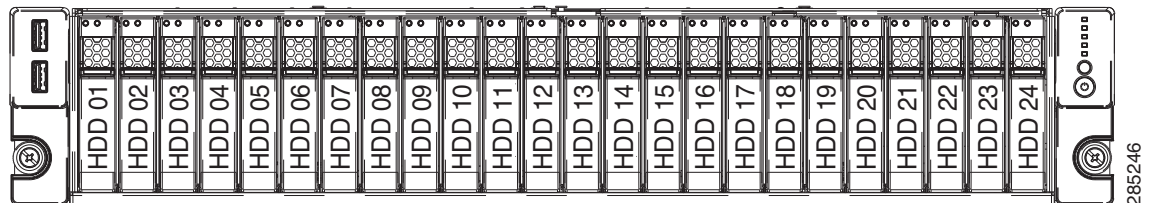
This section includes the following information:

- [Drive Population Guidelines](#), page 3-12
- [Drive Replacement Procedure](#), page 3-12

### Drive Population Guidelines

The drive-bay numbering is shown in [Figure 3-5](#).

**Figure 3-5** Drive Numbering, Small Form Factor



Observe these drive population guidelines for optimal performance:

- When populating drives, add drives in the lowest numbered bays first (populate HDD1 to HDD24).
- Keep an empty drive blanking tray in any unused bays to ensure optimal air flow and cooling.
- You can mix hard drives and solid state drives 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 hard drives or all SSDs.

### Drive Replacement Procedure

To replace or install a hot-pluggable drive, follow these steps:



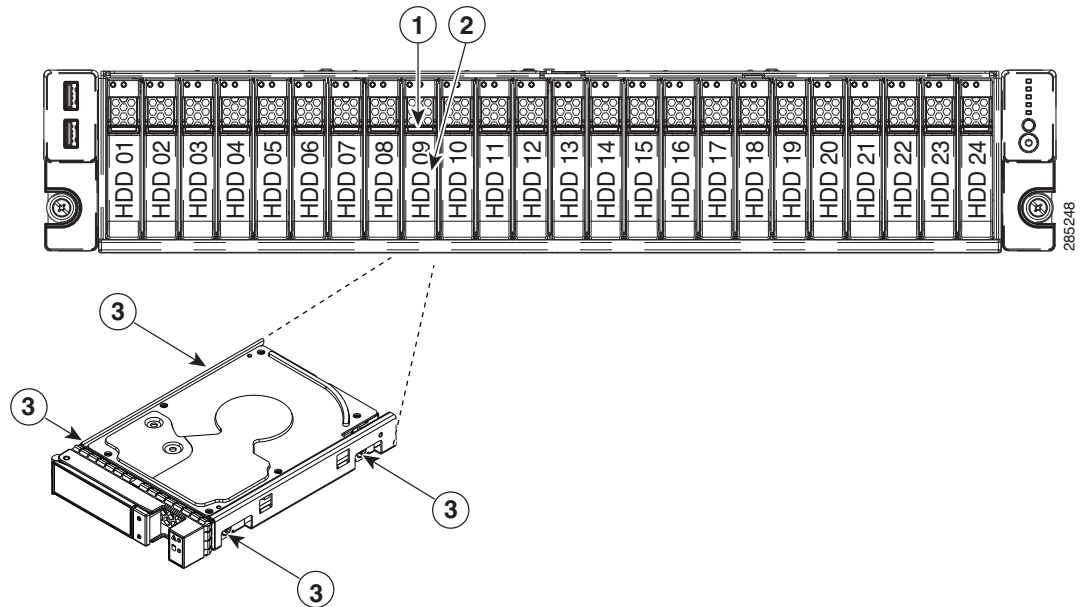
**Tip**

You do not have to shut down or power off the server to replace hard drives or solid state drives (SSDs) because they are hot-pluggable.

- Step 1** Remove the drive that you are replacing or remove a blank drive tray from an empty bay:
- Press the release button on the face of the drive tray. See [Figure 3-6](#).
  - Grasp and open the ejector lever and then pull the drive tray out of the slot.
  - 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:
- Place a new drive in the empty drive tray and replace the four drive-tray screws.
  - With the ejector lever on the drive tray open, insert the drive tray into the empty drive bay.
  - Push the tray into the slot until it touches the backplane, then close the ejector lever to lock the drive in place.



Figure 3-6 Replacing Hard Drives



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

## Replacing a Drive Backplane

To install or replace a drive backplane, follow these steps:

- Step 1** Prepare the server for component replacement:
- Power off the server as described in the [“Shutting Down and Powering Off the Server”](#) section on page 3-6.
  - 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.

- Remove the top cover as described in [“Removing and Replacing the Server Top Cover”](#) section on page 3-7.
  - Remove the front chassis panel as described in [Removing and Replacing the Front Chassis Panel](#), page 3-8.
- Step 2** Remove all drives and any empty drive trays from the server.
- Step 3** Disconnect all cables from the backplane.

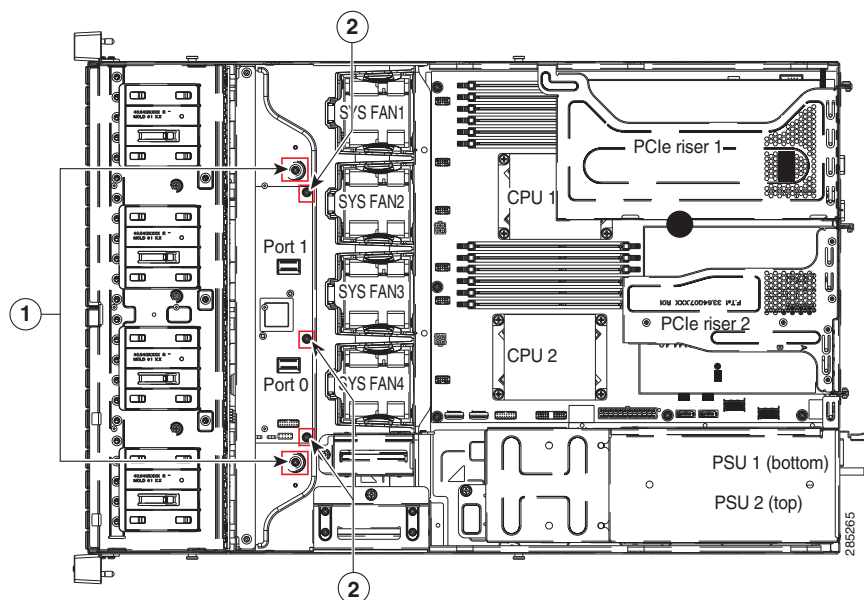


**Tip**

Label the cables as you remove them to aid replacement.

- Step 4** Disconnect all cables from the SAS expander card.
- Step 5** Remove the two screws that secure the backplane assembly to the chassis floor (see [Figure 3-7](#)).
- Step 6** Lift the backplane assembly, including steel tray and expander card straight up from the chassis.
- Step 7** Remove the SAS expander card from the backplane assembly:
- Remove the three screws that secure the SAS expander to the backplane assembly steel tray (see [Figure 3-8](#)).
  - Pull the SAS expander from the sockets on the drive backplane and then set the SAS expander aside on an antistatic surface.
- Step 8** Install the SAS expander card to the new backplane assembly:
- Push the two connectors on the SAS expander into the two sockets on the backplane assembly.
  - Install the three screws that secure the SAS expander to the backplane assembly steel tray (see [Figure 3-8](#)).
- Step 9** Align the new backplane assembly within the chassis walls, and then lower it evenly to the chassis floor until the screw-holes in the assembly align with the corresponding screw-holes in the chassis floor.
- Step 10** Install the two screws that secure the backplane assembly to the chassis floor.
- Step 11** Reconnect all cables to the SAS expander.
- Step 12** Reconnect all cables to the backplane.
- Step 13** Replace all drives and drives trays to the drive bays.
- Step 14** Replace the front chassis panel.
- Step 15** Replace the top cover.
- Step 16** Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

**Figure 3-7** Replacing the Drive Backplane





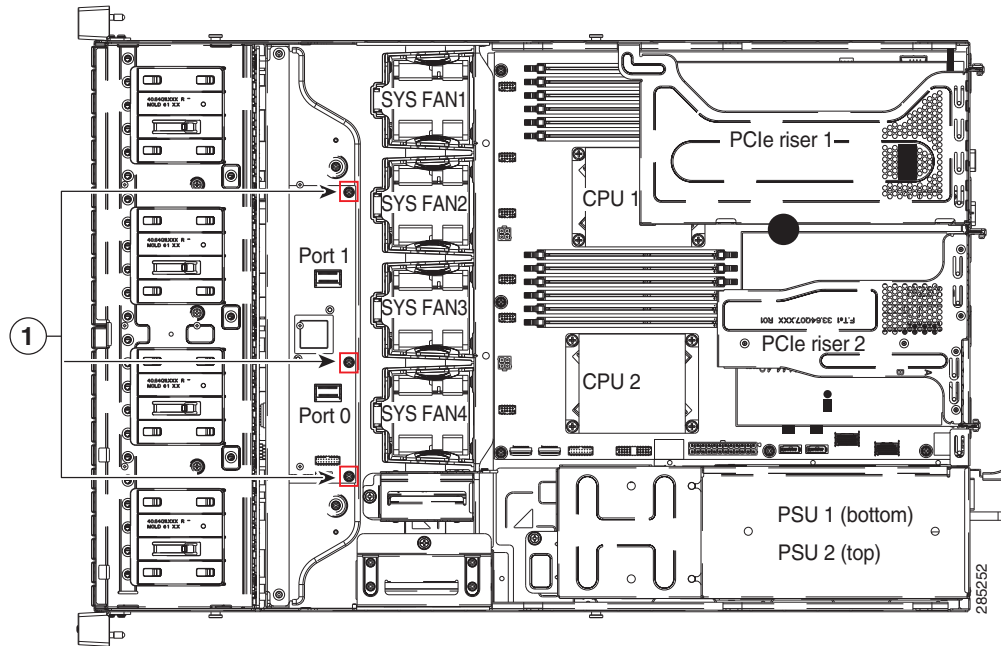
- |                                                   |                                               |
|---------------------------------------------------|-----------------------------------------------|
| <b>1</b> Backplane assembly securing screws (two) | <b>2</b> SAS expander securing screws (three) |
|---------------------------------------------------|-----------------------------------------------|

## Replacing a SAS Expander

The SAS expander is a card that plugs directly into the drive backplane. The SAS expander allows control of up to 24 drives with one RAID controller card. See [Appendix C, “RAID Controller Considerations”](#) for more information about supported RAID controllers.

To install or replace a SAS expander, follow these steps:

- 
- Step 1** Prepare the server for component replacement:
- Power off the server as described in the [“Shutting Down and Powering Off the Server”](#) section on page 3-6.
  - 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.
- 
- Remove the top cover as described in [“Removing and Replacing the Server Top Cover”](#) section on page 3-7.
  - Remove the front chassis panel as described in [Removing and Replacing the Front Chassis Panel](#), page 3-8.
- Step 2** Disconnect all cables from the SAS expander.
-  **Tip** Label the cables as you remove them to aid replacement.
- 
- Step 3** Remove the SAS expander:
- Remove the three screws that secure the SAS expander to the backplane assembly steel tray (see [Figure 3-8](#)).
  - Grasp both ends of the SAS expander and pull evenly to disengage it from the sockets on the drive backplane. Do not tilt the SAS expander until it is free from the sockets on the backplane.
- Step 4** Install the new SAS expander:
- Lower the SAS expander to its position on the backplane assembly. Return the SAS expander to a horizontal position before you begin pushing it into the backplane sockets.
  - Evenly push the two connectors on the edge of the new SAS expander into the two sockets on the backplane. Stop when the screw-holes in the SAS expander align with the screw-holes in the backplane assembly steel tray.
  - Install the three screws that secure the SAS expander to the backplane assembly steel tray (see [Figure 3-8](#)).
- Step 5** Reconnect SAS cables to the new SAS expander.
- Step 6** Replace the front chassis panel.
- Step 7** Replace the top cover.
- Step 8** Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

**Figure 3-8** Replacing the SAS Expander

|   |                                      |  |
|---|--------------------------------------|--|
| 1 | SAS expander securing screws (three) |  |
|---|--------------------------------------|--|

## Replacing Fan Modules

The four hot-pluggable fan modules in the server are numbered as follows when you are facing the front of the server.

**Figure 3-9** Fan Module Numbering

|      |      |      |      |
|------|------|------|------|
| FAN1 | FAN2 | FAN3 | FAN4 |
|------|------|------|------|

To replace or install a hot-pluggable fan module, follow these steps:



### Caution

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

### Step 1

Remove a fan module that you are replacing (see [Figure 3-10](#)):

- 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 as described in “Removing and Replacing the Server Top Cover” section on page 3-7.
- c. Grasp and squeeze together the two green plastic finger-latches on the top of the fan module and then lift straight up to disengage the fan from the fan tray connector.

**Step 2** Install a new fan module:

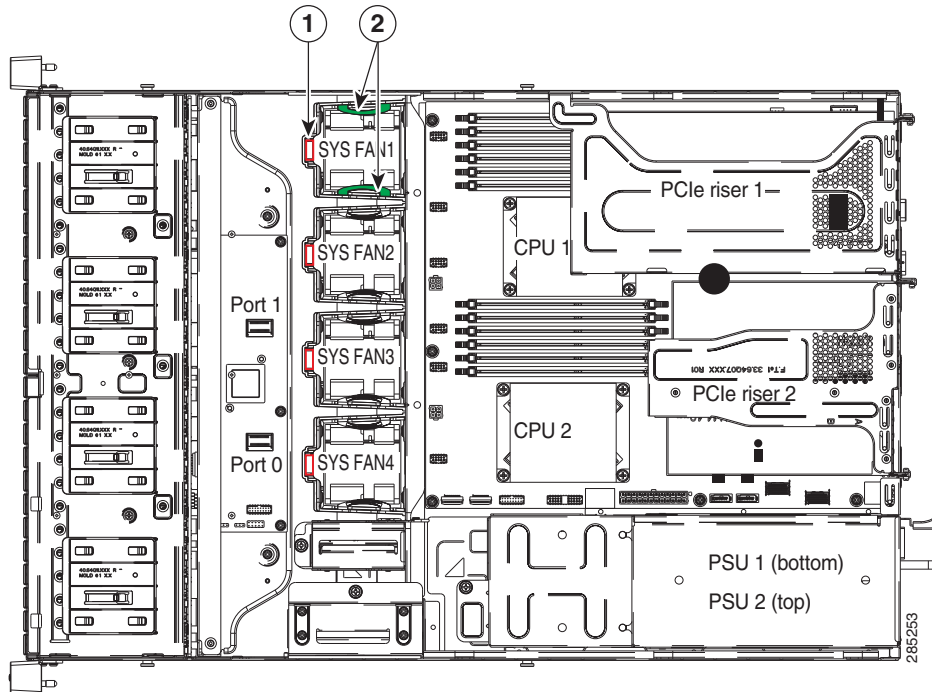
- a. Set the new fan module in place, aligning the connector on the fan module with the connector on the fan tray (see Figure 3-10).



**Note** The arrow on the top of the fan module should point toward the rear of server.

- b. Press down gently on the fan module until the finger-latches click and lock in place.
- c. Replace the top cover.
- d. Replace the server in the rack.

**Figure 3-10 Replacing Fan Modules**



|          |                                             |          |                                      |
|----------|---------------------------------------------|----------|--------------------------------------|
| <b>1</b> | Fan tray connector (one on each fan module) | <b>3</b> | Connector on underside of fan module |
| <b>2</b> | Finger latches (two on each fan module)     |          |                                      |

## Replacing DIMMs

This section includes the following topics:

- [Memory Performance Guidelines and Population Rules, page 3-18](#)
- [DIMM Replacement Procedure, page 3-21](#)

**Caution**

---

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

---

**Caution**

---

Cisco does not support 3rd-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 memory.

---

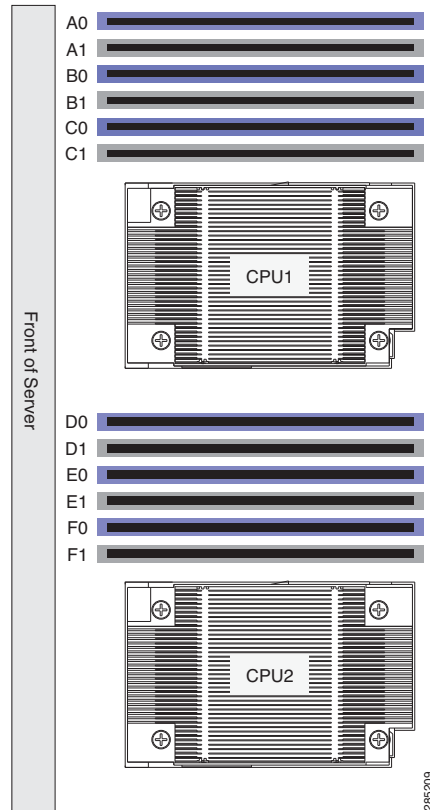
## Memory Performance Guidelines and Population Rules

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

- [DIMM Slot Numbering, page 3-18](#)
- [DIMM Population Rules, page 3-19](#)
- [Memory Mirroring, page 3-20](#)

### DIMM Slot Numbering

[Figure 3-11](#) shows the numbering of the DIMM slots.

**Figure 3-11** DIMM Slots and CPUs

### DIMM Population Rules

Observe the following guidelines when installing or replacing DIMMs:

- Each CPU supports three memory channels.
  - CPU1 supports channels A, B, and C.
  - CPU2 supports channels D, E, and F
- Each channel has two DIMM slots (for example, channel A = slots A0 and A1).
  - A channel can operate with one or two DIMMs installed.
  - If a channel has only one DIMM, populate slot 0 first (the blue slot).
- When both CPUs are installed, populate the DIMM slots of each CPU identically.
  - Fill blue slots in the channels first: A0, D0, B0, E0, C0, F0
  - Fill black slots in the channels second: A1, D1, B1, E1, C1, F1
- Any DIMM installed in a DIMM socket for which the CPU is absent is not recognized. In a single-CPU configuration, populate the channels for CPU1 only.
- Although 1600 MHz DIMMs can be run in Power Savings Mode (1.35 V operation), 1600 MHz operation is supported only when the DDR mode is set to Performance Mode (see “[Enabling Low-Voltage DIMM Operation.](#)”) A 1600 MHz DIMM set to Power Savings Mode operates at 1066 MHz.
- Observe the DIMM mixing rules shown in [Table 3-3](#).

**Table 3-3** DIMM Mixing Rules

| DIMM Parameter Mixed          | Mix Across Single Channel?        | Mix Across Multiple Channels?         |
|-------------------------------|-----------------------------------|---------------------------------------|
| DIMM size (4, 8, 16 GB)       | No—Must be same size in channel.  | Yes—Can be different sizes in server. |
| DIMM speed (1333 or 1600 MHz) | No—Must be same speed in channel. | No—Must be the same speed in server.  |
| DIMM type (R-DIMM)            | No—Must be same type in channel.  | No—Must be the same type in server.   |

- Memory mirroring reduces the amount of memory available by 50% because only one of the two populated channels provides data. When memory mirroring is enabled, DIMMs must be installed in sets of four as described in [Memory Mirroring, page 3-20](#).

### Enabling Low-Voltage DIMM Operation

You can enable low voltage (1.35 V) DIMM operation for all DIMMs in the server. There is a setting in the BIOS Setup utility that you can use to change the DDR memory mode to Power Saving mode, as described in the following procedure:

- 
- Step 1** Enter the BIOS setup utility by pressing the **F2** key when prompted during bootup.
  - Step 2** Select the **Advanced** tab.
  - Step 3** Select **Low Voltage DDR Mode**.
  - Step 4** In the pop-up window, select either **Power Saving** or **Performance Mode**:
    - Power Saving Mode—Prioritizes low-voltage memory operation.
    - Performance Mode—Prioritizes performance memory operation. If you mix low-voltage DIMMs with standard DIMMs, the system defaults to this setting.
  - Step 5** Press **F10** to save your changes and exit the setup utility.
- 

### Memory Mirroring

When memory mirroring is enabled, the memory subsystem simultaneously writes identical data to two channels. If a memory read from one of the channels returns incorrect data due to an uncorrectable memory error, the system automatically retrieves the data from the other channel. A transient or soft error in one channel does not affect the mirrored data, and operation continues unless there is a simultaneous error in exactly the same location on a DIMM and its mirrored DIMM. Memory mirroring reduces the amount of memory available to the operating system by 50% because only one of the two populated channels provides data.

If you choose to enable memory mirroring, populate the DIMM slots in the order shown in [Table 3-4](#).



**Table 3-4** Memory Mirroring DIMM Population, Two CPUs

| Number of DIMMs per CPU | CPU 1 Population | CPU2 Population |
|-------------------------|------------------|-----------------|
| 2                       | A0; B0           | D0; E0          |
| 4                       | A0, B0; A1, B1   | D0, E0; D1, E1  |

## DIMM Replacement Procedure

To install a DIMM assembly, follow these steps:

- Step 1** Remove the DIMMs that you are replacing:
- Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-6](#).
  - 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.

- Remove the top cover as described in “[Removing and Replacing the Server Top Cover](#)” section on [page 3-7](#).
- Remove PCIe riser 1 to provide clearance and set it aside on an antistatic surface (see [Replacing a PCIe Riser, page 3-29](#)).
- Remove the plastic air baffle that covers the DIMM slots and CPUs.
- Open the ejector levers at both ends of the DIMM slot, then lift the DIMM out of the slot.

- Step 2** Install a new DIMM:



**Note** Before installing DIMMs, refer to the population guidelines. See [Memory Performance Guidelines and Population Rules, page 3-18](#).

- Align the new DIMM with the empty slot on the motherboard. Use the alignment key in the DIMM slot to correctly orient the notch on the bottom edge of the DIMM.
- 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.
- Replace the plastic air baffle over the DIMM slots.
- Replace PCIe riser 1 to its slot. See [Replacing a PCIe Riser, page 3-29](#).
- Replace the top cover.
- Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

## Replacing CPUs and Heatsinks

This server can have two CPUs. Each CPU supports four DIMM channels (12 DIMM slots). See [Figure 3-11](#).



### Caution

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



### Caution

The Pick-and-Place tools used in this procedure are required to prevent damage to the contact pins between the motherboard and the CPU. Do not attempt this procedure without the required tools, which are included with each CPU option kit. If you do not have the tool, you can order a spare (Cisco PID UCS-CPU-EN-PNP).

To install or replace a CPU heatsink and CPU, follow these steps:

### Step 1

Remove the CPU and heatsink that you are replacing:

- a. Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-6](#).
- 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.

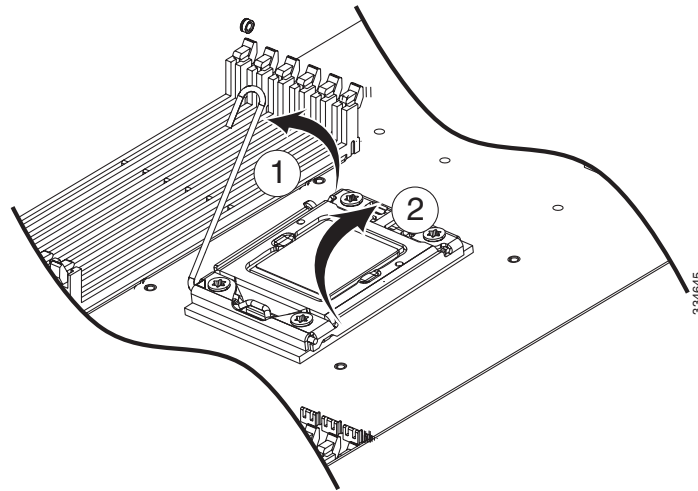
- c. Remove the top cover as described in “[Removing and Replacing the Server Top Cover](#)” section on [page 3-7](#).
- d. Remove the internal air baffle from the server to provide access to the CPUs.
- e. Use a #2 Phillips-head screwdriver to loosen the four captive screws that secure the heatsink and then lift it off of the CPU.



### Note

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

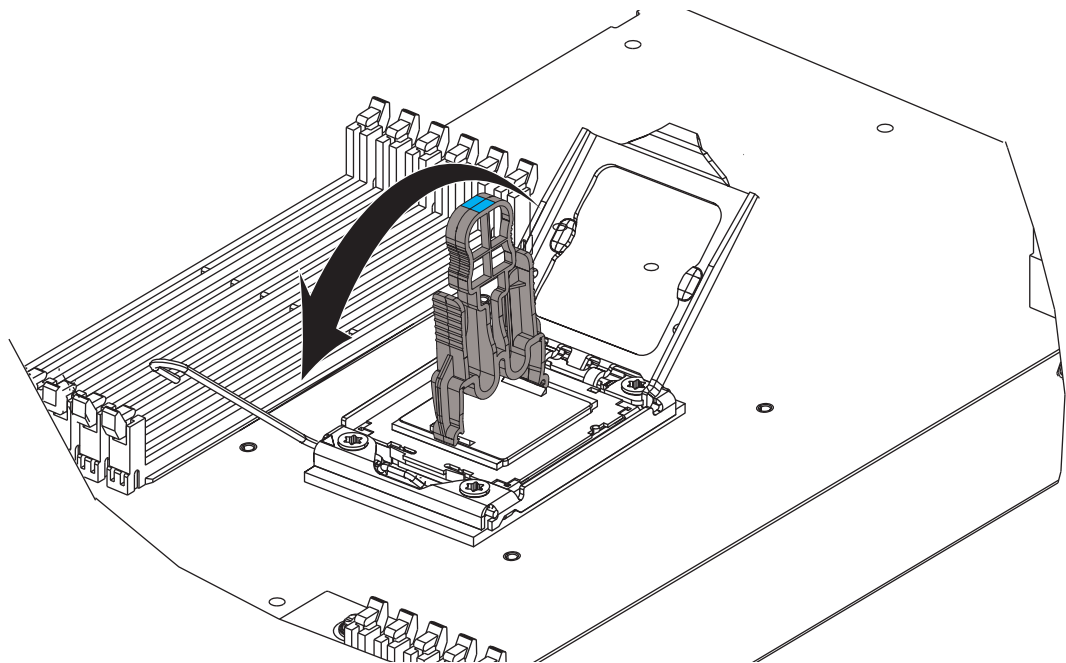
- f. Unclip the CPU retaining latch, then open the hinged CPU cover plate. See [Figure 3-12](#).

**Figure 3-12 CPU Socket Latches**

|   |                        |   |                        |
|---|------------------------|---|------------------------|
| 1 | Heatsink screws (four) | 4 | Hinged CPU cover plate |
| 2 | Heatsink               | 5 | CPU                    |
| 3 | CPU retaining latch    |   |                        |

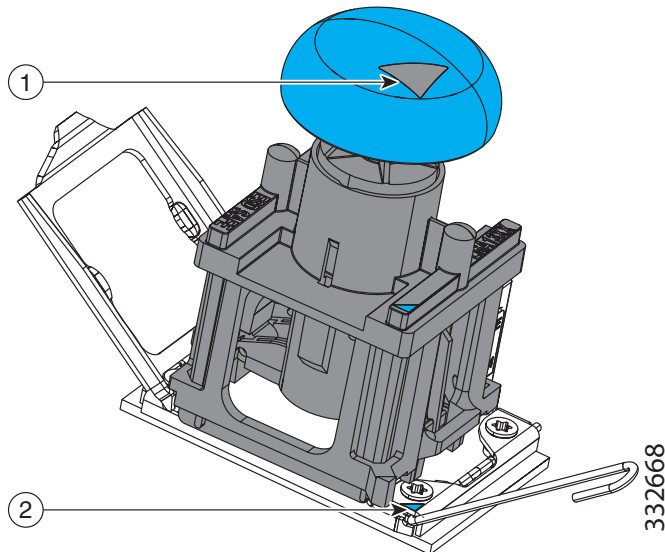
**Step 2** Remove a protective cap or an old CPU from the socket (if present):

- If you are removing an old CPU, skip to [Step 3](#).
- If you are installing a new CPU to a socket that was shipped empty, the socket has a protective cap that is intended to prevent bent contact pins. Use the tool as shown in [Figure 3-13](#) to grasp the protective cap and then pivot to remove the cap.

**Figure 3-13 Protective Cap Removal Tool**

- Step 3** Remove an old CPU:
- Set the Pick-and-Place tool on the CPU in the socket, aligning the arrow on the tool with the registration mark on the socket (the small triangular mark). See [Figure 3-14](#).
  - Press the top button on the tool to grasp the installed CPU.
  - Lift the tool and CPU straight up.
  - Press the top button on the tool to release the old CPU on an anti-static surface.

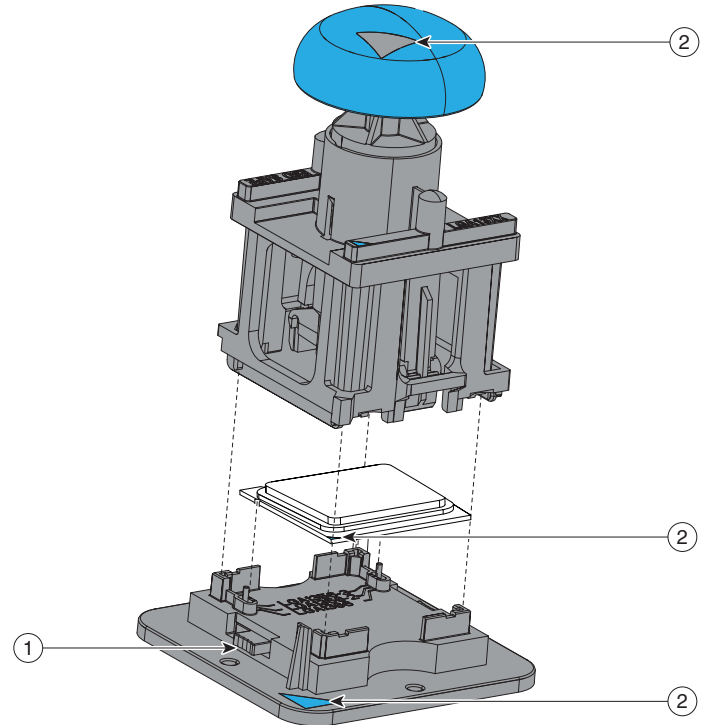
**Figure 3-14** Removing or Inserting a CPU



|          |               |          |                                 |
|----------|---------------|----------|---------------------------------|
| <b>1</b> | Arrow on tool | <b>2</b> | Registration mark on CPU socket |
|----------|---------------|----------|---------------------------------|

- Step 4** Insert the new CPU into the Pick-and-Place tool:
- Remove the new CPU from the packaging and place it on the pedestal that is included in the kit. Align the registration mark on the corner of the CPU with the arrow on the corner of the pedestal (see [Figure 3-15](#)).
  - Set the Pick-and-Place tool on the CPU pedestal, aligning the arrow on the tool with the arrow on the corner of the pedestal. Make sure that the tabs on the tool are fully seated in the slots on the pedestal.
  - Press the top button on the tool to grasp and lock in the CPU.
  - Lift the tool and CPU straight up off the pedestal.

**Figure 3-15 CPU and Pick-and-Place Tool on Pedestal**



|          |                           |   |
|----------|---------------------------|---|
| <b>1</b> | Arrow marks for alignment | - |
|----------|---------------------------|---|

**Step 5** Install a new CPU:

- a. Set the Pick-and-Place tool with CPU over the empty CPU socket on the motherboard.



**Note**

Align the arrow on the top of the tool with the registration mark (small triangle) that is stamped on the metal of the CPU socket, as shown in [Figure 3-14](#).

- b. Press the top button on the tool to set the CPU into the socket. Remove the empty tool.
- c. Close the hinged CPU cover plate.
- d. Clip down the CPU retaining latch. See [Figure 3-12](#).

**Step 6** Install a heatsink:



**Caution**

The heatsink must have a new, undamaged thermal pad on the heatsink-to-CPU surface to ensure proper cooling. If you are replacing a heatsink that was previously used, you must remove the old thermal pad. If you are installing a new heatsink, skip to step **d.** below.

- a. Apply an alcohol-based cleaning solution to the old thermal pad and let it soak for a least 15 seconds.
- b. Wipe all of the old thermal pad off the old heatsink using a soft cloth that will not scratch the heatsink surface.

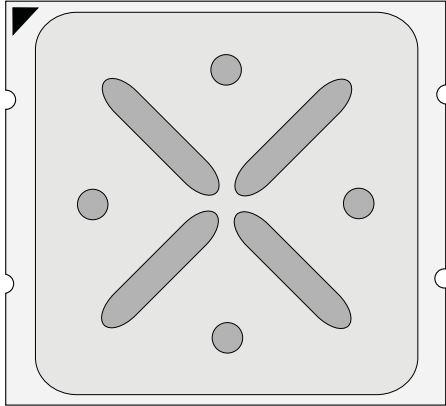
- c. Apply thermal grease from an included syringe to the top of the CPU.

Apply about 2 cubic centimeters of grease (about half the syringe contents) to the top of the CPU in the pattern that is shown in [Figure 3-16](#).



**Note** If you do not have a syringe of thermal grease, you can order a spare (Cisco PID UCS-CPU-GREASE).

**Figure 3-16** Thermal Grease Application Pattern



- d. For a new heatsink, peel the protective film from the thermal pad that is on the bottom of the new heatsink.



**Note** Do not apply a syringe of thermal grease if you are installing a new heatsink that already has a pre-applied thermal pad.

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



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

- f. Replace the top cover.
- g. Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

## Replacing the Motherboard RTC Battery

**Warning**

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

The real-time clock (RTC) battery retains system settings when the server is disconnected from power. The RTC battery is on the motherboard under the fan tray.

The battery type is Panasonic CR2032 or equivalent.

To replace or install the motherboard CMOS battery, follow these steps:

**Step 1**

Remove the RTC battery (see [Figure 3-17](#)):

- a. Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-6](#).
- 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 as described in “[Removing and Replacing the Server Top Cover](#)” section on [page 3-7](#).
- d. Locate the RTC battery on the motherboard between the PCIe risers (see [Figure 3-17](#)).
- e. Use a small screwdriver or pointed object to push aside the metal clip that holds the battery in the holder.

**Note**

If you have difficulty reaching the battery because of cards in the PCIe risers, remove PCIe riser 1 to provide access. See [Replacing a PCIe Riser, page 3-29](#).

- f. Lift the battery from the holder.

**Step 2**

Install an RTC battery:

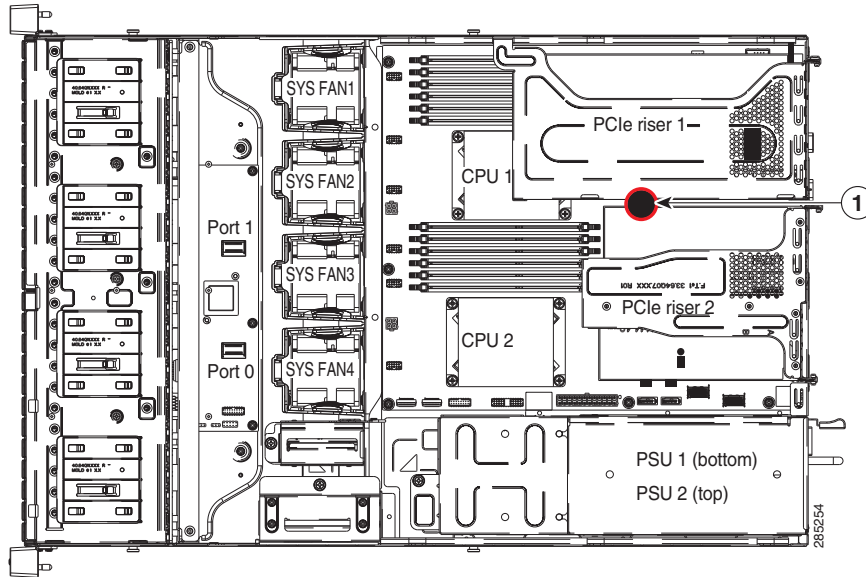
- a. Insert the battery into its holder positive-side-up and press down until it clicks in place.

**Note**

The positive side of the battery marked “3V+” should face upward.

- b. If you removed PCIe riser 1, replace it to its slot. See [Replacing a PCIe Riser, page 3-29](#).
- c. Replace the top cover.
- d. Replace the server in the rack, replace cables, and power on the server by pressing the **Power** button.

**Figure 3-17** Replacing the Motherboard RTC Battery



|          |                                   |   |
|----------|-----------------------------------|---|
| <b>1</b> | RTC battery holder on motherboard | - |
|----------|-----------------------------------|---|

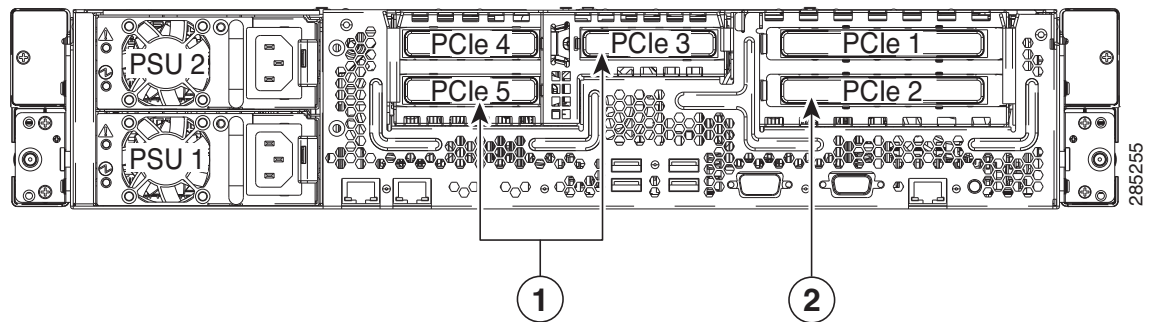


## Replacing a PCIe Riser

The server contains two toolless PCIe risers for horizontal installation of PCIe cards. PCIe riser 2 also includes two internal sockets for Cisco Flexible Flash cards (SD cards).

See [PCIe Slots](#), page 3-31 for specifications of the PCIe slots on the risers.

**Figure 3-18 Rear Panel, Showing PCIe Slots**



|          |                                              |          |                                            |
|----------|----------------------------------------------|----------|--------------------------------------------|
| <b>1</b> | PCIe riser 2 slots (three half-height slots) | <b>2</b> | PCIe riser 1 slots (two full-height slots) |
|----------|----------------------------------------------|----------|--------------------------------------------|

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

- Step 1** Remove the PCIe riser that you are replacing:
- Power off the server as described in the [“Shutting Down and Powering Off the Server”](#) section on page 3-6.
  - 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.

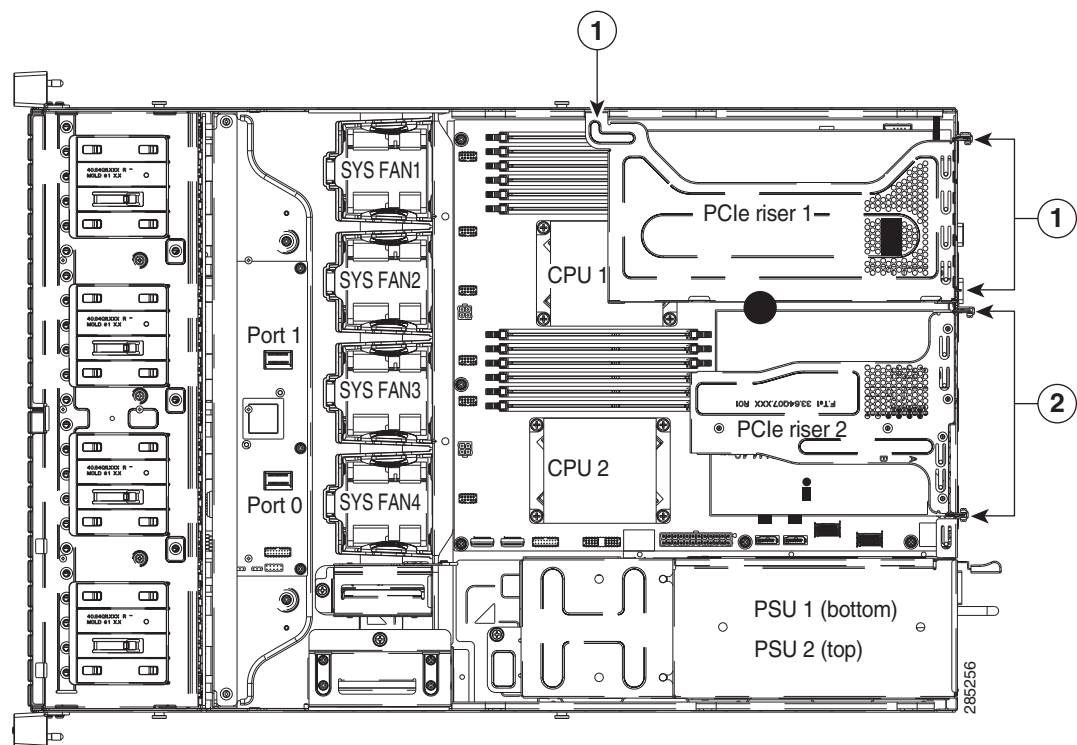
- Remove the top cover as described in [“Removing and Replacing the Server Top Cover”](#) section on page 3-7.
  - Disconnect all cables from any PCIe cards that are installed in the PCIe riser.
  - Grasp both ends of the riser and evenly pull straight up to disengage its circuit board from the socket on the motherboard. Set the riser on an antistatic surface.
  - If the riser has a card installed, remove the card from the riser (see [Replacing a PCIe Card](#), page 3-31).
- Step 2** Install a new PCIe riser:
- If you removed a card from the old PCIe riser, install the card to the new riser (see [Replacing a PCIe Card](#), page 3-31).
  - Position the PCIe riser over its socket on the motherboard and over its alignment points in the chassis (see [Figure 3-19](#)).

**Caution**

Make sure that the circuit board connector of the riser is aligned correctly with the motherboard socket before you push down to seat the riser in the next step.

- c. Carefully push down on both ends of the PCIe riser to fully engage its circuit board connector with the socket on the motherboard.
- d. Reconnect cables to any PCIe cards installed in the riser.
- e. Replace the top cover.
- f. Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

**Figure 3-19** Replacing the PCIe Riser



|          |                                                |          |                                              |
|----------|------------------------------------------------|----------|----------------------------------------------|
| <b>1</b> | PCIe riser 1 alignment point locations (three) | <b>2</b> | PCIe riser 2 alignment point locations (two) |
|----------|------------------------------------------------|----------|----------------------------------------------|

# Replacing a PCIe Card



**Caution** Cisco supports all PCIe cards qualified and sold by Cisco. PCIe cards not qualified or sold by Cisco are the responsibility of the customer. Although Cisco will always stand behind and support the 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 third-party card occurs.

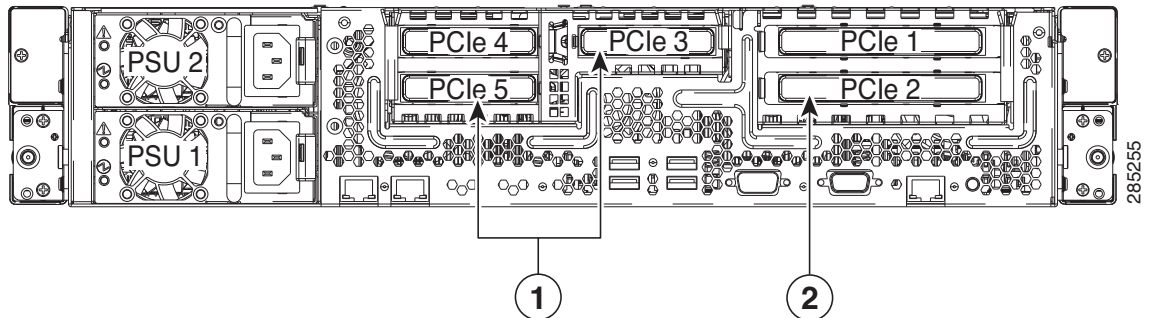
This section includes the following topics:

- [PCIe Slots, page 3-31](#)
- [Replacing a PCIe Card, page 3-32](#)
- [Special Considerations for Cisco UCS Virtual Interface Cards, page 3-33](#)
- [RAID Controller Card Cable Routing, page 3-33](#)

## PCIe Slots

The server contains two PCIe risers for horizontal installation of PCIe cards. See [Figure 3-20](#) and [Table 3-5](#).

**Figure 3-20 Rear Panel, Showing PCIe Slots**



|          |                                    |          |                                 |
|----------|------------------------------------|----------|---------------------------------|
| <b>1</b> | PCIe riser 2 slots (slots 3, 4, 5) | <b>2</b> | PCIe riser 1 slots (slots 1, 2) |
|----------|------------------------------------|----------|---------------------------------|

**Table 3-5 PCIe Expansion Slots**

| Slot Number | Electrical Lane Width | Connector Length | Card Length <sup>1</sup> | Card Height <sup>2</sup> | NCSI <sup>3</sup> Support |
|-------------|-----------------------|------------------|--------------------------|--------------------------|---------------------------|
| 1           | Gen-3 x16             | x16 extended     | Full length              | Full-height              | Yes <sup>4</sup>          |
| 2           | Gen-3 x4              | x8 connector     | 1/2 length               | Full-height              | No                        |
| 3           | Gen-3 x8              | x16 connector    | 1/2 length               | Half-height              | No                        |
| 4           | Gen-3 x8              | x8 connector     | 1/2 length               | Half-height              | No                        |
| 5           | Gen-3 x4              | x8 connector     | 1/2 length               | Half-height              | No                        |

1. This is the supported length because of internal clearance.
2. This is the size of the rear panel opening.
3. Network Communications Services Interface protocol.
4. Slot 1 can operate when the server is in standby power mode.

## Replacing a PCIe Card


**Note**

If you are installing a Cisco UCS Virtual Interface Card, there are prerequisite considerations. See [Special Considerations for Cisco UCS Virtual Interface Cards, page 3-33](#).


**Note**

If you are installing a RAID controller card, see [RAID Controller Considerations, page C-1](#) for more information about supported cards and cabling.

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

**Step 1**

Remove a PCIe card (or a blank filler panel) from the PCIe riser assembly:

- a. Shut down and power off the server as described in the [“Shutting Down and Powering Off the Server” section on page 3-6](#).
- 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 as described in the [“Removing and Replacing the Server Top Cover” section on page 3-7](#).
- d. Disconnect cables from the PCIe cards that you are replacing.


**Tip**

Label the cables when you disconnect them to aid correct connection to the new card.

- e. Grasp both ends of the riser and evenly pull straight up to disengage its circuit board from the socket on the motherboard. Set the riser on an antistatic surface.
- f. Remove the single screw that secures the tab of the card to the riser.
- g. Pull evenly on both ends of the card to disengage it from the socket on the riser (or remove a blanking panel) and then set the card aside.

**Step 2**

Install a PCIe card:

- a. Align the new card with the empty socket on the riser.
- b. Push down evenly on both ends of the card until it is fully seated in the socket.  
Ensure that the card rear panel tab sits flat against the riser rear panel opening.
- c. Replace the screw that secures the tab of the card to the riser.
- d. Position the riser over its socket on the motherboard and over its alignment features in the chassis (see [Figure 3-19](#)).


**Caution**

Make sure that the circuit board connector of the riser is aligned correctly with the motherboard socket before you push down to seat the riser in the next step.

- e. Carefully push down on both ends of the PCIe riser to fully engage its circuit board connector with the socket on the motherboard.
- f. Connect cables to the PCIe card. See [RAID Controller Considerations, page C-1](#) for more information about supported cards and cabling.
- g. Replace the top cover.
- h. Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.
- i. If you replaced a RAID controller card, continue with [Restoring RAID Configuration After Replacing a RAID Controller, page C-6](#).

## Special Considerations for Cisco UCS Virtual Interface Cards

[Table 3-6](#) describes the requirements for the supported Cisco UCS virtual interface cards (VICs).

**Table 3-6** Cisco UCS C24 Requirements for Virtual Interface Cards

| Virtual Interface Card (VIC)        | Number of VICs Supported in Server | Slots That Support VICs <sup>1</sup> | Primary Slot For UCS Integration or Cisco Card NIC Mode | Minimum CIMC Firmware | Minimum VIC Firmware For Use With UCS Integration | Minimum Nexus OS on an Upstream Nexus Fabric Interconnect |
|-------------------------------------|------------------------------------|--------------------------------------|---------------------------------------------------------|-----------------------|---------------------------------------------------|-----------------------------------------------------------|
| Cisco UCS VIC P81E N2XX-ACPCI01     | 2                                  | PCIE 1<br>PCIE 2                     | PCIE 1                                                  | 1.4(5)                | 2.0(2)                                            | 5.0                                                       |
| Cisco UCS VIC 1225 UCSC-PCIE-CSC-02 | 2                                  | PCIE 1<br>PCIE 2                     | PCIE 1                                                  | 1.4(6)                | 2.1(0)                                            | 5.0                                                       |

1. See [PCIe Slots, page 3-31](#).

## RAID Controller Card Cable Routing

If the PCIe card that you are installing or replacing is a RAID controller card, see [RAID Controller Considerations, page C-1](#) for cable routing and other guidelines.

See also [Replacing a SuperCap Power Module \(RAID Backup Unit\), page 3-34](#) for instructions on installing a RAID backup unit for a RAID controller card.

## Replacing a SuperCap Power Module (RAID Backup Unit)

This server supports installation of up to two SuperCap power modules (SCPMs). The SCPMs mount inside a cage that is next to the cooling fans (see [Figure 3-21](#)).

The SCPM is supported only when using the LSI MegaRAID-CV controller card. This supercap module provides approximately 3 years of backup for the disk write-back cache DRAM in the case of sudden power loss by offloading the cache to the NAND flash.

To replace the RAID backup unit, follow these steps:

- 
- Step 1** Remove an SCPM (see [Figure 3-21](#)).
- a. Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-6](#).
  - 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 as described in the “[Removing and Replacing the Server Top Cover](#)” section on [page 3-7](#).
- d. Disconnect the RAID controller cable that is attached to the existing SCPM.
- e. Remove the cage that holds the SCPMs (see [Figure 3-21](#)).
  - Use a screwdriver to loosen the captive thumbscrew that secures the cage to the chassis floor.



**Note**

If you cannot access the thumbscrew, you can remove the front chassis panel to provide clearance. See [Removing and Replacing the Front Chassis Panel](#), [page 3-8](#).

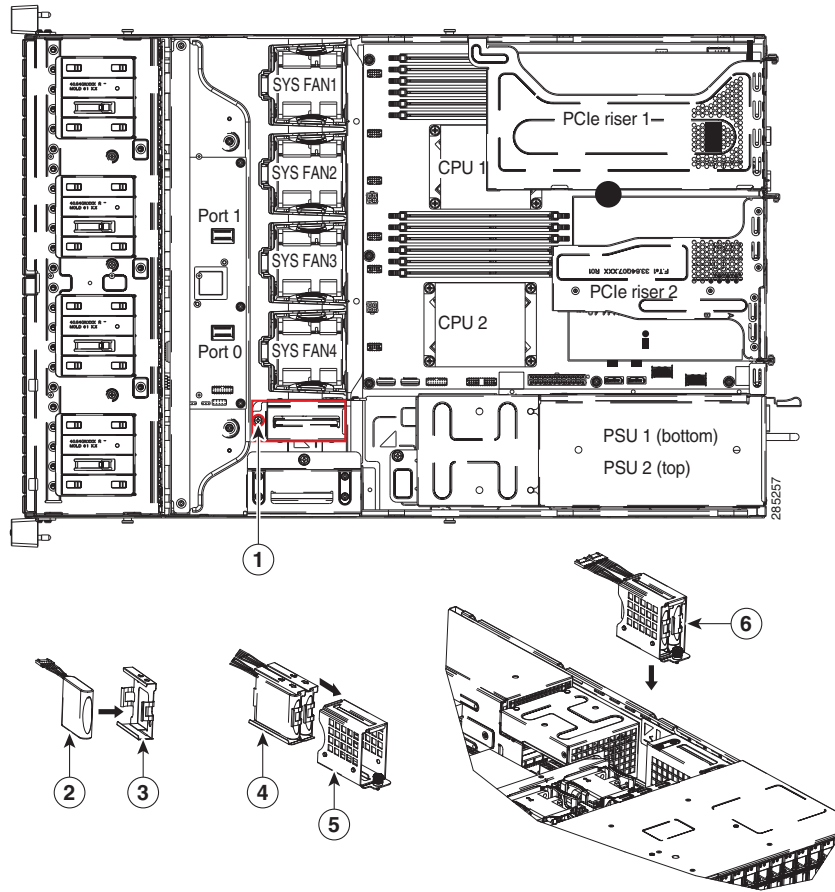
- Push the cage toward the server front about 1/4 inch to free the pegs on the sides of the cage from the keyed slots on the chassis bracket.

- f. Remove the SCPM holder, with backup unit, from the cage (see [Figure 3-21](#)).
- g. Remove the SCPM from the holder.

**Step 2** Install a new SCPM:

- a. Insert the new SCPM into the empty holder that you removed in the previous step (see [Figure 3-21](#)).
- b. Insert the holder, with new SCPM, into the cage.
- c. Replace the cage to the chassis.
  - Set the cage in place in the chassis bracket, aligning the pegs on the sides of the cage with the keyed slots in the chassis bracket.
  - Push the cage toward the server rear about 1/4 inch to lock it into the keyed slots on the chassis bracket.
  - Use a screwdriver to tighten the captive thumbscrew that secures the cage to the chassis floor.
- d. Reconnect the cable from the RAID controller to the new SCPM.
- e. Replace the top cover.
- f. Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Figure 3-21 Replacing an SCPM



|   |                                 |   |                                                        |
|---|---------------------------------|---|--------------------------------------------------------|
| 1 | Captive thumbscrew on SCPM cage | 4 | SCPM holders with SCPMs installed (up to two)          |
| 2 | SuperCap power module (SCPM)    | 5 | SCPM cage removed from server                          |
| 3 | SCPM holder                     | 6 | SCPM cage with holders and SCPMs installed (up to two) |

## Replacing a Cisco USB Flash Drive

The server has two options for USB flash drives:

- The server can be ordered with one blank 8-GB flash drive pre-installed in the internal USB slot.
- This server is shipped from the factory with one 16-GB Cisco USB flash drive in the accessory kit. This flash drive is pre-loaded with Cisco UCS C-Series Utilities.

This section includes the following topics:

- [Overview of the Pre-Loaded 16-GB Cisco USB Flash Drive, page 3-36](#)
- [Enabling a Pre-Loaded Cisco USB Flash Drive Virtual Drive, page 3-36](#)
- [Booting a Pre-Loaded Cisco USB Flash Drive Virtual Drive, page 3-37](#)
- [Monitoring and Managing a Cisco USB Flash Drive, page 3-38](#)
- [Internal Cisco USB Flash Drive Replacement Procedure, page 3-38](#)
- [Enabling or Disabling the Internal USB Port, page 3-39](#)

### Overview of the Pre-Loaded 16-GB Cisco USB Flash Drive

This Cisco USB flash drive is pre-loaded with three software bundles, each on one of four preconfigured virtual drives (VDs). The fourth VD allows you to install an OS or embedded hypervisor.

The VDs are configured as follows:

1. Cisco UCS Server Configuration Utility (SCU).
2. Hypervisor (HV). This is a VD that you can use for your own purposes.
3. Cisco Drivers (Drivers).
4. Cisco Host Upgrade Utility (HUU).

### Enabling a Pre-Loaded Cisco USB Flash Drive Virtual Drive

Each of the VDs on the pre-loaded Cisco USB flash drive can be separately enabled or hidden from the host. The default as shipped from the factory is for all VDs to be hidden.

To enable VDs and expose them to the host, follow these steps:

- 
- Step 1** Log in to CIMC interface for the server, using the IP address of the server.
  - Step 2** Navigate through GUI tabs to **Server > Inventory > Storage**.
  - Step 3** Click **FlexFlash-0** in the Storage Adapters list.
  - Step 4** Click on **Configure Operational Profile** in the Actions area.  
The Operational Profile dialog opens.
  - Step 5** Check the box for each VD that you want to enable and expose to the host, then click **Save Changes**.
-



## Booting a Pre-Loaded Cisco USB Flash Drive Virtual Drive

When you want to access the Cisco SCU or Cisco HUU software, you boot its VD with a one-time boot option. When you want to boot the hypervisor (HV) VD, you boot it with a permanent boot order selection. See the following topics in this section:

- [Booting the Cisco SCU and Cisco HUU Software VDs, page 3-37](#)
- [Booting the Hypervisor VD, page 3-37](#)

### Booting the Cisco SCU and Cisco HUU Software VDs

You can access the preinstalled Cisco SCU and Cisco HUU software bundles by booting their respective VDs with a one-time boot option:

- 
- Step 1** Enable the SCU or HUU VD.  
See [Enabling a Pre-Loaded Cisco USB Flash Drive Virtual Drive, page 3-36](#).
- Step 2** In the CIMC GUI interface, navigate through the tabs to **Server > BIOS**.
- Step 3** Click **Configure Boot Override Priority**.  
The Boot Override Priority dialog opens.
- Step 4** Pull down the menu and select **SCU** or **HUU**, then click **OK**.
- Step 5** Reboot the server.  
The server boots the selected VD.



---

**Note** This is a one-time boot option. After running Cisco SCU or Cisco HUU, the server returns to its previously configured boot path.

---

### Booting the Hypervisor VD

You can boot the hypervisor (HV) VD with a more permanent boot selection. (To change the boot order one time, use the procedure in [Booting the Cisco SCU and Cisco HUU Software VDs, page 3-37](#).)

To permanently set the boot order for an HV VD, use the following steps:

- 
- Step 1** Boot the server and watch for the prompt to press F2 to open the BIOS Setup utility.
- Step 2** When prompted, press **F2** to open the BIOS Setup utility.
- Step 3** Navigate to the **Boot Options** tab.
- Step 4** Use the Boot Options screen to set the HV VD to your desired boot order for the server.
-

## Monitoring and Managing a Cisco USB Flash Drive

You can monitor and manage your installed Cisco USB Flash Drive by using the CIMC GUI interface or the CLI interface. See the *Cisco UCS C-Series Rack-Mount Server Configuration Guide* or the *Cisco UCS C-Series Rack-Mount Server CLI Configuration Guide* in the documentation roadmap linked below. The links to these documents are in the C-Series documentation roadmap:

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

## Internal Cisco USB Flash Drive Replacement Procedure

To install or replace an internal Cisco USB Flash Drive, follow these steps:

- 
- Step 1** Remove the USB flash drive that you are replacing. See [Figure 3-22](#):
- Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-6](#).
  - 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.



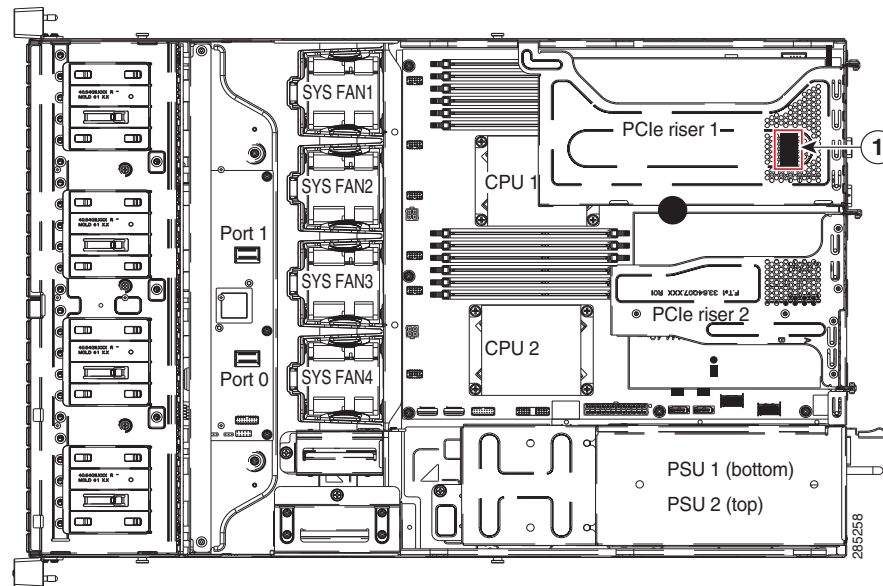
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**Caution** If you cannot safely view and access the component, remove the server from the rack.

---

- Remove the top cover as described in “[Removing and Replacing the Server Top Cover](#)” section on [page 3-7](#).
  - Remove PCIe riser 1 to provide access to the USB flash drive socket that is on the motherboard (see [Figure 3-22](#)). See [Replacing a PCIe Riser, page 3-29](#) for more information.
  - Pull the USB flash drive from the socket.
- Step 2** Install a USB flash drive:
- Insert the USB flash drive into the socket.
  - Replace PCIe riser 1 to the server. See [Replacing a PCIe Riser, page 3-29](#) for more information.
  - Replace the top cover.
  - Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.

Figure 3-22 Cisco USB Flash Drive Socket



|          |                                             |   |
|----------|---------------------------------------------|---|
| <b>1</b> | Cisco USB flash drive socket on motherboard | - |
|----------|---------------------------------------------|---|

## Enabling or Disabling the Internal USB Port

The factory default is for all USB ports on the server to be enabled. However, the internal USB port can be enabled or disabled in the server BIOS. To enable or disable the internal USB port, follow these steps:

- 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 select either Enabled or Disabled from the pop-up menu.
- Step 6** Press **F10** to save and exit the utility.

## Installing a Trusted Platform Module

The trusted platform module (TPM) is a small circuit board that attaches to a motherboard socket. The socket location is on the motherboard, underneath PCIe riser 1 (see [Figure 3-23](#)).



### Note

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

To install a trusted platform module (TPM), follow these steps:

### Step 1

Prepare the server for component installation.

- a. Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-6](#).
- 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 as described in the “[Removing and Replacing the Server Top Cover](#)” section on [page 3-7](#).
- d. Remove PCIe riser 2 to provide access (see [Figure 3-23](#)). See [Replacing a PCIe Riser, page 3-29](#).

### Step 2

Install a TPM (see [Figure 3-23](#)):

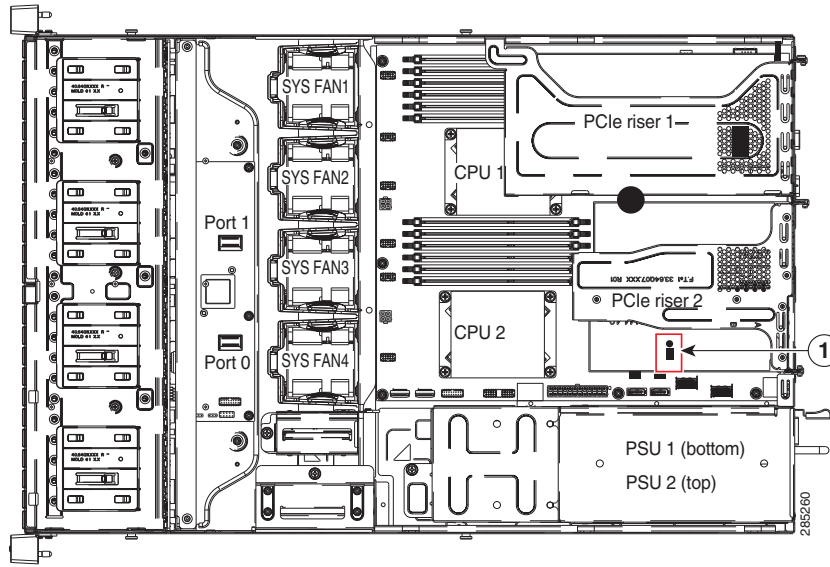
- a. Locate the TPM socket on the motherboard, as shown in [Figure 3-23](#).
- b. Align the connector that is on the bottom of the TPM circuit board with the motherboard TPM socket. Align the screw hole and standoff on the TPM board with the screw hole adjacent to the TPM socket.
- c. Push down evenly 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. Replace PCIe riser 2 to its motherboard socket. See [Replacing a PCIe Riser, page 3-29](#).
- f. Replace the top cover.
- g. Replace the server in the rack, replace cables, and then power on the server by pressing the **Power** button.



### Note

The TPM and the Intel Trusted Execution Technology (TXT) feature must be enabled in the server BIOS. If you have not previously enabled the TXT and TPM, continue with the next steps.

Figure 3-23 TPM Socket Location on Motherboard



|   |                                          |   |              |
|---|------------------------------------------|---|--------------|
| 1 | TPM socket and screw hole on motherboard | 2 | PCIe riser 1 |
|---|------------------------------------------|---|--------------|

## Enabling the Intel Trusted Execution Technology (TXT) Feature For the TPM

Intel TXT provides greater protection for information that is used and stored on the business server. A key aspect of that protection is the provision of an isolated execution environment and associated sections of memory where operations can be conducted on sensitive data, invisibly to the rest of the system. Likewise, Intel TXT provides for a sealed portion of storage where sensitive data such as encryption keys can be kept, helping to shield them from being compromised during an attack by malicious code.

To enable the TXT feature, follow these steps:

---

**Step 1** Verify that a TPM is now installed and enabled in the server:

- a. Either attach a VGA monitor and USB keyboard to the server, or log in remotely to the CIMC interface of the server and open a virtual KVM console window.
- b. Reboot the server.
- c. Watch during bootup for the F2 prompt, and then press **F2** to enter BIOS setup.
- d. Log in to the BIOS Setup utility with your BIOS Administrator password.




---

**Note** You must be logged in as the BIOS administrator to perform this procedure. If you have not done so already, set a BIOS administrator password on the Security tab of the BIOS Setup utility.

---

- e. Select the **Security** tab. Verify that TPM State now says Enabled & Activated.

**Step 2** Verify VT/VT-d and enable the Intel Trusted Execution Technology (TXT) feature in the server BIOS:

- a. Verify that the Intel Virtualization Technology (VT) and the Intel VT for Directed I/O (VT-d) features are enabled (the factory default).

Select the **Advanced** tab of the utility, then select **Processor Configuration**. These features are listed on the page that appears, along with their states.

- b. On this same Advanced > Processor Configuration page, select **Intel Trusted Execution Technology** and set it to **Enabled**.




---

**Note** The Intel Trusted Execution Technology feature is only listed when the server has a TPM installed on the TPM header.

---

- c. Press **Escape** to return to the BIOS Setup utility screen.

**Step 3** Verify that the Intel TXT, VT, and VT-d features are enabled:

- a. Reboot the server.
  - b. Watch during bootup for the F2 prompt, and then press **F2** to enter BIOS setup.
  - c. Select the **Advanced** tab, then select **Processor Configuration**. Verify that the state of these three features is Enabled.
-

## Replacing Power Supplies

The server can have one or two power supplies. When two power supplies are installed they are redundant as 1+1.


**Note**

The power supplies must both be either 450W or 650W; do not mix power supply types.

See [Power Specifications, page A-2](#) for more information about the power supplies. See [Rear Panel LEDs and Buttons, page 3-4](#) for information about the power supply LEDs.

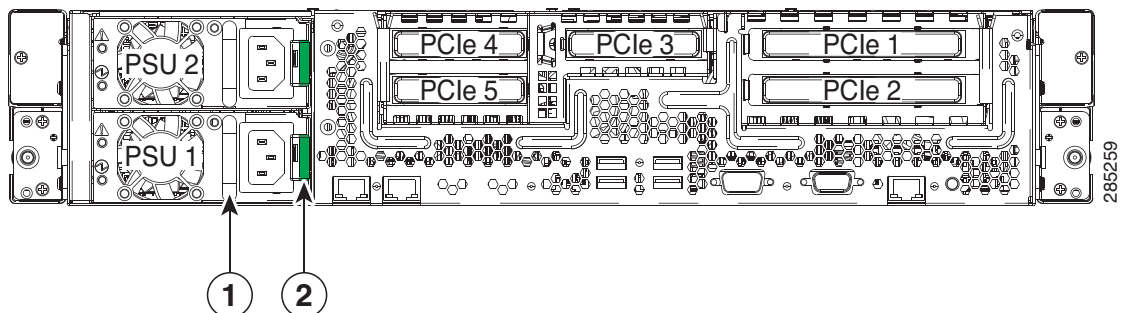
To replace or install a power supply, follow these steps:


**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 power supplies because they are redundant as 1+1.

- Step 1** Remove the power supply that you are replacing or a blank panel from an empty bay (see [Figure 3-24](#)):
- a. Perform one of the following actions:
    - If your server has only one power supply, shut down and power off the server as described in the [“Shutting Down and Powering Off the Server”](#) section on page 3-6.
    - 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 towards the handle.
  - d. Pull the power supply out of the bay.
- Step 2** Install a new power supply:
- a. Grasp the power supply handle and insert the new power supply into the empty bay.
  - b. Push the power supply into the bay until the release lever locks.
  - c. Connect the power cord to the new power supply.
  - d. If you shut down the server, press the **Power** button to return the server to main power mode.

**Figure 3-24** Removing and Replacing Power Supplies



|          |                     |          |                            |
|----------|---------------------|----------|----------------------------|
| <b>1</b> | Power supply handle | <b>2</b> | Power supply release lever |
|----------|---------------------|----------|----------------------------|







# APPENDIX **A**

## Server Specifications

---

This appendix lists the technical specifications for the server and includes the following sections:

- [Physical Specifications, page A-1](#)
- [Power Specifications, page A-2](#)
- [Environmental Specifications, page A-3](#)

## Physical Specifications

[Table A-1](#) lists the physical specifications for the server.

**Table A-1**      *Physical Specifications*

| <b>Description</b>             | <b>Specification</b>                   |
|--------------------------------|----------------------------------------|
| Height                         | 3.4 in. (8.76 cm)                      |
| Width (including slam-latches) | 16.9 in. (43.00 cm)                    |
| Depth                          | 26.0 in. (66.05 cm)                    |
| Weight (fully loaded)          | Small Form Factor: 47.2 lbs. (21.4 Kg) |

# Power Specifications

The power specifications for the two power supply options are listed in the following sections:

- [450W Power Supply, page A-2](#)
- [650W Power Supply, page A-3](#)

You can get more specific power information for your exact server configuration by using the Cisco UCS Power Calculator:

[http://www.cisco.com/assets/cdc\\_content\\_elements/flash/dataCenter/cisco\\_ucs\\_power\\_calculator/](http://www.cisco.com/assets/cdc_content_elements/flash/dataCenter/cisco_ucs_power_calculator/)

## 450W Power Supply

[Table A-2](#) lists the specifications for each 450W power supply (Cisco part number UCSC-PSU-450W).

**Table A-2** Power Supply Specifications

| Description                                | Specification                                                                                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| AC input voltage range                     | 90 to 264 VAC self-ranging<br>Low range: 100 VAC to 120 VAC nominal<br>High range: 200 VAC to 240 VAC nominal |
| AC input frequency                         | Range: 47 to 63 Hz (single phase, 50 to 60Hz nominal)                                                         |
| AC line input current (steady state)       | 6.0 A peak at 100 VAC<br>3.0 A peak at 208 VAC                                                                |
| Maximum AC inrush current                  | 9 A                                                                                                           |
| Maximum output power for each power supply | 450 W                                                                                                         |
| Power supply output voltage                | Main power: 12 VDC<br>Standby power: 12 VDC                                                                   |

## 650W Power Supply

Table A-3 lists the specifications for each 650W power supply (Cisco part number UCSC-PSU-650W).

**Table A-3** Power Supply Specifications

| Description                                | Specification                                                                                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| AC input voltage range                     | 90 to 264 VAC self-ranging<br>Low range: 100 VAC to 120 VAC nominal<br>High range: 200 VAC to 240 VAC nominal |
| AC input frequency                         | Range: 47 to 63 Hz (single phase, 50 to 60Hz nominal)                                                         |
| AC line input current (steady state)       | 7.6 A peak at 100 VAC<br>3.65 A peak at 208 VAC                                                               |
| Maximum AC inrush current                  | 11 A                                                                                                          |
| Maximum output power for each power supply | 650 W                                                                                                         |
| Power supply output voltage                | Main power: 12 VDC<br>Standby power: 12 VDC                                                                   |

## Environmental Specifications

Table A-4 lists the environmental specifications for the server.

**Table A-4** Environmental Specifications

| Description                                                                                   | Specification                                                                                                        |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Temperature, operating:                                                                       | 35 to 104°F (1.7 to 40°C)<br>Derate the maximum temperature by 1°C per every 305 meters of altitude above sea level. |
| Temperature, non-operating                                                                    | -40 to 149°F (-40 to 65°C)                                                                                           |
| Humidity (RH), noncondensing                                                                  | 10 to 90%                                                                                                            |
| Altitude, operating                                                                           | 0 to 10,000 feet (0 to 3000 m)                                                                                       |
| Altitude, non-operating                                                                       | 0 to 40,000 feet (0 to 12,192 m)                                                                                     |
| Sound power level<br>Measure A-weighted per ISO7779 LwAd (Bels)<br>Operation at 73°F (23°C)   | 5.9                                                                                                                  |
| Sound pressure level<br>Measure A-weighted per ISO7779 LpAm (dBA)<br>Operation at 73°F (23°C) | 46                                                                                                                   |





# APPENDIX **B**

## Power Cord Specifications

This appendix provides supported power cable specifications.

### Supported Power Cords and Plugs

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



**Note**

Only the approved power cords or jumper power cords provided with the server are supported.

[Table B-1](#) lists the power cords for the server power supplies

**Table B-1** Supported Power Cords for the Server

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

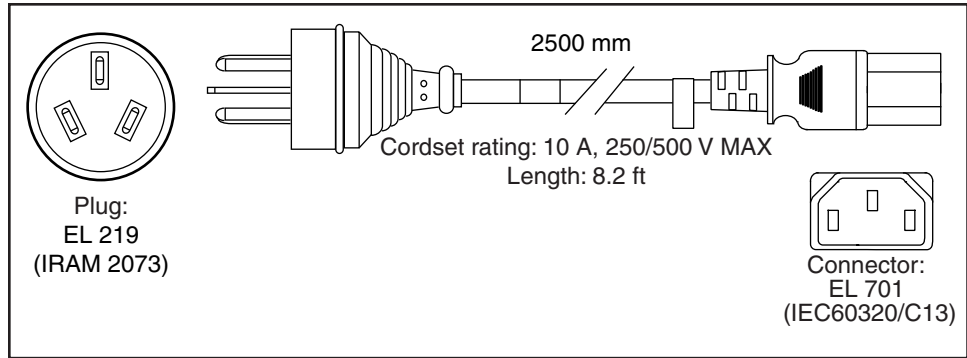
**Table B-1** Supported Power Cords for the Server (continued)

| Description                                                                           | Length |        | Power Cord Reference Illustration |
|---------------------------------------------------------------------------------------|--------|--------|-----------------------------------|
|                                                                                       | Feet   | Meters |                                   |
| CAB-9K10A-IT<br>Power Cord, 250 VAC 10 A CEI 23-16 Plug<br>Italy                      | 8.2    | 2.5    | <a href="#">Figure B-7</a>        |
| CAB-9K10A-SW<br>Power Cord, 250 VAC 10 A MP232 Plug<br>Switzerland                    | 8.2    | 2.5    | <a href="#">Figure B-8</a>        |
| CAB-9K10A-UK<br>Power Cord, 250 VAC 10 A BS1363 Plug (13 A<br>fuse)<br>United Kingdom | 8.2    | 2.5    | <a href="#">Figure B-9</a>        |
| CAB-AC-250V/13A<br>Power Cord, 250 VAC 13 A IEC60320 Plug<br>North America            | 6.6    | 2.0    | <a href="#">Figure B-10</a>       |
| CAB-N5K6A-NA<br>Power Cord, 250 VAC 13 A NEMA 6-15 Plug,<br>North America             | 8.2    | 2.5    | <a href="#">Figure B-11</a>       |
| CAB-9K12A-NA<br>Power cord, 125 VAC, 13 A, NEMA 5-15 Plug<br>North America            | 8.2    | 2.5    | <a href="#">Figure B-12</a>       |
| CAB-C13-C14-JMPR<br>Cabinet Jumper Power Cord, 250 VAC 13 A,<br>C13-C14 Connectors    | 2.2    | 0.7    | <a href="#">Figure B-13</a>       |

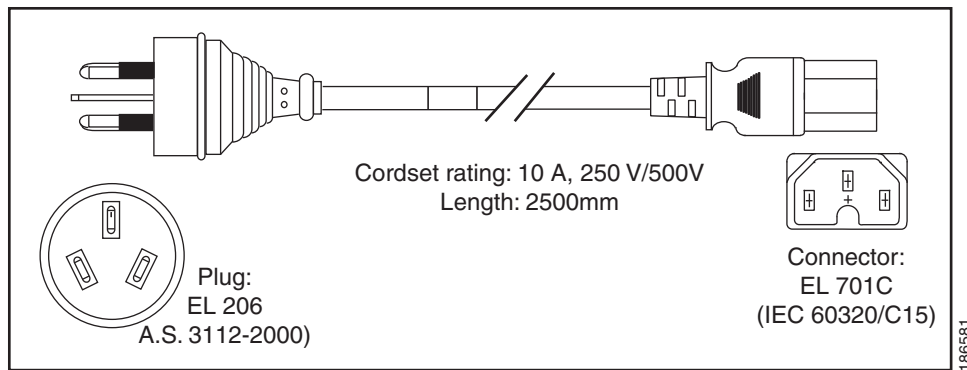
# AC Power Cord Illustrations

This section includes the AC power cord illustrations. See [Figure B-1](#) through [Figure B-13](#).

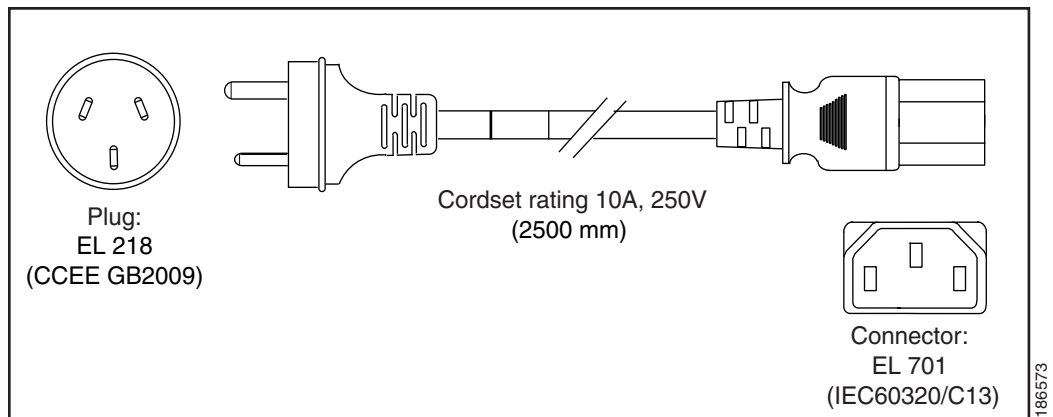
**Figure B-1 SFS-250V-10A-AR**



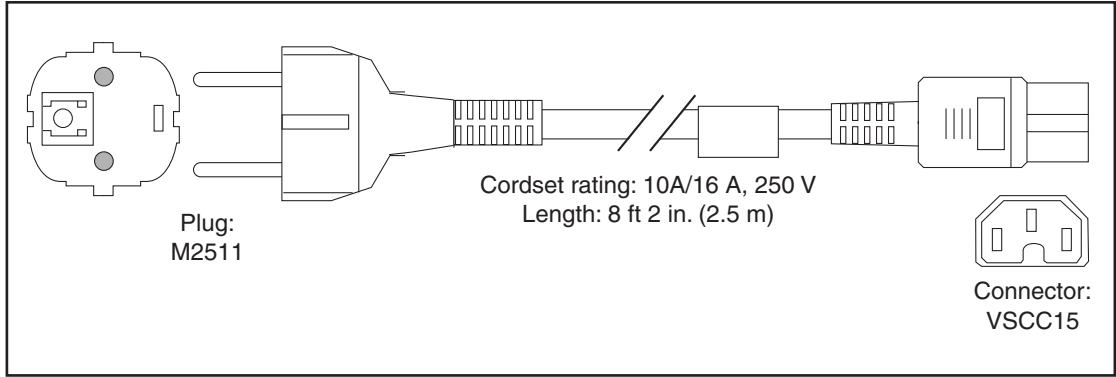
**Figure B-2 CAB-9K10A-AU**



**Figure B-3 SFS-250V-10A-CN**

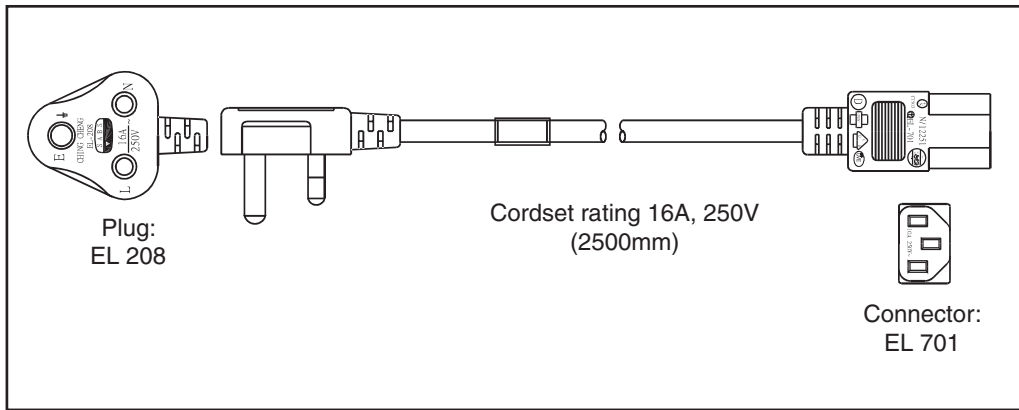


**Figure B-4 CAB-9K10A-EU**



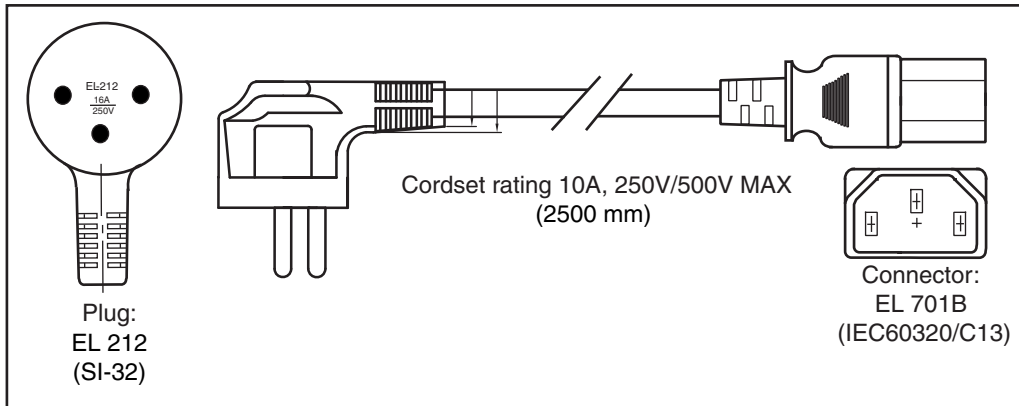
186576

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



187490

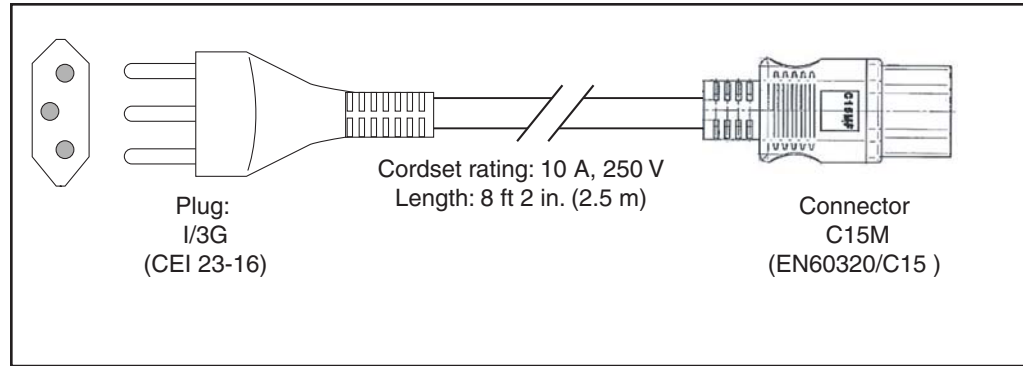
**Figure B-6 SFS-250V-10A-IS**



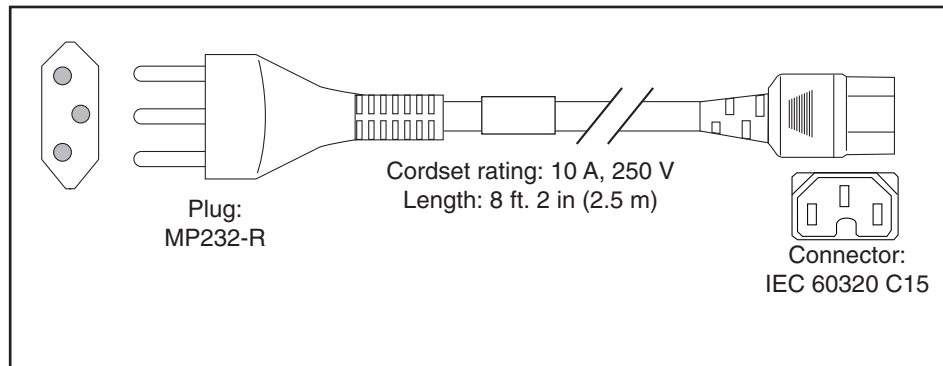
186574



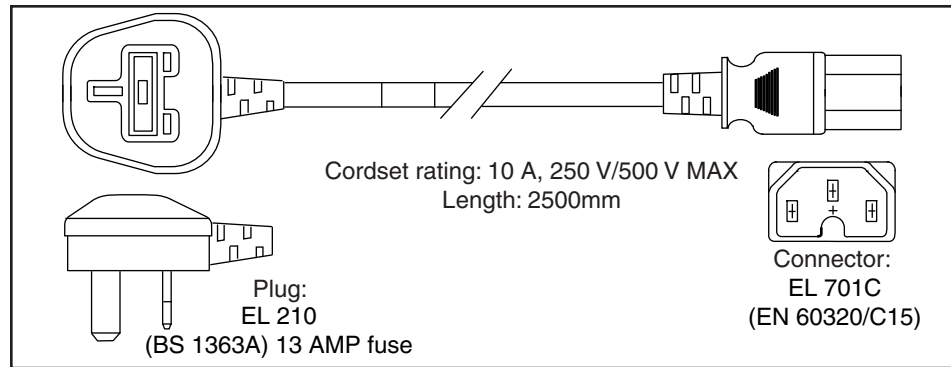
**Figure B-7 CAB-9K10A-IT**



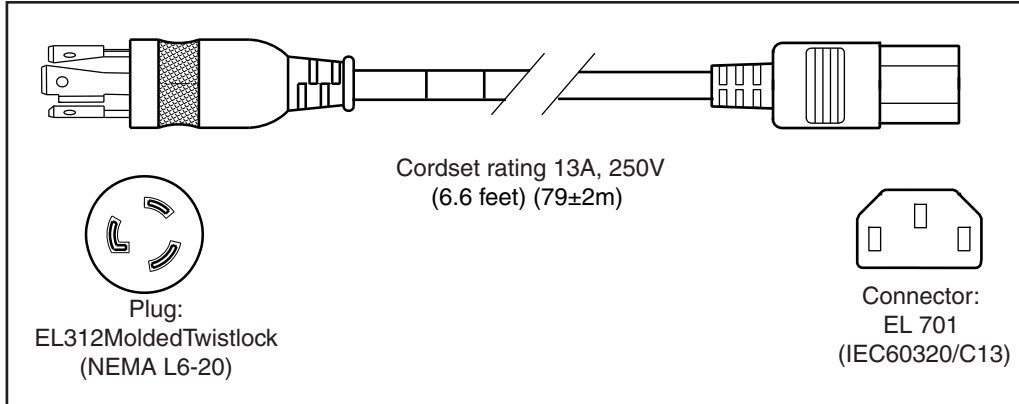
**Figure B-8 CAB-9K10A-SW**



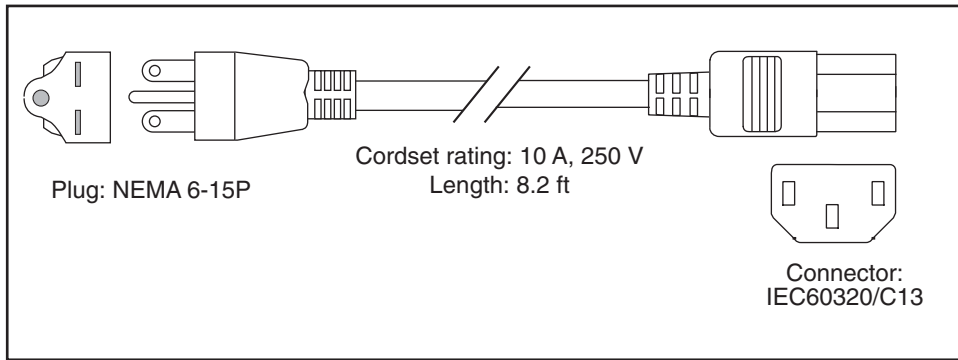
**Figure B-9 CAB-9K10A-UK**



**Figure B-10 CAB-AC-250V/13A**



**Figure B-11 CAB-N5K6A-NA**



**Figure B-12 CAB-9K12A-NA**

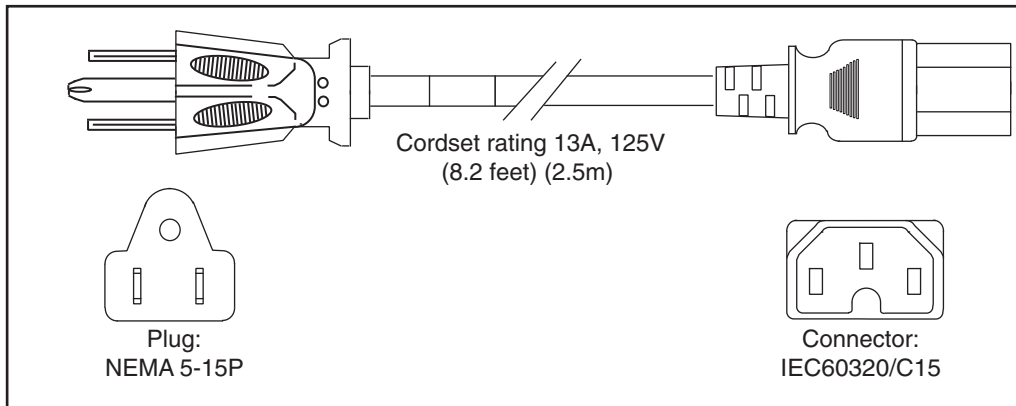
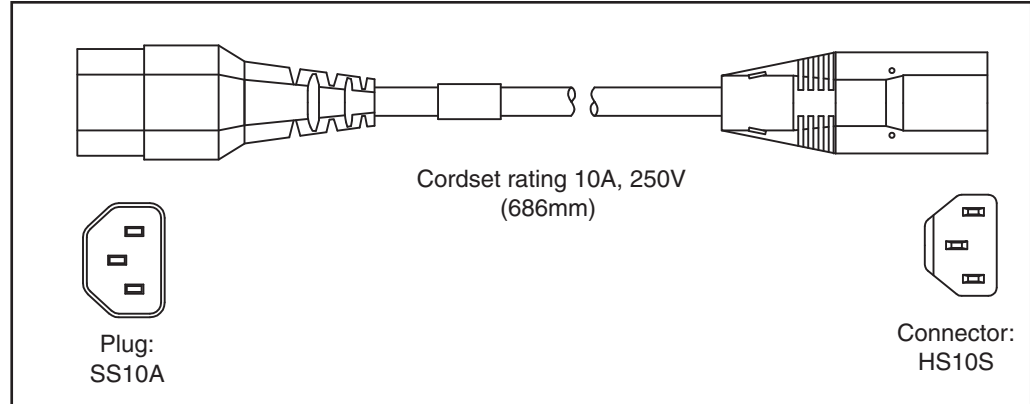


Figure B-13 CAB-C13-C14-JMPR, Jumper Power Cord







# APPENDIX **C**

## RAID Controller Considerations

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This appendix contains the following sections:

- [Supported RAID Controllers and Required Cables, page C-2](#)
- [Mixing Drive Types in RAID Groups, page C-2](#)
- [SuperCap Power Modules \(RAID Backup Units\), page C-3](#)
- [RAID Controller Cabling, page C-3](#)
- [LSI MegaRAID Card Beep Codes, page C-5](#)
- [Restoring RAID Configuration After Replacing a RAID Controller, page C-6](#)
- [For More Information, page C-6](#)

# Supported RAID Controllers and Required Cables

This server supports the RAID controller options, cable requirements, and RAID backup units shown in [Table C-1](#).

A SAS expander is required for the small-form factor 24-drive backplane. RAID controller cables connect to the SAS expander connectors.



### Caution

Do not mix controller types in the server. Do not use the embedded MegaRAID controller and a hardware RAID controller card at the same time. This is not supported and could result in data loss.



### Note

This server supports up to two RAID controllers. However, do not mix controller types in the server.

**Table C-1** Cisco UCS C24 RAID Options

| Controller                 | Style | Maximum Drives           | SuperCap Power Module? | RAID Levels Supported  | Required Cables        |
|----------------------------|-------|--------------------------|------------------------|------------------------|------------------------|
| LSI MegaRAID SAS 9220-8i   | PCIe  | 16 internal <sup>1</sup> | No                     | 0, 1, 10               | 2 SAS<br>UCSC-CABLE-A4 |
| LSI MegaRAID SAS 9240-8i   | PCIe  | 16 internal <sup>2</sup> | No                     | 0, 1, 5, 10, 50        | 2 SAS<br>UCSC-CABLE-A4 |
| LSI MegaRAID SAS 9265CV-8i | PCIe  | 24 internal              | Yes                    | 0, 1, 5, 6, 10, 50, 60 | 2 SAS<br>UCSC-CABLE-A4 |

1. The 9220-8i controller can create a RAID array with maximum 16 drives, even if it detects more than 16 drives.
2. The 9240-8i controller can create a RAID array with maximum 16 drives, even if it detects more than 16 drives.

## Mixing Drive Types in RAID Groups

Following are the rules for mixing hard disk drive (HDD) and solid state drive (SSD) types in a RAID group.

**Table C-2** Drive Type Mixing in RAID Groups

| Mix of Drive Types in RAID Group | Allowed? |
|----------------------------------|----------|
| SAS HDD + SATA HDD               | Yes      |
| SAS SSD + SATA SSD               | Yes      |
| HDD + SSD                        | No       |

# SuperCap Power Modules (RAID Backup Units)

This server supports installation of up to two SuperCap power modules (SCPMs). The SCPMs mount inside a cage that is next to the cooling fans (see [Figure C-1](#)).

The SCPM is supported only when using the LSI MegaRAID-CV controller card. This supercap module provides approximately 3 years of backup for the disk write-back cache DRAM in the case of sudden power loss by offloading the cache to the NAND flash.

For SCPM replacement instructions, see [Replacing a SuperCap Power Module \(RAID Backup Unit\)](#), page 3-34.

## RAID Controller Cabling

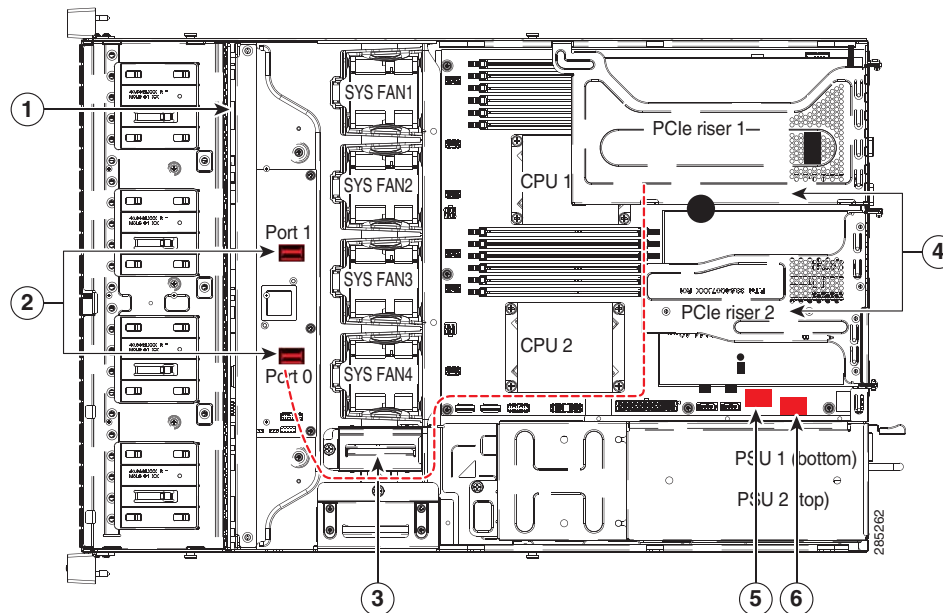
This section includes the following topics:

- [Cable Routing](#), page C-3
- [Cisco UCS C24 Server RAID Cabling](#), page C-4

## Cable Routing

The RAID controller connectors in this server are shown in [Figure C-1](#). The red line indicates the recommended cable routing path from the SAS expander to the possible controller locations.

**Figure C-1** RAID Controller Cable Routing



|   |                         |   |                                       |
|---|-------------------------|---|---------------------------------------|
| 1 | Drive backplane         | 3 | SCPM mounting cage                    |
| 2 | SAS expander connectors | 4 | PCIe risers for RAID controller cards |

## Cisco UCS C24 Server RAID Cabling

### SFF 24-Drive Backplane With Expander Cabling

The cable connections required for each type of controller are as follows:

#### LSI MegaRAID SAS 9220-8i or 9240-8i PCIe Card

These options can control up to 16 drives.

The required UCSC-CABLE-A4 cable kit has two cables. Cable 1 controls drives 1–8 and cable 2 controls drives 9–16.

1. Connect SAS cable 1 from card connector SAS 0 to the Port0 connector on the expander.
2. Connect SAS cable 2 from card connector SAS 1 on the card to the Port1 connector on the expander.

#### LSI MegaRAID SAS 9265-8i or 9265CV-8i PCIe Card

These options can control up to 24 drives.

The required UCSC-CABLE-A4 cable kit has two cables. Cable 1 controls drives 1–12 and cable 2 controls drives 13–24.

1. Connect SAS cable 1 from card connector SAS 0 to the Port0 connector on the expander.
2. Connect SAS cable 2 from card connector SAS 1 on the card to the Port1 connector on the expander.
3. If you are using the 9265CV-8i card, you can also install an SCPM for RAID backup. Install the SCPM (see [Replacing a SuperCap Power Module \(RAID Backup Unit\), page 3-34](#)), then attach the cable from the card to the SCPM.



# LSI MegaRAID Card Beep Codes

Table C-3 contains a summary of the LSI MegaRAID card beep codes. These beep codes indicate activity and changes from the optimal state of your RAID array. For full documentation on the LSI MegaRAID cards and the LSI utilities, refer to the LSI documentation for your card.

**Table C-3** Summary of LSI MegaRAID Card Beep Codes

| Beep Code                  | LSI Firmware State     | Cause (Depending on RAID Level)                                                                                                                                                                                        |
|----------------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 seconds on, 1 second off | SPEAKER_OFFLINE_ENTRY  | <ul style="list-style-type: none"> <li>RAID 0: One or more drives offline.</li> <li>RAID 1: Two drives offline.</li> <li>RAID 5: Two or more drives offline.</li> <li>RAID 6: More than two drives offline.</li> </ul> |
| 1 second on, 1 second off  | SPEAKER_DEGRADED_ENTRY | <ul style="list-style-type: none"> <li>RAID 1: A mirrored drive failed.</li> <li>RAID 5: One drive failed.</li> <li>RAID 6: One or two drives failed.</li> </ul>                                                       |
| 1 second on, 3 seconds off | SPEAKER_HOTSPARE_ENTRY | A hot spare drive has completed the rebuild process and has been brought into the array.                                                                                                                               |

# Restoring RAID Configuration After Replacing a RAID Controller

When you replace a RAID controller, the RAID configuration that is stored in the controller is lost. Use the following procedure to restore your RAID configuration to your new RAID controller.

- 
- Step 1** Replace your RAID controller. See [Replacing a PCIe Card, page 3-31](#).
- Step 2** If this was a full chassis swap, replace all drives into the drive bays, in the same order that they were installed in the old chassis.
- Step 3** Reboot the server and watch for the prompt to press F.
- Step 4** Press **F** when you see the following on-screen prompt:
- ```
Foreign configuration(s) found on adapter.
Press any key to continue or 'C' load the configuration utility,
or 'F' to import foreign configuration(s) and continue.
```
- Step 5** Press any key (other than C) to continue when you see the following on-screen prompt:
- ```
All of the disks from your previous configuration are gone. If this is
an unexpected message, then please power of your system and check your cables
to ensure all disks are present.
Press any key to continue, or 'C' to load the configuration utility.
```
- Step 6** Watch the subsequent screens for confirmation that your RAID configuration was imported correctly.
- If you see the following message, your configuration was successfully imported. The LSI virtual drive is also listed among the storage devices.
 

```
N Virtual Drive(s) found on host adapter.
```
  - If you see the following message, your configuration was not imported. This can happen if you do not press F quickly enough when prompted. In this case, reboot the server and try the import operation again wen you are prompted to press F.
 

```
0 Virtual Drive(s) found on host adapter.
```
- 

## For More Information

The LSI utilities have help documentation for more information about using the utilities.

For basic information about RAID and for using the utilities for the RAID controller cards, see the [Cisco UCS Servers RAID Guide](#).

Full LSI documentation is also available:

- LSI MegaRAID SAS Software User's Guide (for LSI MegaRAID)  
[http://www.cisco.com/en/US/docs/unified\\_computing/ucs/3rd-party/lsi/mrsas/userguide/LSI\\_MR\\_SAS\\_SW\\_UG.pdf](http://www.cisco.com/en/US/docs/unified_computing/ucs/3rd-party/lsi/mrsas/userguide/LSI_MR_SAS_SW_UG.pdf)



## APPENDIX **D**

# Installation for Cisco UCS Integration

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The Cisco UCS integration instructions have been moved to the integration guides found here:  
[Cisco UCS C-Series Server Integration with UCS Manager Guides](#)

Refer to the guide that is for the version of Cisco UCS Manager that you are using.

