SGI® Rackable™ RP2 Standard-Depth Servers User Guide

C2108-RP2, ISS3112-RP2, and ISS3124-RP2

007-5837-002

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Record of Revision

Version	Description
001	June 2012 Original printing.
002	September 2013 Added support for Intel® Xeon® E5-2600v2 Series processors plus miscellaneous front matter changes.

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About This Guide

This guide provides an overview of the features and the major components of SGI® Rackable™ RP2 standard-depth servers. It also provides system monitoring and maintenance information as well as important safety and regulatory specifications.

Audience

This guide is written for owners, installers, system administrators, and users of the RP2 server. It is written with the assumption that the reader has a good working knowledge of computers and computer systems.

Chapter Descriptions

The following topics are covered in this guide:

- Chapter 1, “System Overview”
  Provides an overview of the server features and components.
- Chapter 2, “System Safety”
  Provides system safety information.
- Chapter 3, “System Operation and Monitoring”
  Describes control buttons and LEDs on the control panel as well as LEDs on the disk drive carriers.
- Chapter 4, “Chassis Maintenance”
  Describes procedures for replacing system components.

- Appendix A, “Power and Environmental Specifications,”
  Lists input/output voltage specifications for the power supplies and also environmental specifications for operating the system.
- Appendix B, “Regulatory Compliance Information,”
  Summarizes the product regulatory information.
- Appendix C, “Rail Kit Installation,”
  Describes the steps to install the rail kit.
- Appendix D, “BMC Error Codes,”
  Describes the BMC beep codes associated with failure conditions.

Related Publications

The following SGI documents are relevant to RP2 servers:

- *MegaRAID® SAS Software User’s Guide*, publication number 860-0488-xx*x*
- *MegaRAID® 6GB/s SAS RAID Controllers User Guide*, publication number 860-0502-xx*x*
- *LSI Integrated SAS for RAID User’s Guide*, publication number 860-0476-xx*x*
- SGI Foundation Software release notes
- SGI Performance Suite release notes
- SGI InfiniteStorage series documentation
- Man pages

You can obtain SGI documentation, release notes, or man pages in the following ways:

- Refer to the SGI Technical Publications Library at http://docs.sgi.com. Various formats are available. This library contains the most recent books and man pages.
- Refer to the SGI Supportfolio™ webpage for release notes and other documents whose access require a support contract. See “Product Support” on page xiii.

Conventions

The following conventions are used throughout this document:

Convention	Meaning
`Command`	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.
variable	The italic typeface denotes variable entries and words or concepts being defined. Italic typeface is also used for book titles.
`user input`	This bold fixed-space font denotes literal items that the user enters in interactive sessions. Output is shown in nonbold, fixed-space font.
[ ]	Brackets enclose optional portions of a command or directive line.
...	Ellipses indicate that a preceding element can be repeated.
`man page`(*x*)	Man page section identifiers appear in parentheses after man page names.
GUI element	This font denotes the names of graphical user interface (GUI) elements such as windows, screens, dialog boxes, menus, toolbars, icons, buttons, boxes, fields, and lists.

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System Overview

The SGI Rackable RP2 standard-depth servers are 2U rackmount servers. The servers have two main subsystems: the 2U server chassis and a dual-processor serverboard. There are three models of RP2 servers based on the disk configurations:

- C2108-RP2 (8 hard disk drives as shown in Figure 1-1)
- ISS3112-RP2 (12 hard disk drives)
- ISS3124-RP2 (24 hard disk drives)

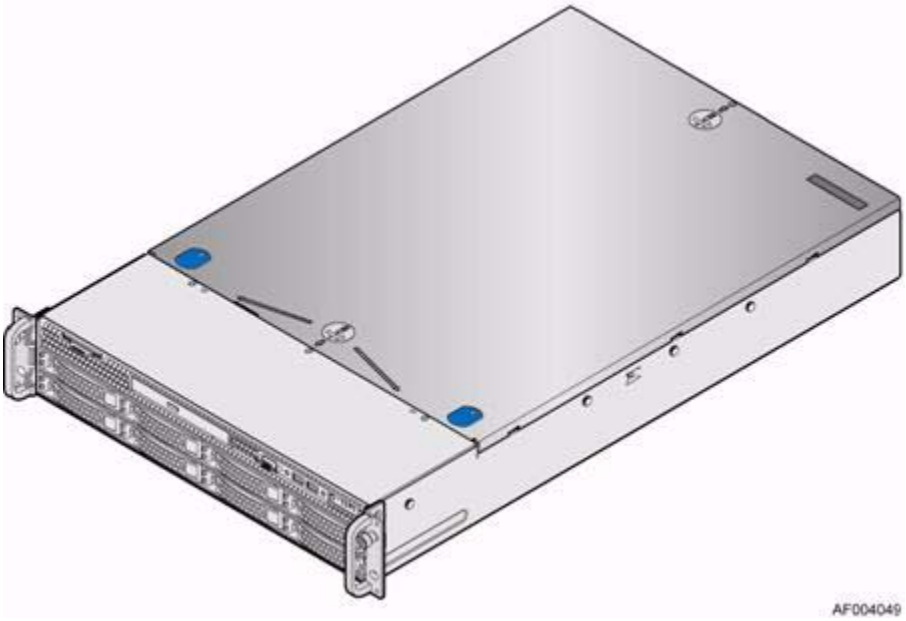

Figure 1-1 SGI Rackable C2108-RP2 Server

This chapter describes the main features and configuration options of an RP2 server as well as the components pertinent to monitoring and maintaining your server.

System Features and Configuration Options

Table 1-1 summarizes the features and configuration options of an RP2 server.

Table 1-1 System Features and Configuration Options

Feature	Description
Motherboard	Intel Server Board S2600GZ
Processor support	Support for one or two Intel® Xeon® E5-2600 or E5-2600v2 Series processors with a Thermal Design Power (TDP) of up to 130 W. A 135-watt CPU is available with product warranty contingencies.
Memory	– 24 DIMM slots, 3 DIMMs per channel, 4 memory channels per processor – Unbuffered DDR3 (UDIMM), Registered DDR3 (RDIMM), and Load Reduced DDR3 (LRDIMM) – Memory DDR3 data transfer rates of 800, 1066, 1333 MT/s, and 1600 MT/s – DDR3 standard I/O voltage of 1.5V and DDR3 low voltage of 1.35V
Chipset	Intel C600-A chipset with support for optional Storage Option Select keys
External I/O connections	– Video (back panel + front panel on non-max hard drive SKUs) – RJ-45 Serial- A Port – Four RJ-45 Network Interface Connectors supporting 10/100/1000Mb – USB 2.0 connectors (three on back panel and two on front panel on non-max hard drive SKUs)
Internal I/O connectors/headers	– One Type-A USB 2.0 connector – One DH-10 Serial-B port connector
Optional I/O module support	The following I/O modules utilize a single proprietary on-board connector. An installed I/O module can be supported in addition to standard on-board features and any add-in expansion cards. – Quad port 1 GbE based on Intel Ethernet Controller I350 – Dual port 10GBase-T Ethernet module based on Intel Ethernet Controller X540 – Dual SFP+ port 10GbE module based on Intel 82599 10 GbE controller – Single port FDR speed InfiniBand module with QSFP connector
System fans	– Five system fans – One power supply fan for each installed power supply module

Table 1-1 System Features and Configuration Options **(continued)**

Feature	Description
Riser cards	Support for two riser card slots. Each riser card slot has support for the following riser card options: – 3-Slot PCIe riser card Slots 1 & 2: PCIe x16 slot, x8 lanes Slot 3: PCIe x8 slot, x8 lanes – 2-Slot PCIe riser card Slot 1: PCIe x16 slot, x16 lanes Slot 2: PCIe x8 slot, x8 lanes
Video	Integrated 2D video controller, 16 MB DDR3 memory
On-board storage controllers and options	– One eUSB 2x5 pin connector to support 2mm low-profile eUSB solid state devices – Two 7-pin single port AHCI SATA connectors capable of supporting up to 6 GB/sec – Two SCU 4-port mini-SAS connectors capable of supporting up to 3 GB/sec SAS/SATA
Server management	Integrated baseboard management controller (BMC), IPMI 2.0-compliant
Power supply options	The server system has two power supply modules installed, providing support for the following power configurations: – 1+1 redundant power – 2+0 combined power Power supply type: AC 750W Platinum
Storage bay options	– 8x 3.5 SATA/SAS hot-swap hard drive bays + optical drive support – 12x 3.5 SATA/SAS hot-swap hard drive bays – 24x 2.5 SATA/SAS hot-swap hard drive bays
Rack mount kit options	Value rack mount rail kit

Server Components

This section describes the server components pertinent to monitoring and maintaining your server. There are also quick reference labels inside of the chassis cover to assist you in identifying components.

The RP2 server has one serverboard in the chassis. Figure 1-2 provides an overhead view of the server with the top cover removed.

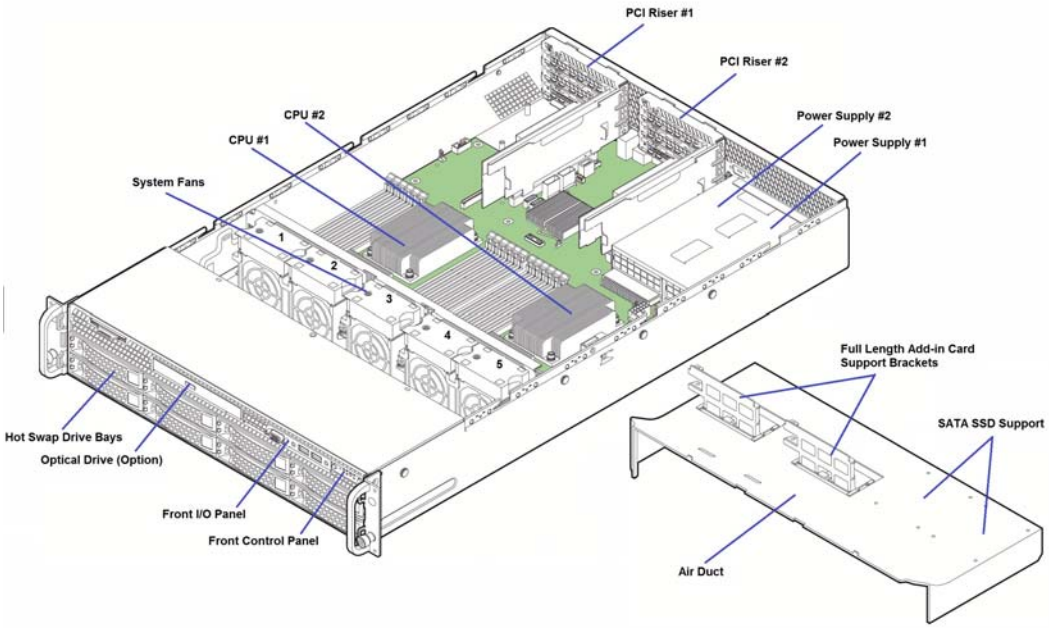

Figure 1-2 Overhead View of Server with the Top Cover Removed

Hard Disk Drive Bays

There are three configurations of hard disk drives (HDDs) for the RP2 server:

- 8 x 3.5” HDD bays (model C2108-RP2)
- 12 x 3.5” HDD bays (model ISS3112-RP2)
- 24 x 2.5” HDD bays (model ISS3124-RP2)

Figure 1-3, Figure 1-4, and Figure 1-5 show the front view of these three configurations.

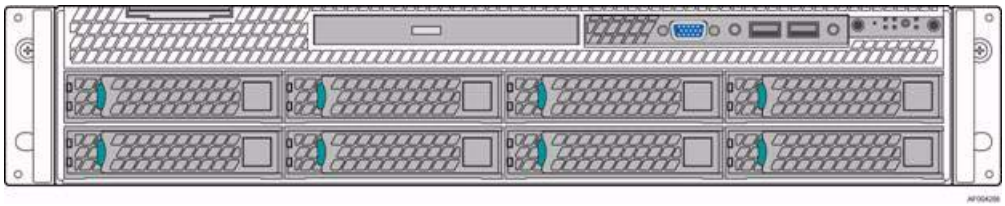

Figure 1-3 8-HDD Configuration

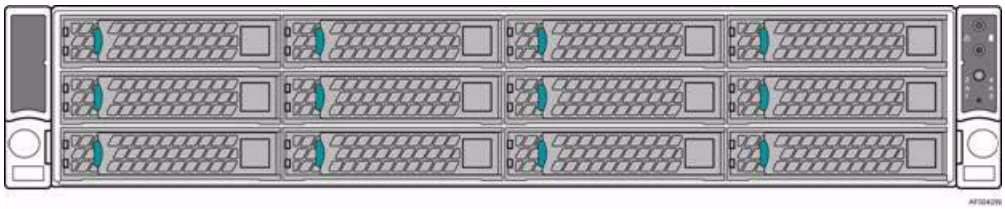

Figure 1-4 12-HDD Configuration

Figure 1-5 24-HDD Configuration

Front Control Panel

Dependent upon your configuration, the control panel may have a horizontal or vertical orientation. Figure 1-6 and Figure 1-7 show the two layouts of the control panel.

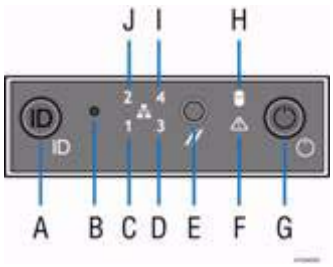

Figure 1-6 Front Control Panel—Horizontal Layout

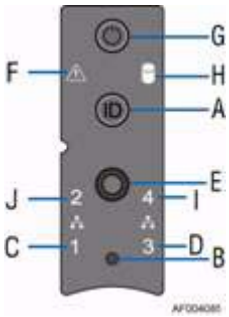

Figure 1-7 Front Control Panel—Vertical Layout

Table 1-2 identifies the components of the control panel. For a description of the function of these buttons and LEDs, see Chapter 3, “System Operation and Monitoring.”

Table 1-2 Control Panel Components

Label	Description
A	System ID button with integrated LED
B	NMI button (recessed, tool required for use)
C	NIC-1 Activity LED
D	NIC-3 Activity LED
E	System Cold Reset button
F	System Status LED
G	Power button with integrated LED
H	Hard Drive Activity LED
I	NIC-4 Activity LED
J	NIC-2 Activity LED

Back Panel Components

Figure 1-8 and Table 1-3 identify the components on the back panel of the server.

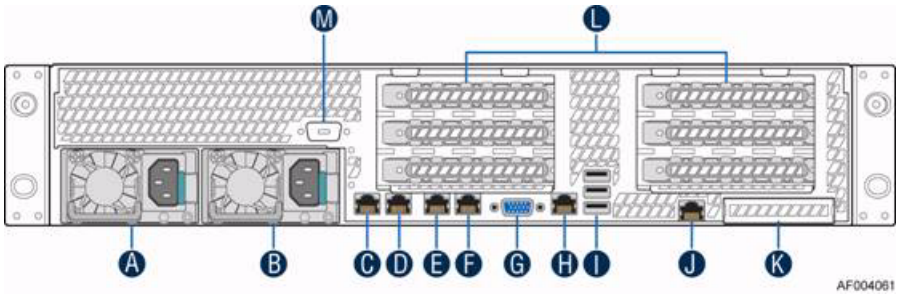

Figure 1-8 Typical Back Panel of Server.

Table 1-3 Back Panel Components

Label	Description
A	Power Supply Module #1
B	Power Supply Module #2
C	NIC 1
D	NIC 2
E	NIC 3
F	NIC 4
G	Video connector
H	RJ45 Serial-A port
I	USB ports
J	RMM4 NIC port
K	I/O module ports/connectors (optional)
L	Add-in adapter slots via Riser Card 1 and Riser Card 2
M	Serial-B port (optional)

Peripheral Devices

The server supports hard drives and an optical drive (CD-ROM or DVD-ROM). Figure 1-9 and Table 1-4 identify the various drive locations along with other IO ports.

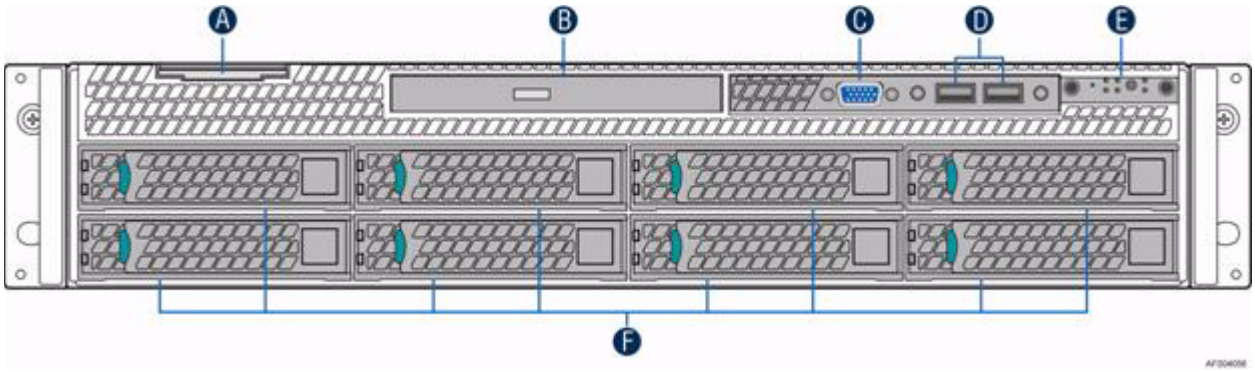

Figure 1-9 Peripheral Devices

Table 1-4 Peripheral Devices

Label	Description
A	System label pull-out
B	Slimline optical drive bay
C	Video port
D	USB ports
E	Front control panel
F	Hard disk drive bays

Hard Drive Support

As shown in Table 1-5, the server supports both 2.5” and 3.5” hard drives.

Table 1-5 Maximum Number of Hard Drives

Supported Hard Drive Type	Maximun Hard Drive Number
3.5-inch or 2.5-inch	8
3.5-inch or 2.5-inch	12
2.5-inch	24

Special Notes:

- The 3.5-inch HDD carriers support a hardware interface bracket that allows the use of 2.5-inch drives.
- Drives can consume up to 17 watts of power each. Drives must be specified to run at a maximum ambient temperature of 45ºC.
- Not all SATA and SAS drives are supported. Contact your local SGI representative for a list of supported hard drives.

Slimline Optical Drive Support

The system has support for a single optical drive. The optical drive is NOT hot-swappable. The system power must be turned off to insert or remove the slimline optical drive.

SGI makes accessory kits available for the following optical drives:

- Slimline DVD-ROM Drive
- Slimline DVD-RW Drive

Solid State Disk (SSD) Support

In addition to the support of the 2.5” and 3.5” HDDs in the conventional storage bays, the RP2 servers support SATA SSDs. As indicated in Figure 1-10, you place an SSD on top of the air duct.

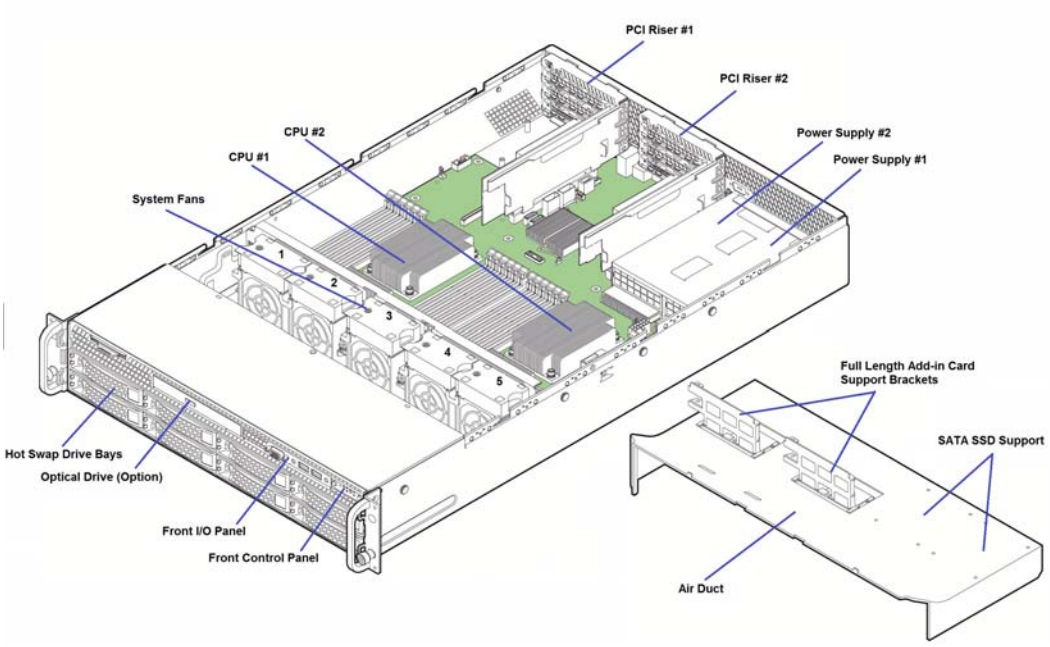

Figure 1-10 Overhead View of Server with the Top Cover Removed

System Safety

This chapter describes basic safety precautions.

Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the RP2 system from damage, as follows:

• Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

• Do not work alone when working with high voltage components.

• Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and disk drives. When disconnecting power, you should first power down the operating system first and then unplug the power cords. The unit has more than one power supply cord. Disconnect two power supply cords before servicing to avoid electrical shock.

• When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

• Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

• Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

• The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

• Serverboard Battery

Caution: There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites (see Figure 2-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

• Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

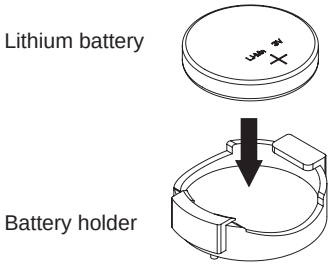

Figure 2-1 Installing the Onboard Battery

General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the RP2 system clean and free of clutter.
- The RP2 system might approach 100 lbs (45 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.
- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

ESD Precautions

Caution: Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic com ponents and printed circuit boards.

The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

System Operation and Monitoring

Depending on your hard drive configuration, your control panel may be on the top row of the front panel components or may be the right-most panel on the front. Figure 3-1 shows the possible locations.

There are several LEDs on the control panel as well as others on the hard drive carriers and power supplies. The LEDs keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also control buttons on control panel. This chapter describes the buttons and LEDs.

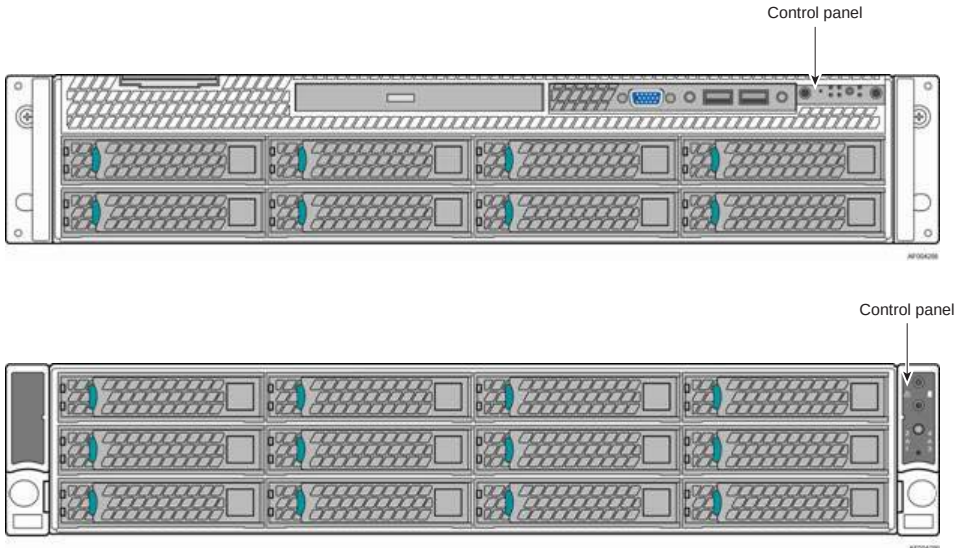

Figure 3-1 Front Control Panel

Front Panel Controls and LEDs

Each control panel contains control buttons and status LEDs. Figure 3-2 and Figure 3-3 show the components of a control panel.

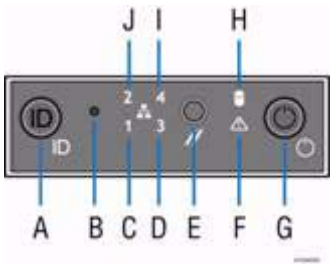

Figure 3-2 Control Panel—Horizontal

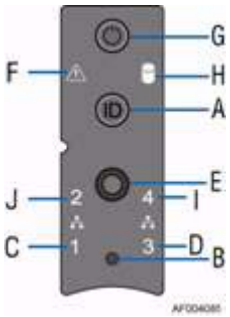

Figure 3-3 Control Panel—Vertical

Table 3-1 describes the control panel components and their functions.

Table 3-1 Control Panel Components and Functions

Label	Button/LED	Color	Condition	Function
A	System ID button with LED	Blue	On	Highlights targeted system. Can be activated by the button or software.
B	NMI button			Used for diagnostics. Recessed (tool required for use).
C, D, I, J	NIC-*x* Link/Activity LED	Green	On	Network link to NIC-*x* detected.
			Blink	NIC-*x* activity detected.
			Off	No link.
E	System Cold Reset button			When pressed, this button reboots and re-initializes the server.
F	System Status LED	Green	On	System ready/No alarm.
			Blink	System ready, but degraded: – Redundancy lost such as the power supply or fan failure. – Non-critical temp/voltage threshold. – Battery failure. – Predictive power supply failure.
		Amber	On	Critical Alarm: critical power modules failure, critical fans failure, voltage (power supply), critical temperature and voltage
			Blink	Non-Critical Alarm: Redundant fan failure, redundant power module failure, non-critical temperature and voltage
			Off	– Power off: System unplugged. – Power on: System powered off and in standby, no prior degraded\non-critical\critical state.
G	System Power button with LED	Green	On	Power On/ACPI S0 state
			Blink	Sleep/ACPI S1 state
			Off	Power Off/ACPI S5 state

Table 3-1 Control Panel Components and Functions **(continued)**

Label	Button/LED	Color	Condition	Function
H	Hard Drive Activity LED	Amber	On	Hard drives are available.
			Blink	Hard drive activity detected.
			Off	No hard drives are available.

Notes:

- Blink rate is ~1 Hz at 50% duty cycle.
- It is also off when the system is powered off (S5) or in a sleep state (S1).
- The power LED sleep indication is maintained on standby by the chipset. If the system is powered down without going through the BIOS, the LED state in effect at the time of power off is restored when the system is powered on until the BIOS clear it.
- If the system is not powered down normally, it is possible the Power LED will blink at the same time the system status LED is off due to a failure or configuration change that prevents the BIOS from running.

Hard Disk Drive (HDD) LEDs

Figure 3-4 shows the location of the LEDs for both the 2.5” and 3.5” HDD carriers.

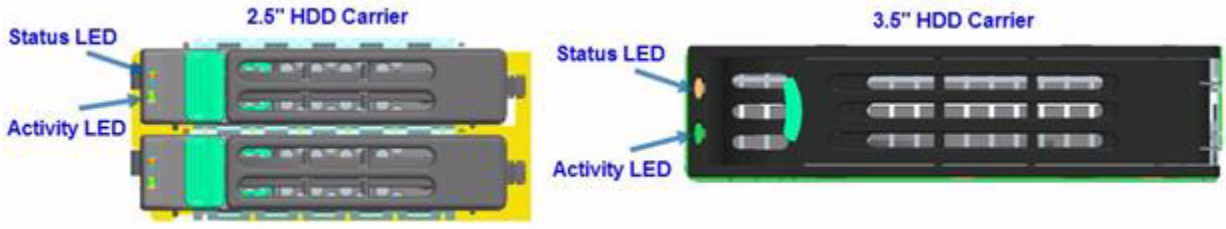

Figure 3-4 HDD Carrier LEDs

Table 3-2 describes the functions of the Status LED.

Table 3-2 HDD Status LED Functions

LED Color	LED Behavior	Drive Status
Amber	Off	No access and no fault.
	Solid On	Hard drive fault has occurred.
	Blink	– RAID rebuild in progress (1Hz). – Identify (2Hz).

Table 3-3 describes the functions of the Activity LED.

Table 3-3 HDD Activity LED Functions

LED Color	Drive Condition	Drive Type	LED Behavior
Green	Power on with no drive activity.	SAS	LED stays on.
		SATA	LED stays off.
	Power on with drive activity.	SAS	LED blinks off when processing a command.
		SATA	LED blinks off when processing a command.
	Power on and drive spun down.	SAS	LED stays off.
		SATA	LED stays off.
	Power on and drive spinning up.	SAS	LED blinks.
		SATA	LED stays off.

Power Supply LED

There is a single bi-color LED (green/amber) to indicate the power supply status. Table 3-4 describes the different states of the LED.

Table 3-4 Power Supply LED States

LED State	Power Supply (PS) State
Off	No AC power to any PS.
Green	Output on and Ok.
Green, 1Hz blink	AC present (only 12VSB on). PS off or PS in cold redundant state.
Green, 2Hz blink	PS firmware updating.
Amber	– PS critical event causing a shutdown/failure (OCP, OVP, fan failure) – AC cord unplugged or AC power lost. A second power supply in parallel still has AC input power.
Amber, 1Hz blink	PS warning events where the power supply continues to operate (high temperature, high power,high current, slow fan).

Chassis Maintenance

This chapter describes the following chassis maintenance activities:

- "Removing the System Top Cover" on page 25
- "Replacing the System Cover" on page 27
- "Removing and Installing the Air Duct" on page 28
- "Replacing the Power Supply" on page 30
- "Installing and Removing Hot-Swap Hard Drives" on page 33
- "Installing and Removing a Slimline Optical Drive" on page 40
- "Installing and Removing a Solid State Drive (SSD)" on page 43
- "Replacing a System Fan" on page 45
- "Replacing the Backup Battery" on page 46
- "Mounting the Chassis to a Rack" on page 47
- "Removing the Chassis from a Rack" on page 50

Before working with your server product, read the safety information in Chapter 2, “System Safety.”

Note: Whenever you service the system, you must first power down the server and unplug all peripheral devices and the AC power cord.

Tools and Supplies Needed:

- Phillips (cross head) screwdriver (#1 bit and #2 bit)
- Needle-nosed pliers
- Anti-static wrist strap and conductive foam pad (recommended)

Left-Right and User Position

All references to left, right, front, top, and bottom assume you are facing the front of the chassis as it would be positioned for normal operation.

Removing the System Top Cover

The server system must be operated with the system cover in place to ensure proper cooling. You will need to remove the top cover to add or replace components inside of the server. Before removing the top cover, power down the server and unplug all peripheral devices and the power cable(s).

Note: A non-skid surface or a stop behind the server system may be needed to prevent the server system from sliding on your work surface.

To remove the system cover, use the following steps:

1. Observe the safety and ESD precautions in Chapter 2, “System Safety.”.
2. Turn off all peripheral devices connected to the server.
3. Turn off the server.
4. Disconnect the power cord.

5. Remove the four screws.

   See **A** in Figure 4-1.

6. Slide the cover back and lift upwards.

   See **B** in Figure 4-1.

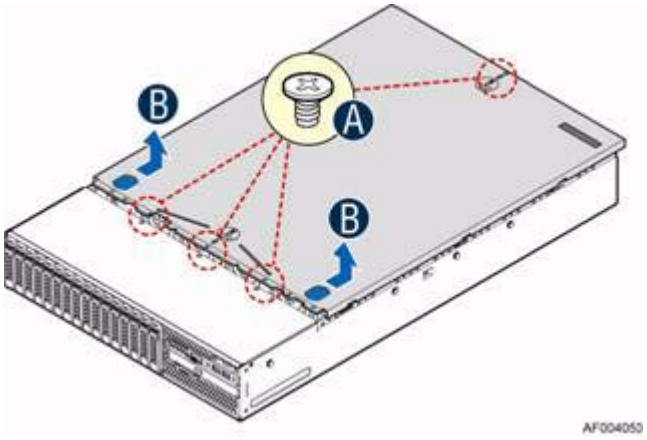

Figure 4-1 Removing the System Top Cover

Replacing the System Cover

To replace the system cover, use the following steps:

1. Place the system cover onto the chassis and slide the cover forward to engage the recessed edge at the front of the cover.

   See **A** in Figure 4-2.

2. Tighten the four screws.

   See **B** in Figure 4-2.

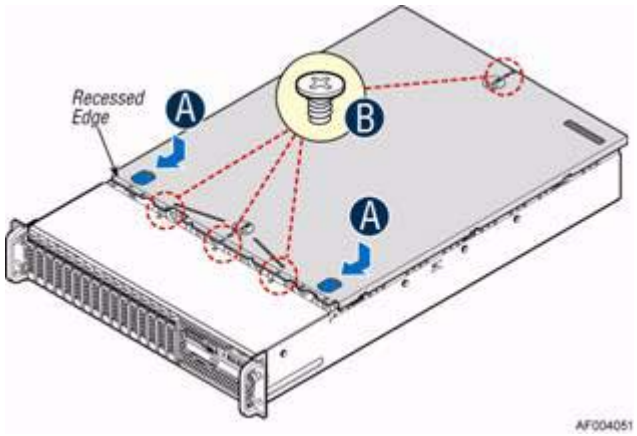

Figure 4-2 Installing the System Cover

Removing and Installing the Air Duct

Always operate your server system with the air duct in place. The air duct is required for proper airflow within the server system.

Removing the Air Duct

1. Carefully push in the two latches on the air duct.

   See **A** in Figure 4-3.

2. Rotate the back edge of the air duct up to disengage the two tabs from fan bulkhead.

   See **B** in Figure 4-3.

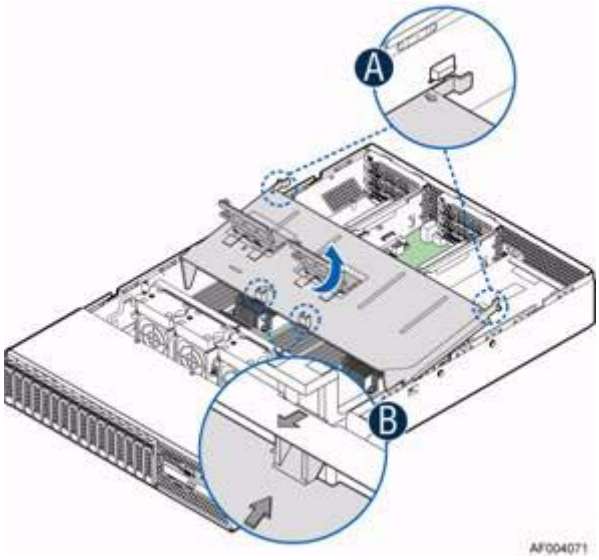

Figure 4-3 Removing the Air Duct

Installing the Air Duct

1. Lower the front edge of the air duct to engage the two tabs on the fan bulkhead.

   See **A** in Figure 4-4.

2. Carefully push in the two latches on the air duct.

   See **B** in Figure 4-4.

3. Push down the air duct into place.

   See **C** in Figure 4-4.

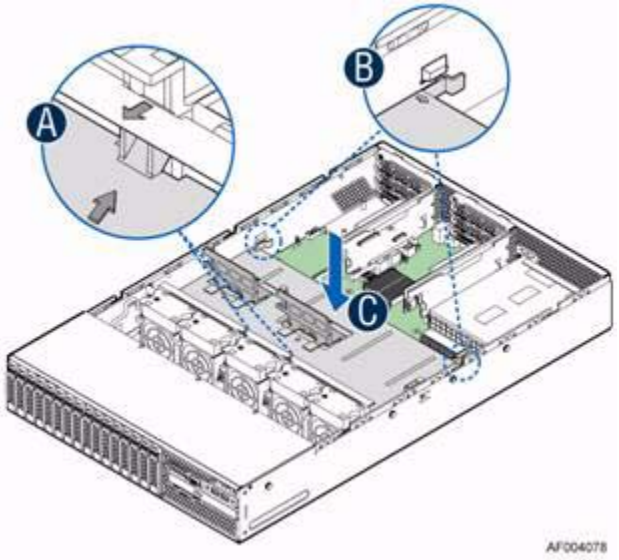

Figure 4-4 Installing the Air Duct

Replacing the Power Supply

Caution: The power supply is only hot-swappable if you have a redundant system with two power supplies installed. If you only have one power supply installed, before removing or replacing the power supply, you must first take the server out of service and turn off all peripheral devices connected to the system. Turn off the system by pressing the power button and unplug the power cord from the system or wall outlet.

This section describes how to replace the power supply.

1. If a filler panel is installed, use the *finger hole* to remove the filler panel.

   See **A** in Figure 4-5.

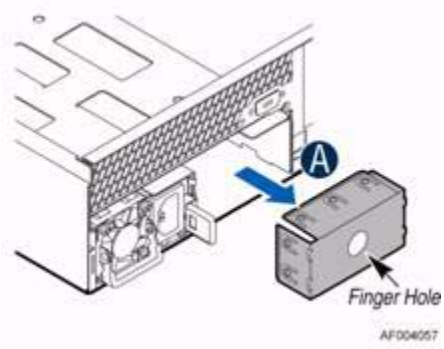

Figure 4-5 Removing the Filler Panel

2. If a power supply is installed, push the green latch in the direction shown while pulling out of the system by the handle.

   See Figure 4-6.

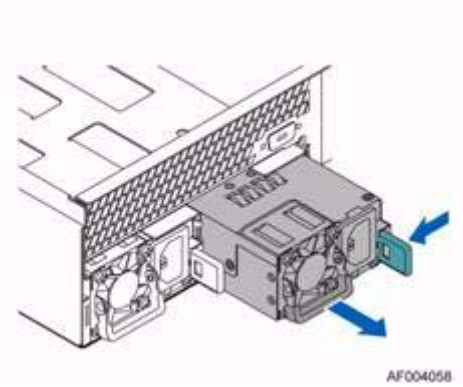

Figure 4-6 Removing the Power Supply Module

3. Insert the power supply module into the power supply cage and push it in until it clicks into place.

   See **B** Figure 4-7.

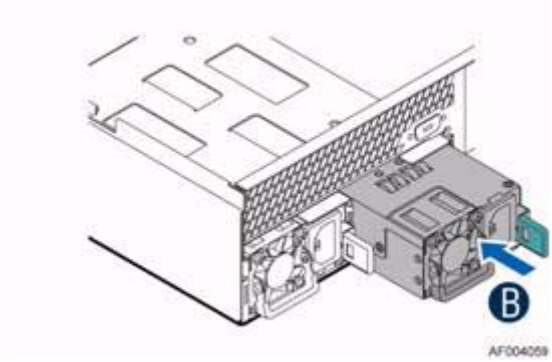

Figure 4-7 Installing the Power Supply Module

4. If no power supply is to be installed, install the filler panel into the power supply cage. See Figure 4-8.

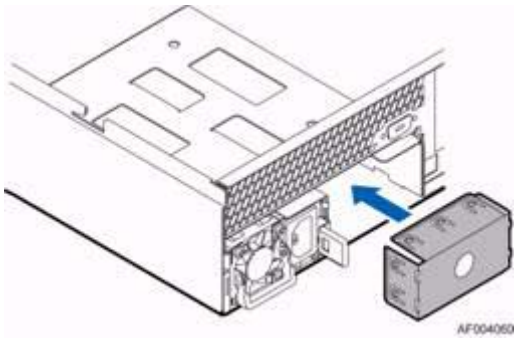

Figure 4-8 Installing the Filler Panel

Installing and Removing Hot-Swap Hard Drives

Caution: To maintain proper system cooling, use drive carriers with plastic drive blanks to populate drive days that would be otherwise empty.

You can install either a 2.5” or a 3.5” drive into a 3.5” drive carrier. This section describes the three cases of drive replacements:

- 3.5” drive into 3.5” drive carrier
- 2.5” drive into 3.5” drive carrier
- 2.5” drive into 2.5” drive carrier

Installing 3.5” Hard Disk Drive into 3.5” Hard Drive Carrier

To install a 3.5” drive into a 3.5” drive carrier, use the following steps.

1. Remove the drive carrier by pressing the green button and opening the lever.

   See **A** in Figure 4-9.

2. Slide the carrier out.

   See **B** in Figure 4-9.

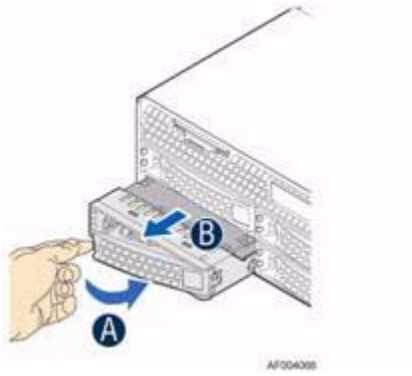

Figure 4-9 Removing 3.5” HDD Carrier

3. Remove the four screws securing the HDD to the carrier and remove the HDD or HDD interface bracket (in the case where there is a 2.5” drive in place).

   See **C** in Figure 4-10.

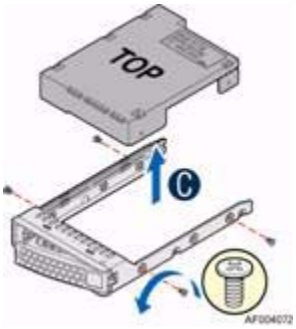

Figure 4-10 Removing 3.5” HDD or Interface Bracket

4. Install the hard disk drive using the same four screws.

See **D** in Figure 4-11.

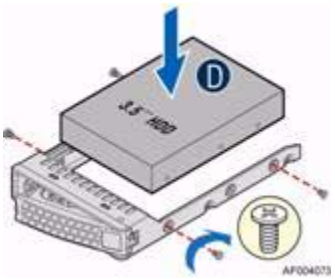

Figure 4-11 Inserting 3.5” HDD

5. Ensure that the connector end of the drive matches the backplane connector. With the lever open, insert the hard disk drive assembly into the chassis.

   See **E** in Figure 4-12.

6. Push in the lever to lock it into place.

   See **F** in Figure 4-12.

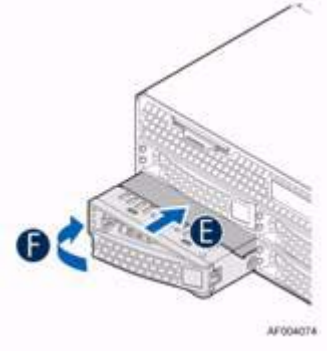

Figure 4-12 Inserting 3.5” HDD Carrier

Installing 2.5” Hard Disk Drive in 3.5” HDD Carrier

To install a 2.5” drive into a 3.5” drive carrier, use the following steps.

1. Remove the drive carrier by pressing the green button and opening the lever.

   See **A** in Figure 4-9.

2. Slide the carrier out.

   See **B** in Figure 4-9.

3. Remove the four screws securing the HDD to the carrier and remove the HDD or HDD interface bracket (in the case where there is a 2.5” drive in place).

   See **C** in Figure 4-10.

4. Break off the tab on the HDD interface bracket.

   See **d1** in Figure 4-13.

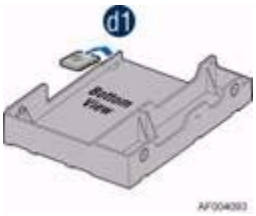

Figure 4-13 Breaking Tab on HDD Interface Bracket

5. Install the HDD interface bracket from the top.

   See Figure 4-14.

6. Secure the bracket with three screws.

   See **d2** in Figure 4-14.

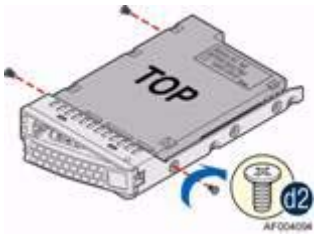

Figure 4-14 Inserting HDD Interface Bracket

7. Slide the HDD into the bracket to align the screw holes with the right and left rail.

   See **d3** in Figure 4-15.

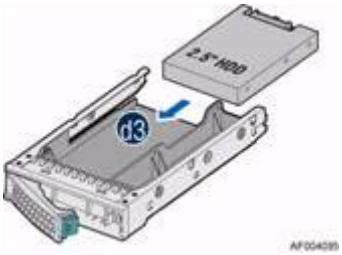

Figure 4-15 Sliding 2.5” HDD into Interface Bracket

8. Secure the hard disk drive using the four screws for HDD.

   See **d4** in Figure 4-16.

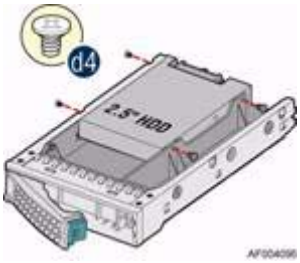

Figure 4-16 Securing 2.5” HDD in Interface Bracket

9. With the lever open, insert the hard disk drive assembly into the chassis.

   See **E** in Figure 4-12.

10. Push in the lever to lock it into place.

    See **F** in Figure 4-12.

Installing Hard Disk Drive into 2.5” Hard Drive Carrier

To install a 2.5” drive into a 2.5” drive carrier, use the following steps.

1. Remove the drive carrier by pressing the green latch to unlock.

   See **A** in Figure 4-17.

Figure 4-17 Unlatching 2.5” HDD Carrier

2. Pull out the black lever and slide the carrier out.

   See **B** in Figure 4-18.

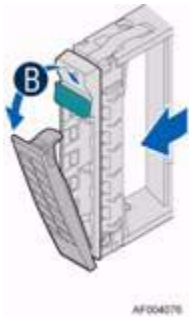

Figure 4-18 Removing 2.5” HDD Carrier

3. Remove the four screws securing the HDD or drive blank from the HDD carrier.

   See **C** in Figure 4-19.

4. Remove the drive from the HDD carrier.

   See **D** in Figure 4-19.

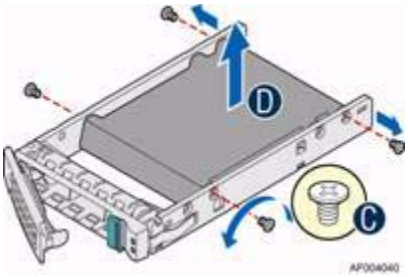

Figure 4-19 Removing 2.5” HDD from Carrier

5. Install the hard disk drive using the same four screws removed earlier.

   See Figure 4-20.

6. Ensure that the connector end of the drive matches the backplane connector.

   See **E** in Figure 4-20.

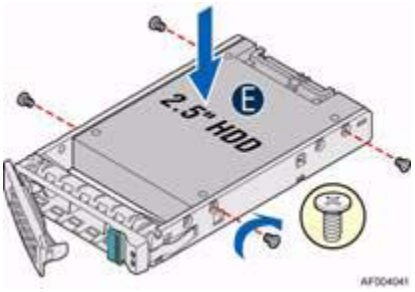

Figure 4-20 Inserting 2.5” HDD

7. With the lever open, insert the hard disk drive assembly into the chassis and push in the lever to lock it into place.

   See **F** in Figure 4-21.

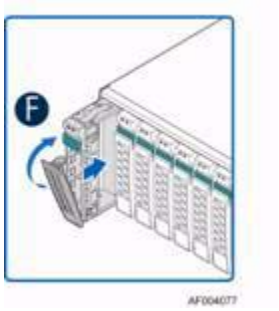

Figure 4-21 Inserting 2.5” HDD Carrier

Installing and Removing a Slimline Optical Drive

Caution: The slimline optical drive is not hot-swappable. Before removing or replacing the drive, you must first take the server out of service: turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the power cord from the system or wall outlet.

To maintain proper system cooling, a filler panel must be installed if you do not install a device at this location.

Installing a Slimline Optical Drive

1. Install the plastic guide onto the back of the drive and attach with two screws.

   See **A** in Figure 4-22

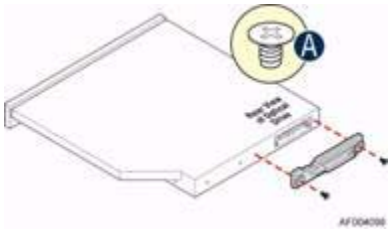

Figure 4-22 Installing the Plastic Guide to the Optical Drive

2. Insert the optical drive into chassis opening and push until it stops.

   See **B** in Figure 4-23.

3. Connect the cables.

   See **C** in Figure 4-23.

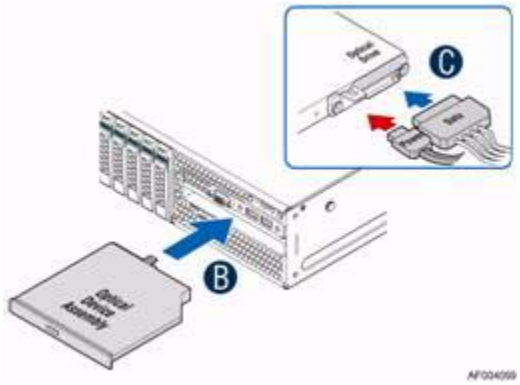

Figure 4-23 Installing an Optical Drive

Removing a Slimline Optical Drive

1. Remove the cables.

   See **A** in Figure 4-24.

2. Lift up the blue tab to release the optical drive.

   See **B** in Figure 4-24.

3. Slide the optical drive out.

   See **C** in Figure 4-24.

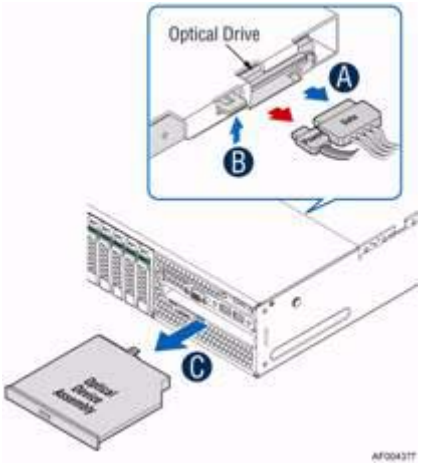

Figure 4-24 Removing the Optical Drive

4. If no device will be installed in this location, install a filler panel in this location.

Installing and Removing a Solid State Drive (SSD)

Installing an SSD

1. Place the SSD on the air duct.

   See **A** in Figure 4-25.

2. Secure the SSD with four screws.

   See **B** in Figure 4-25.

3. Connect the cables.

   See **C** in Figure 4-25.

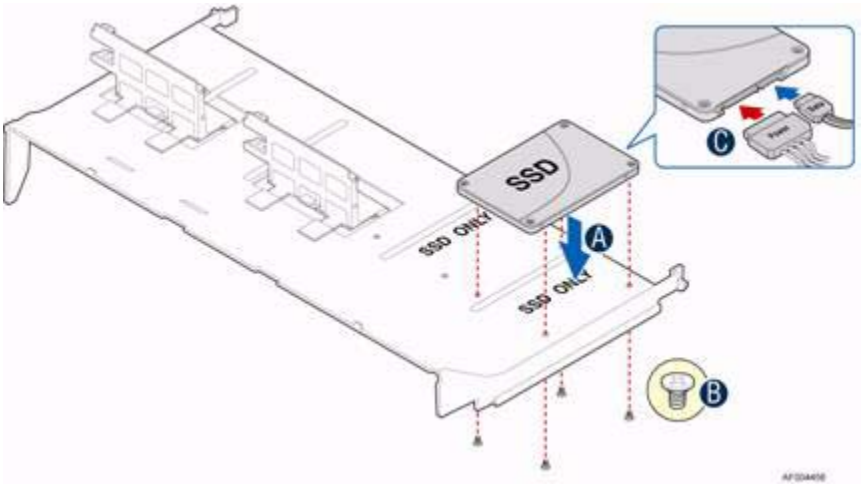

Figure 4-25 Installing an SSD

Removing an SSD

1. Disconnect the cables.

   See **A** in Figure 4-26.

2. Remove the four screws to release the SSD.

   See **B** in Figure 4-26.

3. Pull the SSD up to remove it from the air duct.

   See **C** in Figure 4-26.

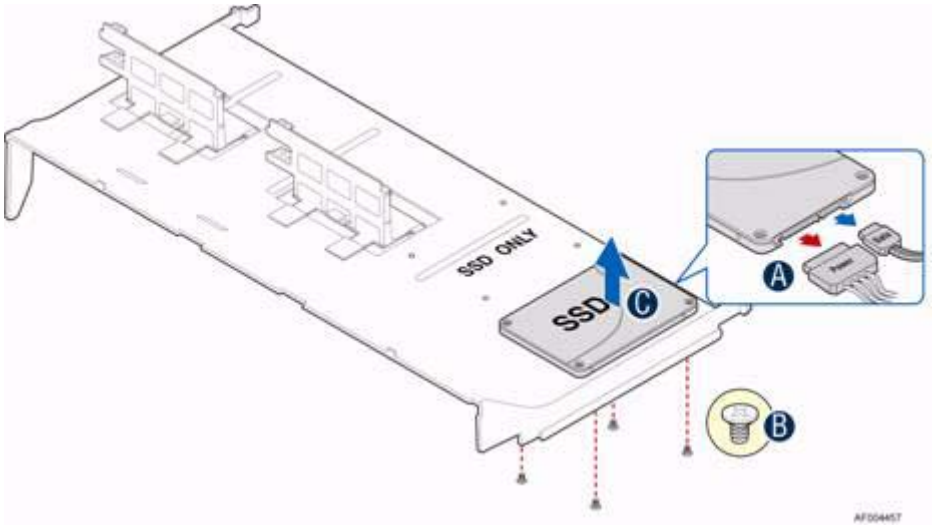

Figure 4-26 Removing an SSD

Replacing a System Fan

Use the following steps to replace a system fan.

1. Pull the system fan straight up to remove it from the fan holder.

   See Figure 4-27.

2. Replace the system fan.

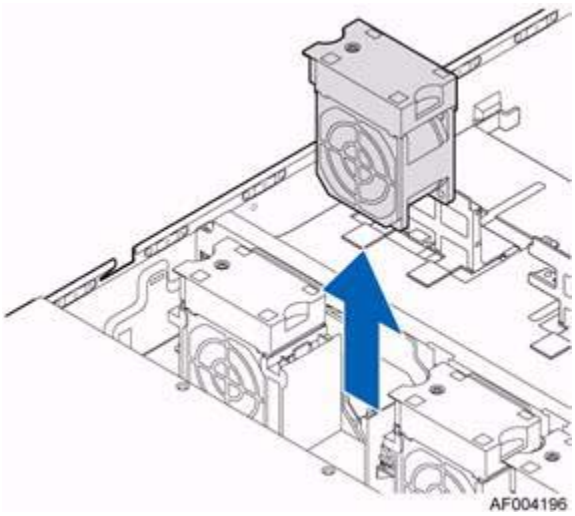

Figure 4-27 Replacing a Fan

Replacing the Backup Battery

The lithium battery on the serverboard powers the RTC for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.

Warning: There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to the manufacturer's instructions.

To replace the backup battery, use the following steps:

1. Locate the battery on the server board.
2. Gently press the metal clip as shown to release the battery.

   See **A** Figure 4-28.
3. Remove the battery from the plastic socket.

   See **B** in Figure 4-28.

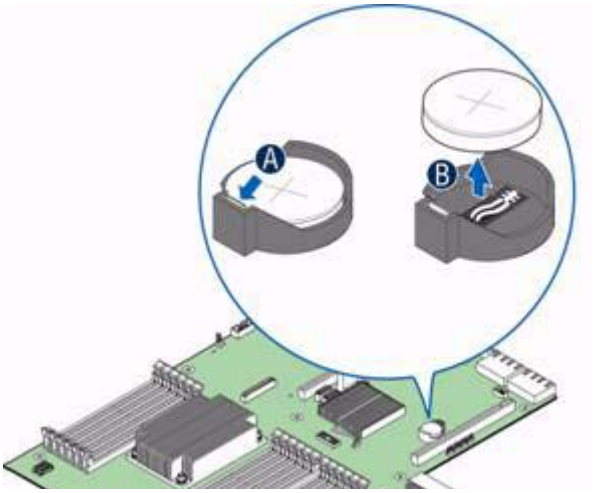

Figure 4-28 Replacing the Backup Battery

4. Dispose of the battery according to local ordinance.
5. Using the correct polarity, insert the new lithium battery in the battery socket.

Note: You will need to run the BIOS setup to restore the configuration settings to the real-time clock (RTC).

Mounting the Chassis to a Rack

A slide rail kit is bundled with the server and is packed in the same shipping box with the chassis. Use the following steps to install the chassis in the rack.

1. Remove the inner member from the slides as shown in Figure 4-29.

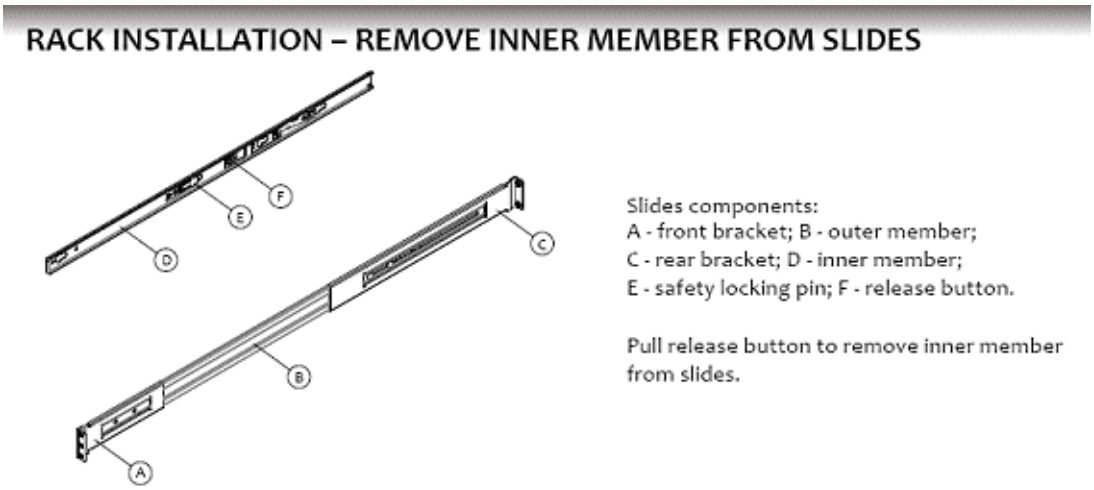

Figure 4-29 Removing Inner Member from Slides

2. Attach the slides to the rack as shown in Figure 4-30.

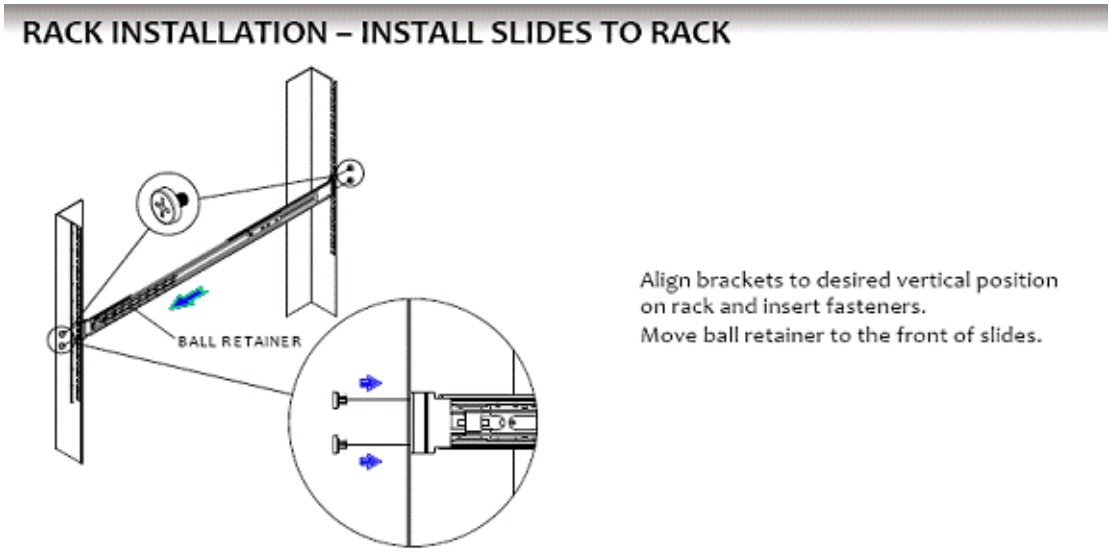

Figure 4-30 Attaching Slides to the Rack

3. Install the inner members to the chassis as shown in Figure 4-31.

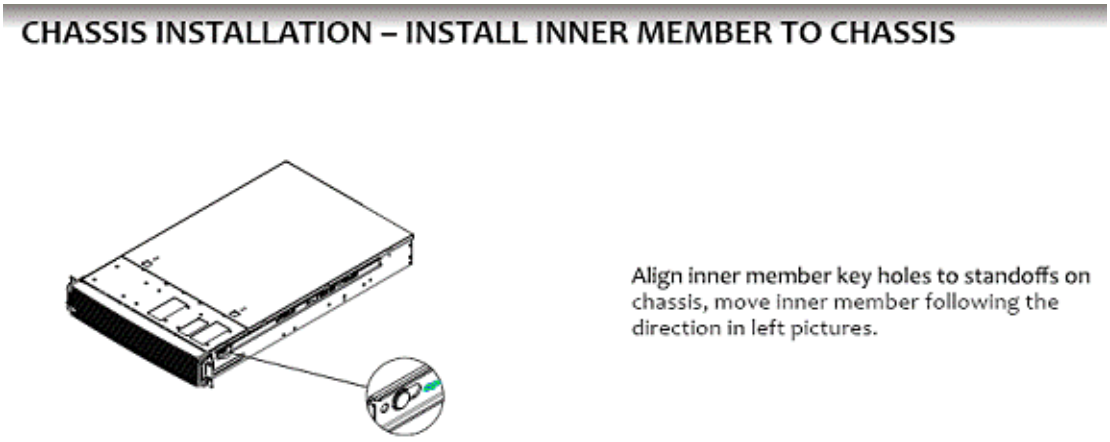

Figure 4-31 Installing the Inner Members to the Chassis

4. Install the chassis to the fixed slides as shown in Figure 4-32.

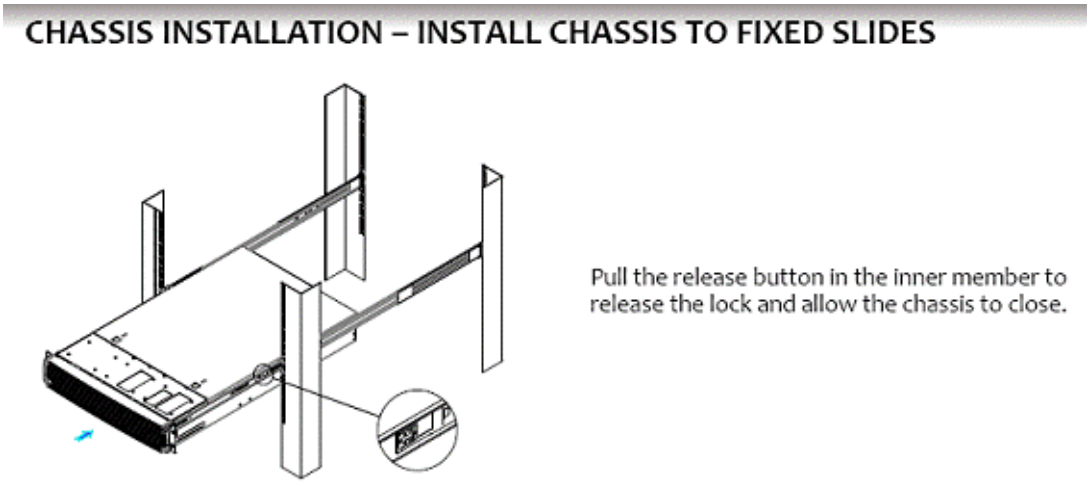

Figure 4-32 Installing the Chassis in the Rack

Removing the Chassis from a Rack

To remove the chassis from a rack, use the following steps:

1. Extend the slides as shown in Figure 4-33.

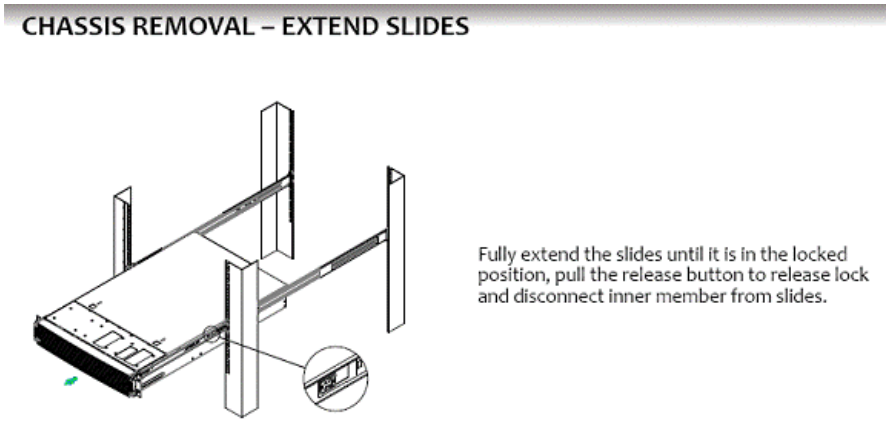

Figure 4-33 Extending Slides to Remove the Chassis

2. Remove the inner members from the chassis as shown in Figure 4-34.

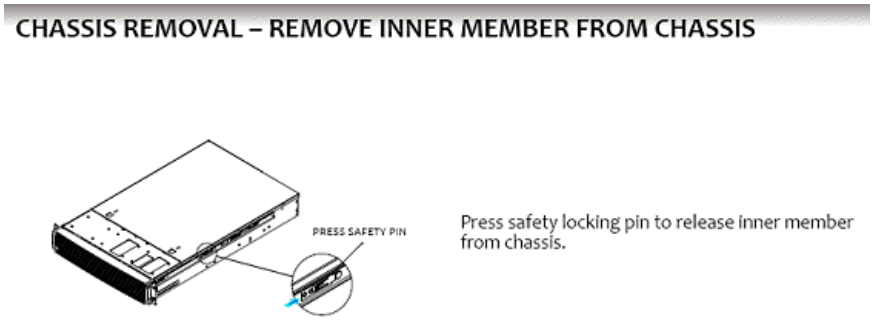

Figure 4-34 Removing the Inner Member from the Chassis

Power and Environmental Specifications

This appendix describes the following:

- "Power Supply Input Voltages" on page 51
- "Power Supply Output Voltages" on page 51
- "Environmental Specifications" on page 52

Power Supply Input Voltages

For a 750W power supply module, the following are the input specifications:

- 100 - 127 V at 50/60 Hz 8.2 A
- 200 - 240 V at 50/60 Hz 4.4 A

Power Supply Output Voltages

Table A-1 lists the total wattage available from the power subsystem for each voltage.

Table A-1 Power Supply Output Capability

Voltage	Maximum Current
12V	62.0A
12VSB	2.1A

Environmental Specifications

Table A-2 lists allowable ranges for temperature, humidity, and altitude for the server.

Table A-2 Temperature, Humidity, and Altitude Specifications

Attribute	Specification	Rate of Change Constraints
While Product Operating		
Temperature	– Up to 1500m (5000ft) +5°C (41°F) to +35°C (95°F) – 1525m (5000ft) to 3050m (10,000ft) Reduce max temperature (35°C) by 1°C per 305m (1000ft) of altitude above 1525m (5000ft).	Maximum: 10°C/hour (18°F/hour)
Humidity	20% to 80% Non-condensing	Maximum: 10% relative humidity/hour
Altitude	3050m (10,000ft)	
While Product Power Off		
Temperature	+5°C (41°F) to +45°C (113°F)	Maximum: 20°C/hour (36°F/hour)
Humidity	8% to 80% Non-condensing	
Altitude	3050m (10,000ft)	
While Product Packaged for Shipping		
Temperature	-40°C (-40°F) to +60°C (140°F)	Maximum: 20°C/hour (36°F/hour)
Humidity	8% to 80% Non-condensing	
Altitude	12,200m (40,000ft)	

Table A-3 lists additional environmental limits.

Table A-3 Miscellaneous Environmental Specifications

Attribute	Limits
Acoustic noise	Sound power: 7.0 BA in operating condition at typical office ambient temperature ($23^{o}C$ +/– $2^{o}C$).
Shock, operating	Half sine, 2 g peak, 11 milliseconds
Shock, unpackaged	Trapezoidal, 25 g, velocity change 136 inches/second (40 lbs to less than 80 lbs)
Shock, packaged	Non-palletized free fall in height 24 inches (40 lbs to less than 80 lbs)
Vibration, unpackaged	5 Hz to 500 Hz, 2.20 g RMS random
ESD	+/-12 KV, except I/O port +/- 8 KV per test specification
System cooling requirement in BTU/Hr	460 Watt Max – 1570 BTU/hour 750 Watt Max – 2560 BTU/hour

Regulatory Compliance Information

Table B-1summarizes the product regulatory compliance.

Table B-1 Product Regulatory Compliance

Category	Compliance Information
Electromagnetic Emissions	FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A
Electromagnetic Immunity	EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)
Safety	CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)
Perchlorate Materials	California Best Management Practices Regulations for Perchlorate Materials: ”This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. Special handling for perchlorate material may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate.”

Rail Kit Installation

If the chassis for your server does not have pre-installed rail slides, SGI provides a rail kit. Use the following steps to install the rail kit.

1. Attach the slide rails to the racks as shown in Figure C-1.

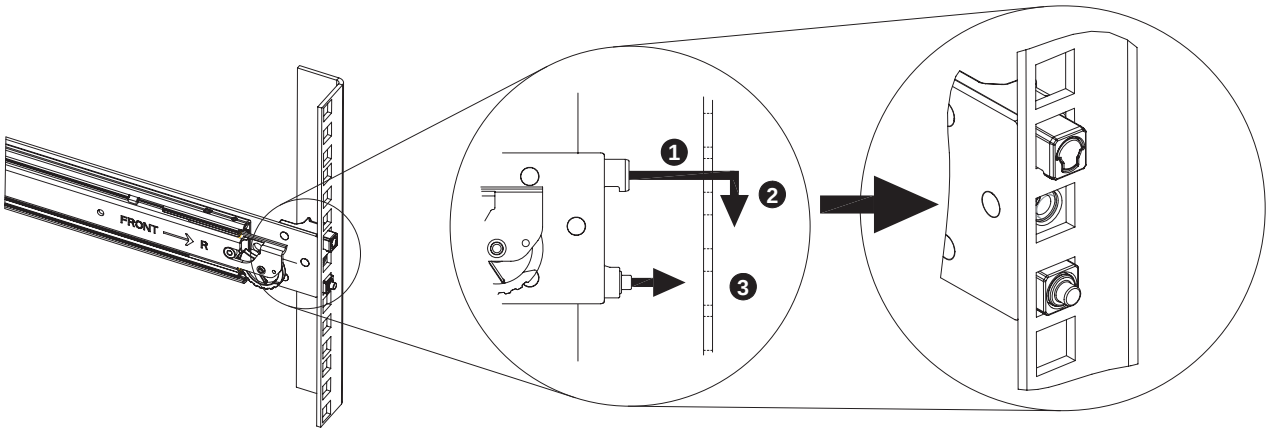

Figure C-1 Attaching Rail Slides to Rack

2. Fully extend the rail slides as shown in Figure C-2.

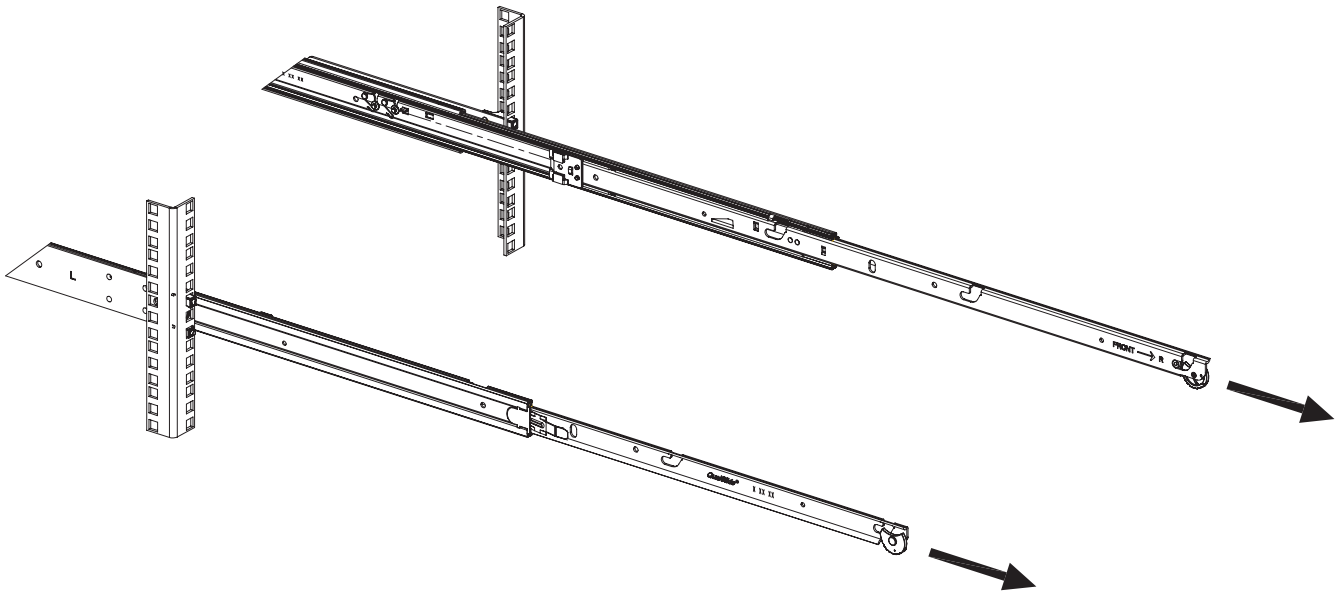

Figure C-2 Extending Rail Slides

3. Attach the chassis to the rail slides as shown in Figure C-3.

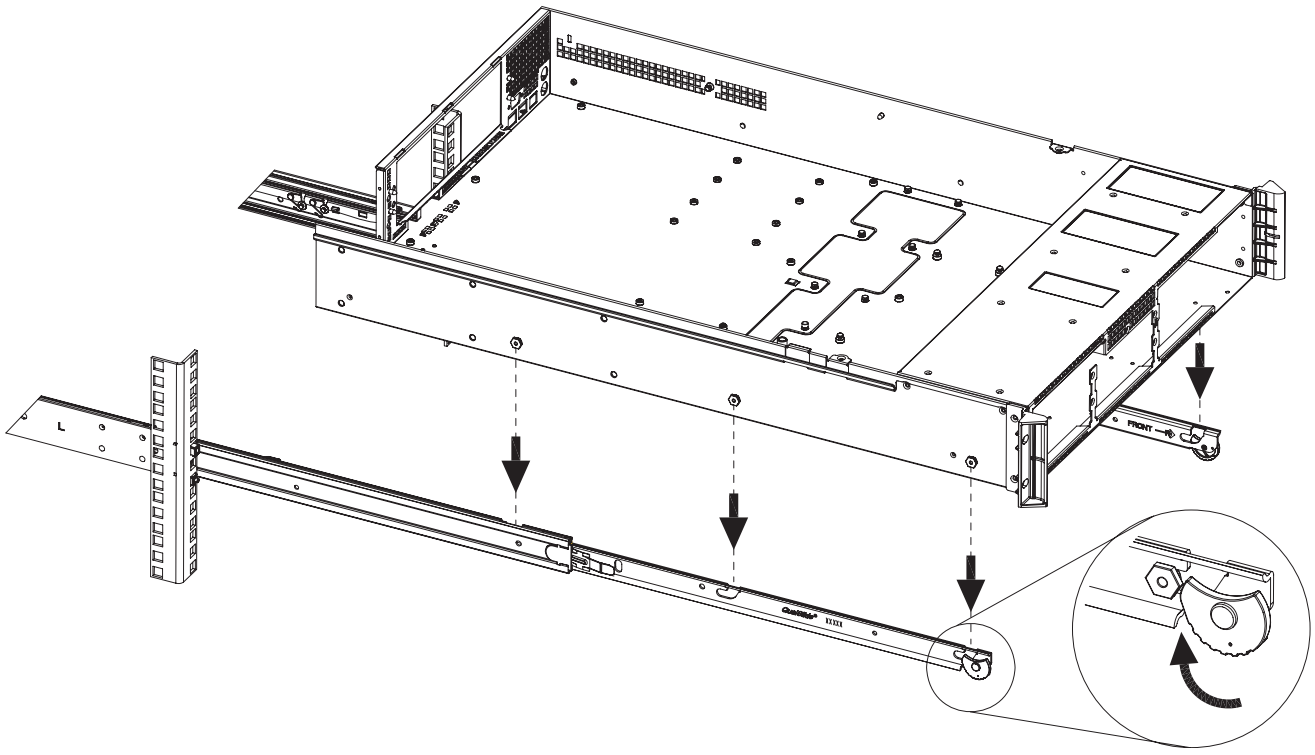

Figure C-3 Attaching Chassis to Rail Slides

4. Push the release tab and push the chassis into the rack as shown in Figure C-4.

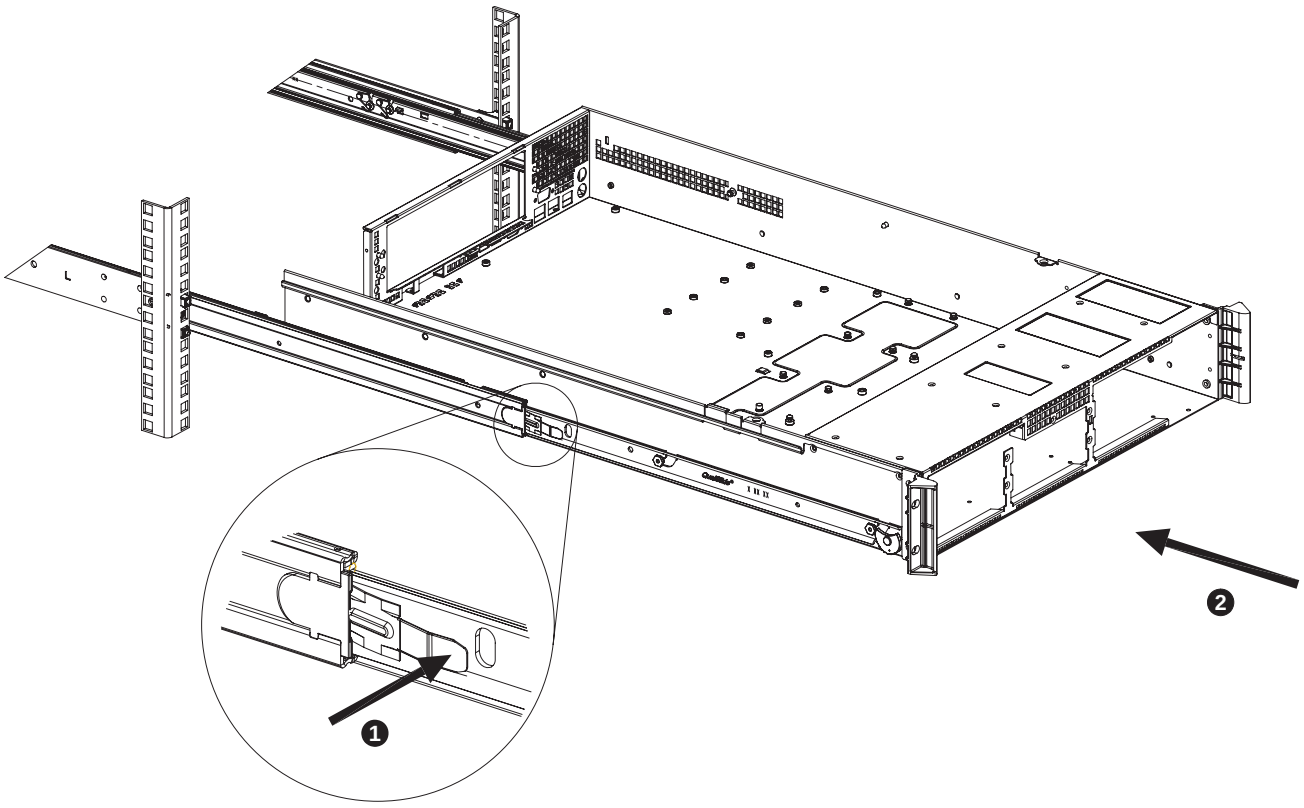

Figure C-4 Rail Slide Release Tab

BMC Error Codes

The BMC may generate beep codes upon detection of failure conditions. Beep codes are sounded each time the problem is discovered (for example, on each power-up attempt) but are not sounded continuously. Common supported codes are listed in Table D-1.

In Table D-1, each digit in the code is represented by a sequence of beeps whose count is equal to the digit.

Table D-1 BMC Beep Codes

Beep Code	Reason for Beep	Associated Sensors	Supported
1-5-2-1	No CPUs installed or first CPU socket is empty.	CPU Missing sensor	Yes
1-5-2-4	MSID Mismatch.	MSID Mismatch sensor.	Yes
1-5-4-2	Power fault: DC power is unexpectedly lost (power good dropout).	Power unit—power unit failure offset.	Yes
1-5-4-4	Power control fault (power good assertion timeout).	Power unit—soft power control failure offset.	Yes
1-5-1-2	VR Watchdog Timer sensor assertion	VR Watchdog timer	
1-5-1-4	The system does not power on or unexpectedly powers off and a power supply unit (PSU) is present that is an incompatible model with one or more other PSUs in the system.	PSU status	