Cisco UCS C250 Server
Installation and Service Guide
Covers UCS C250 Server Generations M1 and M2

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Cisco UCS C250 Server Installation and Service Guide
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Preface

This preface describes the audience, organization, and conventions of the Cisco UCS C250 Server Installation and Service Guide. It also provides information on how to obtain related documentation.

This guide covers UCS C250 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:

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1</td>
<td>Overview</td>
<td>Provides a brief overview of the Cisco Unified Computing System (UCS) and the role that the Cisco UCS C250 server plays in the Cisco Unified Computing System environment.</td>
</tr>
<tr>
<td>Chapter 2</td>
<td>Installing the Server</td>
<td>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.</td>
</tr>
<tr>
<td>Chapter 3</td>
<td>Maintaining the Server</td>
<td>Identifies the replaceable components of the server and describes how to replace them.</td>
</tr>
<tr>
<td>Appendix A</td>
<td>Technical Specifications</td>
<td>Lists physical, environmental, and power specifications.</td>
</tr>
<tr>
<td>Appendix B</td>
<td>Power Cord Specifications</td>
<td>Lists specifications for the supported international power cords.</td>
</tr>
</tbody>
</table>
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.

**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

**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**
TÄRKEITÄ TURVALLISUUSOHJEITA

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

SÄILYTÄ NÄMÄ OHJEET
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

安全上的重要注事项

「危险」的意味是。人身事故要防止的为注事项事项被记载着。装置的取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


GEM DISSE ANVISNINGER

警告 重要的安全性说明

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GUARDE ESTAS INSTRUÇÕES

Advarsel VIGTIGE SIKKERHEDSANVISNINGER


GEM DISSE ANVISNINGER
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 jakémkoli vybavení si uvedomte nebezpečí související s elektrickými obvody a seznamte se se standardními opatřeními pro předcházání úrazům. Podle čísla na konci každého upozornění vyhledejte jeho překlad v přeložených bezpečnostních upozorněních, která jsou přiložena k zařízení.

USCHOVEJTE TYTO POKyny

Преидапоиинη

ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ

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

ΦΥΛΑΞΕΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ

הוראות בטיחות חובהות

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שמרו הוראות אלה

Opmena

ВАЖНИ БЕЗБЕДНОСНИ НАПАТСТВИЈА

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. Исхранатете го бројот на изјавата што се наоѓа на крајот на секое предупредување за да го најдете неговиот период во преведените безбедносни предупредувања што се испорачани со уредот.

ЧУВАЈТЕ ГИ ОВИЕ НАПАТСТВИЈА
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:


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.
Overview

The Cisco UCS C250 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.

Supporting up to 384 GB of DDR3 main memory, this server is a high-performance, memory-intensive, two-socket, two rack unit (2 RU) server that increases performance and capacity for demanding virtualization and large dataset workloads.

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**

<table>
<thead>
<tr>
<th></th>
<th>Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Locator button/LED</td>
</tr>
<tr>
<td>2</td>
<td>Network activity LED</td>
</tr>
<tr>
<td>3</td>
<td>System fault LED</td>
</tr>
<tr>
<td>4</td>
<td>Power button/Power status LED</td>
</tr>
<tr>
<td>5</td>
<td>CPU fault LED</td>
</tr>
<tr>
<td>6</td>
<td>Memory fault LED</td>
</tr>
<tr>
<td>7</td>
<td>Power supply fault LED</td>
</tr>
<tr>
<td>8</td>
<td>Console connector (with supplied KVM cable, provides DB15 video, DB9 serial, and two USB 2.0 connectors)</td>
</tr>
<tr>
<td>9</td>
<td>DVD drive</td>
</tr>
<tr>
<td>10</td>
<td>Hard drive (up to eight)</td>
</tr>
<tr>
<td>11</td>
<td>Fan module (five)</td>
</tr>
</tbody>
</table>
Table 1-1 lists the hardware components and features of the Cisco UCS C250 server:

Table 1-1 Hardware Features of the Server

<table>
<thead>
<tr>
<th>Feature or Component</th>
<th>Cisco UCS C250 Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enclosure</td>
<td>Two rack unit (2RU) chassis.</td>
</tr>
<tr>
<td>Processors</td>
<td>Two quad-core Intel Xeon processors (Xeon 5500 Series for UCS C250 Generation M1 and Xeon 5600 Series for UCS C250 Generation M2).</td>
</tr>
<tr>
<td>Memory</td>
<td>48 DIMM(^1) slots supporting up to 384 GB of industry-standard DDR3(^2) main memory.</td>
</tr>
<tr>
<td>Storage</td>
<td>Up to eight internal SAS(^3) or SATA(^4) hard drives, supporting up to 4 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 Figure 3-4).</td>
</tr>
<tr>
<td>Disk Management</td>
<td>Factory-configured RAID(^5) support options:</td>
</tr>
<tr>
<td>PCIe I/O</td>
<td>Up to five PCIe(^6) expansion cards, plugged into horizontal riser card sockets:</td>
</tr>
</tbody>
</table>

1. Low-profile PCIe card slots (three)  
2. Locator button/LED  
3. Standard-profile PCIe card slots (two)  
4. Serial connector (DB9)  
5. Video connector (DB15 VGA)  
6. USB 2.0 connectors (two)  
7. 10/100/1000 Gigabit Ethernet ports (four)  
8. 10/100 Ethernet management port M1  
9. 10/100 Ethernet management port M2  
10. Power supply (up to two)
The server provides these rear-panel connectors:

- Four 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.
- Two 10/100 Ethernet management ports (RJ-45 connector).
- One DB9 serial connector.
- One 15-pin VGA\(^7\) connector.
- Two USB\(^8\) 2.0 connectors.

The server also has one front-panel console connector (with supplied KVM\(^9\) cable provides DB15 video, DB9 serial, and two USB 2.0 connectors).

**Removable media devices**

<table>
<thead>
<tr>
<th>Feature or Component</th>
<th>Cisco UCS C250 Server</th>
</tr>
</thead>
</table>

**Power**

- Up to two power supplies, each with a maximum output of 750W.

**Cooling**

- Five fan modules that force front-to-rear cooling with four fans in each module; also one fan in each power supply.

---

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 also the “Technical Specifications” section on page A-1 for more physical, environmental, and power details.
Installing the Server

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

**Warning**

**IMPORTANT SAFETY INSTRUCTIONS**

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

Statement 1071

SAVE THESE INSTRUCTIONS

**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
Unpacking and Inspecting the Server

**Caution**

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

**Tip**

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

**Note**

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

To inspect the shipment, follow these steps:

**Step 1**

Remove the server from its cardboard container—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*

<table>
<thead>
<tr>
<th>1</th>
<th>Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Drivers and Utilities disc</td>
</tr>
<tr>
<td>3</td>
<td>Power cord (optional, up to two)</td>
</tr>
<tr>
<td>4</td>
<td>Documentation</td>
</tr>
<tr>
<td>5</td>
<td>KVM cable</td>
</tr>
</tbody>
</table>
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 the “Rack Requirements” section on 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).

Tip

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.

There are optional Phillips-head screws included with the slide rails that you can use for additional stability (as noted in the installation procedure), but they are not required.

Slide Rail Adjustment Range

There are two types of slide rails available for this server:

- R200-1032RAIL: Range 27 to 36 inches (686 to 914 mm)
- UCSC-RAIL-KT-C250: Range 24 to 36 inches (610 to 914 mm)

Note

UCSC-RAIL-KT-C250 cannot be used with a cable management arm.
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:

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:

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

Chapter 2  Installing the Server

Figure 2-2  Attaching a Slide-Rail Assembly

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front-left rack post</td>
</tr>
<tr>
<td>2</td>
<td>Rear-left rack post</td>
</tr>
<tr>
<td>3</td>
<td>Slide-rail assembly</td>
</tr>
<tr>
<td>4</td>
<td>Length-adjustment bracket</td>
</tr>
<tr>
<td>5</td>
<td>Locking clip (one on each end of assembly)</td>
</tr>
<tr>
<td>6</td>
<td>Mounting pegs (two on each end of assembly)</td>
</tr>
</tbody>
</table>

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 2-3.

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.
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 4 in Figure 2-3), 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**
Slide rail UCSC-RAIL-KT-C250 cannot be used with a CMA. Slide rail R200-1032RAIL can be used with a CMA.

**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 2-4.
- 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 2-4 Attaching the Cable Management Arm**

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

**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 supplied power cord to each power supply in your server, and then attach the power cord to a grounded AC power outlet. See the “Power Specifications” 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.

Note

Depending on how much memory is installed in the server, bootup might take two minutes or more because of the memory verification operation during bootup. Servers with the full 384 GB of memory might take up to four minutes to boot.

You can verify power status by looking at the Power Status LED (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.
- Amber—The server is in standby power mode. Power is supplied only to the CIMC 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).
Step 3

Set NIC mode, NIC redundancy, and choose whether to enable DHCP or set static network settings:

a. Press the Power button to boot the server. Watch for the prompt to press F8.

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

c. 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 two 10/100 management ports are 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.

- Shipping—The two 10/100 management ports are used to access the CIMC, but each port has a default setting:
  - Port M1—DHCP is enabled, with no NIC redundancy.
  - Port M2—Static IP address is 10.1.1.7, with no NIC redundancy.

- 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 D (see Figure 3-17 on page 3-33). See also Special Considerations for the Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01), page 3-35.

d. Use this utility to change the NIC redundancy to your preference. This server has three possible NIC redundancy settings:
Chapter 2 Installing the Server

Initial Server Setup

- 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:

NIC Modes and NIC Redundancy Settings

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

- **Dedicated**—The two 10/100 management ports are 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.

- **Shipping**—The two 10/100 management ports are used to access the CIMC, but each port has a default setting:
  - Port M1—DHCP is enabled, with no NIC redundancy.
  - Port M2—Static IP address is 10.1.1.7, with no NIC redundancy.

- **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 D (see Figure 3-17 on page 3-33). See also Special Considerations for the Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01), page 3-35.

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](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

The P35 header is a 20-pin header on the front edge of the motherboard (see Figure 2-5 on page 2-14). You can use a jumper on this header to clear CMOS settings and to clear the BIOS administrator password.

- Using a BIOS Recovery Jumper on Header P35, page 2-15
- Using a Clear BIOS Admin Password Jumper on Header P35, page 2-16
- Using a Clear CMOS Jumper on Header P35, page 2-17

*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

*Figure 2-5 Service Jumper Location*

1 Location of P35 header (20-pin header on front edge of motherboard)
Using a BIOS Recovery Jumper on Header P35

This jumper is adjacent to the CMOS battery (see Figure 2-5 on page 2-14). 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 a USB thumb drive.

**Step 3** Power off the server as described in the “Shutting Down and Powering Off the Server” section on page 3-9.

**Step 4** Disconnect all power cords from the power supplies.

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

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

**Step 6** Remove the top cover as described in the “Removing and Replacing the Server Top Cover” section on page 3-10.

**Step 7** Remove the clear air baffle that covers the motherboard. Loosen the six thumbscrews, and then lift the baffle up and out of the server.

**Step 8** Install a shorting jumper on pins 3 and 4 of the P35 header (see Figure 2-5 on page 2-14).

**Step 9** 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 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 BIOS recovery. This is because the state of the jumper cannot be determined without the host CPU running.

**Step 11** 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 12** Remove the top cover from the server.

**Step 13** Remove the shorting jumper from the header pins.

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

**Step 14** Reinstall the air baffle and the top cover.

**Step 15** Replace the server in the rack, replace power cords and any other cables, then power on the server by pressing the Power button.
Using a Clear BIOS Admin Password Jumper on Header P35

This procedure describes how to clear the 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 3-9.

**Step 2** Disconnect all power cords from the power supplies.

**Step 3** Slide the server out 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** Remove the clear air baffle that covers the motherboard. Loosen the six thumbscrews, and then lift the baffle up and out of the server.

**Step 6** Install a shorting jumper on pins 9 and 10 of the P35 header (see Figure 2-5 on page 2-14).

**Step 7** 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 8** 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 9** 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 10** Remove the top cover from the server.

**Step 11** Remove the shorting jumper from the header pins.

---

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

**Step 12** Reinstall the air baffle and the top cover.

**Step 13** Replace the server in the rack, replace power cords and any other cables, then power on the server by pressing the **Power** button.
Using a Clear CMOS Jumper on Header P35

You can use this procedure to clear the server’s CMOS settings in the case of a system hang. For example, if the server hangs because of incorrect settings and does not boot, use this jumper to invalidate the settings and reboot with defaults.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Power off the server as described in the “Shutting Down and Powering Off the Server” section on page 3-9.</td>
</tr>
<tr>
<td>Step 2</td>
<td>Disconnect all power cords from the power supplies.</td>
</tr>
<tr>
<td>Step 3</td>
<td>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.</td>
</tr>
<tr>
<td>Caution</td>
<td>If you cannot safely view and access the component, remove the server from the rack.</td>
</tr>
<tr>
<td>Step 4</td>
<td>Remove the top cover as described in the “Removing and Replacing the Server Top Cover” section on page 3-10.</td>
</tr>
<tr>
<td>Step 5</td>
<td>Remove the clear air baffle that covers the motherboard. Loosen the six thumbscrews, and then lift the baffle up and out of the server.</td>
</tr>
<tr>
<td>Step 6</td>
<td>Install a shorting jumper pins 5 and 6 of the P35 header (see Figure 2-5 on page 2-14).</td>
</tr>
<tr>
<td>Step 7</td>
<td>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.</td>
</tr>
<tr>
<td>Step 8</td>
<td>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.</td>
</tr>
<tr>
<td>Note</td>
<td>You must allow the entire server to reboot to main power mode to complete the reset. This is because the state of the jumper cannot be determined without the host CPU running.</td>
</tr>
<tr>
<td>Step 9</td>
<td>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.</td>
</tr>
<tr>
<td>Step 10</td>
<td>Remove the top cover from the server.</td>
</tr>
<tr>
<td>Step 11</td>
<td>Remove the shorting jumper from the header pins.</td>
</tr>
<tr>
<td>Note</td>
<td>If you do not remove the jumper, the CMOS settings are reset to the default every time you power-cycle the server.</td>
</tr>
<tr>
<td>Step 12</td>
<td>Reinstall the air baffle and the top cover.</td>
</tr>
<tr>
<td>Step 13</td>
<td>Replace the server in the rack, replace power cords and any other cables, then power on the server by pressing the Power button.</td>
</tr>
</tbody>
</table>
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 3-8
- Installing or Replacing Components, page 3-12

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:


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:

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 3-5

Front Panel LEDs

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

![Figure 3-1 Front Panel LEDs](image)

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Locator LED/Locator button</td>
<td>2</td>
<td>Network activity LED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>System fault LED</td>
<td>4</td>
<td>Power status LED/Power button</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CPU fault LED</td>
<td>6</td>
<td>Memory fault LED</td>
<td>7</td>
<td>Power supply fault LED</td>
</tr>
<tr>
<td>9</td>
<td>Hard drive activity LED</td>
<td>10</td>
<td>Hard drive power LED</td>
<td>11</td>
<td>Fan module fault LED</td>
</tr>
</tbody>
</table>

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

**Note**

In the LED states descriptions, a *moderate fault* is a fault in which the first warning threshold for the component has been passed (for example, overheating). In most cases, the moderate fault self-corrects, at which time the LED returns to normal state. A “severe fault” is a fault that requires immediate service action.
### Table 3-1  Front Panel LEDs

<table>
<thead>
<tr>
<th>LED Name</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locator (this is also a Locator button)</td>
<td>• Off—The Locator LED is not in use.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td>Network activity</td>
<td>• Off—The server is in standby power mode.</td>
</tr>
<tr>
<td></td>
<td>• Green—The server is in main power mode.</td>
</tr>
<tr>
<td></td>
<td>• Green, blinking—The server is communicating with the network. The blink rate is faster as network activity increases.</td>
</tr>
<tr>
<td>System status</td>
<td>• Green—The server is operating properly within thresholds.</td>
</tr>
<tr>
<td></td>
<td>• Amber—A moderate fault event has been detected. Investigate other LEDs and sensors to isolate the problem.</td>
</tr>
<tr>
<td></td>
<td>• Amber, blinking—A severe fault event that requires immediate service action has been detected. Investigate other LEDs and sensors to isolate the problem.</td>
</tr>
<tr>
<td>Power status (this is also the Power button)</td>
<td>• Off—No AC power is present.</td>
</tr>
<tr>
<td></td>
<td>• Amber—The server is in standby power mode.</td>
</tr>
<tr>
<td></td>
<td>• Green—The server is in main power mode.</td>
</tr>
<tr>
<td></td>
<td>See the “Connecting and Powering On the Server (Standalone Mode)” section on page 2-9 for definitions of these power modes.</td>
</tr>
<tr>
<td>CPU fault</td>
<td>• Green—All CPUs are operating properly.</td>
</tr>
<tr>
<td></td>
<td>• Amber—At least one CPU has a moderate fault.</td>
</tr>
<tr>
<td></td>
<td>• Amber, blinking—At least one CPU has a severe fault.</td>
</tr>
<tr>
<td>Memory fault</td>
<td>• Off—All DIMMs are operating properly.</td>
</tr>
<tr>
<td></td>
<td>• Amber—At least one DIMM has a moderate fault.</td>
</tr>
<tr>
<td></td>
<td>• Amber, blinking—At least one DIMM has a severe fault.</td>
</tr>
<tr>
<td>Power supply fault</td>
<td>• Off—All power supplies are operating properly.</td>
</tr>
<tr>
<td></td>
<td>• Amber—At least one power supply has a moderate fault.</td>
</tr>
<tr>
<td></td>
<td>• Amber—At least one power supply has a severe fault.</td>
</tr>
<tr>
<td>DVD activity</td>
<td>• Off—The DVD drive is not in use.</td>
</tr>
<tr>
<td></td>
<td>• Green, blinking—The DVD drive is reading or writing data.</td>
</tr>
<tr>
<td>Hard drive activity</td>
<td>• Off—There is no hard drive in the hard drive sled.</td>
</tr>
<tr>
<td></td>
<td>• Green—The hard drive is ready.</td>
</tr>
<tr>
<td></td>
<td>• Green, blinking—The hard drive is reading or writing data.</td>
</tr>
</tbody>
</table>
Table 3-1  Front Panel LEDs (continued)

<table>
<thead>
<tr>
<th>LED Name</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard drive fault</td>
<td>• Off—The hard drive is operating properly.</td>
</tr>
<tr>
<td></td>
<td>• Amber—This hard drive has failed.</td>
</tr>
<tr>
<td></td>
<td>• Amber, blinking—The device is rebuilding.</td>
</tr>
<tr>
<td>Fan module fault</td>
<td>• Off—The fan module is operating properly.</td>
</tr>
<tr>
<td></td>
<td>• Amber—This fan module has failed.</td>
</tr>
</tbody>
</table>
## Rear Panel LEDs

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

Figure 3-2  Rear Panel LEDs

1. Rear Locator button/LED
2. Network activity LED
3. Overheating fault LED
4. CPU fault LED
5. Memory fault LED
6. Hard drive fault LED
7. System fault LED
8. Power supply status LED
9. Power supply fault LED
10. 10/100/1000 Gigabit Ethernet speed LED
11. 10/100/1000 Gigabit Ethernet link status LED
12. 10/100 Ethernet speed LED
13. 10/100 Ethernet link status LED

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

### Table 3-2  Rear Panel LEDs

<table>
<thead>
<tr>
<th>LED Name</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locator (This is also a Locator button)</td>
<td>• Off—The Locator LED is not in use.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td>Network activity</td>
<td>• Off—The server is in standby power mode.</td>
</tr>
<tr>
<td></td>
<td>• Green—The server is in main power mode.</td>
</tr>
<tr>
<td></td>
<td>• Green, blinking—The server is communicating with the network. The blink rate is faster as network activity increases.</td>
</tr>
<tr>
<td>System status</td>
<td>• Green—The server is operating properly within thresholds.</td>
</tr>
<tr>
<td></td>
<td>• Amber—A moderate fault event has been detected. Investigate other LEDs and sensors to isolate the problem.</td>
</tr>
<tr>
<td></td>
<td>• Amber, blinking—A severe fault event that requires immediate service action has been detected. Investigate other LEDs and sensors to isolate the problem.</td>
</tr>
</tbody>
</table>
### Status LEDs

<table>
<thead>
<tr>
<th>LED Name</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU fault</td>
<td>• Green—All CPUs are operating properly.</td>
</tr>
<tr>
<td></td>
<td>• Amber—At least one CPU has a moderate fault.</td>
</tr>
<tr>
<td></td>
<td>• Amber, blinking—At least one CPU has a severe fault.</td>
</tr>
<tr>
<td>Memory fault</td>
<td>• Off—All DIMMs are operating properly.</td>
</tr>
<tr>
<td></td>
<td>• Amber—At least one DIMM has a moderate fault.</td>
</tr>
<tr>
<td></td>
<td>• Amber, blinking—At least one DIMM has a severe fault.</td>
</tr>
<tr>
<td>Hard drive fault</td>
<td>• Off—The hard drive is operating properly.</td>
</tr>
<tr>
<td></td>
<td>• Amber—This hard drive has failed.</td>
</tr>
<tr>
<td>Fan module fault</td>
<td>• Off—All fan modules are operating properly.</td>
</tr>
<tr>
<td></td>
<td>• Amber—At least one fan module has a moderate fault.</td>
</tr>
<tr>
<td></td>
<td>• Amber, blinking—At least one fan module has a severe fault.</td>
</tr>
</tbody>
</table>

**Note**
The power supply status LED and the power supply fault LED on the power supply must be read in combination for the following interpretations.

<table>
<thead>
<tr>
<th>LED Name</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply status</td>
<td>• Status off + Fault off—No AC power is present in any power supplies.</td>
</tr>
<tr>
<td>Power supply fault</td>
<td>• Status green + Fault off—This power supply is operating properly in main power mode.</td>
</tr>
<tr>
<td></td>
<td>• Status green, blinking + Fault off—This power supply is operating properly in standby power mode.</td>
</tr>
<tr>
<td></td>
<td>• Status off + Fault amber, blinking—This power supply has had a warning event, but continues to operate. Warning events occur when thresholds are passed for high temperature, high power, or slow power supply fan.</td>
</tr>
<tr>
<td></td>
<td>• Status off + Fault amber—This power supply has failed. Failure events occur when thresholds are passed for over-voltage, over-current, over-temperature, and power supply fan failure.</td>
</tr>
</tbody>
</table>

See the “Connecting and Powering On the Server (Standalone Mode)” section on page 2-9 for definitions of these power modes.

**Note**
The 10/100 Ethernet link status LED and the speed LED must be read in combination for the following interpretations.
**Table 3-2**  Rear Panel LEDs (continued)

<table>
<thead>
<tr>
<th>LED Name</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/100 Ethernet speed (left)</td>
<td>• Link status off + speed off—No link is present on this port.</td>
</tr>
<tr>
<td>10/100 Ethernet link status (right)</td>
<td>• Link status off + speed solid green—A half-duplex, 10-Mbps link is present.</td>
</tr>
<tr>
<td></td>
<td>• Link status amber + speed solid green—A half-duplex, 100-Mbps link is present.</td>
</tr>
<tr>
<td></td>
<td>• Link status off + speed blinking green—A full-duplex, 10-Mbps link is present.</td>
</tr>
<tr>
<td></td>
<td>• Link status amber + speed blinking green—A full-duplex, 100-Mbps link is present.</td>
</tr>
</tbody>
</table>

**Note**  The 10/100/1000 Gigabit Ethernet link status LED and the speed LED must be read in combination for the following interpretations.

<table>
<thead>
<tr>
<th>LED Name</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/100/1000 Gigabit Ethernet speed (left)</td>
<td>• Link status off + speed off—No link is present on this port.</td>
</tr>
<tr>
<td>10/100/1000 Gigabit Ethernet link status (right)</td>
<td>• Link status off + speed solid green—A half-duplex, 10-Mbps link is present.</td>
</tr>
<tr>
<td></td>
<td>• Link status green + speed solid green—A half-duplex, 100-Mbps link is present.</td>
</tr>
<tr>
<td></td>
<td>• Link status amber + speed solid green—A half-duplex, 1000-Mbps link is present.</td>
</tr>
<tr>
<td></td>
<td>• Link status off + speed blinking green—A full-duplex, 10-Mbps link is present.</td>
</tr>
<tr>
<td></td>
<td>• Link status green + speed blinking green—A full-duplex, 100-Mbps link is present.</td>
</tr>
<tr>
<td></td>
<td>• Link status amber + speed blinking green—A full-duplex, 1000-Mbps link is present.</td>
</tr>
</tbody>
</table>
Preparing for Component Installation

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

- Required Equipment, page 3-8
- Shutting Down and Powering Off the Server, page 3-9
- Removing and Replacing the Server Top Cover, page 3-10
- Replaceable Component Locations, page 3-11

**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 2 Phillips-head screwdriver
- Number 1 Phillips-head screwdriver
- Needle-nose pliers
- Electrostatic discharge (ESD) strap or other grounding equipment such as a grounded mat.
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 and fan modules 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 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, fan modules, or power supplies.

**Step 1**  
Remove the top cover:

a. Use a Number 2 Phillips-head screwdriver to turn the locking screw one-quarter turn to the unlocked position (see Figure 3-3).

b. Lift the release latch.

c. Push the cover toward the server rear about one inch, until it stops.

d. Lift the cover from the server and set it aside.

**Step 2**  
Replace the top cover:

a. With the release latch in the raised, open position, set the cover in place about one inch back from the fully closed position.

b. Push the cover toward the server front until it stops.

c. Push the release latch to the flat, closed position.

d. Use a screwdriver to return the locking screw to the locked position.

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

1  Release latch  
2  Locking screw
Replaceable Component Locations

This section shows the locations of the components that are discussed in this chapter. The view in Figure 3-4 is from the top down, with the top cover and internal air baffle removed.

Figure 3-4  Replaceable Component Locations (top view)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fan modules (five), accessed through the front panel</td>
</tr>
<tr>
<td>2</td>
<td>Hard drives (up to eight), accessed through the front panel</td>
</tr>
<tr>
<td>3</td>
<td>DVD drive</td>
</tr>
<tr>
<td>4</td>
<td>Internal USB port on motherboard, not visible in this view (active in server Generation M2 only)</td>
</tr>
<tr>
<td>5</td>
<td>Motherboard CMOS battery</td>
</tr>
<tr>
<td>6</td>
<td>DIMM slots (48)</td>
</tr>
<tr>
<td>7</td>
<td>CPUs and heatsinks (up to two)</td>
</tr>
<tr>
<td>8</td>
<td>Power supplies (up to two), accessed through the rear panel</td>
</tr>
<tr>
<td>9</td>
<td>PCIe riser card assembly (with chassis slots for two standard-profile cards)</td>
</tr>
<tr>
<td>10</td>
<td>PCIe riser card assembly (with chassis slots for three low-profile cards)</td>
</tr>
</tbody>
</table>
Installing or Replacing Components

⚠️ **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

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

Statement 1029

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

🔍 **Tip**
You can press the Locator button on the front panel or rear 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 opposite side of the rack. See the “Server Monitoring and Management Tools” section on page 3-1 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 3-13
- Installing Power Supplies, page 3-16
- Installing a DVD Drive, page 3-17
- Installing Fan Modules, page 3-15
- Installing DIMMs, page 3-19
- Installing CPUs and Heatsinks, page 3-27
- Installing a Motherboard CMOS Battery, page 3-30
- Replacing a PCIe Riser Card Assembly, page 3-31
- Installing a PCIe Card, page 3-33
- Replacing an LSI Battery Backup Unit, page 3-39
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*:


**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 drive, use the LSI configuration utility for your mass storage device. See the “RAID Controller Considerations” section on page C-1 for more information.

**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 C250 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 3-6*):

- a. Press the release button to expose the ejector lever.
- b. Pull the ejector lever toward you, and then pull the drive sled from the drive bay.
- c. 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:

- a. Place the drive in the sled with the connectors facing the rear.
- b. Install the four securing screws on the sides of the sled.
- c. With the ejector lever still open, push the sled into the drive bay until you feel the drive stop against the backplane.
- d. Press the ejector lever flat until the lock clicks into place.
**Figure 3-5**  Hard Drive/SSD CIMC Numbering and Physical Orientation, Facing Server Front

<table>
<thead>
<tr>
<th>HDD 01</th>
<th>HDD 02</th>
<th>HDD 03</th>
<th>HDD 04</th>
<th>HDD 05</th>
<th>HDD 06</th>
<th>HDD 07</th>
<th>HDD 08</th>
</tr>
</thead>
</table>

**Figure 3-6**  Removing and Replacing Drives

1. Release button
2. Ejector lever
3. Securing screws (four on sides of sled)
Installing Fan Modules

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:

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

---

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

---

**Step 1**
Remove the fan module that you are replacing (see Figure 3-8):

a. Press the release button to expose the ejector lever.

b. Pull the ejector lever toward you to pull the fan module from its bay.

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

c. With the ejector lever still open, push the fan module into the bay until you feel it fully engage the backplane and stop.

d. Press the ejector lever flat until the lock clicks into place.

e. Press the **Power** button to return the server to main power mode.

---

**Figure 3-7**  
Fan Module CIMC Numbering and Physical Orientation, Facing Server Front

<table>
<thead>
<tr>
<th>fantray-0</th>
<th>fantray-1</th>
<th>fantray-2</th>
<th>fantray-3</th>
<th>fantray-4</th>
</tr>
</thead>
</table>

**Figure 3-8**  
Removing and Replacing Fan Modules

1. Release button
2. Ejector lever
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:

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.

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 3-9.
   - 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 3-10).

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 3-9 Power Supply CIMC Numbering and Physical Orientation, Facing Server Rear

| PSU1 | PSU0 |

Figure 3-10 Removing and Replacing a Power Supply

1 Release lever 2 Power supply handle
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:


**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 3-9.

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 cable from the connector on the rear of the DVD drive (see Figure 3-11).

f. Remove the one screw that secures the DVD drive to the chassis.

g. Push the DVD drive out of the front chassis opening.

---

**Step 2**

Replace a DVD drive:

a. Align the new DVD drive with the front panel opening and push it into the chassis until the front plate is even with the chassis front.

b. Replace the one screw that secures the DVD drive to the chassis.

c. Replace the cable to the connector on the rear of the DVD drive.

d. Replace the top cover.

e. Replace the server in the rack, replace power cords and any other cables, then power on the server by pressing the **Power** button.
Figure 3-11 Removing and Replacing a DVD drive

1. DVD drive (shown with top cover removed)
2. DVD cable connector
3. DVD securing screw (one)
Installing DIMMs

This section includes the following sections:

- Memory Performance Guidelines and Population Rules, page 3-19
- DIMM Installation Procedure, page 3-25

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 3-19
- Banks and Channels, page 3-19
- Memory Population Rules and Supported Configurations, page 3-21
- Low-Voltage DIMM Considerations (Generation M2 Only), page 3-23

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:

Banks and Channels

Each channel is identified by a letter—A, B, and C for CPU 1, and D, E, and F for CPU 2. Each channel has eight DIMM slots numbered 0 through 7.

Each bank is identified by numbers, 0 through 7. For example, DIMM slots A1, B1, and C1 belong to Bank 1, while A2, B2, C2 belong to Bank 2.

Figure 3-12 shows how DIMM slot banks and channels are physically arranged on the motherboard.
Figure 3-12  Physical Representation of Banks and Channels

CPU 1

CPU 2

Front of Server
Memory Population Rules and Supported Configurations

This server uses Cisco extended memory technology. To improve performance, write operations are made simultaneously to both DIMMs of a matched pair. When considering the memory configuration of your server, consider the following items:

- Refer to Table 3-3 on page 3-22 for the supported DIMM configurations and the total memory for each.
- Refer to Table 3-4 on page 3-23 for the order in which DIMM pairs must be populated for each supported configuration. Find the column for the number of DIMMs in your configuration, then read down the column to see which DIMM slots on each CPU must be populated for that configuration. Also see Figure 3-12 on page 3-20 for DIMM slot positions.
- Both DIMMs of a pair must be installed side-by-side, under the same CPU, in matching color DIMM sockets.

For example, to add DIMM pairs to go from a 16-DIMM configuration to a 20-DIMM configuration, refer to Table 3-4 on page 3-23. As the differences between the columns for the 16-DIMM and 20-DIMM configurations indicate, you add one DIMM pair to slots B4 and B5 under CPU1 and one DIMM pair to slots E4 and E5 under CPU2.

As shown in Figure 3-12 on page 3-20, B4 and B5 are side-by-side blue slots controlled by CPU1; E4 and E5 are side-by-side blue slots controlled by CPU2.

- The two DIMMs within a DIMM pair must have the identical manufacturer, type, speed, and size. Cisco provides spare DIMMs for this product in matched pair kits.
- We recommend you do not mix different sized DIMMs or DIMMs with different clock rates in the same server. This causes the memory system to operate at the speed of the slowest DIMMs that are installed.
- (Generation M2 only) Low-voltage (1.35 V) DIMM pairs and standard-voltage DIMM pairs (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 the Low-Voltage DIMM Considerations (Generation M2 Only), page 3-23.

Note

Low voltage DIMMs are supported in Generation M2 servers only.

1. Refer to Table 3-3, which summarizes the supported DIMM configurations.
2. Refer to Table 3-4 on page 3-23 for the slot population rules for each configuration, based on the total number of DIMMs.

Note

All Generation M2 server DIMM configurations require two CPUs to be installed in the server.
### Table 3-3  Supported DIMM Configurations

<table>
<thead>
<tr>
<th>Total Memory for CPU1+CPU2</th>
<th>CPU1 DIMMs</th>
<th>CPU2 DIMMs</th>
<th>Total Number of DIMMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>64GB</td>
<td>Four 8GB pair-kits (eight 4GB DIMMs)</td>
<td>Four 8GB pair-kits (eight 4GB DIMMs)</td>
<td>16</td>
</tr>
<tr>
<td>80GB</td>
<td>Five 8GB pair-kits (ten 4GB DIMMs)</td>
<td>Five 8GB pair-kits (ten 4GB DIMMs)</td>
<td>20</td>
</tr>
<tr>
<td>96GB</td>
<td>Six 8GB pair-kits (twelve 4GB DIMMs)</td>
<td>Six 8GB pair-kits (twelve 4GB DIMMs)</td>
<td>24</td>
</tr>
<tr>
<td>128GB</td>
<td>Eight 8GB pair-kits (sixteen 4GB DIMMs)</td>
<td>Eight 8GB pair-kits (sixteen 4GB DIMMs)</td>
<td>32</td>
</tr>
<tr>
<td>128GB</td>
<td>Four 16GB pair-kits (eight 8GB DIMMs)</td>
<td>Four 16GB pair-kits (eight 8GB DIMMs)</td>
<td>16</td>
</tr>
<tr>
<td>144GB</td>
<td>Nine 8GB pair-kits (eighteen 4GB DIMMs)</td>
<td>Nine 8GB pair-kits (eighteen 4GB DIMMs)</td>
<td>36</td>
</tr>
<tr>
<td>160GB</td>
<td>Ten 8GB pair-kits (twenty 4GB DIMMs)</td>
<td>Ten 8GB pair-kits (twenty 4GB DIMMs)</td>
<td>40</td>
</tr>
<tr>
<td>192GB</td>
<td>Twelve 8GB pair-kits (twenty-four 4GB DIMMs)</td>
<td>Twelve 8GB pair-kits (twenty-four 4GB DIMMs)</td>
<td>48</td>
</tr>
<tr>
<td>192GB</td>
<td>Six 16GB pair-kits (twelve 8GB DIMMs)</td>
<td>Six 16GB pair-kits (twelve 8GB DIMMs)</td>
<td>24</td>
</tr>
<tr>
<td>256GB</td>
<td>Eight 8GB pair-kits (sixteen 4GB DIMMs) plus Four 16GB pair-kits (eight 8GB DIMMs)</td>
<td>Eight 8GB pair-kits (sixteen 4GB DIMMs) plus Four 16GB pair-kits (eight 8GB DIMMs)</td>
<td>48</td>
</tr>
<tr>
<td>320GB</td>
<td>Four 8GB pair-kits (eight 4GB DIMMs) plus Eight 16GB pair-kits (sixteen 8GB DIMMs)</td>
<td>Four 8GB pair-kits (eight 4GB DIMMs) plus Eight 16GB pair-kits (sixteen 8GB DIMMs)</td>
<td>48</td>
</tr>
<tr>
<td>384GB</td>
<td>Twelve 16GB pair-kits (twenty-four 8GB DIMMs)</td>
<td>Twelve 16GB pair-kits (twenty-four 8GB DIMMs)</td>
<td>48</td>
</tr>
</tbody>
</table>
Table 3-4 shows the order in which you must populate the DIMM slots for each configuration, based on the total number of DIMMs.

Note

Before you install DIMMs, see Table 3-3 on page 3-22 to ensure that you are using a supported configuration. Then populate the DIMM slots as shown in Table 3-4.

Note

The 4-, 8-, or 12-DIMM configurations are not supported in UCS C250 Generation M2 servers. The 4-, 8-, or 12-DIMM configurations are supported in UCS C250 Generation M1 only.

<table>
<thead>
<tr>
<th>4 DIMM</th>
<th>8 DIMM</th>
<th>12 DIMM</th>
<th>16 DIMM</th>
<th>20 DIMM</th>
<th>24 DIMM</th>
<th>32 DIMM</th>
<th>36 DIMM</th>
<th>40 DIMM</th>
<th>48 DIMM</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU1</td>
<td>CPU2</td>
<td>CPU1</td>
<td>CPU2</td>
<td>CPU1</td>
<td>CPU2</td>
<td>CPU1</td>
<td>CPU2</td>
<td>CPU1</td>
<td>CPU2</td>
</tr>
<tr>
<td>A1</td>
<td>D0</td>
<td>A1</td>
<td>D0</td>
<td>A4</td>
<td>D0</td>
<td>A4</td>
<td>D0</td>
<td>A4</td>
<td>D0</td>
</tr>
<tr>
<td>A0</td>
<td>D1</td>
<td>A0</td>
<td>D1</td>
<td>A0</td>
<td>D4</td>
<td>A0</td>
<td>D4</td>
<td>A0</td>
<td>D4</td>
</tr>
<tr>
<td>E0</td>
<td>C1</td>
<td>E0</td>
<td>C1</td>
<td>E0</td>
<td>C4</td>
<td>E0</td>
<td>C4</td>
<td>E0</td>
<td>C4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E1</td>
<td>C5</td>
<td>E1</td>
<td>C5</td>
<td>E1</td>
<td>C5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E1</td>
<td>C5</td>
<td>E1</td>
<td>C5</td>
<td>E1</td>
<td>C5</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>E1</td>
<td>C5</td>
<td>E1</td>
<td>C5</td>
<td>E1</td>
<td>C5</td>
</tr>
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<td></td>
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<td>E1</td>
<td>C5</td>
<td>E1</td>
<td>C5</td>
<td>E1</td>
<td>C5</td>
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<td></td>
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<td></td>
<td></td>
<td>E1</td>
<td>C5</td>
<td>E1</td>
<td>C5</td>
<td>E1</td>
<td>C5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E1</td>
<td>C5</td>
<td>E1</td>
<td>C5</td>
<td>E1</td>
<td>C5</td>
</tr>
</tbody>
</table>

Low-Voltage DIMM Considerations (Generation M2 Only)

The Generation M2 of this server can be ordered with low-voltage (1.35 V) DIMM pairs or standard-voltage (1.5 V) DIMM pairs. Note the following considerations:
The two low-voltage DIMMs within a DIMM pair must have the identical manufacturer, type, speed, and size. Cisco provides spare DIMMs for this product in matched pair kits.

Low-voltage DIMM pairs and standard-voltage DIMM pairs 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 DIMM pairs in the server 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—Enables low-voltage memory operation. This setting is available only if all DIMMs installed are low-voltage DIMMs.
- Performance Mode—Disables low-voltage 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.
DIMM Installation Procedure

To install or replace a DIMM, follow these steps:

---

**Note**
Refer to the DIMM slot information and population rules before removing or installing DIMMs. See the “Memory Performance Guidelines and Population Rules” section on page 3-19.

---

**Step 1**
Remove an existing DIMM:

1. Power off the server as described in the “Shutting Down and Powering Off the Server” section on page 3-9.
2. Disconnect all power cords from the power supplies.
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.

4. Remove the top cover as described in the “Removing and Replacing the Server Top Cover” section on page 3-10.
5. Remove the clear air baffle that covers the motherboard. Loosen the six thumbscrews and then lift the baffle up and out of the server.
6. Push down on the ejector levers at both ends of the DIMM slot (see Figure 3-13).
7. 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:

**Note**
If you are upgrading and adding memory, be sure to check the supported configurations shown in the “Memory Population Rules and Supported Configurations” section on page 3-21. Upgrading to some configurations might require you to move existing DIMMs.

**Note**
If you are installing low-voltage DIMMs, see the “Low-Voltage DIMM Considerations (Generation M2 Only)” section on page 3-23.

1. 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.
2. Press down on both top corners of the DIMM simultaneously until the ejector levers click and lock in place on the DIMM.
3. Replace the air baffle and the top cover.
4. 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

1  DIMM slot ejector lever (two on each slot)
2  Alignment key in DIMM slot
Installing CPUs and Heatsinks

Note

All Generation M2 server DIMM configurations require two CPUs to be installed in the server.

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:


This section contains the following topics:

- Additional CPU-Related Parts To Order With RMA Replacement Motherboards, page 3-27
- CPU Replacement Procedure, page 3-27

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 C250 (UCS-CPU-GREASE=)
- Scenario 2—You are replacing the existing heatsinks:
  - Heat sink (C250 M1: N20-BHTS2= or C250 M2: N20-BHTS7=)
  - 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 heat sink 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 3-9.

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.
Installing or Replacing Components

Chapter 3      Maintaining the Server

Installing or Replacing Components

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 clear air baffle that covers the motherboard. Loosen the six thumbscrews and then lift the baffle up and out of the server.

f. Loosen the four captive screws that hold the heatsink to the chassis posts and lift the heatsink out of the server (see Figure 3-14).

Note

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

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, then tighten all captive screws evenly.

e. Replace the air baffle and 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 3-14  Removing and Replacing CPUs and Heatsinks

1 Captive heatsink screws (four per CPU)  
3 CPU socket latch (open)  
5 CPU socket alignment key (both sides of CPU)

2 CPU heatsink  
4 CPU socket cover plate (open)
Installing a Motherboard CMOS Battery

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:

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

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 3-9.

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 (see Figure 3-15).

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 flat side and positive marking (+) toward the outer chassis wall. Ensure that the retaining clip clicks over the top of the battery.

Note

The flat, positive side of the battery marked with “+” must face the outer chassis wall.

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.
### 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*:


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 3-9.

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.

---

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

1. Motherboard CMOS battery socket (positive + side toward chassis wall)
2. Battery retaining clip

**Note**

The flat, positive side of the battery marked with “+” must face the outer chassis wall as shown.
Installing or Replacing Components

Chapter 3  Maintaining the Server

Installing or Replacing Components:

e. Remove the riser card retaining plate by loosening the two captive thumbscrews, then lifting the plate out of the chassis (see Figure 3-16).

f. Lift the riser card 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.

g. Remove any PCIe card from the riser card assembly and set it aside. See the “Installing a PCIe Card” section on page 3-33.

Step 2  Install a PCIe riser card assembly:

a. Replace any PCIe card that was in the riser card assembly.

b. Set the assembly in place, aligning the riser card connector with the socket on the motherboard.

c. Press down evenly on both ends of the assembly to fully engage the riser cards with the sockets on the motherboard.

d. Replace the riser card retaining plate. Align the pegs on the plate with both riser card assemblies, then tighten the captive thumbscrews on the plate.

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 3-16  Removing and Replacing a PCIe Riser Card Assembly

<table>
<thead>
<tr>
<th>1</th>
<th>Riser card retaining plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Riser card assembly (standard profile)</td>
</tr>
</tbody>
</table>
Installing a PCIe Card

This section contains the following topics:

- RAID Card Firmware Compatibility, page 3-34
- Replacement Procedure, page 3-34
- Special Considerations for the Cisco UCS P81E Virtual Interface Card (N2XX-ACPCI01), page 3-35
- Installing Multiple PCIe Cards and Resolving Limited Resources, page 3-37

**Note**
For more information about RAID controllers and cables, see also 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 3-35.

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:


The PCIe slots in this server are numbered as shown in Figure 3-17. The specifications for each slot are shown in Table 3-5.

*Figure 3-17  PCIe Slot Numbering and Physical Orientation, Facing Server Rear*

| PCIe Slot C | PCIe Slot D |
| PCIe Slot B | PCIe Slot E |
| PCIe Slot A |

*Table 3-5  PCIe Expansion Slots*

<table>
<thead>
<tr>
<th>Slot Number</th>
<th>Electrical Lane Width</th>
<th>Connector Length</th>
<th>Card Length¹</th>
<th>Card Height²</th>
<th>NCSI³ Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Gen-2 x8</td>
<td>x16 extended</td>
<td>1/2 length</td>
<td>Half-height</td>
<td>No</td>
</tr>
<tr>
<td>B</td>
<td>Gen-2 x8</td>
<td>x16 connector</td>
<td>1/2 length</td>
<td>Half-height</td>
<td>No</td>
</tr>
<tr>
<td>C</td>
<td>Gen-2 x8</td>
<td>x16 connector</td>
<td>1/2 length</td>
<td>Half-height</td>
<td>No</td>
</tr>
<tr>
<td>D</td>
<td>Gen-2 x16</td>
<td>x16 connector</td>
<td>1/2 length</td>
<td>Full-height</td>
<td>Yes⁴</td>
</tr>
<tr>
<td>E</td>
<td>Gen-2 x16</td>
<td>x16 connector</td>
<td>1/2-length</td>
<td>Full-height</td>
<td>No</td>
</tr>
</tbody>
</table>

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

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

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

Replacement Procedure

Installing a PCIe card requires that you first remove the riser card assembly from the chassis. To install or replace a PCIe card, follow these steps:

---

Step 1

Remove a PCIe card:

a. Power off the server as described in the “Shutting Down and Powering Off the Server” section on page 3-9.

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 riser card retaining plate by loosening the two captive thumbscrews, then lift the plate out of the chassis.

f. Lift the riser card 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.

g. Remove the screw that secures the PCIe card rear plate to the assembly rear opening and disconnect any cables attached to the card (see Figure 3-18).

h. 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 panel. Set the screw aside.

Note

A standard-profile PCIe card must be installed in the right-hand riser card assembly, as viewed from the rear of the server. A low-profile PCIe card can be installed in either the low-profile assembly on the left, or the standard-profile assembly on the right if a standard-profile I/O bracket is used on the card.

b. Align the PCIe card connector with the riser card socket and push on both ends of the card evenly to fully engage the connector with the riser card socket.

c. Install the screw that secures the rear plate of the card to the assembly rear opening.

d. Set the assembly in place, aligning the riser card connector with the socket on the motherboard.
e. Press down evenly on both ends of the assembly to fully engage the riser cards with the sockets on the motherboard.

f. Replace the riser card retaining plate. Align the pegs on the plate with both riser card assemblies, then tighten the captive thumbscrews on the plate.

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.

---

**Figure 3-18 Removing and Replacing a PCIe Card**

---

### 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 up to two of these cards.
- These cards are supported only in PCIe slots D and E of this server.

**Note** This card must be installed in PCIe slot D to use the Cisco Card NIC mode (see Figure 3-17 on page 3-33). 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.
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 3-37
- Resolving Insufficient 16-Bit I/O Space, page 3-38

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 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:

<table>
<thead>
<tr>
<th>ERROR CODE</th>
<th>SEVERITY</th>
<th>INSTANCE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>146</td>
<td>Major</td>
<td>N/A</td>
<td>PCI out of resources error. Major severity requires user intervention but does not prevent system boot.</td>
</tr>
</tbody>
</table>

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 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 an LSI Battery Backup Unit

In the Cisco UCS C250 server, the battery backup unit (BBU) is installed directly onto the LSI controller card.

**Note**
A cable is shipped with the BBU that is used for installing the BBU on a bracket in other server models. Do not use this cable in the Cisco UCS C250 server; install the BBU directly onto the LSI controller card. Connecting the extra cable causes error messages because the multiple connections are detected as multiple BBUs (an unsupported configuration).

**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

To install or replace a battery backup unit (BBU), follow these steps:

**Step 1** Remove a BBU:
- a. Remove the three screws that secure the BBU to the LSI controller card.
- b. Lift the BBU straight up to free its connector from the socket on the LSI controller card.

**Step 2** Install a BBU:
- a. With the battery side up, set the BBU on the front of the LSI controller card.
   - Align the three screw-holes in the BBU with the three standoffs on the LSI controller card for guidance.
- b. Carefully align the J5 connector on the underside of the BBU with the socket on the LSI controller card and then press downward to fully join the J5 connector with the socket.
- c. Install the three screws that secure the BBU to the LSI controller card.
**Technical Specifications**

This appendix lists the technical specifications for the Cisco UCS C250 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>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>3.45 in. (8.75 cm)</td>
</tr>
<tr>
<td>Width</td>
<td>17.25 in. (43.82 cm)</td>
</tr>
<tr>
<td>Depth (including power supply handle)</td>
<td>29.30 in. (74.42 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>51.50 lbs (23.36 kg)</td>
</tr>
</tbody>
</table>
Environmental Specifications

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

Table A-2  Environmental Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature, operating:</td>
<td>50 to 95°F (10 to 35°C)</td>
</tr>
<tr>
<td>Derate 1°C for every 1000 ft (304 m) up to a</td>
<td></td>
</tr>
<tr>
<td>maximum altitude of 10,000 ft (3048 m).</td>
<td></td>
</tr>
<tr>
<td>Temperature, nonoperating within altitude:</td>
<td>–40 to 149°F (–40 to 65°C)</td>
</tr>
<tr>
<td>0 to 40,000 feet (0 to 12,000 meters)</td>
<td></td>
</tr>
<tr>
<td>Humidity (RH), noncondensing</td>
<td>5 to 93%</td>
</tr>
<tr>
<td>Altitude</td>
<td>0 to 10000 feet</td>
</tr>
<tr>
<td>Sound Pressure Level (dBA)</td>
<td>83 dB sound power—at normal operating</td>
</tr>
<tr>
<td>temperature</td>
<td></td>
</tr>
</tbody>
</table>

Power Specifications

Table A-3 lists the specifications for each power supply.

Table A-3  Power Supply Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Requirements</td>
<td></td>
</tr>
<tr>
<td>Rated input voltage</td>
<td>115 to 240 VAC nominal (Range: 90 to 264 VAC)</td>
</tr>
<tr>
<td>Rated input frequency</td>
<td>50 to 60 Hz nominal (Range: 47 to 63 Hz)</td>
</tr>
<tr>
<td>Maximum input current</td>
<td>10 Amps at 100 VAC</td>
</tr>
<tr>
<td>Maximum inrush current</td>
<td>35 A for Yms</td>
</tr>
<tr>
<td>Input connector</td>
<td>IEC60320 C14</td>
</tr>
<tr>
<td>Power Supply Output</td>
<td></td>
</tr>
<tr>
<td>Maximum output power for</td>
<td>750 W (up to two power supplies can be installed)</td>
</tr>
<tr>
<td>each power supply</td>
<td></td>
</tr>
<tr>
<td>Power supply output voltage</td>
<td>Main power: 12 VDC</td>
</tr>
<tr>
<td></td>
<td>Standby power: 12 VDC</td>
</tr>
<tr>
<td>Power Supply Information</td>
<td></td>
</tr>
<tr>
<td>Maximum hold-up time</td>
<td>12 ms</td>
</tr>
<tr>
<td>Efficiency rating</td>
<td>Climate Savers Gold</td>
</tr>
</tbody>
</table>

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/
Power Cord Specifications

This appendix provides supported power cable specifications.

Supported Power Cords and Plugs

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

Note

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

Table B-1 lists the power cords for the server power supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
<th>Power Cord Reference Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAB-250V-10A-AR Power Cord, 250 VAC 10 A IRAM 2073 Plug Argentina</td>
<td>8.2 2.5</td>
<td>Figure B-1</td>
</tr>
<tr>
<td>CAB-9K10A-AU 250 VAC 10 A 3112 Plug, Australia</td>
<td>8.2 2.5</td>
<td>Figure B-2</td>
</tr>
<tr>
<td>CAB-250V-10A-CN Power Cord, 250 VAC 10 A GB 2009 Plug China</td>
<td>8.2 2.5</td>
<td>Figure B-3</td>
</tr>
<tr>
<td>CAB-9K10A-EU Power Cord, 250 VAC 10 A M 2511 Plug Europe</td>
<td>8.2 2.5</td>
<td>Figure B-4</td>
</tr>
<tr>
<td>CAB-250V-10A-ID Power Cord, 250 VAC 16A EL-208 Plug South Africa, United Arab Emirates, India</td>
<td>8.2 2.5</td>
<td>Figure B-5</td>
</tr>
<tr>
<td>CAB-250V-10A-IS Power Cord, 250 VAC 10 A SI32 Plug Israel</td>
<td>8.2 2.5</td>
<td>Figure B-6</td>
</tr>
</tbody>
</table>
### Table B-1  Supported Power Cords for the Server (continued)

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

This section includes the AC power cord illustrations. See Figure B-1 through Figure B-15.

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

- **Plug:** EL 219 (IRAM 2073)
- **Connector:** EL 701 (IEC60320/C13)
- **Cordset rating:** 10 A, 250/500 V MAX
- **Length:** 8.2 ft

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

- **Plug:** EL 206 (A.S. 3112-2000)
- **Connector:** EL 701C (IEC 60320/C15)
- **Cordset rating:** 10 A, 250 V/500V
- **Length:** 2500mm

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

- **Plug:** EL 218 (CCEE GB2009)
- **Connector:** EL 701 (IEC60320/C13)
- **Cordset rating:** 10A, 250V (2500 mm)
### Appendix B  Power Cord Specifications

#### Supported Power Cords and Plugs

- **Figure B-4  CAB-9K10A-EU**
  - **Plug:** M2511
  - **Connector:** VSCC15
  - **Cordset rating:** 10A/16 A, 250 V
  - **Length:** 8 ft 2 in. (2.5 m)

- **Figure B-5  CAB-250V-10A-ID**
  - **Plug:** EL 208
  - **Connector:** EL 701
  - **Cordset rating:** 16A, 250V (2500mm)

- **Figure B-6  CAB-250V-10A-IS**
  - **Plug:** EL 212 (SI-32)
  - **Connector:** EL 701B (IEC60320/C13)
  - **Cordset rating:** 10A, 250V/500V MAX (2500 mm)
Appendix B  Power Cord Specifications

Supported Power Cords and Plugs

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

- **Plug:** I/3G (CEI 23-16)
- **Cordset rating:** 10 A, 250 V
- **Length:** 8 ft 2 in. (2.5 m)
- **Connector:** C15M (EN60320/C15)

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

- **Plug:** MP232-R
- **Cordset rating:** 10 A, 250 V
- **Length:** 8 ft. 2 in (2.5 m)
- **Connector:** IEC 60320 C15

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

- **Plug:** EL 210 (BS 1363A) 13 AMP fuse
- **Cordset rating:** 10 A, 250 V/500 V MAX
- **Length:** 2500mm
- **Connector:** EL 701C (EN 60320/C15)
**Supported Power Cords and Plugs**

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

- **Cordset rating**: 13A, 250V  
- **Length**: (6.6 feet) (79±2m)

- **Plug**: EL312 Molded Twistlock (NEMA L6-20)
- **Connector**: EL 701 (IEC60320/C13)

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

- **Cordset rating**: 10 A, 250 V
- **Length**: 8.2 ft

- **Plug**: NEMA 6-15P
- **Connector**: IEC60320/C13

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

- **Cordset rating**: 13A, 125V  
- **Length**: (8.2 feet) (2.5m)

- **Plug**: NEMA 5-15P
- **Connector**: IEC60320/C15
Figure B-13  CAB-C13-CBN, Jumper Power Cord (0.68 m)

Cordset rating 10A, 250V (686mm)

Plug: SS10A

Connector: HS10S

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

Cordset rating 10A, 250V (2.0 m)

Plug: SS10A

Connector: HS10S

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

Cordset rating 10A, 250V (3.0 m)

Plug: SS10A

Connector: HS10S
RAID Controller Considerations

This appendix contains the following sections:

- Supported RAID Controllers and Required Cables, page C-1
- RAID Card Firmware Compatibility, page C-2
- Battery Backup Unit, page C-2
- RAID Controller Cabling, page C-2
- 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-6

Supported RAID Controllers and Required Cables

This server supports the RAID controller options and cable requirements shown in Table C-1.

**Note**

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

**Table C-1** Cisco UCS C250 Server Supported RAID Options

<table>
<thead>
<tr>
<th>Controller</th>
<th>Style</th>
<th>Max. Internal Drives</th>
<th>SAS</th>
<th>SATA</th>
<th>Opt. BBU</th>
<th>RAID Levels</th>
<th>Required Cables</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSI SAS3081E-R</td>
<td>PCIe</td>
<td>8</td>
<td>Yes(^1)</td>
<td>Yes</td>
<td>No</td>
<td>0, 1, 1E</td>
<td>2 SAS R2XX-PL003-CBL</td>
</tr>
<tr>
<td>LSI MegaRAID 9261-8i</td>
<td>PCIe</td>
<td>8</td>
<td>Yes(^2)</td>
<td>Yes</td>
<td>Yes</td>
<td>0, 1, 5, 6, 10, 50, 60</td>
<td>2 SAS R2XX-PL003-CBL</td>
</tr>
</tbody>
</table>

1. You can mix SAS and SATA drives when using an LSI SAS3081E-R card. However, you cannot mix SAS and SATA drives within a volume.
2. You can mix SAS and SATA drives when using an LSI MegaRAID card. However, you cannot mix SAS and SATA drives within a volume.
RAID Card Firmware Compatibility

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

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

Battery Backup Unit

This server supports installation of one LSI RAID battery backup unit (BBU). The unit mounts directly to the LSI MegaRAID card (see Replacing an LSI Battery Backup Unit, page 3-39).

The optional LSI BBU is available only when using the optional LSI MegaRAID controller cards. This BBU provides approximately 72 hours of battery backup for the disk write-back cache DRAM in the case of sudden power loss.

RAID Controller Cabling

This section includes the following topics:

- Cable Routing, page C-2
- Cisco UCS C250 Server Cabling, page C-4

Cable Routing

The red line in Figure C-1 shows the recommended cable routing path from the backplane to the possible controller locations.
Figure C-1    RAID Controller Cabling

1. Drive backplane
2. PCIe risers for controller cards
Cisco UCS C250 Server Cabling

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

LSI SAS3081E-R PCIe Card

The required R2XX-PL003-CBL cable kit has two mini-SAS cables. Cable 1 controls drives 1–4 and cable 2 controls drives 5–8.

1. Connect mini-SAS cable 1 from connector SAS1 on the controller to the SAS1 connector on the backplane.
2. Connect mini-SAS cable 2 from connector SAS2 on the controller to the SAS2 connector on the backplane.

LSI MegaRAID SAS 9261-8i PCIe Card

The required R2XX-PL003-CBL cable kit has two mini-SAS cables. Cable 1 controls drives 1–4 and cable 2 controls drives 5–8.

1. Connect mini-SAS cable 1 from connector SAS1 on the controller to the SAS1 connector on the backplane.
2. Connect mini-SAS cable 2 from connector SAS2 on the controller to the SAS2 connector on the backplane.

How to Determine Which Controller Is in Your Server

If you do not have a record of which option is used in the server, you can disable quiet boot and read the on-screen messages that are displayed during system bootup.

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.
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.

**Step 5**  
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 quite 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 (Ctrl-H).

---

**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:  
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 Installing a PCIe Card, page 3-33.

**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 down 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 when 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)
  

- LSI Fusion-MPT Device Management User’s Guide (for LSI 3081E)
  
APPENDIX D

Installation for Cisco UCS Integration

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.