# 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.

**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.

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

**Step 2**     Compare the shipment to the equipment list provided by your customer service representative. 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

# Preparing for Server Installation

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

- Installation Guidelines, page 2-2
- 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, page A-1.

- Ensure that the cabinet or rack meets the requirements listed in the Rack Requirements, page 2-4.

- Ensure that the site power meets the power requirements listed in the Server Specifications, page A-1. If available, you can use an uninterruptible power supply (UPS) to protect against power failures.

# 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 four RUs, equal to 7 in. (17.78 cm).

# 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.

# 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 contains the following topics:

⚠ **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

## Installing the Slide Rails

**Step 1**   Remove the inner rail from the slide-rail assembly (see Figure 2-1):

  **a.**   Push down on the rear end of the rail release latch and pull out the inner rail until it stops.

  **b.**   Hold down the inner rail release clip and at the same time, pull the inner rail free from the rail assembly.

*Figure 2-1       Removing the Inner Rail From the Assembly*
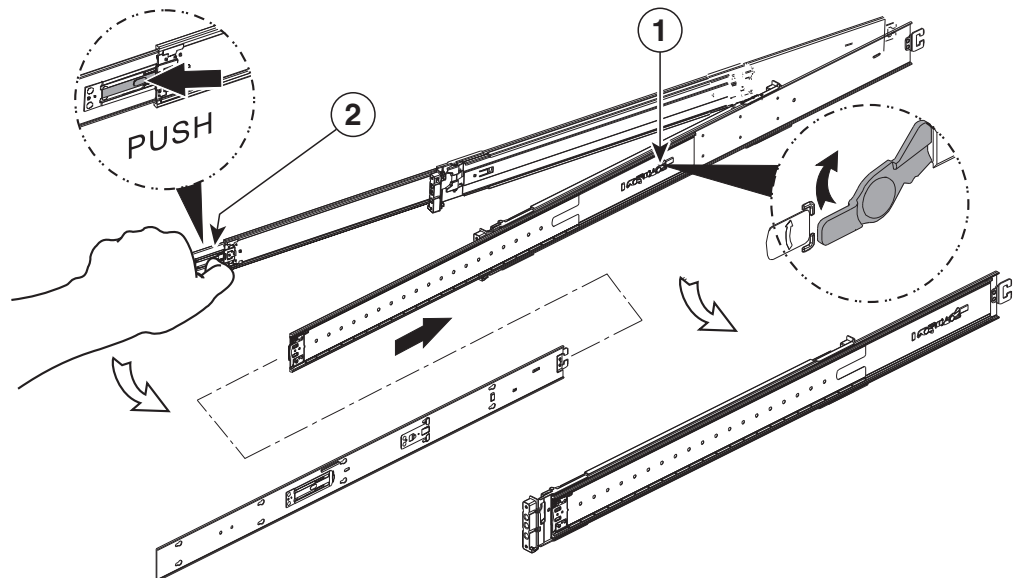


| **1** | Rail release latch (close-up view) | **2** | Inner rail release clip |
|---|---|---|---|

**Step 2**    Attach the inner rails to the sides of the server (see Figure 2-2):

    **a.**  Align an inner rail with one side of the server so that the 10 keyed slots in the rail align with the 10 pegs on the side of the server.

    **b.**  Set the keyed slots over the pegs, then slide the rail toward the rear to lock it in place on the pegs.

    **c.**  Install the second inner rail to the opposite side of the server.

*Figure 2-2*        ***Attaching Inner Rail to Side of Server***
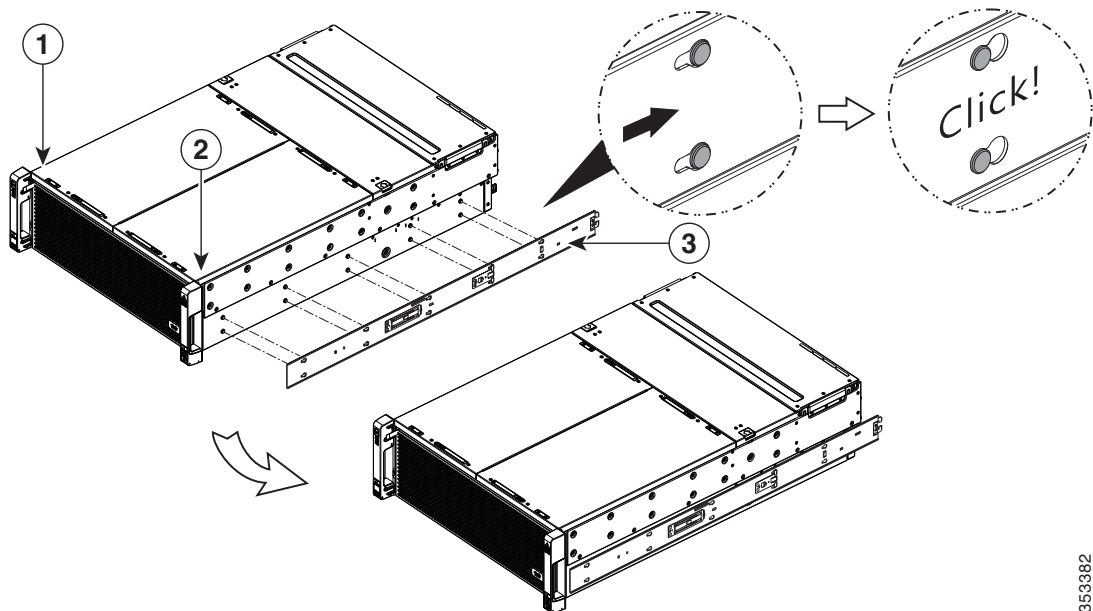


| 1 | Rear of server | 2 | Inner rail |
|---|----------------|---|------------|

**Step 3**    Install the slide rails into the rack (see Figure 2-3):

    **a.**  Align one slide-rail assembly front end with the front rack-post holes that you want to use.

        The slide rail front-end wraps around the outside of the rack post and the mounting pegs enter the rack-post holes from the outside-front.

    **b.**  Push the front mounting pegs into the rack-post holes until you hear them click and lock.

    **c.**  Adjust the slide-rail length until it reaches the rear rack post perfectly level.

    **d.**  Hold open the rear-peg spring latch, then push the rear mounting pegs into the rear rack-post-holes.

        The rear mounting pegs enter the rear rack-post holes from the inside of the rack post.

    **e.**  Release the rear-peg spring latch to lock the rear pegs in place.

    **f.**  Attach the second slide-rail assembly to the opposite side of the rack. Ensure that the two slide-rail assemblies at the same height with each other and level front-to-back.

*Figure 2-3        Attaching Rail Assembly to the Rack Post*
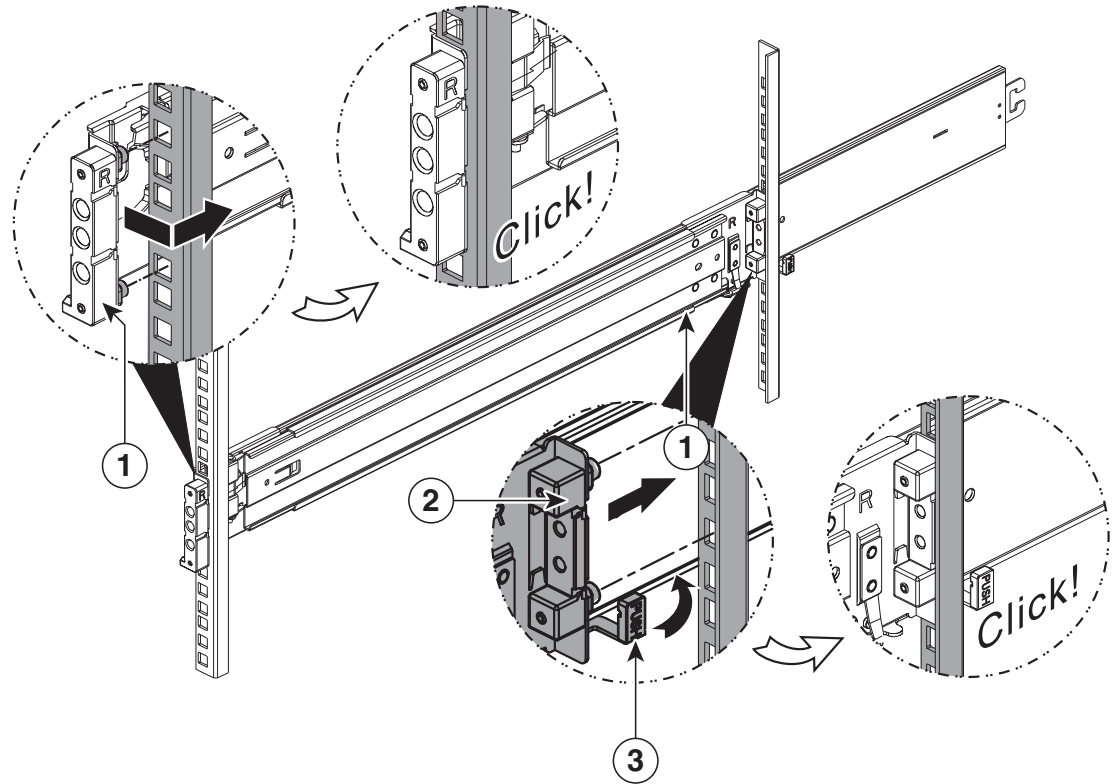


| **1** | Front mounting pegs, entering rack-post holes from the outside front | **3** | Rear peg spring-latch |
|---|---|---|---|
| **2** | Rear mounting pegs, entering rack post-holes from inside rear | | |

**Step 4**    Pull the intermediate slide rails on each assembly out toward the rack front until they hit the internal stops and lock in place (see Figure 2-4).

**Step 5**    Insert the server with inner rails into the intermediate rails:

⚠
**Caution**    This server weighs approximately 190 pounds (86 kilograms) when fully loaded with components. We recommend that you use a minimum of two people or a mechanical lift when lifting the server. Attempting this procedure alone could result in personal injury or equipment damage.

   **a.**   Align the rear of the inner rails that are attached to the server sides with the front ends of the empty intermediate rails on the rack.

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

   **c.**   Depress the release clip on each inner rail inward, and then continue pushing the server into the rack until its front slam-latches engage with the rack posts (see Figure 2-4).

⚠
**Caution**    Ensure that both release clips are disengaged before pushing the system into the rack. Push the server into the rails slowly to avoid damaging the rails.

*Figure 2-4        Attaching Rail Assembly to the Rack Post*
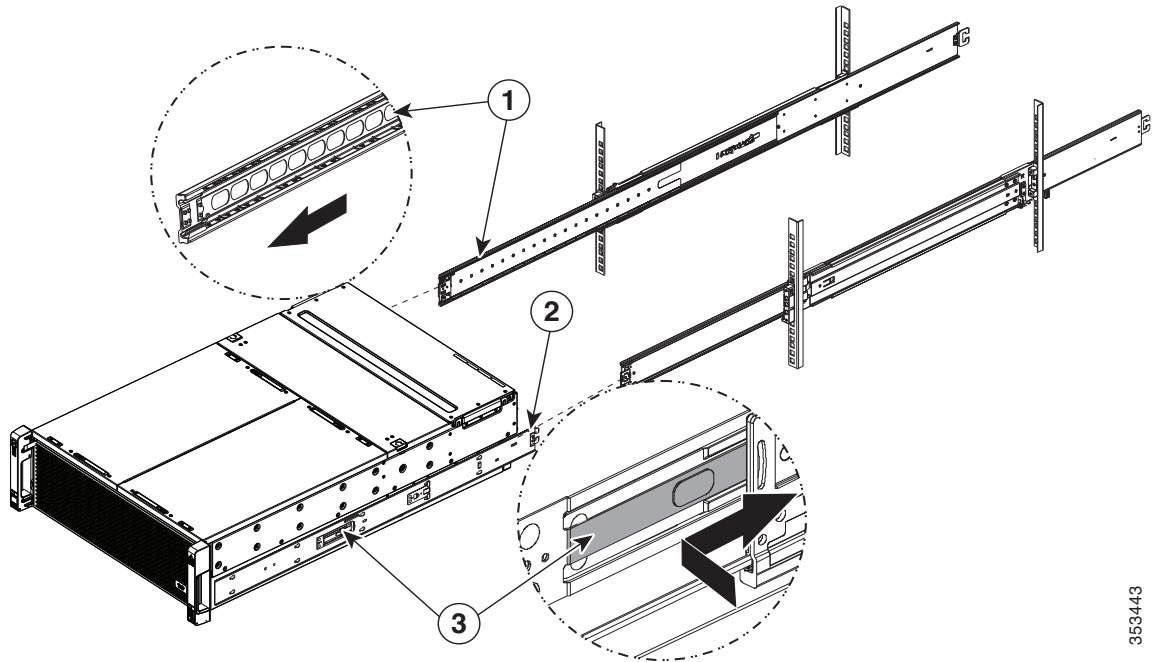


| **1** | Intermediate rail pulled out from outer rail | **3** | Inner rail release clip |
|---|---|---|---|
| **2** | Inner rail mounted on server | | |

**Step 6**    (Optional) Secure the server in the rack more permanently by using the two screws provided with the slide rails. For example, you can install these screws if you plan to move the rack with servers installed.

With the server fully pushed into the slide rails, open a hinged slam-latch lever on the front of the server and insert the screw through the hole that is under the lever. The screw threads into the static part of the rail on the rack post and prevents the server from being pulled out. Repeat for the opposite slam latch.

⚠

**Caution**    When you pull the server outward from the rack, it stops at internal locking stops. Do not depress the release clips on the inner rails (see Figure 2-4) unless you intend to remove the server from the rack. Depressing the release clips on the inner rails allows the server to slide all the way out of the intermediate rails and could result in injury or equipment damage.

# Installing the Cable Management Arm (Optional)

**Note** The internal drives and cooling fans in the system are hot-swappable and are accessed by opening the top covers. When you rack and cable the system, be sure to allow enough slack in the power and other cables so that the system can be pulled out on the slide rails far enough to allow clearance for opening the top covers.

**Note** The CMA is reversible left to right. To reverse the CMA, see Reversing the Cable Management Arm (Optional), page 2-11 before installation.

**Step 1** With the server pushed fully into the rack, slide the CMA tab of the CMA arm that is farthest from the server onto the end of the stationary slide rail that is attached to the rack post (see Figure 2-5). Slide the tab over the end of the rail until it clicks and locks.

**Step 2** Slide the CMA tab that is closest to the server over the end of the inner rail that is attached to the server (see Figure 2-5). Slide the tab over the end of the rail until it clicks and locks.

**Step 3** Pull out the width-adjustment slider that is at the opposite end of the CMA assembly until it matches the width of your rack (see Figure 2-5).

**Step 4** Slide the CMA tab that is at the end of the width-adjustment slider onto the end of the stationary slide rail that is attached to the rack post (see Figure 2-5). Slide the tab over the end of the rail until it clicks and locks.

**Step 5** Open the hinged flap at the top of each plastic cable guide and route your cables through the cable guides as desired.

*Figure 2-5        Attaching the Cable Management Arm to the Rear of the Slide Rails*
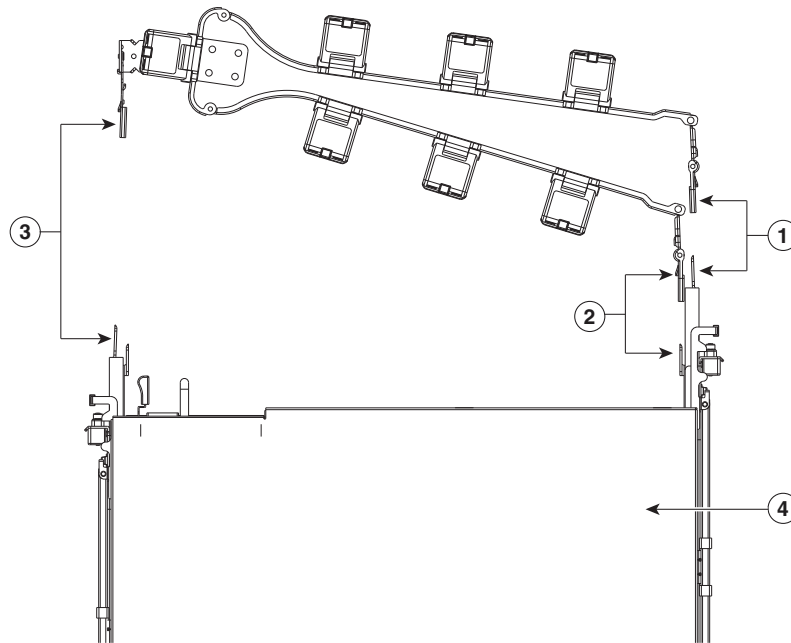


| **1** | CMA tab on arm farthest from server and end of stationary outer slide rail | **3** | CMA tab on width-adjustment slider and end of stationary outer slide rail |
|---|---|---|---|
| **2** | CMA tab on arm closest to the server and end of inner slide rail attached to server | **4** | Rear of server |

# Reversing the Cable Management Arm (Optional)

**Step 1**    Rotate the entire CMA assembly 180 degrees. The plastic cable guides must remain pointing upward.

**Step 2**    Flip the tabs at the end of each CMA arm so that they point toward the rear of the server.

**Step 3**    Pivot the tab that is at the end of the width-adjustment slider. Depress and hold the metal button on the outside of the tab and pivot the tab 180 degrees so that it points toward the rear of the server.

*Figure 2-6*        *Reversing the CMA*
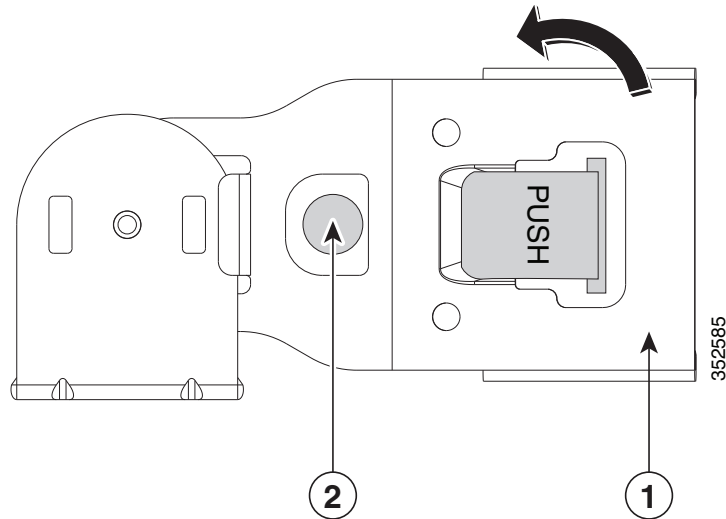


| **1** | CMA tab on end of width-adjustment slider | **2** | Metal button for rotating |
|---|---|---|---|

# Initial Server Setup

This section includes the following topics:

- Connecting and Powering On the System (Standalone Mode), page 2-12
- NIC Modes and NIC Redundancy Settings, page 2-16

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

This section describes how to power on the system, assign an IP address, and connect to server management when using the server in standalone mode.

The server is shipped with these default settings:

- The NIC mode is Dedicated.

  With the Dedicated mode, the dedicated management port on the system I/O controller (SIOC) is used to access the Cisco IMC. You must select a NIC redundancy and IP setting. If you want to use a different port to access the Cisco IMC, you can connect to the server and change the NIC mode as described in Step 1 of the following procedure.

- The NIC redundancy is None.
- DHCP is enabled.
- IPv4 is enabled.

There are two methods for connecting to the system for initial setup:

- Local setup—Use this procedure if you want to connect a keyboard and monitor to the system for setup. This procedure requires a KVM cable (Cisco PID N20-BKVM). See Local Connection Procedure, page 2-12.
- Remote setup—Use this procedure if you want to perform setup through your dedicated management LAN. See Remote Connection Procedure, page 2-13.

✎

**Note**    To configure the system remotely, you must have a DHCP server on the same network as the system. Your DHCP server must be preconfigured with the range of MAC addresses for this server node. The MAC address is printed on a label on the rear of the server node. This server node has a range of six MAC addresses assigned to the Cisco IMC. The MAC address printed on the label is the beginning of the range of six contiguous MAC addresses.

### Local Connection Procedure

**Step 1**    Attach a power cord to each power supply in your server, and then attach each power cord to a grounded AC power outlet. See 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 system power status by looking at the system Power Status LED on the front panel (see Figure 1-1 on page 1-1). The system is in standby power mode when the LED is amber.

**Step 2**    Connect a KVM cable (Cisco PID N20-BKVM) to the KVM connector on the server node at the rear of the system (see Figure 1-2 on page 1-2 for the connector location).

**Step 3**    Connect a USB keyboard and a VGA monitor to the KVM cable.

**Step 4**     Open the Cisco IMC Configuration Utility:

    **a.**   Press and hold the front panel power button for four seconds to boot the server.

    **b.**   During bootup, press **F8** when prompted to open the Cisco IMC Configuration Utility.

       This utility has two windows that you can switch between by pressing F1 or F2.

> **Note**  The first time that you enter the Cisco IMC Configuration Utility, you are prompted to change the default password. The default password is *password*. The Strong Password feature is enabled.

The following are the requirements for Strong Password:

- The password can have minimum 8 characters; maximum 14 characters.
- The password must not contain the user's name.
- The password must contain characters from three of the following four categories:
  - English uppercase letters (A through Z).
  - English lowercase letters (a through z).
  - Base 10 digits (0 through 9).
  - Non-alphabetic characters !, @, #, $, %, ^, &, *, -, _, =, "

**Step 5**     Continue with Cisco IMC Configuration Utility Setup, page 2-14.

## Remote Connection Procedure

**Step 1**     Attach a power cord to each power supply in your server, and then attach each 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 system power status by looking at the system Power Status LED on the front panel (see Figure 1-1). The system is in standby power mode when the LED is amber.

**Step 2**     Plug your management Ethernet cable into the system I/O controller (SIOC) 1 dedicated management port. SIOC 1 is on the left side as you look at the server rear (see Figure 1-2 on page 1-2).

> **Note**  Always use SIOC 1 for the management port connection, even if you have two SIOCs.

**Step 3**     Allow your preconfigured DHCP server to assign an IP address to the server node.

**Step 4**     Use the assigned IP address to access and log in to the Cisco IMC for the server node. Consult with your DHCP server administrator to determine the IP address.

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

**Step 5**     From the Cisco IMC Server Summary page, click **Launch KVM Console**. A separate KVM console window opens.

**Step 6**     From the Cisco IMC Summary page, click **Power Cycle Server**. The system reboots.

**Step 7**     Select the KVM console window.

> ✎
> **Note**    The KVM console window must be the active window for the following keyboard actions to work.

**Step 8**    When prompted, press **F8** to enter the Cisco IMC Configuration Utility. This utility opens in the KVM console window.

This utility has two windows that you can switch between by pressing F1 or F2.

> ✎
> **Note**    The first time that you enter the Cisco IMC Configuration Utility, you are prompted to change the default password. The default password is *password*. The Strong Password feature is enabled.

The following are the requirements for Strong Password:

- The password can have minimum 8 characters; maximum 14 characters.
- The password must not contain the user's name.
- The password must contain characters from three of the following four categories:
  - English uppercase letters (A through Z).
  - English lowercase letters (a through z).
  - Base 10 digits (0 through 9).
  - Non-alphabetic characters !, @, #, $, %, ^, &, *, -, _, =, "

**Step 9**    Continue with Cisco IMC Configuration Utility Setup, page 2-14.

## Cisco IMC Configuration Utility Setup

The following procedure is performed after you connect to the system and open the Cisco IMC Configuration Utility.

**Step 1**    Set NIC mode and NIC redundancy:

**a.**    Set the NIC mode to your choice for which ports to use to access the Cisco IMC for server management (see Figure 1-2 for identification of the ports):

- Dedicated—This is the default NIC mode. The dedicated management port on SIOC 1 is used to access the Cisco IMC. You must select a NIC redundancy and IP setting.
- Shared LOM—Not supported at this time.
- Cisco Card—The ports on an installed network adapter card are used to access the Cisco IMC. You must select a NIC redundancy and IP setting.
- SIOC Slot—This is set as slot 1 and cannot be changed.

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

- None—The Ethernet ports operate independently and do not fail over if there is a problem. This setting can be used only with the *Dedicated* NIC mode.
- Active-standby—If an active Ethernet port fails, traffic fails over to a standby port.
- Active-active—All Ethernet ports are utilized simultaneously. This setting can be used only with the Cisco Card NIC mode.

**Step 2**    Choose whether to enable DHCP for dynamic network settings, or to enter static network settings.

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

The static IPv4 and IPv6 settings include:

- The Cisco IMC IP address.
- The prefix/subnet.

   For IPv6, valid values are 1–127.

- The gateway.

   For IPv6, if you do not know the gateway, you can set it as none by typing **::** (two colons).

- The preferred DNS server address.

   For IPv6, you can set this as none by typing **::** (two colons).

**Step 3**    Optional: Use this utility to make VLAN settings.

**Step 4**    Press **F1** to go to the second settings window, then continue with the next step.

From the second window, you can press F2 to switch back to the first window.

> ✎ **Note** Save your changes before switching windows.

**Step 5**    Optional: Set a host name for the server.

**Step 6**    Optional: Enable dynamic DNS and set a dynamic DNS (DDNS) domain.

**Step 7**    Optional: If you select the Factory Default check box, the server will be set back to the factory defaults.

**Step 8**    Optional: Set a default user password.

**Step 9**    Optional: Reset port profiles and the port name.

**Step 10**    Press **F5** to refresh the settings you made. You might have to wait about 45 seconds until the new settings appear and the message, `Network settings configured` is displayed before you reboot the server in the next step.

**Step 11**    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.

Use a browser and the IP address of the Cisco IMC to connect to the Cisco IMC management interface. The IP address is based upon the settings that you made (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

## NIC Modes

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

- Dedicated—The dedicated management port on system I/O controller 1 (SIOC 1) is used to access the Cisco IMC. You must select a NIC redundancy and IP setting. This is the factory-default setting.

- Shared LOM—Not supported at this time.

- Cisco Card—The ports on an installed network adapter card are used to access the Cisco IMC. You must select a NIC redundancy and IP setting.

## NIC Redundancy

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. This setting can be used only with the *Dedicated* NIC mode.

- Active-standby—If an active Ethernet port fails, traffic fails over to a standby port.

- Active-active—All Ethernet ports are utilized simultaneously. This setting can be used only with the Cisco Card NIC mode.

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 Cisco IMC Firmware

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

## Updating the BIOS and Cisco IMC Firmware

⚠️

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

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—Use the Cisco Host Upgrade Utility to simultaneously upgrade the Cisco IMC, BIOS, and other component firmware to compatible levels.

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

- 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 Cisco IMC and BIOS firmware by using the Cisco IMC GUI interface.

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

- You can upgrade the Cisco IMC and BIOS firmware by using the Cisco IMC 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

**Note**    Details about the BIOS settings are displayed on the BIOS windows.

**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**.