



## **Cisco UCS C210 Server Installation and Service Guide**

**Covers UCS C210 Server Generations M1 and M2**

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## Preface

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This preface describes the audience, organization, and conventions of the *Cisco UCS C210 Server Installation and Service Guide*. It also provides information on how to obtain related documentation.

This guide covers UCS C210 Server Generations M1 and M2. Differences between the generations are noted in text.

## 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](#)

## Audience

To use this installation guide, you must be familiar with electronic circuitry and wiring practices and preferably be a technician who is experienced with electronic and electromechanical equipment.

## Organization

This guide is organized as follows:

Chapter	Title	Description
Chapter 1	<a href="#">Overview</a>	Provides a brief overview of the Cisco Unified Computing System (UCS) and the role that the Cisco UCS C210 server plays in the Cisco Unified Computing System environment.
Chapter 2	<a href="#">Installing the Server</a>	Describes how to install the server into a rack, how to cable and power on the server, and how to connect to the service processor and your network.
Chapter 3	<a href="#">Maintaining the Server</a>	Identifies the replaceable components of the server and describes how to replace them.
Appendix A	<a href="#">Technical Specifications</a>	Lists physical, environmental, and power specifications.
Appendix B	<a href="#">Cable and Power Cord Specifications</a>	Lists specifications for the supported international power cords.

Chapter	Title	Description
Appendix C	<a href="#">RAID Controller Considerations</a>	Provides information about the RAID controller options for this server and links to LSI documentation for the controllers.
Appendix D	<a href="#">Installation for Cisco UCS Integration</a>	Provides installation and upgrade procedures for installing the server into Unified Computing System (UCS) integration.

## 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*. You are capable of doing something that might result in equipment damage or loss of data.

Safety warnings appear throughout this publication 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**

**Opozorilo 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**

**警告** 重要的安全性说明

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。

これらの注意事項を保管しておいてください。

**주의** 重要 안전 지침

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이 지시 사항을 보관하십시오.

**Aviso** **INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

**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**

**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

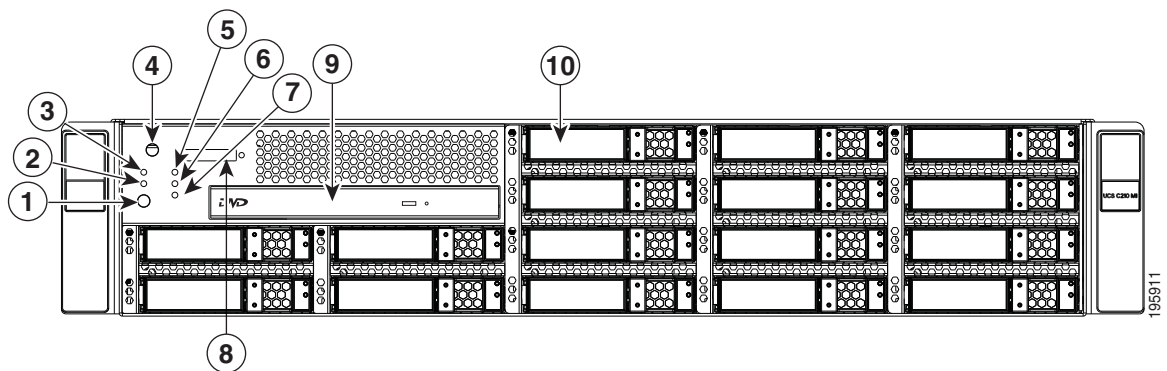
## Overview

The Cisco UCS C210 Server, which is a part of the Cisco UCS C-Series Rack-Mount Server family, operates in a wide range of data center environments, including those environments that use the Cisco Unified Computing System, Cisco Nexus family products, and discrete Ethernet and Fibre Channel switches from Cisco and third parties.

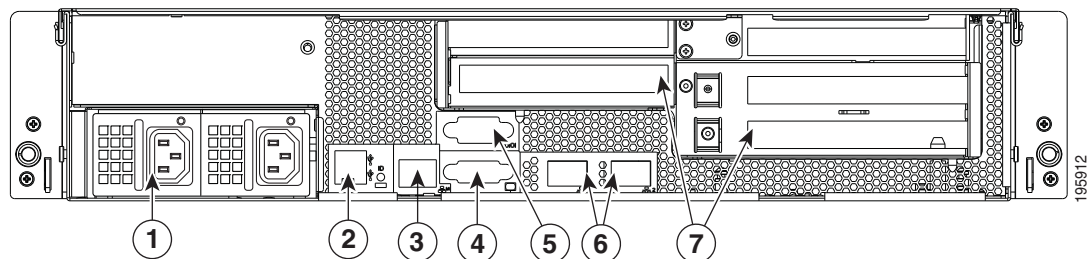
The server is a general-purpose, two-socket, two rack unit (2RU), rack-mount server. The server is designed to balance performance, density, and efficiency for workloads that require up to 8 terabytes of economical, high-capacity, reliable internal storage.

Figure 1-1 shows the external features of the front panel. Figure 1-2 shows the external features of the rear panel.

**Figure 1-1** Front Panel Features



1	Locator button/LED	2	Network activity LED
3	System fault LED	4	Power button/Power status LED
5	CPU fault LED	6	Memory fault LED
7	Power supply fault LED	8	Console connector (with supplied KVM cable, provides DB15 video, DB9 serial, and two USB 2.0 connectors)
9	DVD drive (optional)	10	Hard drives (up to 16)

**Figure 1-2** Rear Panel Features


<b>1</b>	Power supply (up to two)	<b>2</b>	USB 2.0 connectors (two)
<b>3</b>	10/100 Ethernet management port (RJ45)	<b>4</b>	Serial connector (DB9)
<b>5</b>	Video connector (DB15 VGA)	<b>6</b>	10/100/1000 Gigabit Ethernet ports (two)
<b>7</b>	Standard-profile PCIe card slot (five)		

The Cisco UCS C210 server has the following hardware components and features:

**Table 1-1** Hardware Features of the Server

Feature or Component	Cisco UCS C210 Server
Enclosure	Two rack unit (2RU) chassis.
Processors	Up to two quad-core Intel Xeon Series processors.
Memory	12 DIMM <sup>1</sup> slots supporting up to 96 GB of industry-standard DDR3 <sup>2</sup> main memory.
Storage	Up to 16 internal SAS <sup>3</sup> or SATA <sup>4</sup> hard drives or solid state drives, supporting up to 8 TB total.  Server Generation M2 only—There is also one internal USB port on the motherboard that you can use with a USB thumb drive (see <a href="#">Figure 3-5</a> ).

**Table 1-1 Hardware Features of the Server (Continued)**

Feature or Component	Cisco UCS C210 Server
Disk Management	<p>Factory-configured RAID<sup>5</sup> support options:</p> <ul style="list-style-type: none"> <li>• RAID 0 and 1 support for up to five SATA drives with the integrated SATA controller.</li> </ul> <p> <b>Note</b> The integrated ICH10R RAID controller is not compatible for use with VMWare ESX/ESXi Server software in any generation or version of the Cisco UCS C210 server.</p> <ul style="list-style-type: none"> <li>• RAID 0, 1, and 1E support for up to four SAS or SATA drives with the optional LSI 1064-based controller mezzanine card.</li> <li>• RAID 0, 1, 5, 6, 00, 10, 50 and 60 support for up to 16 SAS or SATA drives with the optional LSI 9261-8i MegaRAID controller card.</li> <li>• RAID 0, 1, 5, 6, 00, 10, 50 and 60 support for up to 4 SAS or SATA drives with the optional LSI 9280-4i4e MegaRAID card.</li> </ul> <p>See <a href="#">Appendix C, “RAID Controller Considerations”</a> for more information about RAID in this server.</p>
PCIe I/O	<p>Up to five standard-profile PCIe<sup>6</sup> expansion cards (or low-profile cards with a standard-profile adapters), plugged into horizontal riser card sockets.</p> <p>Two of the riser card sockets are full-length, x8-lane, with a x16 connector. The other three riser cards are half-length, x8-lane, with a x16 connector.</p>
Network and management I/O	<p>The server provides these rear-panel connectors:</p> <ul style="list-style-type: none"> <li>• Two 10/100/1000 Gigabit Ethernet ports (RJ-45 connectors). These integrated Gigabit ports support the Wake on LAN (WoL) and TCP/IP Offload Engine (TOE) standards.</li> <li>• One 10/100 Ethernet management port (RJ-45 connector).</li> <li>• One DB9 serial connector.</li> <li>• One 15-pin VGA<sup>7</sup> connector.</li> <li>• Two USB<sup>8</sup> 2.0 connectors.</li> </ul> <p>The server also has one front-panel console connector (with supplied KVM<sup>9</sup> cable provides DB15 video, DB9 serial, and two USB 2.0 connectors).</p>
Removable media devices	<p>One internal DVD drive (orderable option).</p> <p>The drive supports the following media types: CD-R, CD-ROM, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-ROM, DVD-RW, +R DL</p>
Power	Up to two power supplies, each with a maximum output of 650 W.
Cooling	Three internal fans that force front-to-rear cooling; also one fan in each power supply.
Video	The server CIMC chip includes a Matrox G200 core. The Matrox G200 core shares the same memory as the rest of the CIMC. The first 8 MB of memory are allocated to the video core, followed by another 5 MB allocated to the compression engine for difference buffers.

1. DIMM = dual inline memory module
2. DDR = double data rate (transfer mode)
3. SAS = serial attached SCSI
4. SATA = serial advanced technology attachment
5. RAID = redundant array of independent disks
6. PCIe = peripheral component interconnect express
7. VGA = video graphics array
8. USB = universal serial bus
9. KVM = keyboard, video, mouse

See the [“Technical Specifications” section on page A-1](#) for more physical, environmental, and power details.



# CHAPTER 2

## Installing the Server

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

- [Unpacking and Inspecting the Server, page 2-2](#)
- [Preparing for Installation, page 2-3](#)
- [Installing the Server Into a Rack, page 2-5](#)
- [Initial Server Setup, page 2-9](#)
- [System BIOS and CIMC Firmware, page 2-13](#)



**Note**

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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.

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**Warning**

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### IMPORTANT SAFETY INSTRUCTIONS

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

---

SAVE THESE INSTRUCTIONS



**Warning**

---

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

---

# Unpacking and Inspecting the Server


**Tip**

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

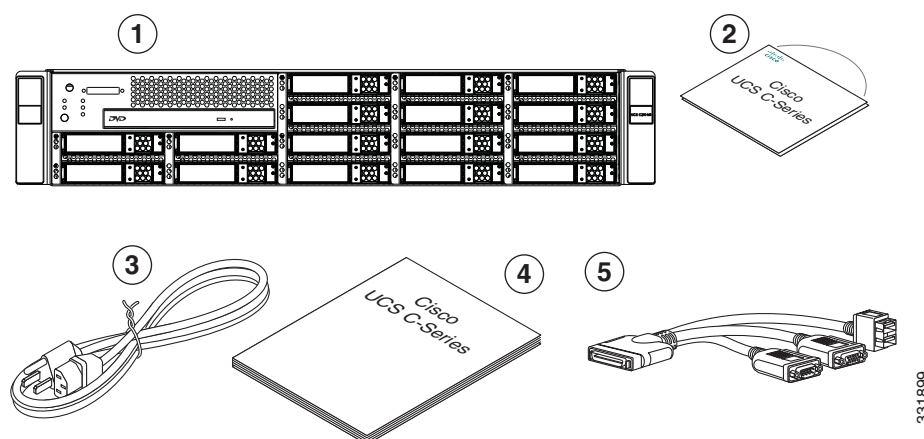

**Note**

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—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



<b>1</b>	Server	<b>2</b>	Drivers and Utilities disc
<b>3</b>	Power cord (optional, up to two)	<b>4</b>	Documentation
<b>5</b>	KVM cable		



# Preparing for Installation

This section includes the following topics:

- [Installation Guidelines](#), page 2-3
- [Rack Requirements](#), page 2-4
- [Required Equipment](#), 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 installing the server, follow these 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 “[Technical Specifications](#)” appendix.
- Ensure that the cabinet or rack meets the requirements listed in [Rack Requirements](#), page 2-4.
- Ensure that the site power meets the power requirements listed in the “[Technical Specifications](#)” appendix. 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, assuming an external ambient air temperature range of 32 to 95°F (0 to 35°C).

The rack must be of the following type:

- Standard 19-inch (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 or round when you use the supplied slide rails.
- The minimum vertical rack space per server must be two rack units (RUs), equal to 3.50 inches (8.89 cm).
- The distance between the front and rear rack posts must be as follows to fit the Cisco slide rails:
  - For the older rails (R200-1032RAIL), 27 to 37 inches (68.6 to 94.0 cm)
  - For the new style rails (R2XX-G31032RAIL), 23.5 to 36 inches (59.7 to 91.4 cm)



**Tip**

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The Cisco R-Series racks and RP-Series PDUs have been designed for optimum performance with Cisco products and are available from Cisco.

---

## Required Equipment

The slide rails supplied by Cisco Systems do not require any tools for installation, but you might want to use a tape measure and level to help level the slide rails during installation.

The slide rails include screws that you can optionally use to apply additional stability. These screws are not required.

## 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 Into a Rack

The qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*:

[http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)

This section describes how to install the server into a rack.



## Warning

---

**To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:**

**This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**

**When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**

**If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.**  
Statement 1006

---

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

## Step 1

Install the slide rails into the rack:



## Tip

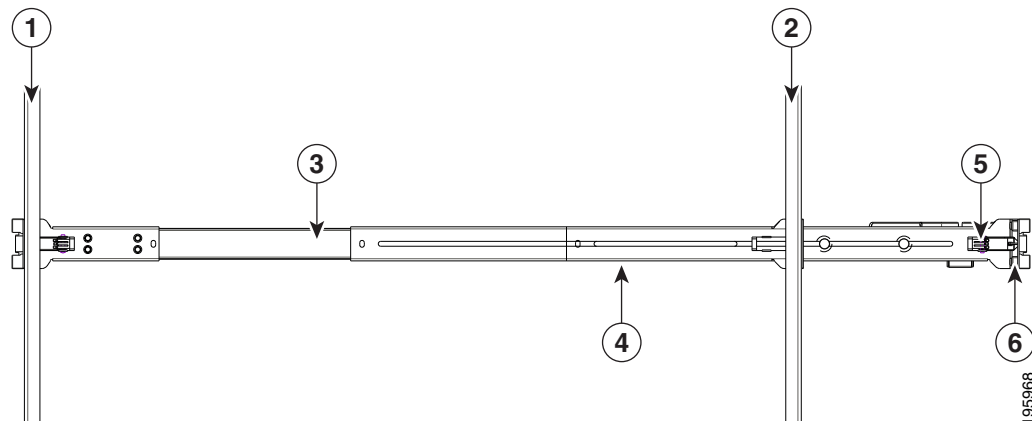
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Use two people to help keep the slide rails and server level during installation. You can use a tape measure and level or count the holes in the rack posts to ensure that the slide rails and server are level.

---

- a. Align the slide-rail assembly inside the rack posts with the length-adjustment bracket (item 4) toward the rear of the rack (see [Figure 2-2](#)).
- b. Compress the length-adjustment bracket until the mounting pegs (item 6) and locking clips (item 5) on the slide-rail assembly engage the desired rack holes on the front and rear rack posts.

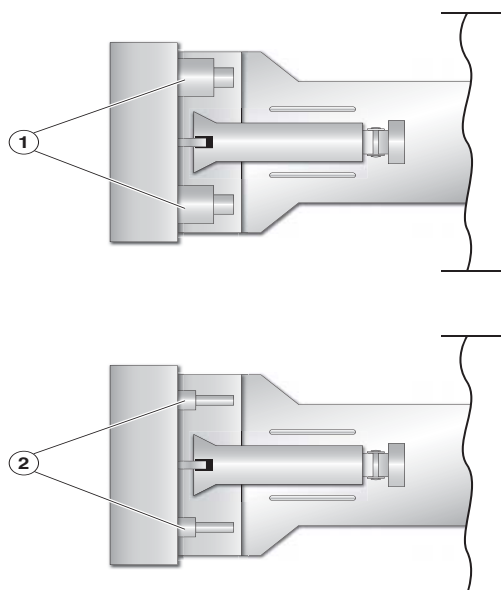
If your rack has #10-32 rack-post holes, align the mounting pegs with the holes and then compress the spring-loaded pegs to expose the #10-32 inner peg (see [Figure 2-3](#)).

**Figure 2-2 Attaching a Slide-Rail Assembly**

<b>1</b>	Front-left rack post	<b>2</b>	Rear-left rack post
<b>3</b>	Slide-rail assembly	<b>4</b>	Length-adjustment bracket
<b>5</b>	Locking clip (one on each end of assembly)	<b>6</b>	Mounting pegs (two on each end of assembly)

**Note**

The mounting pegs that protrude through the rack-post holes are designed to fit round or square #12-24 holes, or #10-32 holes when the mounting peg is compressed (see [Figure 2-3](#)). 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.

**Figure 2-3 Spring-Loaded Mounting Pegs**

<b>1</b>	Pegs in standard (uncompressed) position	<b>2</b>	Pegs compressed to expose 10-32 inner peg
----------	--	----------	---

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

- 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.

**Tip**

You can optionally use the #2 Phillips screws that come with the slide rails to increase stability after installation. These screws can be installed on the front attachment bracket on each assembly, but are not required.

**Step 2**

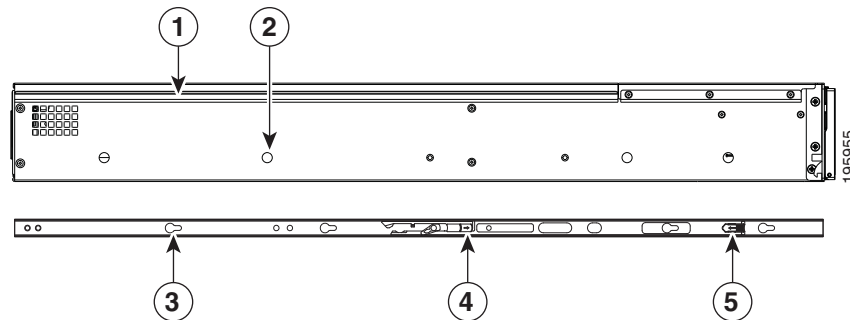
Attach mounting brackets to the server:

- a. Set a mounting bracket (item 3) on the side of the server, aligning its keyed holes over the pegs on the server (item 2). The plastic installation release clip (item 5) on the bracket should be toward the server front. See [Figure 2-4](#).
- b. Push the mounting bracket toward the server rear until the locking clip clicks over the server peg.
- c. Attach the remaining mounting bracket to the opposite side of the server.

**Tip**

You can optionally use the #1 Phillips screws that come with the slide rails to increase stability after installation. You can install two of these screws on each side of the server to more permanently attach the mounting brackets to each side of the server, but they are not required.

**Figure 2-4 Attaching Mounting Brackets to the Server**



<b>1</b>	Rear of server	<b>2</b>	Mounting peg (four)
<b>3</b>	Mounting bracket	<b>4</b>	Removal release clip
<b>5</b>	Installation release clip		

**Step 3**

Insert the server into the slide rails:

**Caution**

This server weighs approximately 50 pounds (23 kilograms) when fully loaded with components. We recommend that you use a minimum of two people when lifting the server. Attempting this procedure alone could result in personal injury or equipment damage.

- a. Align the mounting brackets that are attached to the server sides with the front of the empty slide rails.

- b. Push the server into the slide rails until it stops at the internal stops.
- c. Push the plastic installation release clip on each mounting bracket toward the server rear (see item 5 in [Figure 2-4](#)), and then continue pushing the server into the rack until its front flanges touch the rack posts.
- d. Close the front-flange latches to secure the server to the front rack posts.

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

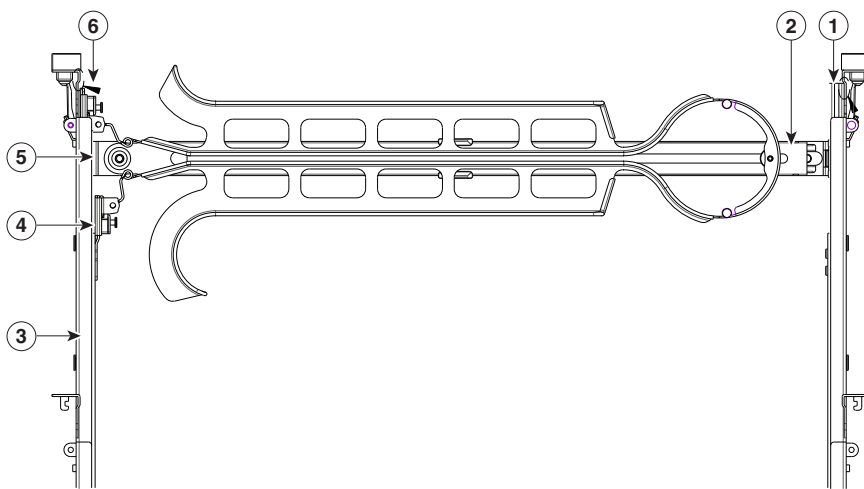


**Note**

The orientation in these instructions refers to a view from the front of the server.

- a. Slide the plastic clip on the right end of the CMA length-adjustment slider (item 2) into the rear of the right slide rail (item 1) until it clips onto the plastic retaining flange inside the slide rail. See [Figure 2-5](#).
- b. Expand the CMA length-adjustment slider (item 2) until its left end aligns with the rear of the left slide-rail assembly (item 3).
- c. Slide the innermost CMA attachment clip (item 4) into the rear of the left slide rail (item 3) and clip it onto the CMA flange that is on the mounting bracket that is attached to the server.
- d. Attach the two-hole slotted bracket (item 5) that is on the left end of the CMA length-adjustment slider to the left slide rail. Fit the two-hole slotted bracket over the two pegs inside the slide rail.
- e. Attach the outermost CMA attachment clip (item 6) onto the CMA flange that is on the left slide rail.

**Figure 2-5** *Attaching the Cable Management Arm*



<b>1</b>	Rear of right slide rail (plastic retaining flange is inside the rail)	<b>2</b>	CMA length-adjustment slider
<b>3</b>	Rear of left slide rail assembly	<b>4</b>	Innermost CMA attachment clip
<b>5</b>	Two-hole slotted bracket on end of CMA length-adjustment slider	<b>6</b>	Outermost CMA attachment clip

**Step 5** Continue with the [“Connecting and Powering On the Server \(Standalone Mode\)”](#) section on page 2-9.

# Initial Server Setup

This section contains the following topics:

- [Connecting and Powering On the Server \(Standalone Mode\)](#), page 2-9
- [NIC Modes and NIC Redundancy Settings](#), page 2-12

## Connecting and Powering On the Server (Standalone Mode)



### Note

This section describes how to power on the server, assign an IP address, and connect to server management when using the server *in standalone mode*. To use the server in UCS integration, specific cabling and settings are required. See [Installation for Cisco UCS Integration](#), page D-1.



### Note

The server is shipped with a default NIC mode called *Shared LOM*, default NIC redundancy is active-active, and DHCP is enabled. Shared LOM mode enables the two 1Gb Ethernet ports to access the Cisco Integrated Management Interface (CIMC). If you want to use the 10/100 management ports or a Cisco network adapter card port to access the CIMC, you must first 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 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](#)” section on [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 on the front panel (see [Figure 1-1](#) on [page 1-1](#)):

- Off—The server is not receiving power. Check the power cord connections and the power source of the facility.
- Blinking green—The server is in standby power mode. Power is supplied only to the service processor and some motherboard functions.
- Solid 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** Use the supplied KVM cable to connect a keyboard and VGA monitor to the console connector on the front panel (see [Figure 1-1 on page 1-1](#)).

**Note**

Alternatively, you can use the VGA and USB ports on the rear panel. However, you cannot use the front panel console connector VGA and the rear panel VGA at the same time. If you are connected to one VGA connector and you then connect a video device to the other connector, the first VGA connector is disabled. You can then reactivate the first VGA connector only by rebooting 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.

```

CIMC Configuration Utility  Version 1.5  Cisco Systems, Inc.
*****
NIC Properties
NIC mode                               NIC redundancy
Dedicated:      [X]                    None:           [X]
Shared LOM:     [ ]                    Active-standby: [ ]
Cisco Card:     [ ]                    Active-active:  [ ]
IPV4 (Basic)
DHCP enabled:   [ ]                    Factory Defaults
CIMC IP:        10.193.66.111          CIMC Factory Default:[ ]
Subnetmask:     255.255.248.0         Default User (Basic)
Gateway:        10.193.64.1          Default password:
                                           Reenter password:
ULAN (Advanced)
ULAN enabled:   [ ]
ULAN ID:        1
Priority:        0

*****
<Up/Down arrow> Select items    <F10> Save    <Space bar> Enable/Disable
<F5> Refresh                    <ESC> Exit

```

- Set the NIC mode to your choice for which ports you want to use to access the CIMC for server management (see [Figure 1-2 on page 1-2](#) for identification of the ports):
  - Dedicated—The 10/100 management port is used to access the CIMC. You have to select a NIC redundancy and IP setting.
  - Shared LOM (default)—The two 1Gb Ethernet ports are used to access the CIMC. This is the factory default setting, along with Active-active NIC redundancy and DHCP enabled.
  - Cisco Card—The ports on an installed Cisco network adapter card are used to access the CIMC. You have to select a NIC redundancy and IP setting.

**Note**

The Cisco Card NIC mode is currently supported only with a Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01) that is installed in PCIe slot 1 (see [Figure 3-18 on page 3-34](#)). See also [Special Considerations for the Cisco UCS P81E Virtual Interface Card \(N2XX-ACPCI01\)](#), page 3-37.



- d. 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. See [NIC Modes and NIC Redundancy Settings, page 2-12](#) for more information.
- e. Choose whether to enable DHCP for dynamic network settings, or 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.

---

- f. 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.

---

- g. 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*.

---

**Step 6** 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>

---

To install or replace hardware components, see the [“Maintaining the Server” section on page 3-1](#).

## NIC Modes and NIC Redundancy Settings

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

- **Dedicated**—The 10/100 management port is used to access the CIMC. You have to select a NIC redundancy and IP setting.
- **Shared LOM (default)**—The two 1-Gb Ethernet ports are used to access the CIMC. This is the factory default setting, along with Active-active NIC redundancy and DHCP enabled.
- **Cisco Card**—The ports on an installed Cisco network adapter card are used to access the CIMC. You have to select a NIC redundancy and IP setting.



---

**Note** The Cisco Card NIC mode is currently supported only with a Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01) that is installed in PCIe slot 1 (see [Figure 3-18 on page 3-34](#)). See also [Special Considerations for the Cisco UCS P81E Virtual Interface Card \(N2XX-ACPCI01\), page 3-37](#).

---

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.

The active/active setting uses Mode 5 or Balance-TLB (adaptive transmit load balancing). This is channel bonding that does not require any special switch support. The outgoing traffic is distributed according to the current load (computed relative to the speed) on each slave. Incoming traffic is received by the current slave. If the receiving slave fails, another slave takes over the MAC address of the failed receiving slave.

# System BIOS and CIMC Firmware

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

- [Updating the BIOS and CIMC Firmware, page 2-13](#)
- [Accessing the System BIOS, page 2-14](#)

## 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 down 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 firmware by using the CIMC GUI interface. See the [Cisco UCS C-Series Rack-Mount Server Configuration Guide](#).
- You can upgrade the CIMC 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

You can change the BIOS settings for your server by using the procedure in this section. 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**.

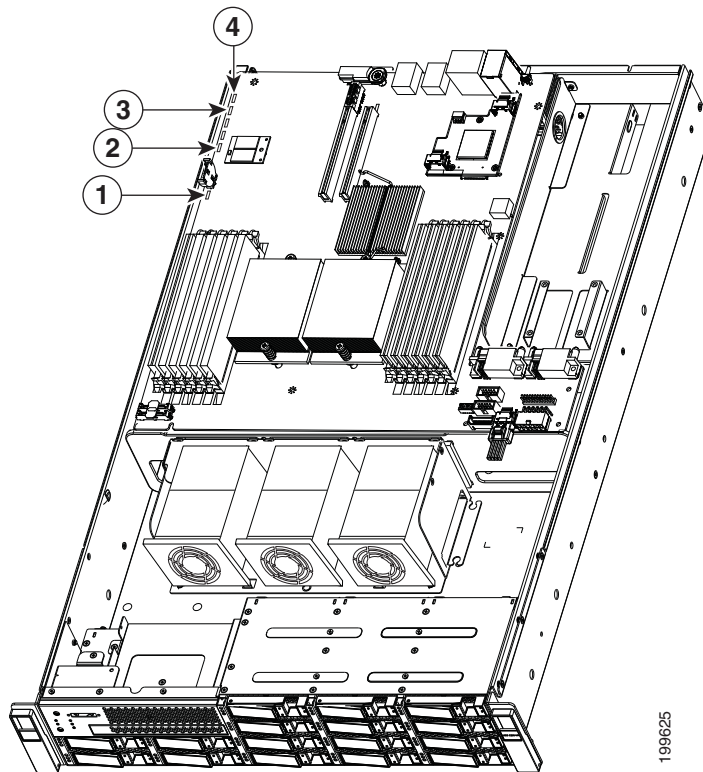
---

## Motherboard Jumpers

These jumpers are adjacent to the CMOS battery (see [Figure 2-6 on page 2-15](#)). This section contains the following topics:

- [Using the BIOS Recovery Jumper J1E5 to Recover Corrupt BIOS, page 2-16](#)
- [Clearing the CIMC Admin Password Using Jumper J45, page 2-17](#)
- [Using the Clear CMOS Jumper J1E6, page 2-18](#)
- [Clearing the BIOS Admin Password Using Jumper J1E4, page 2-19](#)

**Figure 2-6** Service Jumper Locations



<b>1</b>	Jumper J1E6 (clear CMOS)	<b>3</b>	Jumper J45 (clear CIMC password)
<b>2</b>	Jumper J1E5 (BIOS recovery)	<b>4</b>	Jumper J1E4 (clear BIOS password)

## Using the BIOS Recovery Jumper J1E5 to Recover Corrupt BIOS

This jumper is adjacent to the CMOS battery (see [Figure 2-6 on page 2-15](#)). You can use this jumper to force the server to flash a new BIOS, in the case of a system hang. For example, if the system hangs after a BIOS update, use this procedure to force the server to look for the new firmware.

- 
- Step 1** Download the BIOS update package and extract it to a temporary location.
  - Step 2** Copy the contents of the extracted UEFI folder to the root directory of a USB thumb drive.
  - Step 3** Power off the server as described in the [“Shutting Down and Powering Off the Server” section on page 3-8](#).
  - Step 4** Disconnect all power cords from the power supplies.
  - Step 5** Slide the server out of 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 the [“Removing and Replacing the Server in a Rack” section on page 3-9](#).
- Step 7** Move the shorting jumper to pins 3 and 4 of the J1E5 header (see [Figure 2-6 on page 2-15](#)).
- Step 8** 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 9** Insert the USB thumb drive 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 is in main power mode when the Power LED is green.




---

**Note** You must allow the entire server to reboot to main power mode to complete the recovery. This is because the state of the J1E5 jumper cannot be determined without the host CPU running. The server automatically boots into the UEFI shell and updates the BIOS from the USB thumb drive.

---

- Step 11** Wait for server to complete the BIOS update, then remove the USB thumb drive from the server.
- Step 12** 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 13** Remove the top cover from the server.
- Step 14** Move the shorting jumper from header pins 3 and 4, back to its default position on pins 1 and 2.




---

**Note** If you do not move the jumper, the server forces a recovery of the new BIOS every time that you power cycle the server.

---

- Step 15** 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.
-

## Clearing the CIMC Admin Password Using Jumper J45

This procedure describes how to clear the CIMC admin password back to the default in case the user-selected password is lost or forgotten.

- 
- Step 1** Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-8](#).
- 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 the “[Removing and Replacing the Server Top Cover](#)” section on [page 3-10](#).
- Step 5** Move the shorting jumper to pins 2 and 3 of the J45 header (see [Figure 2-6 on page 2-15](#)).
- Step 6** Reinstall the top cover and reconnect AC power cords to the server. The server powers up to standby power mode, indicated when the Power LED on the front panel is amber.
- Step 7** Return the server to main power mode by pressing the **Power** button on the front panel. The server is in main power mode when the Power LED is green.



---

**Note** You must allow the entire server to reboot to main power mode to complete the password reset. This is because the state of the J45 jumper cannot be determined without the host CPU running. The password is then cleared.

---

- Step 8** Press the **Power** button to shut down the server to standby power mode, and then remove AC power cords from the server to remove all power.
- Step 9** Remove the top cover from the server.
- Step 10** Remove the shorting jumper from the header pins.



---

**Note** If you do not remove the jumper, the password is cleared 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.
-

## Using the Clear CMOS Jumper J1E6

You can use this jumper (see [Figure 2-6 on page 2-15](#)) 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.

- 
- Step 1** Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-8](#).
  - 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 the “[Removing and Replacing the Server Top Cover](#)” section on [page 3-10](#).
- Step 5** Move the shorting jumper to pins 2 and 3 of the J1E6 header (see [Figure 2-6 on page 2-15](#)).
- 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 J1E6 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** Remove the shorting jumper from the J1E6 header pins.




---

**Note** If you do not remove the J1E6 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.
-



## Clearing the BIOS Admin Password Using Jumper J1E4

This procedure describes how to clear the BIOS admin password for the BIOS back to the default in case the user-selected password is lost or forgotten.

- 
- Step 1** Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-8](#).
  - 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 the “[Removing and Replacing the Server Top Cover](#)” section on [page 3-10](#).
- Step 5** Move the shorting jumper to pins 2 and 3 of the J1E4 header (see [Figure 2-6 on page 2-15](#)).
- Step 6** Reinstall the top cover and reconnect AC power cords to the server. The server powers up to standby power mode, indicated when the Power LED on the front panel is amber.
- Step 7** Return the server to main power mode by pressing the **Power** button on the front panel. The server is in main power mode when the Power LED is green.



---

**Note** You must allow the entire server to reboot to main power mode to complete the password reset. This is because the state of the jumper cannot be determined without the host CPU running. The password is then cleared.

---

- Step 8** Press the **Power** button to shut down the server to standby power mode, and then remove AC power cords from the server to remove all power.
- Step 9** Remove the top cover from the server.
- Step 10** Remove the shorting jumper from the header pins.



---

**Note** If you do not remove the jumper, the password is cleared every time that you power-cycle the server.

---

- Step 11** Replace 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 hardware problems with status LEDs and how to install or replace hardware components, and includes the following sections:

- [Server Monitoring and Management Tools, page 3-1](#)
- [Status LEDs, page 3-2](#)
- [Preparing for Component Installation, page 3-7](#)
- [Installing or Replacing Components, page 3-13](#)

## 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 shipped with new servers on CD. You can also download the ISO from Cisco.com. See the user documentation for this utility at the following URL:

[http://www.cisco.com/en/US/docs/unified\\_computing/ucs/sw/ucsscu/user/guide/20/SCUUG20.html](http://www.cisco.com/en/US/docs/unified_computing/ucs/sw/ucsscu/user/guide/20/SCUUG20.html)

## Status LEDs

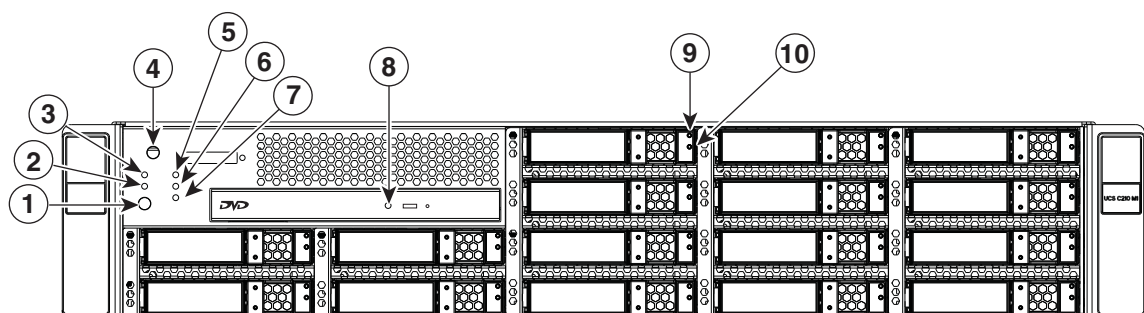
This section describes the locations and interpretations of LEDs on the server that can provide status and troubleshooting information. This section includes the following topics:

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

### Front Panel LEDs

Figure 3-1 shows the names and locations of the front panel LEDs.

**Figure 3-1** Front Panel LEDs




1	Locator LED/Locator button	2	Network activity LED
3	System fault LED	4	Power status LED/Power button
5	CPU fault LED	6	Memory fault LED
7	Power supply fault LED	8	DVD activity LED
9	Hard drive activity LED	10	Hard drive fault LED

Table 3-1 describes the possible states and interpretations for the LEDs that are shown in Figure 3-1.

**Table 3-1** Front Panel LEDs

LED Name	State
Locator	<ul style="list-style-type: none"> <li>• Off—The Locator LED is not in use.</li> <li>• Blue, flashing—The Locator LED button was pressed and the Locator LED flashes on the front and rear panels to help you find the server in a rack.</li> </ul>
Network activity	<ul style="list-style-type: none"> <li>• Off—The server is powered off or in standby power mode.</li> <li>• Green, blinking—The server is communicating with the network in main power mode. The blink rate is faster as network activity increases.</li> </ul>

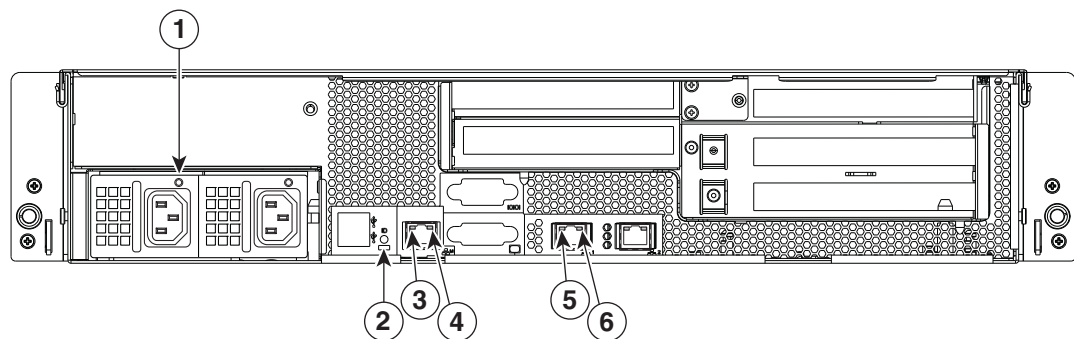
**Table 3-1 Front Panel LEDs (Continued)**

LED Name	State
System fault	<ul style="list-style-type: none"> <li>Green—The server is operating properly.</li> <li>Amber, blinking—An event that requires a service action has been detected. Investigate other LEDs and logs to isolate the problem.</li> </ul>
Power status	<ul style="list-style-type: none"> <li>Off—No AC power is present.</li> <li>Blinking green—The server is in standby power mode.</li> <li>Solid green—The server is in main power mode.</li> </ul> <p>See the “<a href="#">Connecting and Powering On the Server (Standalone Mode)</a>” section on page 2-9 for definitions of these power modes.</p>
CPU fault	<ul style="list-style-type: none"> <li>Off—All CPUs are operating properly.</li> <li>Amber—At least one CPU has failed.</li> </ul>
Memory fault	<ul style="list-style-type: none"> <li>Off—All DIMMs are operating properly.</li> <li>Amber—At least one memory bank has a failed DIMM.</li> </ul>
Power supply fault	<ul style="list-style-type: none"> <li>Off—All power supplies are operating properly.</li> <li>Amber—At least one power supply has failed.</li> </ul>
DVD activity	<ul style="list-style-type: none"> <li>Off—The DVD drive is not in use.</li> <li>Green, blinking—The DVD drive is reading or writing data.</li> </ul>
Hard drive activity	<ul style="list-style-type: none"> <li>Off—There is no hard drive in the hard drive sled.</li> <li>Green—The hard drive is ready.</li> <li>Green, blinking—The hard drive is reading or writing data.</li> </ul>
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> </ul> <p>Some additional LED behavior is possible when the drives are managed by a RAID controller:</p> <ul style="list-style-type: none"> <li>Amber, blink twice every 3 seconds—The drive has been configured as a hot swap drive in the RAID configuration.</li> </ul> <p> <b>Note</b> This LED behavior is possible only when the server has the optional SAS Expander installed. It does not occur with the standard SAS Extender.</p> <ul style="list-style-type: none"> <li>Amber, blink rapidly in unison—The Locator option has been enabled on an LSI MegaRAID 9260-8i RAID controller. The LEDs on the drives that are managed by the controller blink in unison.</li> </ul>

## Rear Panel LEDs

Figure 3-2 shows the names and locations of the rear panel LEDs.


**Figure 3-2** Rear Panel LEDs




<b>1</b>	Power supply fault LED	<b>2</b>	Rear Locator LED
<b>3</b>	10/100 Ethernet speed LED	<b>4</b>	10/100 Ethernet link status LED
<b>5</b>	10/100/1000 Gigabit Ethernet speed LED	<b>6</b>	10/100/1000 Gigabit Ethernet link status LED

Table 3-2 describes the possible states and interpretations for the LEDs that are shown in Figure 3-2.

**Table 3-2**      **Rear Panel LEDs**

LED Name	State
Power supply fault	<ul style="list-style-type: none"> <li>• Off—No AC power is present in any power supplies.</li> <li>• Green—This power supply is operating properly in main power mode.</li> <li>• Green, blinking—This power supply is operating properly in standby power mode.</li> <li>• Amber, blinking—There is no AC power present in this power supply.</li> <li>• Amber and Green, blinking—This power supply has reached a Warning over-temperature condition: 176 °F (80 °C). The power supply auto-recovers from this condition when the temperature is within specification again: 167 °F (75 °C)</li> <li>• Amber—This power supply has failed. This could be because the power supply has reached a Critical Shutdown over-temperature condition: 194 °F (90 °C). The power supply auto-recovers from this condition when the temperature is within specification again: 167 °F (75 °C).</li> </ul> <p>See the <a href="#">“Connecting and Powering On the Server (Standalone Mode)”</a> section on page 2-9 for definitions of these power modes.</p>
Locator	<ul style="list-style-type: none"> <li>• Off—The Locator LED is not in use.</li> <li>• Blue, flashing—The Locator LED/button on the front panel was pressed and the Locator LED flashes on the front and rear panels to help you find the server in a rack.</li> </ul>
<p> <b>Note</b>      The 10/100 Ethernet link status LED and the speed LED must be read in combination for the following interpretations.</p>	
10/100 Ethernet link status (right)	<ul style="list-style-type: none"> <li>• Right off + left off—No link is present on this port. (Also indicates a connected switch port that is set to 1000 Mbps.)</li> <li>• Right off + left green—Half-duplex, 10-Mbps link is present.</li> <li>• Right green + left blinking green—Half-duplex, 100-Mbps link.</li> <li>• Right off + left blinking green—Full-duplex, 10-Mbps link.</li> <li>• Right green + left blinking green—Full-duplex, 100-Mbps link.</li> </ul>
10/100 Ethernet speed (left)	

**Table 3-2**      **Rear Panel LEDs (Continued)**

LED Name	State
 <b>Note</b>	The 10/100/1000 Gigabit Ethernet link status LED and the speed LED must be read in combination for the following interpretations.
10/100/1000 Gigabit Ethernet link status (right) 10/100/1000 Gigabit Ethernet speed (left)	<ul style="list-style-type: none"> <li>• Right off + left off—No link is present on this port.</li> <li>• Right off + left green—Half-duplex, 10-Mbps link.</li> <li>• Right green + left green—Half-duplex, 100-Mbps link.</li> <li>• Right amber + left green—Half-duplex, 1000-Mbps link.</li> <li>• Right off + left blinking green—Full-duplex, 10-Mbps link.</li> <li>• Right green + left blinking green—Full-duplex, 100-Mbps link.</li> <li>• Right amber + left blinking green—Full-duplex, 1000-Mbps link.</li> </ul>



# Preparing for Component Installation

This section describes how to prepare the server for component installation or replacement and includes the following topics:

- [Required Equipment, page 3-7](#)
- [Shutting Down and Powering Off the Server, page 3-8](#)
- [Removing and Replacing the Server in a Rack, page 3-9](#)
- [Removing and Replacing the Server Top Cover, page 3-10](#)
- [Removing and Replacing the Server Front Cover, page 3-11](#)
- [Replaceable Component Locations, page 3-12](#)



**Warning**

---

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

---



**Warning**

---

**This unit might have more than one power cord. To reduce the risk of electric shock, disconnect the two power supply cords before servicing the unit.** Statement 14

---

## Required Equipment

The following items are used to perform the procedures in this chapter:

- Number 1 Phillips-head screwdriver
- Number 2 Phillips-head screwdriver
- Needle-nose pliers
- Electrostatic discharge (ESD) strap or other grounding equipment such as a grounded mat.

## Shutting Down and Powering Off the Server



### Tip

If you have ordered a server with power supply redundancy (at least two power supplies), you do not have to power off the server to replace a power supply because they are redundant and hot-pluggable. The server hard drives are also hot-pluggable.

The server can run in two power modes:

- Main power mode—Power is supplied to all server components and any operating system on your hard 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 emergency shutdown (hard shutdown) by using either of the following methods:

- Use the CIMC management interface. See either the [Cisco UCS C-Series Rack-Mount Server Configuration Guide](#) or the [Cisco UCS C-Series Rack-Mount Server CLI Configuration Guide](#).
- 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 indicates that the server is in main power mode and must be shut down before it can be safely powered off. Go to [Step 2](#).
  - Amber indicates that 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 will perform 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 in a Rack

To remove or replace the server in a rack, follow these steps:

**Tip**

---

You do not have to remove the server from the rack if you can slide it forward enough to remove the top cover and safely view and access the internal components. Always disconnect all power cords before removing the top cover.

---

**Step 1** Remove a server from a rack:

- a. Disconnect all cables from the server. You can leave the cables routed through the CMA.
- a. Loosen the two captive thumbscrews that secure the front of the server to each rack post.
- b. Pull the server out of the front of the rack until the slide rails stop against the internal lock.
- c. Press the removal release clip on each slide rail (see [Figure 2-4 on page 2-7](#)), and then continue pulling the server out evenly until it clears the slide rails.

**Step 2** Replace a server in a rack:

- a. Align the mounting brackets that are attached to the server sides with the front of the empty slide rails.
  - b. Push the server into the slide rails until they stop against the internal stops.
  - c. Press the installation release clip on each slide rail (see [Figure 2-4 on page 2-7](#)), and then continue pushing the server in evenly until its front flanges touch the rack posts.
  - d. Tighten the thumbscrews on each flange to secure the server to the rack posts.
-

## Removing and Replacing the Server Top Cover

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



**Warning**

**This unit might have more than one power cord. To reduce the risk of electric shock, disconnect the two power supply cords before servicing the unit.** Statement 14



**Tip**

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

**Step 1** Remove the top cover:

- a. Use a Number 2 Phillips-head screwdriver to remove the screw that secures the top cover (Generation M1 only).



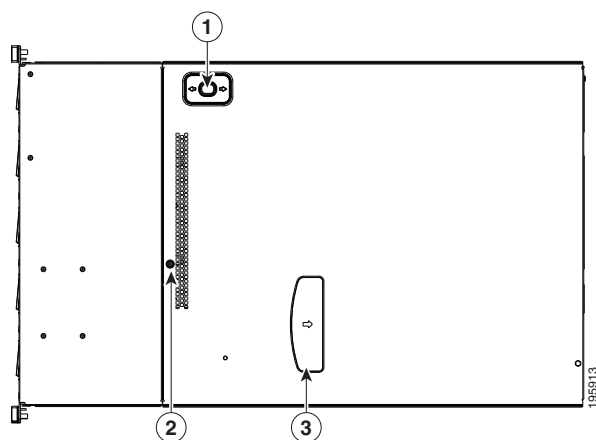
**Note** The UCS C210 Generation M2 server does not have a cover screw.

- b. Press down on the release button and use the nonslip pad to push the cover toward the rear about one inch, until you feel it stop sliding.
- c. Lift the cover from the server and set it aside.

**Step 2** Replace the top cover:

- a. Set the cover in place about one inch back from the fully closed position. Use the three alignment pegs on each inside edge of the cover to align with the alignment notches on the chassis.
- b. Push the cover toward the server front until the release button clicks.
- c. Replace the screw that secures the cover in place (Generation M1 only).

**Figure 3-3** Removing the Top Cover of the Server



<b>1</b>	Release button	<b>2</b>	Securing screw
<b>3</b>	Nonslip pad		

## Removing and Replacing the Server Front Cover

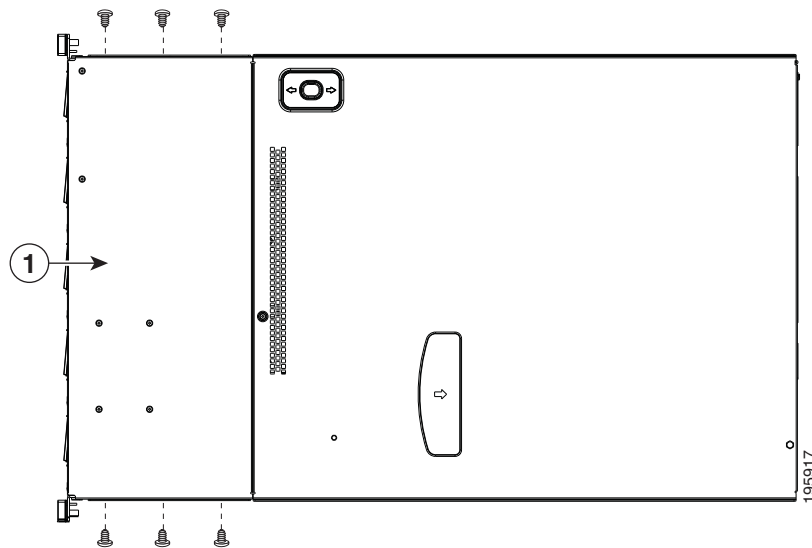


**Note** It is not necessary to remove the front cover unless instructed to do so in a replacement procedure.

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

- Step 1** Remove a front cover:
- Remove the server top cover, as described in [Removing and Replacing the Server Top Cover, page 3-10](#).
  - Use a Number 1 Phillips-head screwdriver to remove the 12 screws that secure the front cover. There are six screws on the upper surface and three screws on each side of the front cover (see [Figure 3-4](#)).
  - Lift the front cover straight up off of the chassis.
- Step 2** Replace a front cover:
- Set the front cover back in place, aligning the screw holes in the cover with those in the chassis. The crescent-shaped cut-out on the cover goes toward the server rear.
  - Replace the 12 securing screws.
  - Replace the top cover as described in [Removing and Replacing the Server Top Cover, page 3-10](#).

**Figure 3-4** Removing the Front Cover of the Server

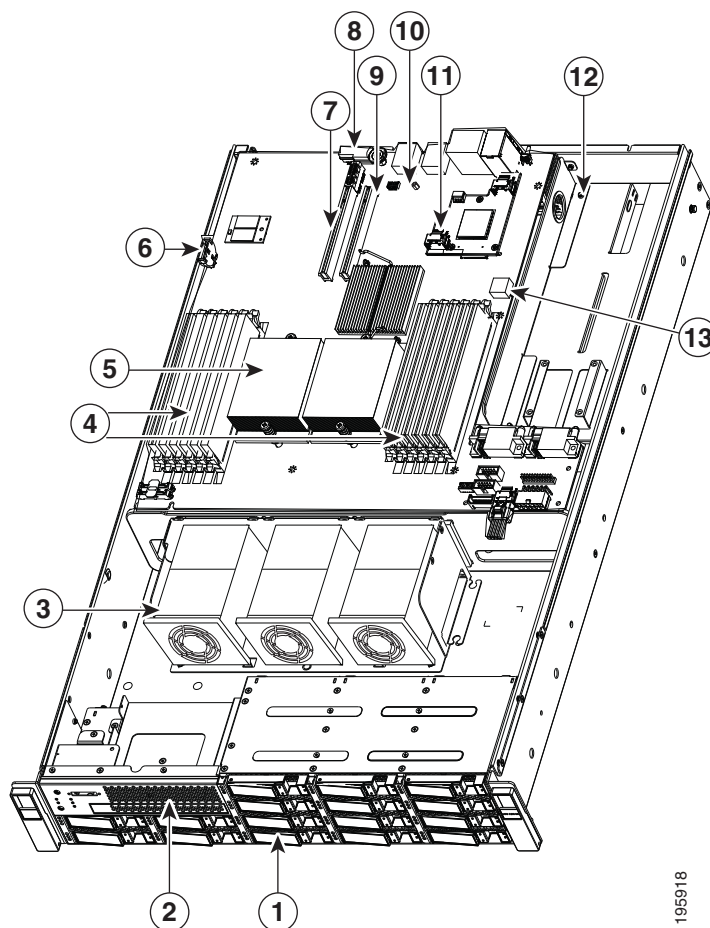


- |          |   |  |  |
|----------|---|--|--|
| <b>1</b> | Front cover, with 6 screws on the upper surface and 3 screws on each side |  |  |
|----------|---|--|--|

## Replaceable Component Locations

This section shows the locations of the components that are discussed in this chapter. The view in [Figure 3-5](#) is from the top down, with the top cover and internal air baffle removed.

**Figure 3-5** Replaceable Component Locations (top view)



<b>1</b>	Hard drives (up to 16, accessible through front bays)	<b>2</b>	DVD drive
<b>3</b>	Fan tray	<b>4</b>	DIMM slots (up to 12)
<b>5</b>	CPUs and heatsinks (up to two)	<b>6</b>	CMOS battery
<b>7</b>	PCIe card slot for riser card (with chassis openings for three standard-profile cards)	<b>8</b>	Riser card assembly
<b>9</b>	PCIe card slot for riser card (with chassis openings for two standard-profile cards)	<b>10</b>	Socket for trusted platform module (TPM)
<b>11</b>	Socket for LSI mezzanine card	<b>12</b>	Power supplies (up to two, accessible through rear bays)
		<b>13</b>	Internal USB port on motherboard (active in server Generation M2 only)

# Installing or Replacing Components



**This unit might have more than one power cord. To reduce the risk of electric shock, disconnect the two power supply cords before servicing the unit.** Statement 14



**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



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



You can press the Locator button on the front panel to turn on a flashing Locator LED on the server front and rear panels. This button allows you to locate the specific server that you are servicing when you go to the rear of the rack. See the [“Status LEDs” section on page 3-2](#) for locations of the LEDs.

This section describes how to remove and replace server components. This section includes the following topics:

- [Installing Hard Drives and Solid State Drives, page 3-14](#)
- [Installing Power Supplies, page 3-16](#)
- [Installing a DVD Drive, page 3-17](#)
- [Installing a Fan Tray, page 3-19](#)
- [Installing DIMMs, page 3-21](#)
- [Installing CPUs and Heatsinks, page 3-26](#)
- [Installing a Motherboard CMOS Battery, page 3-29](#)
- [Installing a Trusted Platform Module \(TPM\), page 3-30](#)
- [Replacing a PCIe Riser Card Assembly, page 3-32](#)
- [Replacing a PCIe Card, page 3-34](#)
- [Replacing a SAS Extender or SAS Expander, page 3-40](#)
- [Replacing an LSI MegaRAID Battery Backup Unit, page 3-42](#)
- [Installing a Mezzanine Card, page 3-44](#)

## Installing Hard Drives and Solid State Drives

The qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*:  
[http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)

**Tip**

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

**Note**

You can mix hard drives and solid state drives (SSDs) in the same server. However, You cannot configure a logical volume (virtual drive) that contains a mix of hard drives and SSDs. That is, when you create a logical volume, it must contain all hard drives or all SSDs.

**Note**

If you need to make changes to your RAID configuration after installing a hard drive, use the LSI configuration utility for your mass storage device. See [RAID Controller Considerations, page C-1](#) for more information.

**Note**

The onboard PCIe extender supports connection to a RAID card for up to eight hard drives. An optional PCIe expander is required for configurations that have more than eight hard drives installed. The LSI RAID cables that are required for cards added after-factory differ based on which configuration that you use. See the [“Supported RAID Controllers and Required Cables” section on page C-1](#).

**Note**

The SAS expander cannot be used with the onboard ICH10R controller. You must use a RAID controller card with the SAS expander.

**Note**

Cisco recommends following the industry-standard practice of using drives of the same capacity when configuring RAID volumes. If you use drives of different capacities, the usable portion of the smallest drive will be used on all drives of the RAID volume.

**Note**

The 500 GB SATA drives (A03-D500GC3) and the 1 TB SATA drives (A03-D1TBSATA) that are sold with the UCS C210 M2 server are supported at 3G speeds. These are 6G drives and might possibly run faster than 3G in this server, but they are supported to run at minimum 3G speeds.



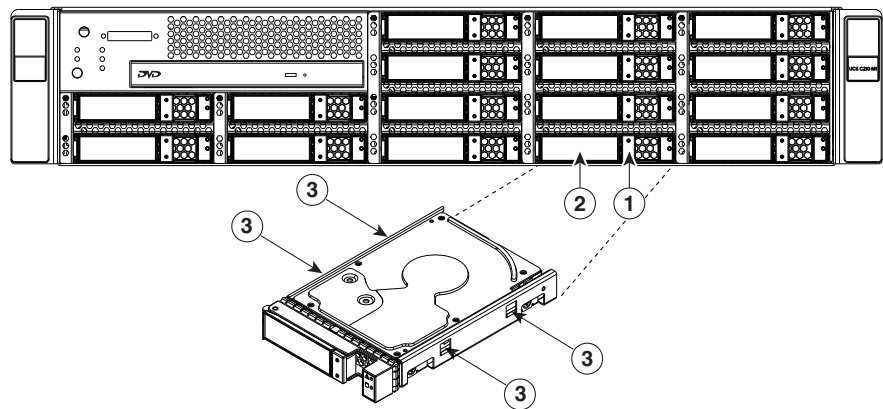
To replace or install a hot-pluggable hard drive or SSD, follow these steps:

- Step 1** Remove the drive that you are replacing or remove a blank panel from an empty bay (see [Figure 3-7](#)):
- Press the release button to expose the ejector lever.
  - Pull the ejector lever toward you, and then pull the drive sled from the drive bay.
  - If you are replacing an existing drive, remove the drive from the sled by removing the four screws from the sides of the sled.
- Step 2** Install a new drive:
- Place the drive in the sled with the connectors facing the rear.
  - Install the four securing screws on the sides of the sled.
  - With the ejector lever still open, push the sled into the drive bay until you feel the drive stop against the backplane.
  - Press the ejector lever flat until the lock clicks into place.

**Figure 3-6** Drive Numbering and Physical Orientation, Facing Server Front

		HDD_01	HDD_02	HDD_03
		HDD_04	HDD_05	HDD_06
HDD_07	HDD_08	HDD_09	HDD_10	HDD_11
HDD_12	HDD_13	HDD_14	HDD_15	HDD_16

**Figure 3-7** Removing and Replacing Hard Drives and SSDs



<b>1</b>	Release button	<b>2</b>	Ejector lever
<b>3</b>	Securing screws (four on sides of sled)		

## Installing Power Supplies

The qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*:

[http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)

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

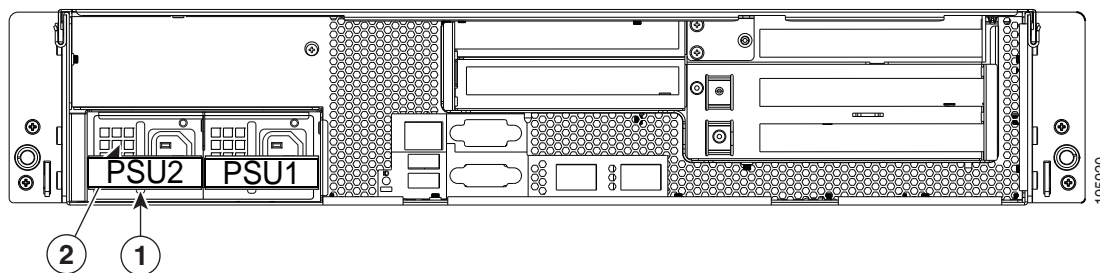


### Note

If you have ordered a server with power supply redundancy (at least two power supplies), you do not have to power off the server to replace power supplies because they are hot pluggable.

- Step 1** Remove a power supply or a blank panel from an empty bay:
- a. Do 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 3-8.
    - If your server has two power supplies, the power supplies are hot pluggable so you do not have to shut down the server.
  - b. Remove the power cord from the power supply that you are replacing.
  - c. Push the release lever toward the center of the power supply and pull on the power supply handle to disengage it from the backplane (see [Figure 3-8](#)).
  - d. Remove the power supply from the bay.
- Step 2** Install a new power supply:
- a. Insert the new power supply into the bay and push it in until the release lever clicks and locks.
  - b. Replace the power cord to the new power supply.
  - c. Press the **Power** button to return the server to main power mode.

**Figure 3-8** Removing and Replacing a Power Supply



<b>1</b>	Power supply handle	<b>2</b>	Release lever
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## Installing a DVD Drive

The qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*:  
[http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)



### Warning

**Class 1 laser product.**  
Statement 1008

To replace a DVD drive, follow these steps:

### Step 1

Remove a DVD drive:

- a. Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-8](#).
- b. Disconnect all power cords from the power supplies.
- c. 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.

- d. Remove the top cover as described in the “[Removing and Replacing the Server Top Cover](#)” section on [page 3-10](#).
- e. Remove the front cover as described in the “[Removing and Replacing the Server Front Cover](#)” section on [page 3-11](#).
- f. Remove the cable from the connector on the rear of the DVD drive (see [Figure 3-9](#)).



**Note** If there is no existing DVD drive, remove the blanking panel.

- g. Remove the two screws that secure the DVD tray to the chassis.
- h. Push the DVD tray and drive inward to clear the front chassis opening, then lift them out of the chassis.
- i. Remove the two screws that secure the DVD drive to the DVD tray. Both screws are on the left side of the DVD drive as you look at the front).

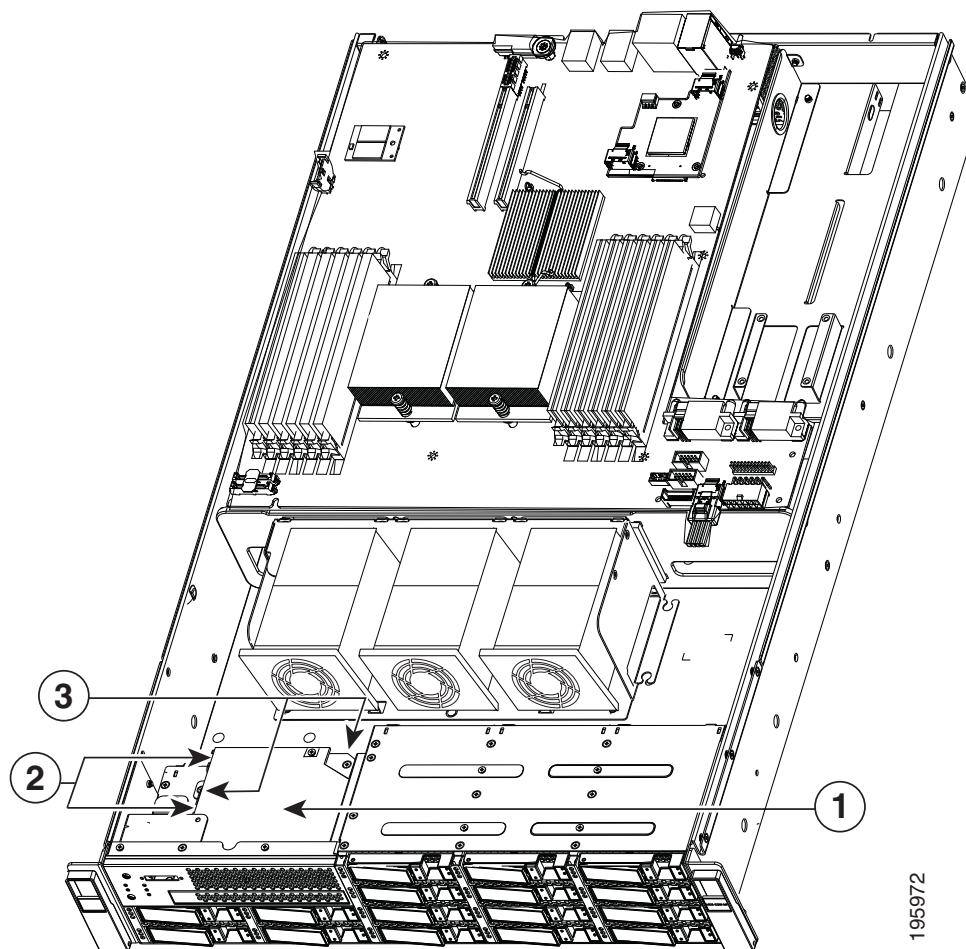
### Step 2

Replace a DVD drive:

- a. Place the new DVD drive in the tray and install the two screws that secure the DVD drive to the tray. Both of these screws insert on the left side of the drive as you look at the front.
- b. Place the DVD drive and tray into the chassis and push the front panel forward until it is flush with the chassis front.
- c. Replace the two screws that secure the DVD tray to the chassis.
- d. Replace the cable to the connector on the rear of the DVD drive.
- e. Replace the front cover as described in [Removing and Replacing the Server Front Cover, page 3-11](#).
- f. Replace the top cover.

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

**Figure 3-9** Removing and Replacing a DVD drive



1	DVD drive (shown with server front cover removed)	2	DVD drive screws (two), which secure the DVD drive to the DVD tray
3	DVD tray screws (two), which secure the DVD tray to chassis		

## Installing a Fan Tray

The qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*:

[http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)

To replace a fan tray, follow these steps:

---

### Step 1 Remove a fan tray:

- a. Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-8](#).
- b. Disconnect all power cords from the power supplies.
- c. 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.

---

- d. Remove the top cover as described in the “[Removing and Replacing the Server Top Cover](#)” section on [page 3-10](#).
- e. Remove the four screws that secure the fan tray to the chassis posts (see [Figure 3-10](#)).



### Tip

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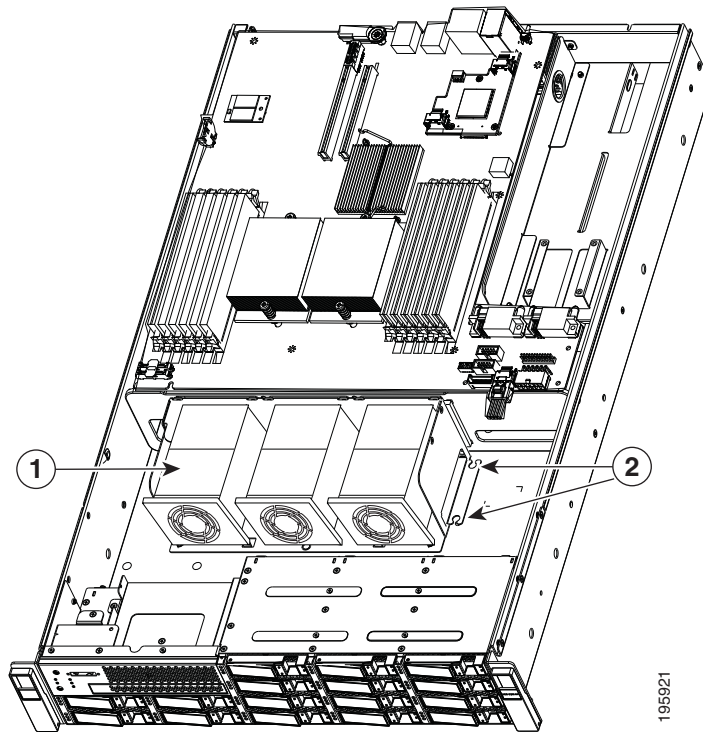
If you have trouble accessing the screws or trouble with cable clearance, you can provide additional clearance by removing the front cover. See the “[Removing and Replacing the Server Front Cover](#)” section on [page 3-11](#).

---

- f. Being careful to avoid damaging the attached cable harnesses, lift the tray and set it on top of the chassis.
- g. Disconnect the motherboard cable harness from the fan tray connector.

### Step 2 Install a fan tray:

- a. Set the new fan tray on top of the chassis.
- b. Replace the motherboard cable harness to the connector on the new fan tray.
- c. Being careful to not kink or damage the cable harnesses, place the new fan tray into the chassis. Align the four bracket holes on the fan tray with the chassis posts.
- d. Replace the four screws that secure the tray to the chassis posts.
- e. Replace the top cover. If you removed the front cover, replace it before replacing the top cover.
- f. Replace the server in the rack, replace power cords and any other cables, and then power on the server by pressing the **Power** button.

**Figure 3-10** *Removing and Replacing a Fan Tray*

<b>1</b>	Fan tray	<b>2</b>	Fan tray securing screws (two on each side)
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## Installing DIMMs

This section includes the following sections:

- [Memory Performance Guidelines and Population Rules, page 3-21](#)
- [DIMM Installation Procedure, page 3-24](#)

**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 modules.

---

## Memory Performance Guidelines and Population Rules

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

- [Supported DIMMs, page 3-21](#)
- [Banks and Channels, page 3-21](#)
- [Memory Population Rules, page 3-23](#)
- [Memory Mirroring and RAS, page 3-24](#)

### Supported DIMMs

The qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*:

[http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)

**Note**

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Non-ECC UDIMMs do not support temperature sensors.

---

### Banks and Channels

Each Channel is identified by a letter—A, B, C for one CPU, and D, E, F for the other CPU. Each bank is identified by a numbers, either 1 or 2. For example DIMM slots A1, B1, and C1 belong to Bank–1, while A2, B2, C2 belong to Bank–2. Note that each slot within Bank 1 is blue, while each slot within Bank 2 is black.

[Figure 3-11](#) shows how banks and channels are physically laid out on the motherboard. The DIMM slots on the right (channels A, B, and C) are associated with CPU1, while the DIMM slots on the left (channels D, E, and F) are associated with CPU2.

**Figure 3-11 Physical Representation of Banks and Channels**

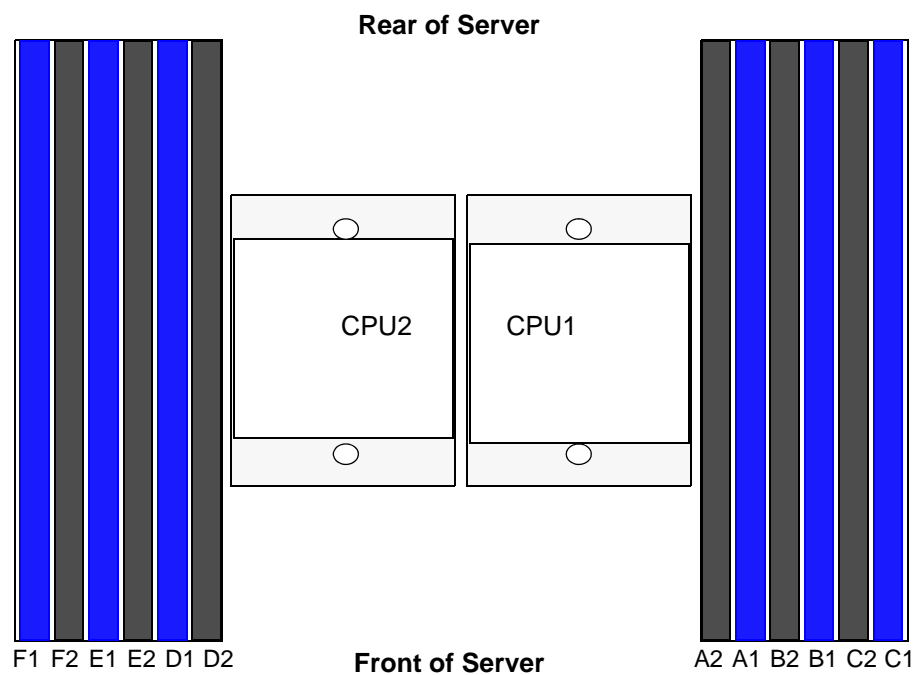
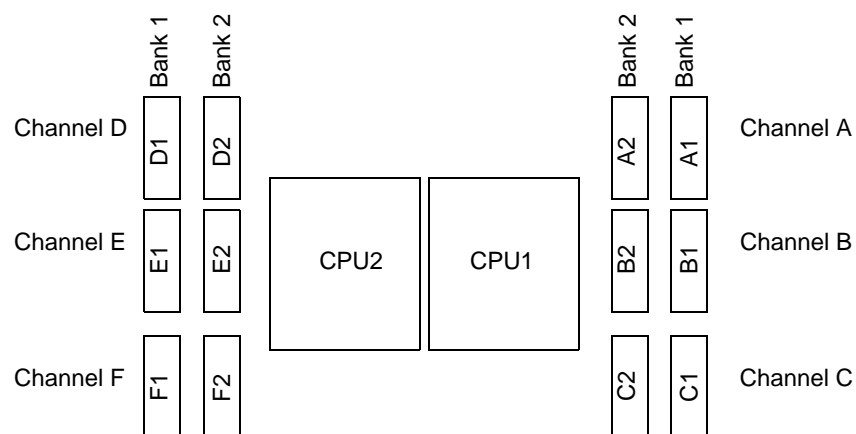


Figure 3-12 shows a logical representation of the channels and banks associated with each CPU.

**Figure 3-12 Logical Representation of Channels and Banks**





## Memory Population Rules

When considering the memory configuration of your server, you should consider the following items:

- DIMMs within the server should all be the same type, speed, and size. Do not mix different sized DIMMs or DIMMs with different clock rates in the same server. Doing so causes the system to set the memory system speed to that of the slowest installed DIMMs.
- DIMMs can be used either in a one DIMM per Channel (1DPC) configuration or in a two DIMMs per Channel (2DPC) configuration.
- There are blue and black DIMM slots. Populate blue slots in a bank first.
- (Generation M2 only) Low-voltage (1.35 V) DIMM and standard-voltage DIMM (1.5 V) can be mixed in the same server. Note that this causes the system BIOS to default to standard-voltage operation (Performance Mode). See [Low-Voltage DIMM Considerations \(Generation M2 Only\)](#), page 3-23.




---

**Note** Low voltage DIMMs are supported in Generation M2 servers only.

---

## Low-Voltage DIMM Considerations (Generation M2 Only)

The Generation M2 of this server can be ordered with low-voltage (1.35 V) DIMMs or standard-voltage (1.5 V) DIMMs. Note the following considerations:

- Low-voltage DIMMs within the server must have the identical manufacturer, type, speed, and size.
- Low-voltage DIMMs and standard-voltage DIMMs can be mixed in the same server. Note that this causes the system BIOS to default to standard-voltage operation (Performance Mode). That is, the server cannot operate in Power Saving Mode unless all DIMMs are low-voltage DIMMs.




---

**Note** CPUs that have a maximum memory frequency less than 1333 MHz support LV DIMMs operating in Power saving Mode only, and do not support Performance mode. However, if your server has one of these CPUs, monitoring output for LV DIMMs will show identical voltages for both Power Saving Mode and Performance Mode. In this case, Performance Mode is not active and its fields only mirror the values from the Power Savings Mode fields.

---

- In Generation M2 only, there is a setting in the BIOS Setup utility that you can use to change the DDR memory mode when the server has all low-voltage DIMMs installed. To access this setting, follow these steps:

- 
- 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 Mode** or **Performance Mode**.
    - Power Saving Mode—Prioritizes low-voltage memory operation. This setting is available only if all DIMMs installed are low-voltage DIMMs.
    - Performance Mode—Prioritizes performance memory operation. If you mix low-voltage DIMM pairs with standard-voltage DIMM pairs, the system defaults to this setting.
  - Step 5** Press **F10** to save your changes and exit the setup utility.
-

## Memory Mirroring and RAS

- The CPUs support memory mirroring only when Channels A and B on CPU 1 are populated with DIMMs that are identical in configuration, size, and speed. Do not populate channel C. If three channels are populated with DIMMs, memory mirroring is automatically disabled.
- If DIMMs on CPU 2 are populated, channels D and E must be populated with DIMMs that are identical in configuration, size, and speed. Do not populate channel F. If three channels are populated with DIMMs, memory mirroring is automatically disabled.
- If memory mirroring is used, the DRAM size is reduced by 50 percent for reasons of reliability. Memory sparing is not supported.

## DIMM Installation Procedure

To install or replace a DIMM, follow these steps:



### Note

Refer to the DIMM population rules before removing or installing DIMMs. See the [“Memory Performance Guidelines and Population Rules”](#) section on page 3-21.

### Step 1

Remove an existing DIMM:

- Power off the server as described in the [“Shutting Down and Powering Off the Server”](#) section on page 3-8.
- Disconnect all power cords from the power supplies.
- 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.

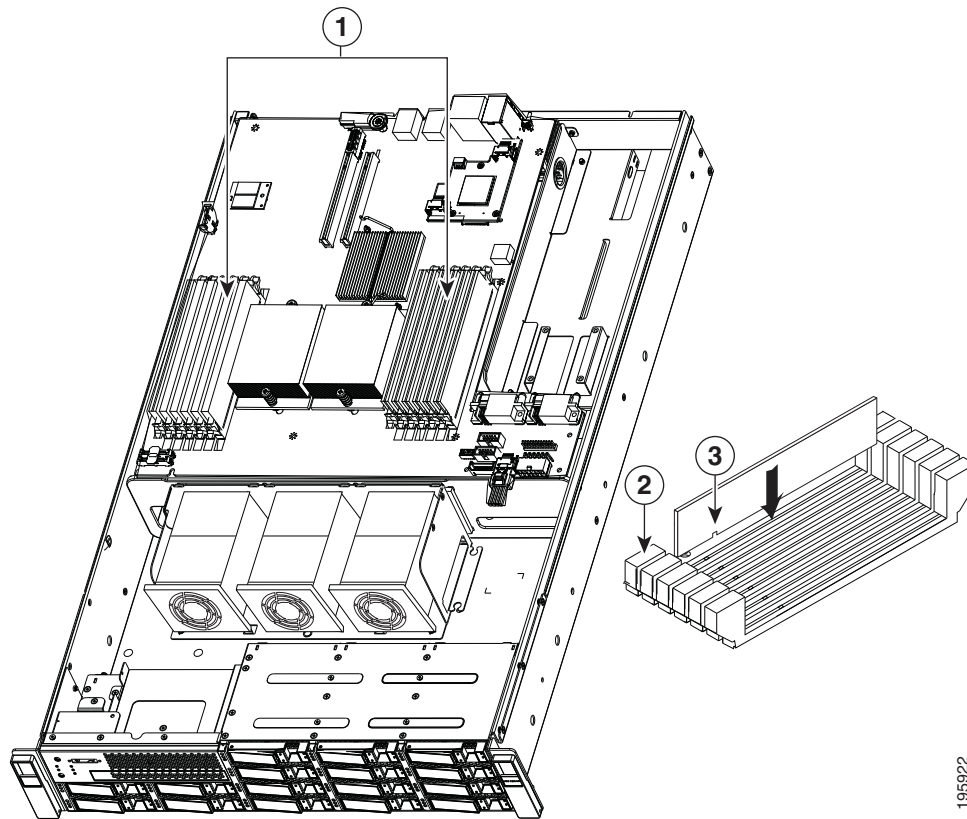
- Remove the top cover as described in the [“Removing and Replacing the Server Top Cover”](#) section on page 3-10.
- Remove the air duct that sits over the CPUs and set it aside. To remove the duct, depress the plastic latch on each end of the duct to disengage it from the chassis standoff posts.
- Push down on the ejector levers at both ends of the DIMM slot.
- Grasp the DIMM by its top corners and remove it from the server. Place the DIMM on an antistatic mat or in antistatic packaging.

### Step 2

Install a DIMM:

- With the ejector levers at both ends of the DIMM slot fully open, orient the DIMM’s alignment notch with the alignment key in the DIMM slot (see [Figure 3-13](#)).
- Press down on both top corners of the DIMM simultaneously until the ejector levers click and lock in place on the DIMM.
- Replace the air duct and the top cover. When you replace the air duct, align the holes on each end of the duct with the chassis standoff posts, then press down on both ends until the plastic latches engage with the posts.
- Replace the server in the rack, replace power cords and any other cables, and then power on the server by pressing the **Power** button.

**Figure 3-13** Removing and Replacing Memory Modules



195922

1	DIMM slots (12)	2	DIMM slot ejector lever (two on each slot)
3	Alignment key in DIMM slot		

## Installing CPUs and Heatsinks

The qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*:

[http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)

This section contains the following topics:

- [Additional CPU-Related Parts To Order With RMA Replacement Motherboards](#), page 3-26
- [CPU Replacement Procedure](#), page 3-26

### Additional CPU-Related Parts To Order With RMA Replacement Motherboards

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

- Scenario 1—You are re-using the existing heatsinks:
  - Heat sink cleaning kit (UCSX-HSCK=)
  - Thermal grease kit for C210 (UCS-CPU-GREASE=)
- Scenario 2—You are replacing the existing heatsinks:
  - Heat sink (R200-BHTS1=)
  - Heat sink cleaning kit (UCSX-HSCK=)

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

New heatsink spares have preinstalled thermal interface material covered by a small sheet of plastic. It is important to clean the old thermal interface material off of the CPU prior to installing the heatsinks. Therefore, when ordering new heatsinks it is still necessary to order the heatsink cleaning kit at a minimum.

### CPU Replacement Procedure

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

- 
- Step 1** Remove an existing CPU and heatsink:
- a. Power off the server as described in the [“Shutting Down and Powering Off the Server”](#) section on [page 3-8](#).
  - b. Disconnect all power cords from the power supplies.
  - c. 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.

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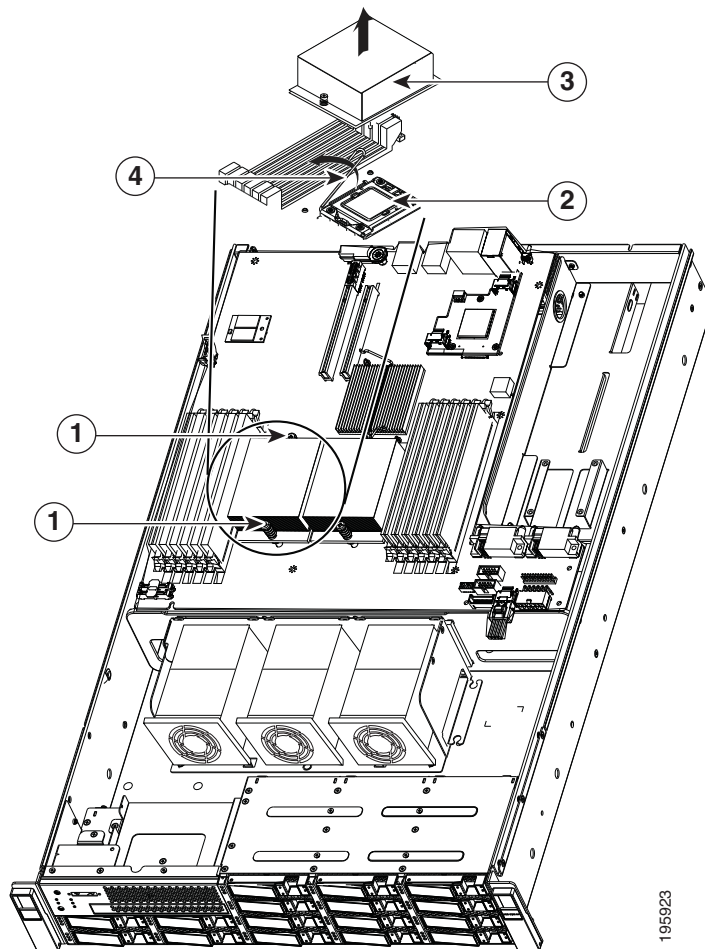
- d. Remove the top cover as described in the [“Removing and Replacing the Server Top Cover”](#) section on [page 3-10](#).
- e. Remove the air duct that sits over the CPUs and set it aside. To remove the duct, depress the plastic latch on each end of the duct to disengage it from the chassis standoff posts.

- f. Loosen the two captive screws that hold the heatsink to the chassis posts and lift the heatsink out of the server (see [Figure 3-14](#)).
- g. If you plan to use this heatsink with your new CPU, clean the old thermal compound from the bottom of the heatsink.
- h. Unhook the CPU socket latch and open the CPU cover plate.
- i. Lift the CPU out of the socket and set it aside on an antistatic mat or in an antistatic bag.

**Step 2** Install a CPU and heatsink:

- a. Set the new CPU into the socket, being careful to orient the CPU alignment notches with the alignment keys in the socket.
- b. Close the CPU cover plate and hook the socket latch back in the locked position.
- c. Prepare the thermal compound, which aids heat transference between the CPU and the heatsink:
  - If you are installing a new heatsink, a thermal pad comes pre-applied on the heatsink. Remove the protective film to expose the thermal pad. Do not use the syringe of thermal compound that is shipped with a replacement CPU in this case.
  - If you are using your existing heatsink, make sure that all of the old thermal compound is removed from the underside of the heatsink. Then apply the full contents of the syringe that is supplied with the new CPU to apply thermal compound to the top of the CPU. Apply the compound as evenly as possible so that it forms an even layer when the heatsink is tightened down.
- d. Align the heatsink captive screws with the chassis posts, and then tighten both captive screws evenly.
- e. Replace the air duct and the top cover. When you replace the air duct, align the holes on each end of the duct with the chassis standoff posts, then press down on both ends until the plastic latches engage with the posts.
- f. Replace the server in the rack, replace power cords and any other cables, and then power on the server by pressing the **Power** button.

**Figure 3-14** Removing and Replacing CPUs and Heatsinks



195923

<b>1</b>	Captive heatsink screws (two per CPU)	<b>2</b>	CPU cover plate (open)
<b>3</b>	CPU socket alignment keys (two)	<b>4</b>	CPU socket latch (open)

## Installing a Motherboard CMOS 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 qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*:

[http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)

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

**Step 1**

Remove a motherboard CMOS battery:

- a. Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-8](#).
- b. Disconnect all power cords from the power supplies.
- c. 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.

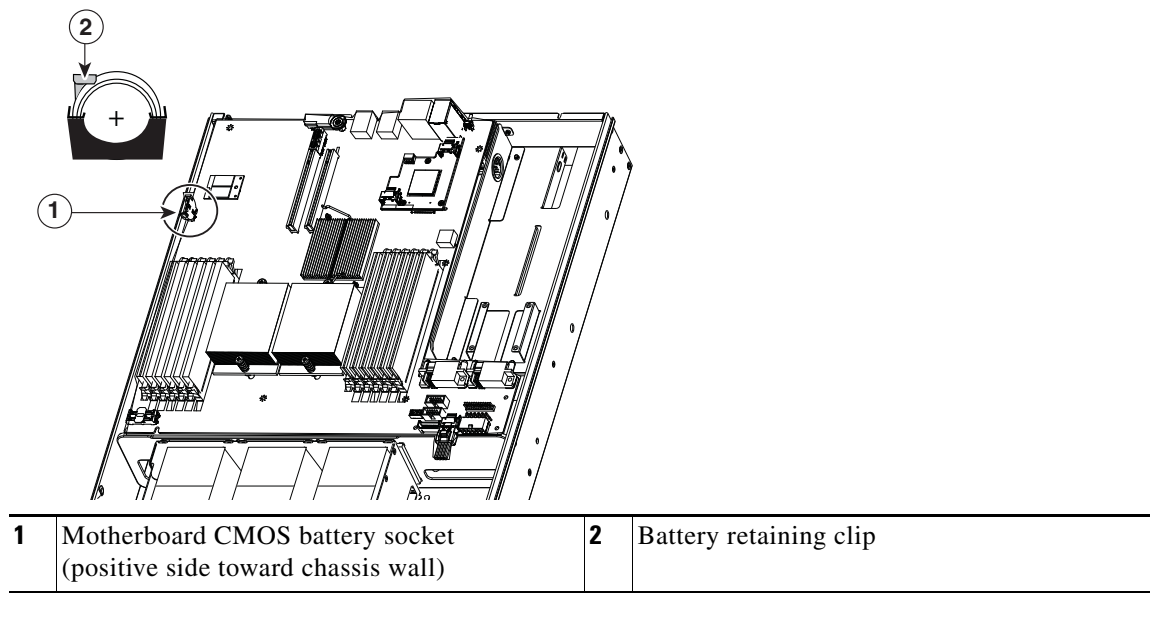
- d. Remove the top cover as described in the “[Removing and Replacing the Server Top Cover](#)” section on [page 3-10](#).
- e. Press the battery socket retaining clip toward the chassis wall.
- f. Lift the battery from the socket. Use pliers to grasp the battery if there is not enough clearance for your fingers.

**Step 2**

Install a motherboard CMOS battery:

- a. Press the battery socket retaining clip toward the chassis wall.
- b. Insert the new battery into the socket with the battery's positive (+) marking toward the chassis wall. Ensure that the retaining clip clicks over the top of the battery.
- c. Replace the top cover.
- d. Replace the server in the rack, replace power cords and any other cables, and then power on the server by pressing the **Power** button.

**Figure 3-15** Removing and Replacing a Motherboard CMOS Battery



## Installing a Trusted Platform Module (TPM)

The qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*:  
[http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)

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

### Step 1 Remove a TPM:

- a. Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on page 3-8.
- b. Disconnect all power cords from the power supplies.
- c. 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.

- d. Remove the top cover as described in the “[Removing and Replacing the Server Top Cover](#)” section on page 3-10.
- e. Remove the PCIe riser card assembly to provide clearance to the TPM.  
See the “[Replacing a PCIe Riser Card Assembly](#)” section on page 3-32 for instructions.
- f. Remove the securing screw that holds the TPM to the motherboard standoff (see [Figure 3-16](#)).
- g. Lift up on both ends of the TPM to free it from the socket on the motherboard.

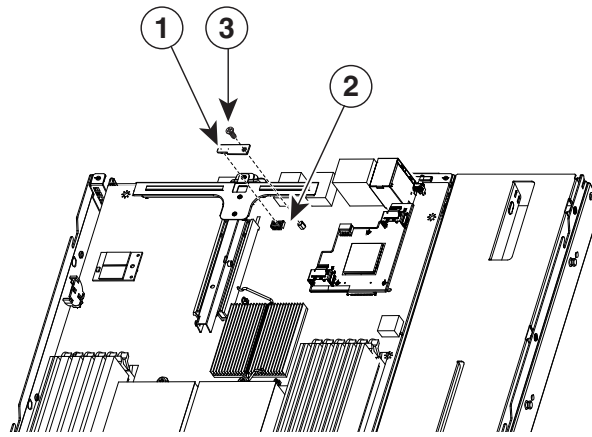


- Step 2** Install a TPM:
- Align the connector that is on the underside of the new TPM with motherboard socket JP2, and then press firmly on both ends of the TPM to press the connector into the socket.
  - Replace the securing screw that holds the TPM to the motherboard standoff.
  - Replace the PCIe riser card assembly.  
See the “[Replacing a PCIe Riser Card Assembly](#)” section on page 3-32 for instructions.
  - Replace the top cover.
  - Replace the server in the rack, replace power cords and any other cables, and then power on the server by pressing the **Power** button.

**Note**

The TPM must be enabled in the server BIOS before you can use it. If you have not previously enabled the TPM, continue with the next step.

**Figure 3-16** Removing and Replacing a TPM



<b>1</b>	TPM	<b>2</b>	Motherboard socket JP2
<b>3</b>	Securing screw		

- Step 3** Activate the TPM in the server BIOS:
- 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. For instructions on using the CIMC, refer to the [Cisco UCS C-Series Rack-Mount Server Configuration Guide](#).
  - Reboot the server.

**Note**

You can reboot the server by pressing the Power button on the server; by selecting **Macros > Ctrl-Alt-Del** on the Cisco KVM Console window menu bar; or by selecting **Power Cycle Server** on the Server Summary tab of the CIMC GUI.

- Watch during bootup for the F2 prompt, and then press **F2** to enter BIOS setup.
- If you have already configured a BIOS Administrator password, enter it and skip to Step [h](#).
- If you have not set a BIOS Administrator password for the server, continue with this step.

On the BIOS utility screen, select the **Security** tab, then select **Set Administrator Password**. Use the pop-up boxes to set the BIOS administrator password, then press **F10** to save your settings and reboot the server.

- f. Watch during bootup for the F2 prompt, and then press **F2** to enter BIOS setup.
- g. Log into the BIOS Setup utility with your BIOS Administrator password.
- h. On the BIOS utility screen, select the **Security** tab.
- i. Scroll down to **TPM** and select **TURN ON**.
- j. Press **F10** to save your settings and reboot the server.
- k. Watch during bootup for the F2 prompt, and then press **F2** to enter BIOS setup.
- l. Log into the BIOS Setup utility with your BIOS Administrator password.
- m. Verify that the TPM is now enabled. Select the **Security** tab. Verify that the TPM entry now says Enabled.

## Replacing a PCIe Riser Card Assembly

The qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*:

[http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)

To replace a PCIe riser card assembly, follow these steps:

### Step 1 Remove a PCIe riser card assembly:

- a. Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-8](#).
- b. Disconnect all power cords from the power supplies.
- c. 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.

- d. Remove the top cover as described in the “[Removing and Replacing the Server Top Cover](#)” section on [page 3-10](#).



**Note** Older servers have a screw that secures the PCIe riser to the rear of the chassis, but newer servers do not have this screw. If your server has the screw, continue with the next step to remove it. If your server does not have this screw, skip to Step f.

- e. Remove the screw that holds the riser card assembly to the rear of the chassis.
- f. Lift the assembly and any attached PCIe cards straight up and out of the chassis. Lift up on both ends of the assembly evenly to avoid damaging the sockets or the riser cards (see [Figure 3-17](#)).
- g. Remove any PCIe card from the riser card and set it aside. See [Replacing a PCIe Card, page 3-34](#).

### Step 2 Install a PCIe riser card assembly:

- a. Replace any PCIe card in the new riser card assembly.

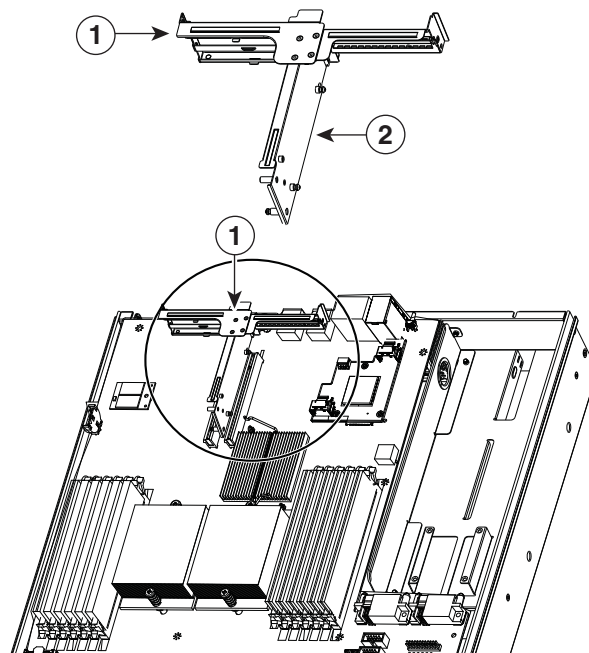
- b. Set the assembly in place, aligning the riser cards with the PCIe slots on the motherboard.
- c. Press down evenly on both ends of the assembly to fully engage the riser cards with the PCIe slots on the motherboard.



**Note** Older servers have a screw that secures the PCIe riser to the rear of the chassis, but newer servers do not have this screw. If your server has the screw, continue with the next step to replace it. If your server does not have this screw, skip to Step e.

- d. Replace the screw that secures the assembly to the chassis.
- e. Replace the top cover.
- f. Replace the server in the rack, replace power cords and any other cables, and then power on the server by pressing the **Power** button.

**Figure 3-17** Removing and Replacing a PCIe Riser Card Assembly



1 Riser card assembly (top view)

2 Riser card

## Replacing a PCIe Card

This section contains the following topics:

- [Replacing a PCIe Card](#), page 3-34
- [Special Considerations for the Cisco UCS P81E Virtual Interface Card \(N2XX-ACPCI01\)](#), page 3-37
- [Installing Multiple PCIe Cards and Resolving Limited Resources](#), page 3-38


**Note**

For more information about RAID controller cards and RAID controller cabling, see the [RAID Controller Considerations](#), page C-1.


**Note**

If you are installing a Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01), there are prerequisite considerations. See [Special Considerations for the Cisco UCS P81E Virtual Interface Card \(N2XX-ACPCI01\)](#), page 3-37.

The qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*: [http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)

Installing a PCIe card requires that you first remove the riser card assembly from the chassis. The PCIe slot numbering on the riser card assembly is shown in [Figure 3-18](#) (as viewed from the rear of the server):

**Figure 3-18** *PCIe Slot Numbering and Physical Orientation, Facing Server Rear*

PCIe Slot 4	PCIe Slot 1
PCIe Slot 5	PCIe Slot 2
	PCIe Slot 3

## Replacing a PCIe Card

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

- Step 1** Remove a PCIe card:
- Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-8](#).
  - Disconnect all power cords from the power supplies.
  - 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 the “[Removing and Replacing the Server Top Cover](#)” section on [page 3-10](#).



---

**Note** Older servers have a screw that secures the PCIe riser to the rear of the chassis, but newer servers do not have this screw. If your server has the screw, continue with the next step to remove it. If your server does not have this screw, skip to Step [f](#).

---

- e. Remove the screw that holds the riser card assembly to the rear of the chassis.
- f. Disconnect any cables from connectors on the PCIe card.
- g. Lift the assembly and any attached PCIe cards straight up and out of the chassis. Lift up on both ends of the assembly evenly to avoid damaging the sockets or the riser cards. See [Figure 3-17 on page 3-33](#).
- h. Remove the screw that secures the PCIe card rear plate to the assembly rear opening.
- i. Pull the PCIe card connector out of the riser card socket and set the card aside.

**Step 2** Install a PCIe card:

- a. If you are installing a PCIe card to an empty slot on the riser card assembly, remove any blank panel from the assembly rear opening by removing the screw that secures the blank panel.
- b. Align the PCIe card connector with the riser card socket and push on both ends of the card evenly to fully engage the card connector with the riser card socket (see [Figure 3-19](#)).
- c. Install the screw that secures the rear plate of the card to the assembly rear opening.
- d. Replace any cables that were connected on the old card to connectors on the new card.
- e. Set the assembly in place, aligning the riser cards with the PCIe slots on the motherboard.
- f. Press down evenly on both ends of the assembly to fully engage the riser cards with the PCIe slots on the motherboard.



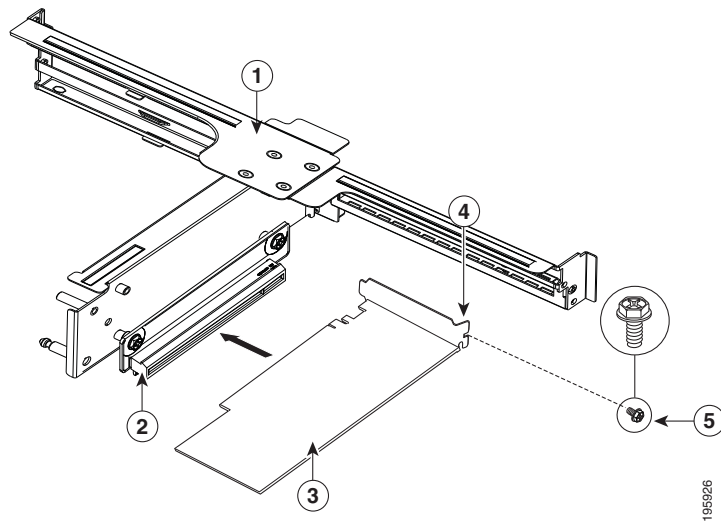
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**Note** Older servers have a screw that secures the PCIe riser to the rear of the chassis, but newer servers do not have this screw. If your server has the screw, continue with the next step to replace it. If your server does not have this screw, skip to Step [h](#).

---

- g. Replace the screw that secures the assembly to the chassis.
- h. Replace the top cover.
- i. Replace the server in the rack, replace power cords and any other cables, and then power on the server by pressing the **Power** button.

**Figure 3-19** *Removing and Replacing a PCIe Card*



<b>1</b>	Riser card assembly removed from chassis (top view)	<b>2</b>	Riser card
<b>3</b>	PCIe card	<b>4</b>	PCIe card rear plate
<b>5</b>	PCIe card securing screw (attaches to assembly)		

## Special Considerations for the Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01)

The Cisco UCS P81E Virtual Interface Card is a standard-profile, half-length, dual-port 10 Gb PCIe card with SFP+. See the following special considerations and prerequisites.

- This card is supported in server Generations M1 and M2.
- This server supports installation of one of these cards.
- This card is supported only in PCIe slots 1 or 2 of this server.



**Note** This card must be installed in PCIe slot 1 to use the Cisco Card NIC mode (see [Figure 3-18 on page 3-34](#)). See also [NIC Modes and NIC Redundancy Settings, page 2-12](#).

- This card requires that the server has CIMC firmware version 1.2(1) or later installed. There is a heartbeat LED on the top and bottom of the card that indicates when firmware is active.
- To use this card for UCS integration (UCSM mode) with Cisco UCS Manager 2.0(2xx) or later, the minimum card-firmware and uboot image level is 2.0(2g).
- To use this card for UCS integration (UCSM mode) with Cisco UCS Manager 1.4 or 2.0(1), the minimum card-firmware and uboot image level is 1.4(1i).
- To connect this card to an upstream Cisco Nexus fabric interconnect (switch), the minimum NXOS version on the fabric interconnect must be 5.0 or later.
- This card requires that you have the new power supply model, R2X0-PSU2-650W-SB. A 5A standby mode has been added to these power supplies to support this card. See [How to Identify Which Power Supply Model is in Your Server, page 3-37](#).
- Both power supplies must be model R2X0-PSU2-650W-SB. Do not mix power supply models in the same server.

### How to Identify Which Power Supply Model is in Your Server

There are two methods that you can use to identify which power supply is installed in your server:

1. Visually inspect the power supply at the rear of the server. The new power supply model R2X0-PSU2-650W-SB has a sticker with the number 650W-SB; the old power supply has no sticker.
2. Use the Cisco Integrated Management Controller (CIMC) GUI to view the power supply model:
  - a. Use a browser to connect to CIMC using the CIMC IP address.
  - b. Log in to CIMC using your administrator user name and password.
  - c. On the CIMC **Server** tab, click **Inventory**.
  - d. On the **Inventory** pane, click the **Power Supplies** tab.
  - e. View the power supply model number in the **Product ID** column. The new power supply is listed by the manufacturer's model number, R2X0-PSU2-650W-SB.

## Installing Multiple PCIe Cards and Resolving Limited Resources

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

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

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

- [Resolving Insufficient Memory Space to Execute Option ROMs, page 3-38](#)
- [Resolving Insufficient 16-Bit I/O Space, page 3-39](#)

### Resolving Insufficient Memory Space to Execute Option ROMs

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

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

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

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

- **Guidelines for RAID controller booting:**

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

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

- **Guidelines for onboard NIC PXE booting:**

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



## Resolving Insufficient 16-Bit I/O Space

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

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

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

To work around this problem, rebalance the 16-bit I/O load using the following methods:

1. Physically remove any unused PCIe cards.
2. If the system has one or more Cisco virtual interface cards (VICs) installed, disable the PXE boot on the VICs that are not required for the system boot configuration by using the Network Adapters page in the CIMC WebUI to free up some 16-bit I/O resources. Each VIC uses a minimum 16 KB of 16-bit I/O resource, so disabling PXE boot on Cisco VICs would free up some 16-bit I/O resources that can be used for other PCIe cards that are installed in the system.

## Replacing a SAS Extender or SAS Expander

This server has two factory-configurable options for hard drive backplane connection: the SAS extender or the SAS expander.



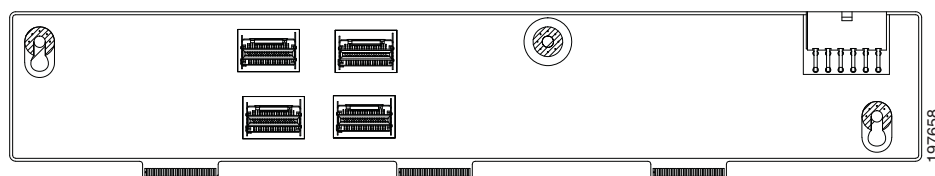
### Note

The extender and the expander are field-replaceable, but you cannot upgrade an extender to an expander after-factory.

### The SAS Extender

Figure 3-20 shows the SAS extender.

**Figure 3-20 SAS Extender**



- The extender supports connection for up to eight drives. Connector 1 provides connection for drives 1–4, connector 2 provides connection for drives 5–8. See [Supported RAID Controllers and Required Cables, page C-1](#) for the required cables.
- To control more than eight drives, your server must have the optional expander.

### The SAS Expander

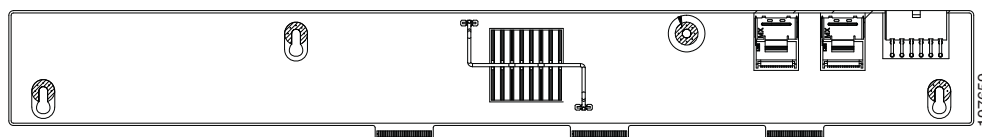


### Note

The SAS expander cannot be used with the onboard ICH10R controller. You must use a RAID controller card with the SAS expander.

Figure 3-21 shows the SAS expander.

**Figure 3-21 SAS Expander**



- The expander supports connection for up to 16 drives when using a single LSI MegaRAID 9261-8i card. See [Supported RAID Controllers and Required Cables, page C-1](#) for the required cables.
- The expander has two mini-SAS SFF-8087 cable connectors. One connector provides connection for up to 16 drives, and the second connector provides redundancy.

## Replacing a SAS Extender or SAS Expander Card

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

**Step 1** Remove a SAS extender or SAS expander card:

- a. Power off the server as described in the [“Shutting Down and Powering Off the Server”](#) section on page 3-8.
- b. Disconnect all power cords from the power supplies.
- c. 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.

- d. Remove the top cover as described in the [“Removing and Replacing the Server Top Cover”](#) section on page 3-10.
- e. Remove the front cover as described in the [“Removing and Replacing the Server Front Cover”](#) section on page 3-11.
- f. Remove all controller cables from the card. Label the cables to make them easier to replace.
- g. Remove the power harness cable from its connector on the corner of the card.
- h. Remove the single screw that secures the card to the chassis floor.
- i. Slide the card toward the server rear about 0.25-inches to disconnect its edge connectors from the backplane and to disengage the keyed slots in the card from the pegs on the chassis floor.
- j. Lift the card straight up off of the pegs.

**Step 2** Install a SAS extender or SAS expander card:



**Note**

Upgrades from a SAS extender to a SAS expander are not supported in the field. Replace an extender or expander only with the same type of card.

- a. Set the new card into the chassis so that the keyed slots in the card fit over the pegs on the chassis floor.
- b. Slide the card toward the server front until its edge connectors engage the backplane and the keyed slots in the card lock onto the pegs.
- c. Replace the single securing screw to the card.
- d. Replace the power harness cable to the connector on the corner of the card.
- e. Replace controller cables to the connectors on the card.
- f. Replace the front cover as described in [Removing and Replacing the Server Front Cover, page 3-11](#).
- g. Replace the top cover.
- h. Replace the server in the rack, replace power cords and any other cables, and then power on the server by pressing the **Power** button.

## Replacing an LSI MegaRAID Battery Backup Unit

When you install an LSI MegaRAID card and the optional BBU in this server, do not install the BBU on top of the card as described in the LSI instructions. To avoid overheating the card, you must install the BBU on a special bracket that is located on the top of the power supply bay.



### Note

LSI recommends that you replace the LSI BBU once per year or after 1,000 recharge cycles, whichever comes first. Verify whether BBU replacement is required by looking in the CIMC. Log in to CIMC for the server, then click **Server—Inventory—Storage—Battery Backup Unit**. If the Battery Replacement Required field says, “True,” then you must purchase a replacement BBU and replace it.



### 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 qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*:  
[http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)

To install or replace an LSI BBU, follow these steps:

### Step 1

Remove a BBU:

- a. Remove the three screws that secure the BBU to the BBU bracket on the power supply bay (see [Figure 3-22](#)).
- b. Disconnect the cable from the BBU. If you are only replacing a BBU and not the LSI card, you do not have to disconnect the other end of the cable from the card.

### Step 2

Install a BBU:

- a. Install the cable that is attached to the LSI controller card to socket J2 on the underside of the BBU.



### Note

Be careful to align the arrow-mark on the cable connector with the arrow-mark on the socket to avoid damaging the connector pins.

- b. Place the new BBU over the BBU bracket on the power supply bay and align the three screw-holes in the BBU with the three screw-holes on the bracket (see [Figure 3-22](#)).
- c. Replace the three securing screws that hold the BBU to the BBU bracket.

### Step 3

If this is a first-time installation of the BBU rather than a replacement, install the cable from the BBU to the LSI card:

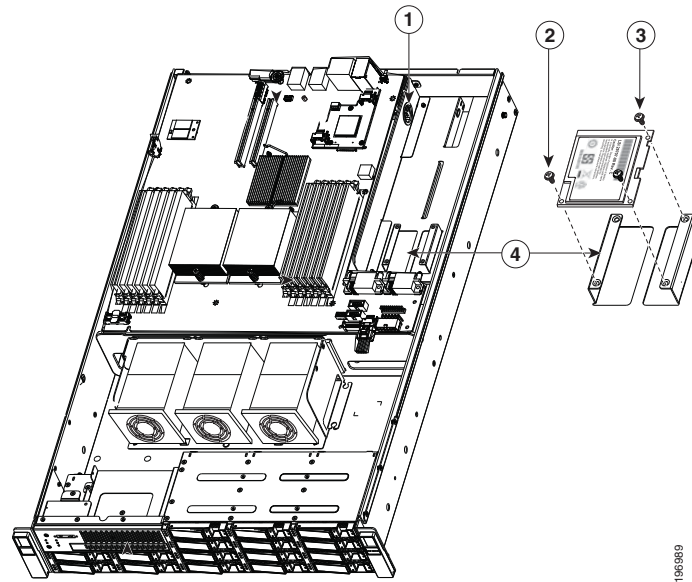
Route the cable from the BBU through the cable access opening on the power supply bay (see [Figure 3-22](#)) and then connect the cable to the socket on the adapter.



### Note

Be careful to align the arrow-mark on the cable connector with the arrow-mark on the socket to avoid damaging the connector pins.

**Figure 3-22** Removing and Replacing an LSI BBU



<b>1</b>	Cable access opening	<b>2</b>	Securing screws (three)
<b>3</b>	BBU (connector J2 is on the underside)	<b>4</b>	BBU bracket on power supply bay

## Installing a Mezzanine Card

The qualified and supported part numbers for this component are subject to change over time. For the most up-to-date list of replaceable components, see the following URL and then scroll to *Technical Specifications*:

[http://www.cisco.com/en/US/products/ps10493/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html)

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

---

### Step 1 Remove a mezzanine card:

- a. Power off the server as described in the “[Shutting Down and Powering Off the Server](#)” section on [page 3-8](#).
- b. Disconnect all power cords from the power supplies.
- c. 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.

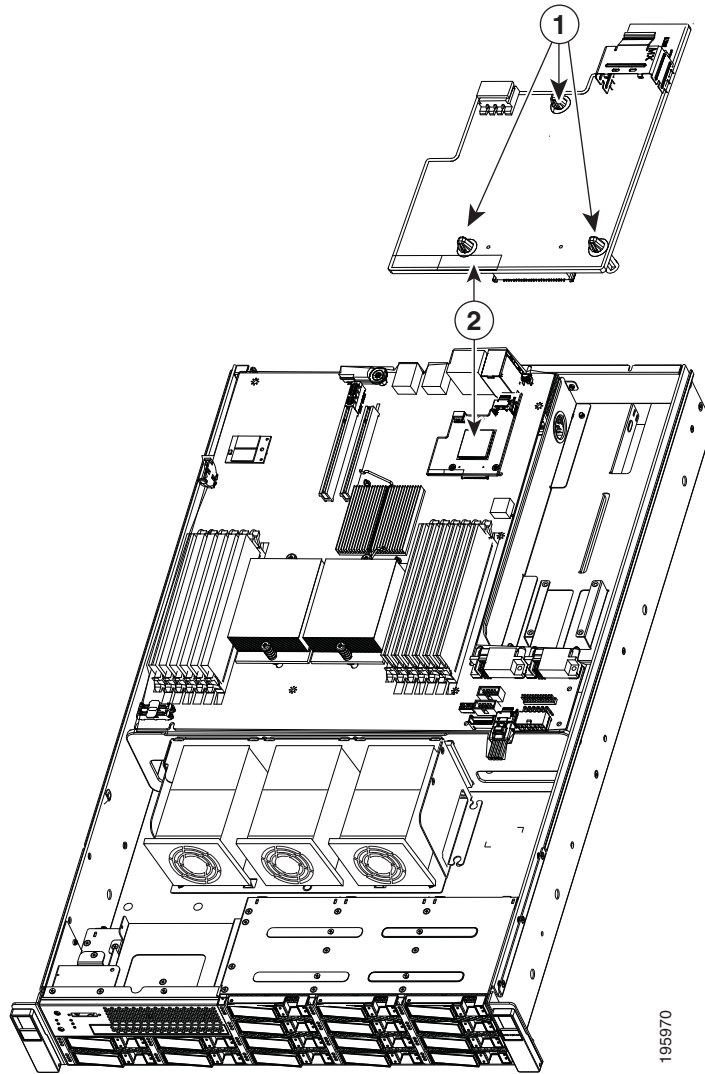
---

- d. Remove the top cover as described in the “[Removing and Replacing the Server Top Cover](#)” section on [page 3-10](#).
- e. Disconnect the SAS cable from the connector on the top of the mezzanine card.
- f. Use needle-nose pliers to pinch the three plastic posts that hold the mezzanine card to the motherboard. Pinching the top of the post provides clearance to lift the mezzanine card off the posts (see [Figure 3-23](#)).
- g. Lift up on both ends of the mezzanine card evenly to disengage its connector from the motherboard socket.

### Step 2 Install a mezzanine card:

- a. Place the mezzanine card in the chassis, aligning the holes on the card with the three plastic posts on the motherboard.
- b. Push down firmly on the card to fully engage the card’s connector with the motherboard socket.
- c. Ensure that the holes in the card click down over the three plastic posts on the motherboard.
- d. Reconnect the SAS cable to the connector on the top of the mezzanine card.
- e. Replace the top cover.
- f. Replace the server in the rack, replace power cords and any other cables, and then power on the server by pressing the **Power** button.

**Figure 3-23** *Removing and Replacing a Mezzanine Card*



<b>1</b> Mezzanine card retaining posts (three)	<b>2</b> Mezzanine card
---	-------------------------







# APPENDIX **A**

## Technical Specifications

---

This appendix lists the technical specifications for the Cisco UCS C210 M1 server and includes the following sections:

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

## Physical Specifications

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

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

<b>Description</b>	<b>Specification</b>
Height	3.45 in. (8.75 cm)
Width	17.39 in. (44.16 cm)
Depth	28.35 in. (72.00 cm)
Weight (loaded chassis)	50.70 lbs (23.00 kg)

# Environmental Specifications

Table A-2 lists the environmental specifications for the server.

**Table A-2**      **Environmental Specifications**

Description	Specification
Temperature, operating: Derate 1°C for every 1000 ft (304 m) up to a maximum altitude of 10,000 ft (3048 m).	50 to 95°F (10 to 35°C)
Temperature, nonoperating within altitude: 0 to 40,000 feet (0 to 12,000 meters)	-40 to 149°F (-40 to 65°C)
Humidity (RH), noncondensing	5 to 93%
Altitude	0 to 10000 feet
Sound power level Measure A-weighted per ISO7779 LwAd (dBA) Operation at 73°F (23°C)	65.5 dBA
Sound power level Measure A-weighted per ISO7779 LwAd (Bels) Operation at 73°F (23°C)	6.8 Bels

# Power Specifications

Table A-3 lists the specifications for each power supply (Cisco part number R2X0-PSU2-650W).

**Table A-3**      **Power Supply Specifications**

Description	Specification
AC-input voltage	115 to 230 VAC nominal (Range: 90 to 264 VAC)
AC-input frequency	50 to 60 Hz nominal (Range: 47 to 63 Hz)
Maximum AC-input current	10 Amps
Maximum output power for each power supply	650 W (up to two power supplies can be installed)
Power supply output voltage	Main power: 12 VDC Standby power: 5 VDC

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/)



# APPENDIX **B**

## Cable and Power Cord Specifications

This appendix provides cabling and port specifications for control devices and power connections and includes the following sections:

- [KVM Cable, page B-1](#)
- [Supported Power Cords and Plugs, page B-2](#)

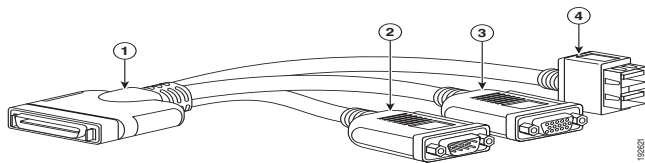
### KVM Cable

The KVM cable provides a connection into the server, providing a DB9 serial connector, a VGA connector for a monitor, and dual USB ports for a keyboard and mouse. With this cable, you can create a direct connection to the operating system and the BIOS running on the server.

This server supports the following Cisco components and part numbers.

Supported Components	Part Number
KVM cable	37-1016-01

**Figure B-1** KVM Cable



<b>1</b>	Connector to server	<b>2</b>	DB9 serial connector
<b>3</b>	VGA connection for a monitor	<b>4</b>	2-port USB connector for a mouse and keyboard

## 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 Power Cord, 250 VAC 10 A IRAM 2073 Plug Argentina	8.2	2.5	<a href="#">Figure B-2</a>
CAB-9K10A-AU 250 VAC 10 A 3112 Plug, Australia	8.2	2.5	<a href="#">Figure B-3</a>
SFS-250V-10A-CN Power Cord, 250 VAC 10 A GB 2009 Plug China	8.2	2.5	<a href="#">Figure B-4</a>
CAB-9K10A-EU Power Cord, 250 VAC 10 A M 2511 Plug Europe	8.2	2.5	<a href="#">Figure B-5</a>
SFS-250V-10A-ID Power Cord, 250 VAC 16A EL-208 Plug South Africa, United Arab Emirates, India	8.2	2.5	<a href="#">Figure B-6</a>
SFS-250V-10A-IS Power Cord, 250 VAC 10 A SI32 Plug Israel	8.2	2.5	<a href="#">Figure B-7</a>
CAB-9K10A-IT Power Cord, 250 VAC 10 A CEI 23-16 Plug Italy	8.2	2.5	<a href="#">Figure B-8</a>
CAB-9K10A-SW Power Cord, 250 VAC 10 A MP232 Plug Switzerland	8.2	2.5	<a href="#">Figure B-9</a>
CAB-9K10A-UK Power Cord, 250 VAC 10 A BS1363 Plug (13 A fuse) United Kingdom	8.2	2.5	<a href="#">Figure B-10</a>
CAB-AC-250V/13A Power Cord, 250 VAC 13 A IEC60320 Plug North America	6.6	2.0	<a href="#">Figure B-11</a>

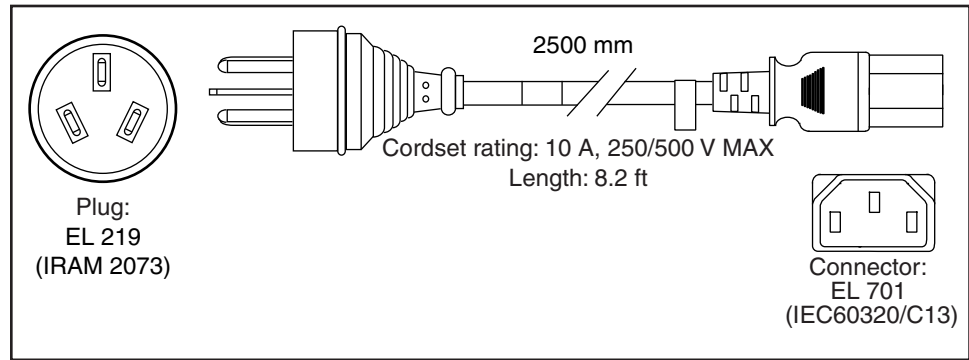
**Table B-1 Supported Power Cords for the Server (Continued)**

Description	Length		Power Cord Reference Illustration
	Feet	Meters	
CAB-N5K6A-NA Power Cord, 250 VAC 13 A NEMA 6-15 Plug, North America	8.2	2.5	Figure B-12
CAB-9K12A-NA Power cord, 125 VAC, 13 A, NEMA 5-15 Plug North America	8.2	2.5	Figure B-13
CAB-C13-C14-JMPR Cabinet Jumper Power Cord, 250 VAC 13 A, C13-C14 Connectors	2.2	0.7	Figure B-14

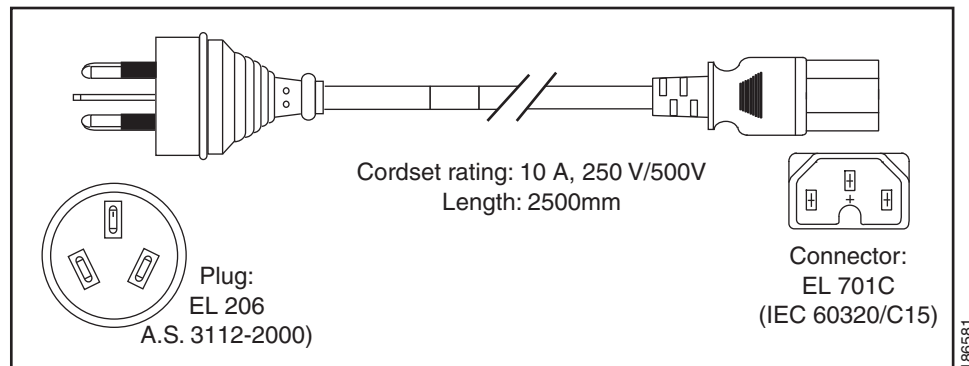
### AC Power Cord Illustrations

This section contains the AC power cord illustrations.

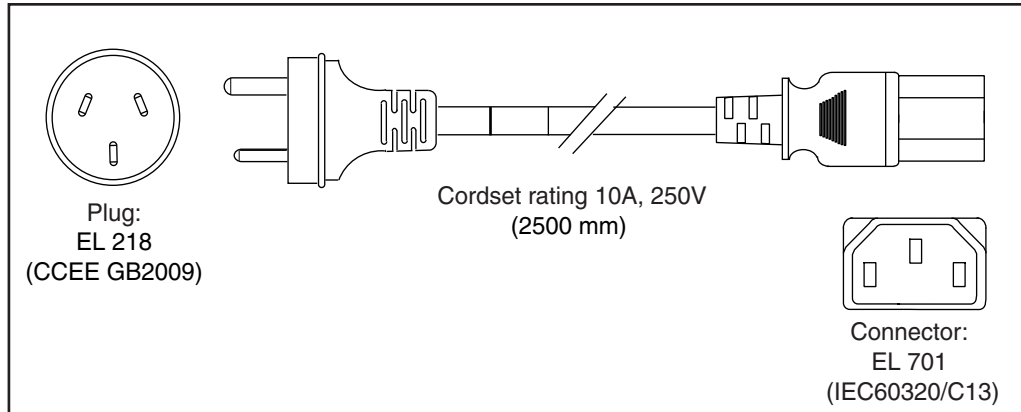
**Figure B-2 SFS-250V-10A-AR**



**Figure B-3 CAB-9K10A-AU**

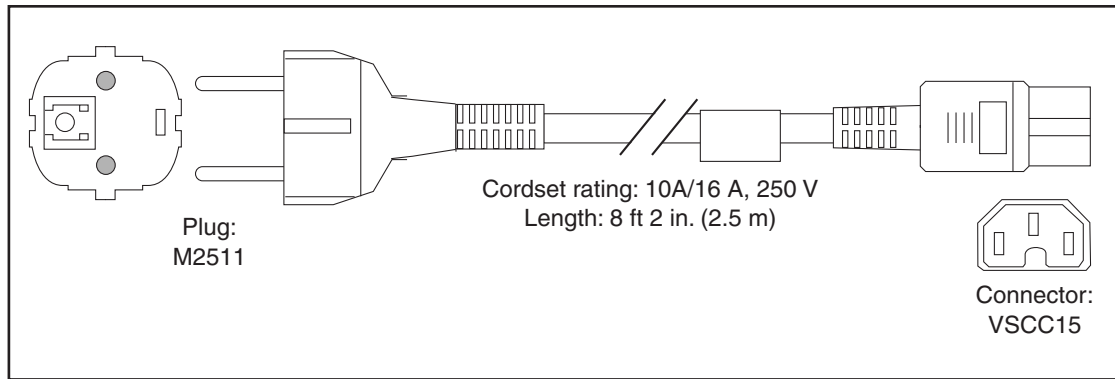


**Figure B-4 SFS-250V-10A-CN**



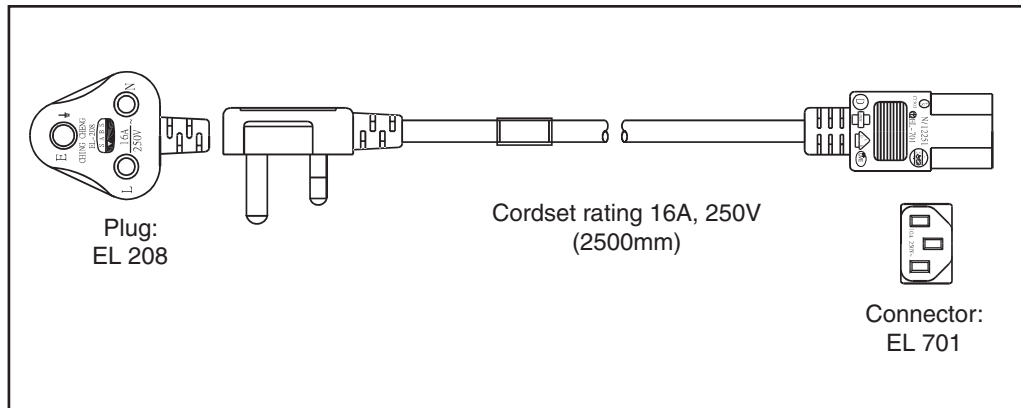
186573

**Figure B-5 CAB-9K10A-EU**



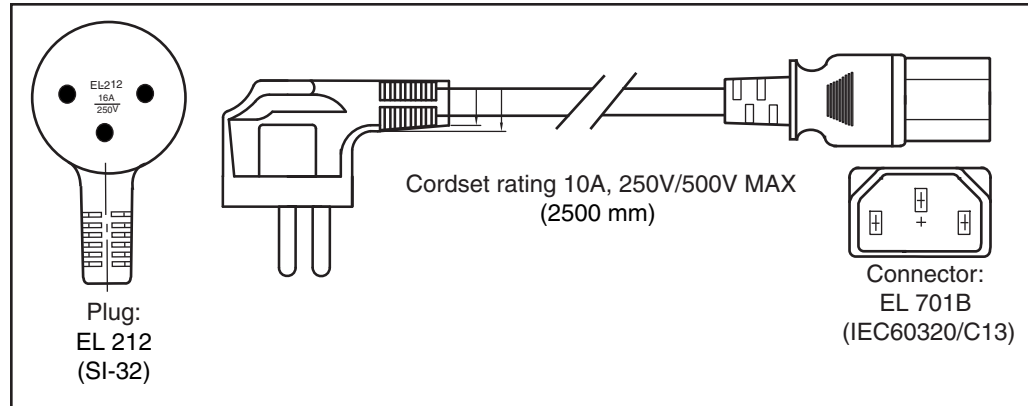
186576

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



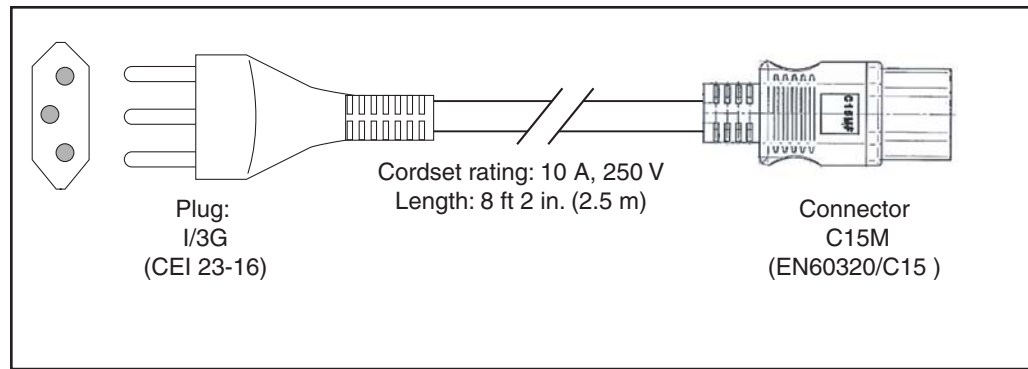
187490

**Figure B-7 SFS-250V-10A-IS**



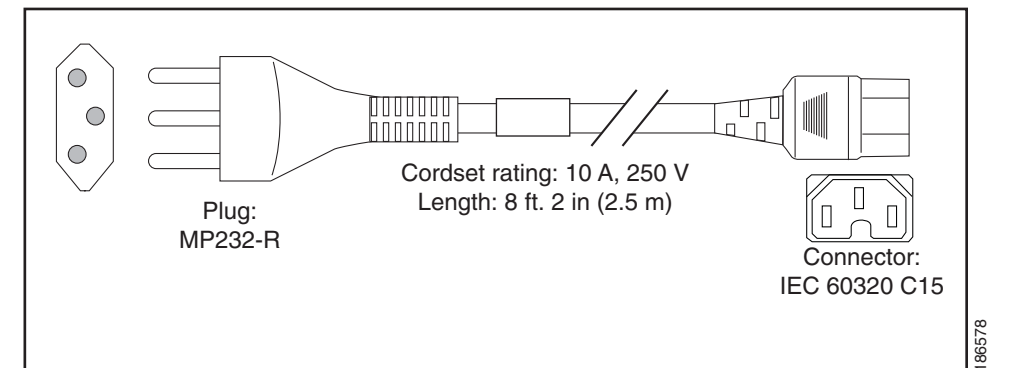
186574

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



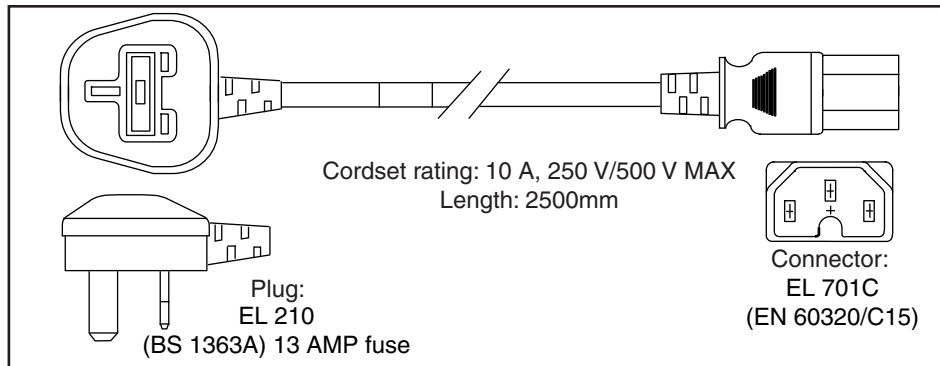
186575

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



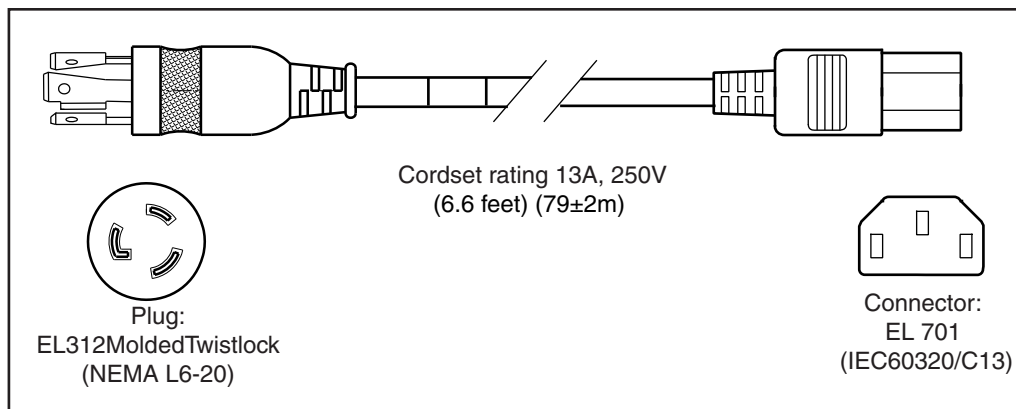
186578

**Figure B-10 CAB-9K10A-UK**



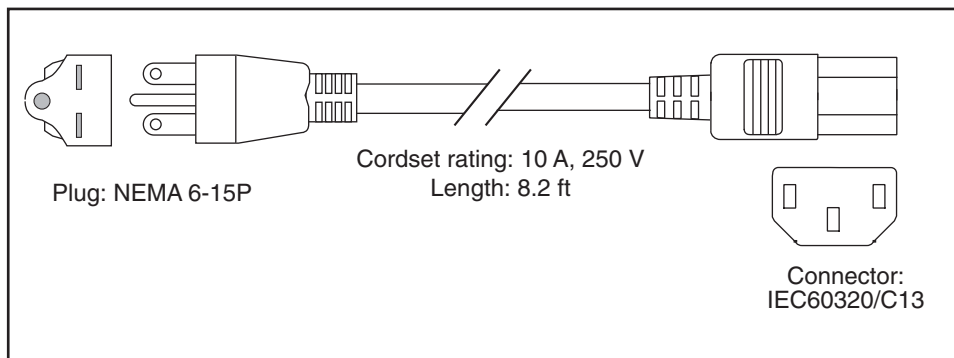
186580

**Figure B-11 CAB-AC-250V/13A**



186568

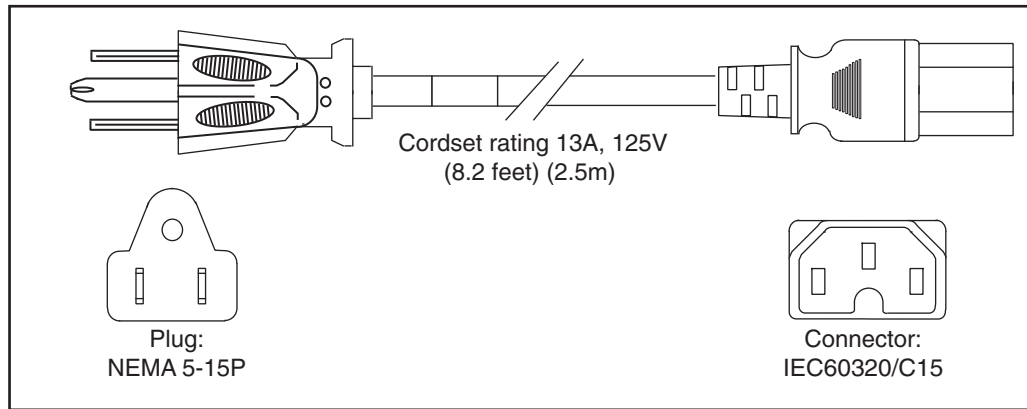
**Figure B-12 CAB-N5K6A-NA**



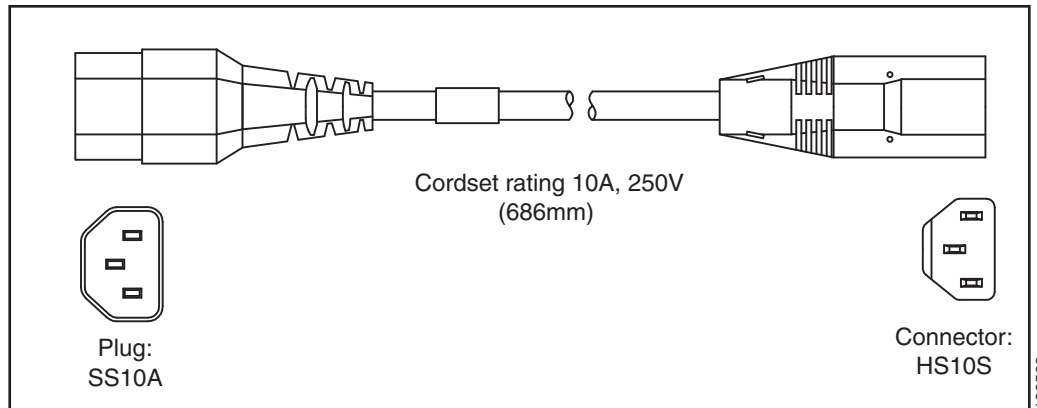
186570



**Figure B-13 CAB-9K12A-NA**



**Figure B-14 CAB-C13-C14-JMPR, Jumper Power Cord**







# APPENDIX **C**

## RAID Controller Considerations

---

This appendix contains the following sections:

- [Supported RAID Controllers and Required Cables, page C-1](#)
- [Enabling the Integrated Intel ICH10R RAID Controller in the BIOS, page C-2](#)
- [Enabling the Mezzanine Card RAID Controller in the BIOS, page C-3](#)
- [RAID Controller Cabling, page C-3](#)
- [How to Determine Which Controller Is in Your Server, page C-4](#)
- [How to Disable Quiet Boot for CIMC Firmware Earlier Than Release 1.2\(1\), page C-5](#)
- [How To Launch Option ROM-Based Controller Utilities, page C-5](#)
- [Restoring RAID Configuration After Replacing a RAID Controller, page C-6](#)
- [For More Information, page C-7](#)

## Supported RAID Controllers and Required Cables

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



### Note

This server contains a default drive backplane called an *extender*, which supports controller connection for up to 8 drives. To control more than 8 drives (maximum 16), the server must be ordered with the optional *expander* backplane. The extender/expander backplanes are not field-upgradeable.



### Note

Different cables might be required when connecting to the extender versus the expander, as described in [Table C-1](#).



### Note

Do not mix controller types in the server. Dual controllers are not supported.

**Table C-1 Cisco UCS C210 RAID Controller Options**

Controller	Style	Max. Internal Drives	SAS	SATA	Opt. BBU	RAID Levels	Required Cables
Intel ICH10R <sup>1</sup>	Integrated	4	No	Yes	No	0, 1	1 SATA <sup>2</sup> (R210-SATACBL)
LSI 1064E	Mezzanine	4	Yes <sup>3</sup>	Yes	No	0, 1, 1E	Extender: 1 Long SAS (R210-SASCBL) Expander: 1 Short SAS (SASCBLSHORT)
LSI MegaRAID 9280-4i4e	PCIe	4	Yes <sup>4</sup>	Yes	Yes	0, 1, 5, 6, 10, 50, 60	Extender: 1 long SAS (R210-SASCBL) Expander: 1 Short SAS (SASCBLSHORT)
LSI MegaRAID 9261-8i	PCIe	16	Yes	Yes	Yes	0, 1, 5, 6, 10, 50, 60	Extender: 2 Long SAS (R210-SASCBL) Expander: 2 Short SAS (SASCBLSHORT)

1. The integrated ICH10R controller must be enabled in the BIOS. This controller is not compatible for use with VMWare ESX/ESXi Server software in any generation or version of the Cisco UCS C210 server.
2. The integrated ICH10R controller cannot be used with the optional expander.
3. You cannot mix SAS and SATA drives when using a 1064E-based controller.
4. You can mix SAS and SATA drives when using an LSI MegaRAID card. However, you cannot mix SAS and SATA drives within a volume.

## Enabling the Integrated Intel ICH10R RAID Controller in the BIOS



### Note

The integrated ICH10R RAID controller is not compatible for use with VMWare ESX/ESXi Server software in any generation or version of the Cisco UCS C200 server.

When using the integrated RAID, you must enable the ICH10R controller in SW RAID mode.

- 
- Step 1** Boot the server and press **F2** when prompted to enter the BIOS Setup utility.
  - Step 2** Select the **Advanced** tab, then **Mass Storage Controllers Configuration**.
  - Step 3** Set Onboard SATA Controller to **Enabled**. Set SATA Mode to **SW RAID**.
  - Step 4** Press **F10** to save your changes and exit the utility.
-

## Enabling the Mezzanine Card RAID Controller in the BIOS

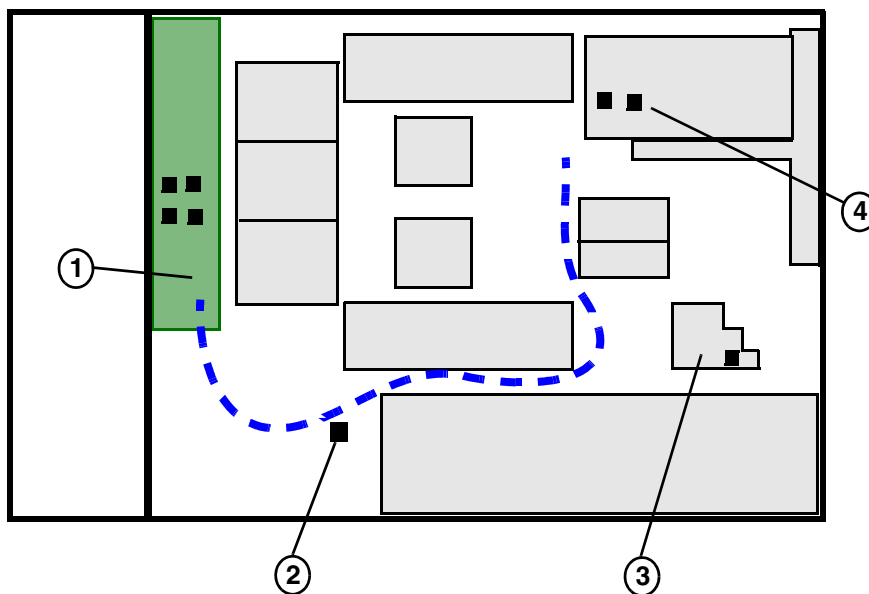
When using the supported mezzanine-style RAID controller cards, you must enable the ICH10R controller in Enhanced mode.

- 
- Step 1** Make sure that a RAID cable is attached between the mezzanine card and the disk backplane.
  - Step 2** Boot the server and press **F2** when prompted to enter the BIOS Setup utility.
  - Step 3** Select the **Advanced** tab, then **Mass Storage Controllers Configuration**.
  - Step 4** Set Onboard SATA Controller to **Enabled**.
  - Step 5** Set SATA Mode to **Enhanced**.
  - Step 6** Press **F10** to save your changes and exit the utility.
  - Step 7** To set up a RAID configuration when using the mezzanine card, boot the server and press **Ctrl-C** when prompted to start the WebBIOS utility.
- 

## RAID Controller Cabling

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

**Figure C-1** RAID Controller Connectors



<b>1</b>	Extender or expander backplane	<b>3</b>	Mezzanine card connector
<b>2</b>	Integrated RAID connector on motherboard	<b>4</b>	LSI MegaRAID PCIe card connectors

In some cases, the default extender backplane requires different cables than the optional expander backplane. The cable connections required for each type of controller are as follows:

- **Integrated ICH10R:**
  - Extender: Connect one SATA cable from the motherboard connector to the drives 1–4 connector on the extender.
  - Expander: This integrated controller cannot be used with the expander.
- **1064E mezzanine card:**
  - Extender: Connect one long SAS cable from the single connector on the mezzanine card to the drives 1–4 connector on the extender.
  - Expander: Connect one short SAS cable from the single connector on the mezzanine card to connector 1 on the expander.
- **LSI MegaRAID 9280-4i4e card:**
  - Extender: Connect one short SAS cable from connector 1 on the card to the drives 1–4 connectors on the extender.
  - Expander: Connect one short SAS cable from connector 1 on the card to connector 1 on the expander.
- **LSI MegaRAID 9261-8i card:**
  - Extender: Connect one long SAS cable from connector 1 on the card to the drives 1–4 connector on the extender. Connect one long SAS cable from connector 2 on the card to the drives 5–8 connector on the extender.
  - Expander: Connect one short SAS cable from connector 1 on the card to connector 1 on the expander. Connect one short SAS cable from connector 2 on the card to connector 2 on the expander. (Connector 1 on the expander can control up to 16 drives, connector 2 provides redundancy.)

## How to Determine Which Controller Is in Your Server

If you do not have a record of which device is used in the server, you can disable quiet boot and read the on-screen messages that are displayed during system bootup. These messages display information about the devices that are installed in your server.

- Information about the models of card installed are displayed as part of the verbose boot. You are also prompted to press **Ctrl-H** to launch configuration utilities for those cards. For servers running CIMC firmware earlier than release 1.2(1), see also [How to Disable Quiet Boot for CIMC Firmware Earlier Than Release 1.2\(1\), page C-5](#).
- If the mezzanine-style card is enabled, you are prompted to press **Ctrl-C** to launch the configuration for these cards. See also [Enabling the Mezzanine Card RAID Controller in the BIOS, page C-3](#).
- If no models of card are displayed but there is a RAID configuration, your server is using the onboard ICH10R controller. You are also prompted to press **Ctrl-M** to launch the configuration utilities for this controller (see graphic below). See also [Enabling the Integrated Intel ICH10R RAID Controller in the BIOS, page C-2](#).

```

Cisco Virtual KVM Console - 172.25.183.144
File View Macros Tools Help
LSI MegaRAID Software RAID BIOS Version A.09.07211059R
LSI SATA RAID Found at PCI Bus No:00 Dev No:1F
Device present at port 0      ST3500320NS      476428MB
Device present at port 1      ST3500320NS      476428MB
Device present at port 5      Optiarc DVD RW AD-7580S
01 Virtual drive(s) Configured.
Array#   Mode      Stripe Size   No.Of Stripes   DriveSize   Status
00       RAID 1      64KB         02              475883MB   Online
Press Ctrl-M or Enter to run LSI Software RAID Setup Utility.

```

## How to Disable Quiet Boot for CIMC Firmware Earlier Than Release 1.2(1)

For CIMC firmware and BIOS release 1.2(1) and later, Quiet Boot has been removed. If you are running CIMC firmware and BIOS earlier than release 1.2(1), you can use the following procedure to disable Quiet Boot.

To disable quiet boot so that the controller information and the prompts for the option ROM-based LSI utilities are displayed during bootup, follow these steps:

- 
- Step 1** Boot the server and watch for the F2 prompt during bootup.
  - Step 2** Press **F2** when prompted to enter the BIOS Setup utility.
  - Step 3** On the Main page of the BIOS Setup utility, set Quiet Boot to Disabled. This allows non-default messages, prompts, and POST messages to display during bootup instead of the Cisco logo screen.
  - Step 4** Press F10 to save your changes and exit the utility.
- 

## How To Launch Option ROM-Based Controller Utilities

To alter the RAID configurations on your hard drives, you can use your host-based utilities that you install on top of your host OS, or you can use the LSI option ROM-based utilities that are installed on the server.

When you boot the server and you have quiet boot disabled (see [How to Disable Quiet Boot for CIMC Firmware Earlier Than Release 1.2\(1\)](#), page C-5), information about your controller is displayed along with the prompts for the key combination to launch the option ROM-based utilities for your controller.

Watch for the prompt for your controller during verbose boot:

- The prompt for LSI controller card utility is **Ctrl-H**.

- The prompt for the mezzanine-style controller cards is **Ctrl-C**.
- The prompt for the onboard Intel ICH10R controller utility is **Ctrl-M**.

**Note**

Cisco has also developed the Cisco Server Configuration Utility for C-Series servers, which can assist you in setting up some RAID configurations for your drives. This utility is shipped with new servers on CD. You can also download the ISO from Cisco.com. See the user documentation for this utility at the following URL:

[http://www.cisco.com/en/US/docs/unified\\_computing/ucs/sw/ucsscu/user/guide/20/SCUUG20.html](http://www.cisco.com/en/US/docs/unified_computing/ucs/sw/ucsscu/user/guide/20/SCUUG20.html)

## 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 3-34](#).
- 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** If Quiet Boot is enabled, disable it in the system BIOS. See [How to Disable Quiet Boot for CIMC Firmware Earlier Than Release 1.2\(1\), page C-5](#).
- Step 4** Reboot the server and watch for the prompt to press F.
- Step 5** 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 6** 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 7** 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)
- LSI SAS2 Integrated RAID Solution User Guide (for LSI SAS1064E)  
[http://www.cisco.com/en/US/docs/unified\\_computing/ucs/3rd-party/lsi/irsas/userguide/LSI\\_IR\\_SAS\\_UG.pdf](http://www.cisco.com/en/US/docs/unified_computing/ucs/3rd-party/lsi/irsas/userguide/LSI_IR_SAS_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.

