C H A P T E R 2

Installing the Server

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

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

Warning **IMPORTANT SAFETY INSTRUCTIONS**

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

SAVE THESE INSTRUCTIONS

Unpacking and Inspecting the Server

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

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

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

To inspect the shipment, follow these steps:

Step 1   Remove the server from its cardboard container and save all packaging material.

Step 2   Compare the shipment to the equipment list provided by your customer service representative and Figure 2-1. Verify that you have all items.

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

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

Figure 2-1   *Shipping Box Contents*
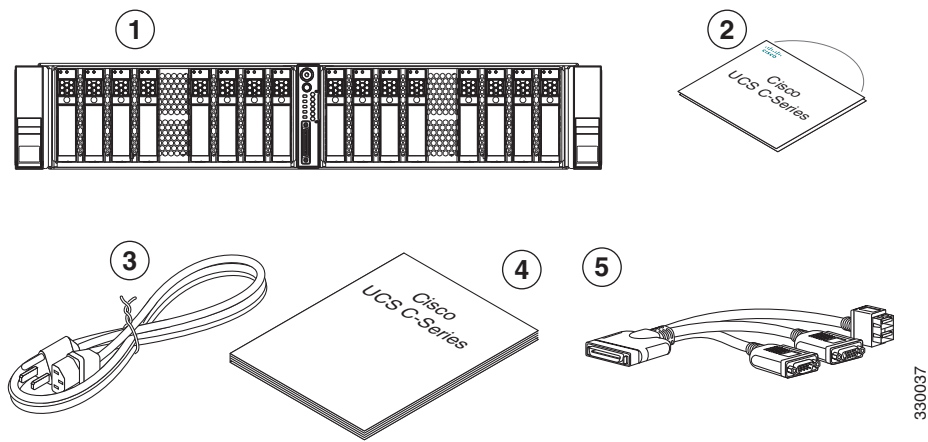
1	Server	**3**	Documentation
2	Power cord (up to two)	**4**	KVM cable

Preparing for Server Installation

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

- Installation Guidelines, page 2-3
- Rack Requirements, page 2-4
- Equipment Requirements, page 2-4
- Slide Rail Adjustment Range, page 2-4

Installation Guidelines

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

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

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

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

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

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

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

Rack Requirements

This section provides the requirements for the standard open racks, assuming an external ambient air temperature range of 41° F to 95° F (5° C to 35° C).

The rack must be of the following type:

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

Equipment Requirements

The slide rails supplied by Cisco Systems for this server do not require tools for installation if you install them in a rack that has square 0.38-inch (9.6 mm), round 0.28-inch (7.1 mm), or #12-24 UNC threaded holes. The inner rails (mounting brackets) are preattached to the sides of the server.

However, if you install the slide rails in a rack that has #10-32 round holes, a flat-bladed screwdriver is required to remove the larger square or round mounting pegs from the front of the slide rails.

Slide Rail Adjustment Range

The slide rails for this server have an adjustment range of 26 to 36 inches (660 to 914 mm).

Installing the Server In a Rack

This section describes how to install the server in 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 (see Figure 2-2):

a.   Align the slide-rail assembly inside the rack posts with the length-adjustment bracket (Figure 2-2, item 4) toward the rear of the rack.

b.   Compress the length-adjustment bracket until the mounting pegs (item 5) and locking clips (item 6) on the slide-rail assembly engage the desired rack holes on the front and rear rack posts:

– The mounting pegs fit square 0.38-inch (9.6 mm), round 0.28-inch (7.1 mm), or #12-24 UNC threaded holes. They fit the shape of the hole when the pegs are compressed.

– The smaller #10-32 round mounting pegs are enclosed in the center of the compressible rear pegs. However, to use the #10-32 pegs, you must use a flat-bladed screwdriver to remove the square or round front pegs.

Figure 2-2   Attaching a Slide-Rail Assembly to the Rack Posts
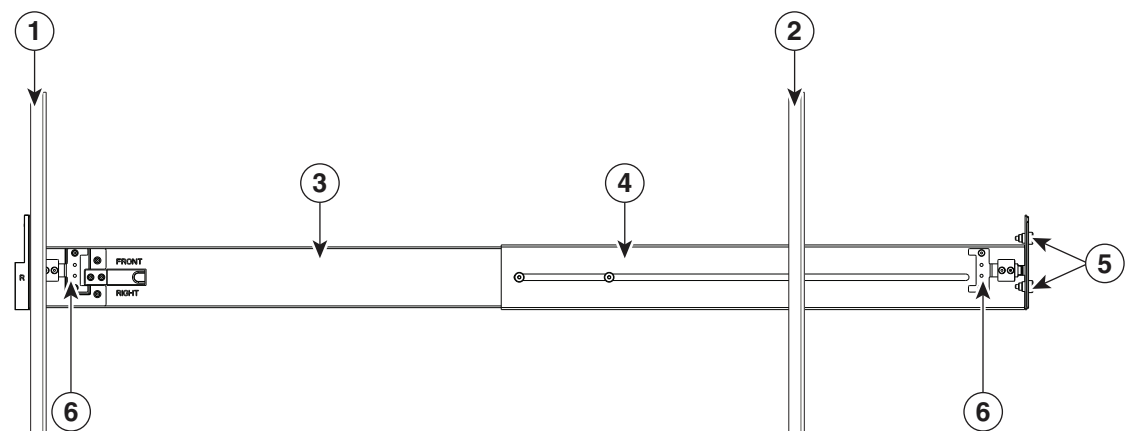
1	Front-right rack post	4	Length-adjustment bracket
2	Rear-right rack post	5	Mounting pegs (two on each end of assembly)
3	Slide-rail assembly	6	Locking clip (one on each end of assembly)

c.   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.

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

Step 2   Insert the server into the slide rails (see Figure 2-3):

⚠️

Caution   This server weighs approximately 86 pounds (39 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.

Note   The inner rails are preattached to the sides of the server at the factory. You can order replacement inner rails if these are damaged or lost (Cisco PID UCSC-RAIL-2U-I).

    a. Align the inner rails that are attached to the server sides with the front ends of the empty slide rails.

    b. Push the server into the slide rails until it stops at the internal stops.

    c. Push in the slide rail locking clip (item 2) on each inner rail, and then continue pushing the server into the rack until its front flanges latch onto the rack posts.

Figure 2-3   *Inserting the Server into the Slide Rails*
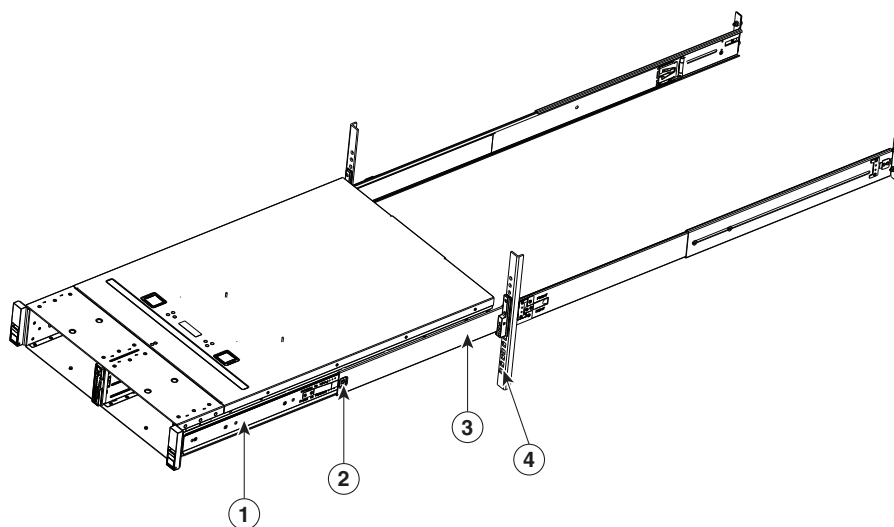
1	Inner rail on server	**3**	Slide rail assembly on rack post
2	Slide rail locking clip	**4**	Right-front rack post

Step 3   Attach the (optional) cable management arm (CMA) to the rear of the slide rails (see Figure 2-4):

Note   The CMA is reversible left to right so that you can attach it to either slide rail.

    a. With the server pushed fully into the rack, insert the CMA tab that is labeled OUTER RAIL (items 1 and 6) into the clip inside the rear of the outer slide rail. Insert the tab into the clip until it clicks and locks.

    b. Pull outward on the spring-loaded peg that is on the CMA tab that is labeled INNER RAIL (items 2 and 5). You can turn this peg 90 degrees to lock it in the open position.

    c. Push the CMA tab that is labeled INNER RAIL over the end of the inner rail that is attached to the server, and then release the spring-loaded peg. The peg must align with and enter the hole in the mounting bracket to lock the CMA in place.

Figure 2-4   *Attaching the Cable Management Arm*
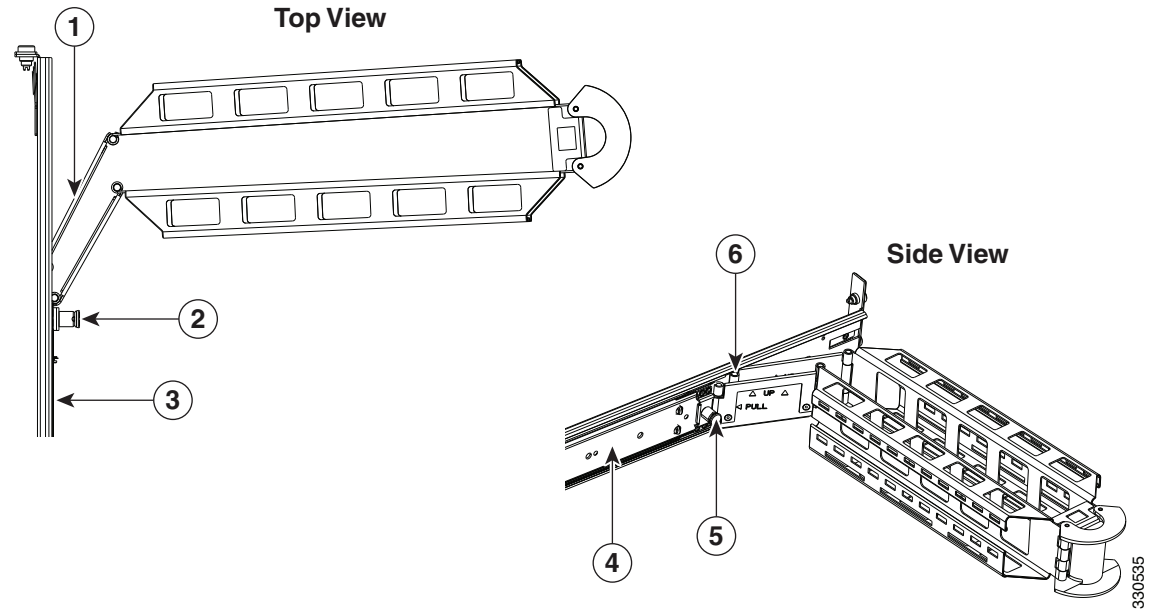
1	OUTER RAIL CMA tab attached to outer slide rail	4	Rear of left slide rail assembly
2	INNER RAIL CMA tab attached to inner slide rail on server	5	INNER RAIL CMA tab attached to inner slide rail on server
3	Rear of left slide rail assembly	6	OUTER RAIL CMA tab attached to outer slide rail

Initial Server Setup

This section includes the following topics:

Connecting and Powering On the Server (Standalone Mode)

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 a Cisco 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 EXT, default NIC redundancy is active-active, and DHCP is enabled. Shared LOM EXT mode enables the 1-Gb Ethernet ports and the ports on any installed Cisco virtual interface card (VIC) to access the Cisco Integrated Management Interface (CIMC). If you want to use the 10/100 dedicated management ports to access the CIMC, you can connect to the server and change the NIC mode as described in Step 4 of the following procedure. In that step, you can also change the NIC redundancy and set static IP settings.

To perform initial setup of the server, follow these steps:

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

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

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

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

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

Step 2   Connect a USB keyboard and VGA monitor by connecting the supplied KVM cable to the KVM connector on the front panel (see Figure 1-1 on page 1-1).

✎ **Note**   Alternatively, you can use the VGA and USB ports on the rear panel. However, you cannot use the front panel VGA and the rear panel VGA at the same time. If you are connected to one VGA connector and you then connect a video device to the other connector, the first VGA connector is disabled.

Step 3   Connect Ethernet cables to the server ports or card ports that you want to use.

Step 4   Set NIC mode and 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 to use to access the CIMC for server management (see Figure 1-2 on page 1-2 for identification of the ports):

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

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

    • Dedicated—The 10/100 management port is used to access the CIMC. You must select a NIC redundancy and IP setting.

    • Shared LOM—The 1-Gb Ethernet ports are used to access the CIMC. You must select a NIC redundancy and IP setting.

    • Cisco Card—The ports on an installed Cisco UCS virtual interface card (VIC) are used to access the CIMC. You must select a NIC redundancy and IP setting.

> **Note**   Cisco Card NIC mode is currently supported only with a Cisco UCS VIC that is installed in PCIe slot 1, 4, or 7. See also Special Considerations for Cisco UCS Virtual Interface Cards, page 3-49.

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

      – None—(Available only with the *Shipping* NIC mode) 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 used simultaneously. See NIC Modes and NIC Redundancy Settings, page 2-11 for more information.

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

> **Note**   Before you enable DHCP, your DHCP server must be preconfigured with the range of MAC addresses for this server. The MAC address is printed on a label on the rear of the server. This server has a range of six MAC addresses that are 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. Press **F5** to refresh the screen 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 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 4 (either a static address or the address assigned by your DHCP server).

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

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

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

NIC Modes and NIC Redundancy Settings

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

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

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

- Dedicated—The 10/100 management port is used to access the CIMC. You must select a NIC redundancy and IP setting.

- Shared LOM—The 1-Gb Ethernet ports are used to access the CIMC. You must select a NIC redundancy and IP setting.

- Cisco Card—The ports on an installed Cisco UCS virtual interface card (VIC) are used to access the CIMC. You must select a NIC redundancy and IP setting.

> **Note** The Cisco Card NIC mode is currently supported only with a Cisco UCS VIC that is installed in PCIe slot 1, 4, or 7. See also Special Considerations for Cisco UCS Virtual Interface Cards, page 3-49.

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 used 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 includes information about the system BIOS and it includes the following topics:

Updating the BIOS and CIMC Firmware

⚠️

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

Cisco provides the Cisco Host Upgrade Utility (HUU) to assist with simultaneously upgrading the BIOS, CIMC, and other firmware to compatible levels. In this server, the HUU is included on the Cisco Flexible Flash card inside the server (see Replacing a Cisco Flexible Flash Drive, page 3-39).

The server uses firmware that is 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 VIC firmware to compatible levels.

  See the *Cisco Host Upgrade Utility Quick Reference Guide* for your firmware level at the documentation roadmap link that is listed in this section.

✎

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 listed in this section to update the BIOS and CIMC firmware individually.

- You can upgrade the BIOS using the EFI interface, or upgrade from a Windows or Linux platform.

  See the *Cisco UCS C-Series Rack-Mount Server BIOS Upgrade Guide*.

- You can upgrade the CIMC firmware by using the CIMC GUI interface.

  See the *Cisco UCS C-Series Rack-Mount Server Configuration Guide*.

- You can upgrade the CIMC firmware by using the CIMC CLI interface.

  See the *Cisco UCS C-Series Rack-Mount Server CLI Configuration Guide*.

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

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

Accessing the System BIOS

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

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

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

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

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

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

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

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

Service DIP Switch

This server includes a DIP switch on the I/O riser that you can use to recover from a corrupted BIOS.

This section includes the following topics:

DIP Switch Location on the I/O Riser

The block of DIP switches is located on the I/O riser (see Figure 2-5). The default position for all switches is open (down).

The I/O riser is the removable card that includes the rear-panel serial and VGA connectors. See Figure 3-5 for the location of the I/O riser in the server.

Figure 2-5   DIP Switches on I/O Riser
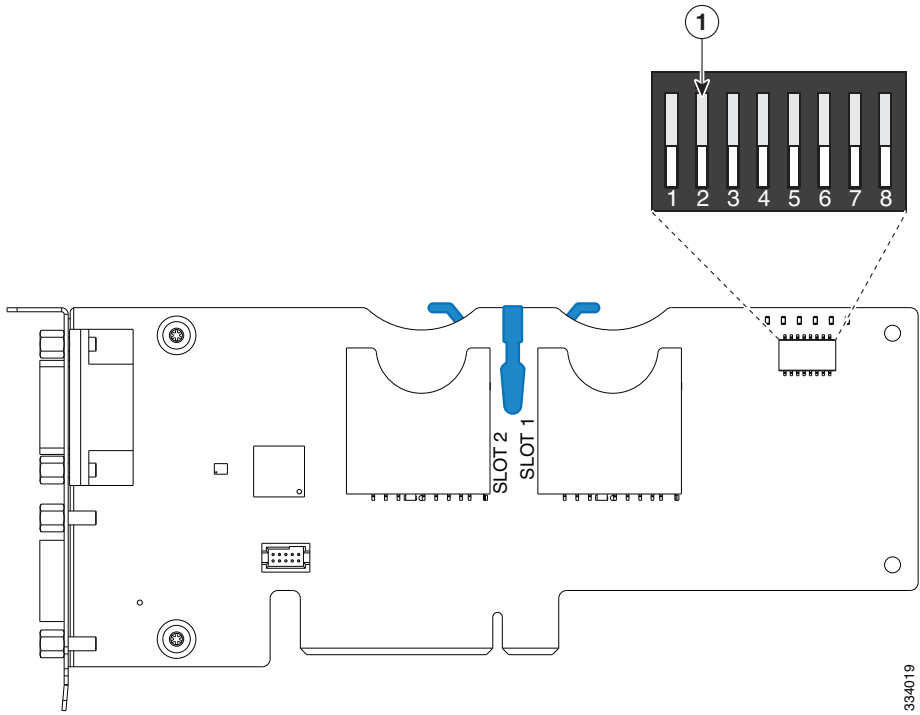
| **1** | DIP switch 2 for BIOS recovery (shown in default open position) | | |

Using the BIOS Recovery DIP Switch

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

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

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

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

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

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

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

Procedure 1: Reboot With recovery.cap File

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

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

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

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

Step 4   Reboot the server.

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

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

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

Step 6   Wait for server to complete the BIOS update, then remove the USB thumb drive from the server.

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

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

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

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

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

Step 3   Power off the server as described in Shutting Down and Powering Off the Server, page 3-8.

Step 4   Disconnect all power cords from the power supplies.

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

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

Step 6   Remove the top cover as described in Removing and Replacing the Server Top Cover, page 3-9.

Step 7   Locate BIOS recovery DIP switch 2. See Figure 2-5.

Step 8   Use a small pointed object such as a screwdriver to move DIP switch 2 to the closed (upper) position.

Step 9   Reconnect AC power cords to the server. The server powers up to standby power mode.

Step 10   Insert the USB thumb drive that you prepared in Step 2 into a USB port on the server.

Step 11   Return the server to main power mode by pressing the **Power** button on the front panel.

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

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

Step 12   Wait for server to complete the BIOS update, then remove the USB thumb drive from the server.

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

Step 13   After the server has fully booted, power off the server again and disconnect all power cords.

Step 14   Move DIP switch 2 back to the default open (lower) position.

> ✎
> **Note**   If you do not move the switch back to the default position, the CIMC attempts to recover the BIOS each time that you boot the server.

Step 15   Replace the top cover, replace the server in the rack, replace power cords and any other cables, and then power on the server by pressing the **Power** button.