Sun Fire X4270 M2 Server

Service Manual

![Sun Oracle logo]

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Contents

Preface

This service manual provides detailed procedures for removing and replacing components in the Sun Fire X4270 M2 Server from Oracle. This document also includes information about the use and maintenance of the server.

It is written for technicians, system administrators, authorized service providers, and users who have advanced experience troubleshooting and replacing hardware.

This preface contains the following topics:

- "Product Information" on page xi
- "Related Documentation" on page xii
- "Feedback" on page xii
- "Support and Accessibility" on page xiii

Product Information

For information about the Sun Fire X4270 M2 Server, go to the following web site:

http://www.oracle.com/goto/x4270m2

At that site, you can find links and navigate to the following information and downloads:

- Product information and specifications
- Supported operating systems
- Software and firmware downloads
- Power calculator

Related Documentation

The related documents listed in the following table and are available online at:

`http://docs.sun.com/app/docs/prod/sf.x4270m2#hic`

Documentation	Link
All Oracle products	`http://www.oracle.com/documentation`
Sun Fire X4270 M2 Servers documentation	`http://www.oracle.com/pls/topic/lookup?ctx=E19245-01`
Oracle Integrated Lights Out Manager (ILOM) 3.0 documentation	`http://www.oracle.com/pls/topic/lookup?ctx=ilom30`
Oracle Hardware Management Pack documentation	`http://www.oracle.com/pls/topic/lookup?ctx=ohmp`

Translated versions of some of these documents are available at the web site URL listed above this table. English documentation is revised more frequently and might be more up-to-date than the translated documentation.

Feedback

Provide feedback about this documentation at:

`http://www.oracle.com/goto/docfeedback`

Support and Accessibility

Description	Links
Access electronic support through My Oracle Support	http://support.oracle.com
	For hearing impaired:
	http://www.oracle.com/accessibility/support.html
Learn about Oracle's commitment to accessibility	http://www.oracle.com/us/corporate/accessibility/index.html

Sun Fire X4270 M2 Server Overview

This chapter provides an overview of the features of the server.

The following information is included:

- "Product Description" on page 1-1
- Section 1.2, "Server Chassis Overview" on page 1-3
- Section 1.3, "Server Front Panel Features" on page 1-6
- Section 1.4, "Server Back Panel Features" on page 1-9
- Section 1.5, "Server Status Indicators and LEDs" on page 1-10

1.1 Product Description

The server is an enterprise-class two-socket rackmount x64 system powered by the Intel Xeon processor, packing high-performance and expansion capability into a compact 2 rack unit footprint.

The Sun Fire X4270 M2 Server product features are listed in TABLE 1-1.

TABLE 1-1 Sun Fire X4270 M2 Server System Features

Feature	Description
Processor	• Intel Xeon processor 5600 series • Supports up to two processors with two Intel processor sockets
Memory	18 slots for DDR3 DIMMs: Up to 144 GB of 1333-MHz ECC registered DDR3 memory
Ethernet ports	Four ports, 10/100/1000 Mbps, auto-negotiating through two separate controllers

TABLE 1-1 Sun Fire X4270 M2 Server System Features *(Continued)*

Feature	Description
Internal storage drives	Available in two configurations: • Up to 12, 3.5-inch SAS, SATA, or SSD storage drives with HW RAID controller or • Up to 24, 2.5-inch SAS, SATA, or SSD storage drives with HW RAID controller
Boot Drives	Two rear-mounted boot drives (optional).
Removable media	None
USB ports	Five USB 2.0 ports, two front, two in rear, one internal.
Service ports	• One RJ-45 serial management port (SER MGT) (default connection to access service processor) • One 10/1000-Mbps network management port (NET MGT) (to access service processor) • One HD-15 VGA video port
Cooling	• Six hot-swappable system fan modules • An air baffle that facilitates processor/memory airflow
PCI interfaces	The number of PCIe2 slots supported varies with the server configuration: • Server without rear-mounted boot drives: Three risers, each having two standard low-profile PCIe2 slots, for a total of six x8 slots. Two slots support native x8 electrical/mechanical, and four slots are active and support switched x8 electrical/mechanical. or • Server with rear-mounted boot drives: Two risers, each having two standard low profile PCIe2 slots, for a total of four x8 slots. Two slots support native x8 electrical/mechanical, and two slots are active and support switched x8 electrical/mechanical.
Power	• AC power: 100–120/200–240 V AC, 13/6.5 A, 50–60 Hz • Up to two hot-swappable 1200W power supply units (PSUs) to provide N+N redundancy, with energy efficient design

TABLE 1-1 Sun Fire X4270 M2 Server System Features *(Continued)*

Feature	Description
Remote management	Oracle ILOM service processor providing: • Command-line interface (CLI) over SSH • Web-based browser interface (BUI) over HTTPS • IPMI 2.0 • SNMP (v1, v2c, and v3) • Remote graphical access (remote KVM) over Ethernet • Remote storage over Ethernet
Operating system	Supports: • Solaris 10 10/09 and subsequent releases • Oracle Linux 5.4 (64-bit) • Red Hat Enterprise Linux 5.4 (64-bit) • SUSE Linux Enterprise Server (SLES) 10 SP3 (64-bit) • SLES 11 (64-bit) • Oracle VM Version 2.2.1 • VMware ESX 4.0 Update 1 • VMware ESXi 4.0 Update 1 • Microsoft Windows Server 2008 SP2 (64-bit) Standard Edition/Enterprise Edition (64-bit)/Datacenter Edition(64-bit) • Microsoft Windows Server 2008 R2 Standard Edition/Enterprise Edition/Datacenter Edition
Other software	Java Enterprise System with a 90-day trial license

See the *Sun Fire X4170 M2 and X4270 M2 Servers Product Notes* for additional information.

1.2 Server Chassis Overview

The following sections provide an overview of the server chassis.

1.2.1 Infrastructure Boards

The server boards are listed in TABLE 1-2.

TABLE 1-2 Infrastructure Boards

Board	Description	Reference
Motherboard	The motherboard includes 2 sockets to 2 CPU modules, slots for 18 DIMMs; 1 port for a USB flash drive, support for 2 rear-mounted, 2.5-inch SATA HDDs; and the ILOM service processor. The ILOM service processor (SP) controls the host power and monitors host system events (power and environmental). The ILOM SP draws 3.3V standby power from the power supply when AC power is applied (without the host being powered on) even when the system is turned off.	Section 4.8, "Servicing the Motherboard" on page 4-36
Power distribution board	This board distributes main 12V power from the power supplies to the rest of the system. It is directly connected to the connector board, and connects to the motherboard via a bus bar and ribbon cable. The power distribution board also has a connector for connecting the top-cover interlock ("kill") switch.	Section 5.6, "Servicing the Power Distribution Board" on page 5-18
Connector board	This board serves as the interconnect between the power distribution board and the fan power board, disk backplane, and the I/O board.	Section 5.7, "Servicing the Connector Board" on page 5-21
Fan power board	This board carries power to the system fan modules. In addition, this board transfers sensor data for the fan modules.	Section 5.3, "Servicing the Fan Board" on page 5-6

TABLE 1-2 Infrastructure Boards *(Continued)*

Board	Description	Reference
Disk backplane	This board includes the connectors for the storage drives, power cables, and signal cable, as well as the interconnect for the I/O board, Power and Locator buttons, and system/component status LEDs. The server can have either a 12-disk backplane or a 24-disk backplane. Each storage drive has Power/Activity and Fault LEDs.	Section 5.4, "Servicing the Disk Backplane" on page 5-9
SAS expander board	This board serves as an interface between the disk backplane and the storage drive cables that connect to the HBA PCIe card.	Section 5.2, "Servicing the SAS Expander Board" on page 5-3
PCIe2 risers	The number of PCIe2 risers supported varies with the server configuration: • **Server without rear-mounted boot drives:** Three risers, each having two standard low-profile PCIe2 slots, for a total of six x8 slots. Two slots support native x8 electrical/mechanical, and four slots are active and support switched x8 electrical/mechanical. or • **Server with rear-mounted boot drives:** Two risers, each having two standard low-profile PCIe2 slots, for a total of four x8 slots. Two slots support native x8 electrical/mechanical, and two slots are active and support switched x8 electrical/mechanical.	Section 4.4, "Servicing PCIe Risers" on page 4-17

1.2.2   Dimensions and Weight

The chassis form factor dimensions and weight are listed in TABLE 1-3.

TABLE 1-3   Servers Dimensions

Parameter	Sun Fire X4270 M2 Server
Height	3.43 inches/87.12 mm
Width	16.75 inches/425.45 mm
Depth	30.0 inches/762.0 mm
Weight	65 lb/29.54 kg

1.2.3 Internal System Cables

The server internal cables are listed in TABLE 1-4.

TABLE 1-4 Server Cables

Cable	Connects...
Top cover interlock cable	To the power distribution board
Power distribution board ribbon cable	Between the power distribution board and the motherboard
Power supply ribbon cable	Between the power distribution board and the power supplies
Storage drive data cables	Between the motherboard HBA PCI-Express card and the SAS expander board
Fan power board cables	Between the connector board and fan power board
Disk backplane cables	Between the connector board and disk drive backplane
Front panel light pipe assembly cables	Between the light pipe assembly and the disk drive backplane
Rear-mounted Boot Disk Drive power and data cables	• Power cable: between the boot disk drive assembly to the motherboard • Data cables: between the boot disk drive and the on-board SATA controller

1.3 Server Front Panel Features

FIGURE 1-1 shows front panel features on the Sun Fire X4270 M2 Server with 12, 3.5-inch, storage drives.

FIGURE 1-1 Front Panel Features on Server With 12 Storage Drives

Figure Legend

1	Product Serial Number (PSN) label and Radio Frequency Identification (RFID) tag	**6**	TOP FAN Fault LED
2	Power Button	**7**	PS (Power Supply) REAR Fault LED
3	Locator LED/Button	**8**	System Overtemperature Fault LED
4	Service Action Required LED (System Level)	**9**	USB ports (2)
5	Power/OK LED	**10**	Disk Configuration Label

FIGURE 1-2 shows front panel features on the Sun Fire X4270 M2 Server with 24, 2.5-inch, storage drives.

FIGURE 1-2 Front Panel Features on Server With 24 Storage Drives
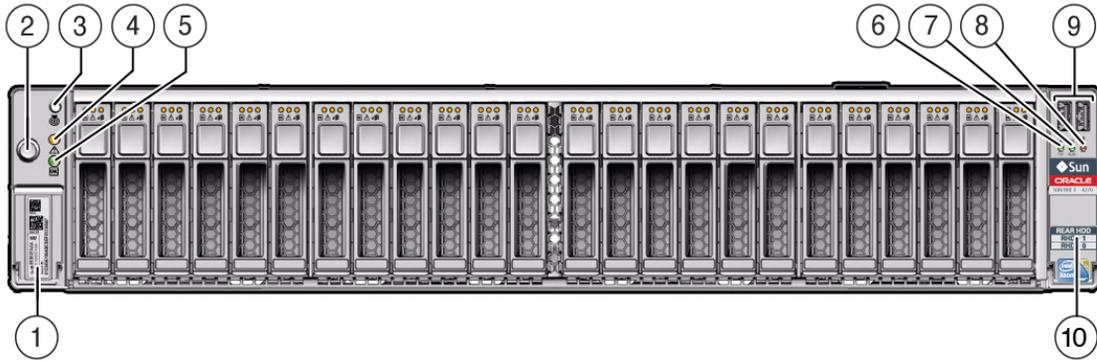
Figure Legend

1	Product Serial Number (PSN) Label and Radio Frequency Identification (RFID) tag	**6**	System Overtemperature LED
2	Power button	**7**	PS (Power Supply) REAR Fault LED
3	Locator LED/Locator button	**8**	TOP FAN Fault LED
4	Service Action Required LED	**9**	USB Ports (2)
5	Power/OK LED	**10**	Disk Drive Layout Label

1.4 Server Back Panel Features

FIGURE 1-3 shows back panel features on the Sun Fire X4270 M2 Server.

FIGURE 1-3 Back Panel Features of Server Without the Rear-Mounted Boot Drives
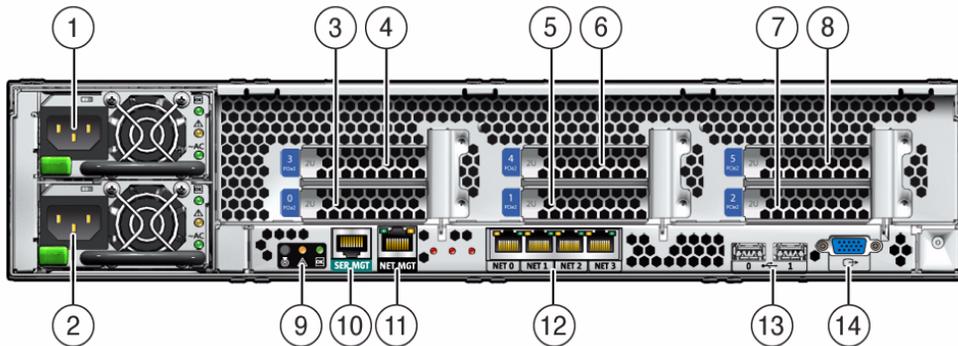
Figure Legend

1	Power Supply Unit 1 (PSU1)	**8**	PCIe2 Slot 5
2	Power Supply Unit 0 (PSU0)	**9**	Rear Panel System Status LEDs: Locator LED/Locator button (white) Service Action Required LED (amber) Power/OK LED (green)
3	PCIe2 Slot 0	**10**	Serial Management Port (SERMGT)
4	PCIe2 Slot 3	**11**	Network Management Port (NETMGT)
5	PCIe2 Slot 1	**12**	Gigabit Ethernet Ports (0, 1, 2, 3)
6	PCIe2 Slot 4	**13**	USB Ports 2.0 (0, 1)
7	PCIe2 Slot 2	**14**	HD-15 Video Port

FIGURE 1-4 shows back panel features on the Sun Fire X4270 M2 Server with rear-mounted disk drives.

FIGURE 1-4 Back Panel Features of Server With Rear-Mounted Boot Drives
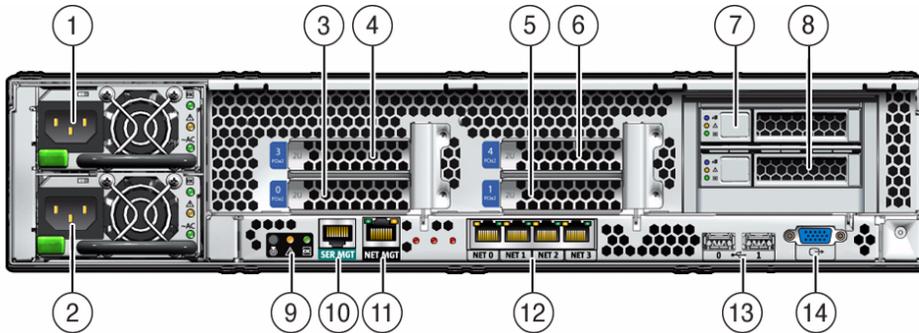
Figure Legend

1	Power Supply Unit (PSU) 0	8	Boot Disk Drive 0
2	Power Supply Unit (PSU) 1	9	Rear Panel System Status LEDs: Locator LED/Locator button (white) Service Action Required LED (amber) Power/OK LED (green)
3	PCIe2 Slot 0	10	Serial Management Port (SERMGT)
4	PCIe2 Slot 3	11	Network Management Port (NETMGT)
5	PCIe2 Slot 1	12	Gigabit Ethernet Ports (0, 1, 2, 3)
6	PCIe2 Slot 4	13	USB Ports 2.0 (0, 1)
7	Boot Disk Drive 1	14	HD-15 Video Port

For a detailed description of PCIe2 slots, see Section 4.5.2, "PCIe Card Configuration Guidelines" on page 4-22.

1.5 Server Status Indicators and LEDs

The server provides many status indicators and LEDs to assist you in monitoring and managing the server.

- Section 1.5.1, "Server General Status Indicators" on page 1-11
- Section 1.5.2, "Server Fan LEDs" on page 1-12
- Section 1.5.3, "Storage and Boot Drive LEDs" on page 1-13
- Section 1.5.4, "Power Supply LEDs" on page 1-13
- Section 1.5.5, "Motherboard LEDs" on page 1-14

1.5.1 Server General Status Indicators

There are six system-level indicators, some of which are located on both the server front panel and the server back panel. These indicators are described in TABLE 1-5.

TABLE 1-5 Server General Status LEDs

Indicator/LED Name	Icon	Color	State Meaning
Power/OK	OK	Green	This LED indicates the operational state of the chassis. This LED can be in the following states: • OFF – AC power is not present or the ILOM boot has not completed. • STANDY BLINK – Standby power is on, but the chassis power is off and the ILOM SP is running. • SLOW BLINK– Startup sequence has been initiated on the host. This pattern should begin soon following powering on the server. This status indicates either 1)POST diagnostics running on server host system, or 2) the host is transitioning from the powered-on state to the standby state on shutdown. • STEADY ON – The server is powered on and all host POST tests have completed. The server is in one of the following states: 1) the server host is booting the operating system (OS), 2) the server host is running the OS.
Service Required	⚠	Amber	• OFF – Normal operation • STEADY ON – Fault present on server. This indicator lights whenever a fault LED lights for a server replaceable component. **Note -** The lighting of this indicator is always accompanied by the system console message that includes a recommended service action.
Locate	⊚	White	• OFF – Server is operating normally • FAST BLINK – Use ILOM to activate this indicator to enable you to locate a particular system quickly and easily. • Pressing the Locate button will toggle LED FAST BLINK on or off.

TABLE 1-5   Server General Status LEDs *(Continued)*

Indicator/LED Name	Icon	Color	State Meaning
Top Fan Failure	TOP FAN	Amber	Indicates that one or more of the internal system fan modules have failed. • OFF – Indicates steady state; no service action is required. • STEADY ON – Indicates service action required; service the fans.
Rear Power Supply Failure	REAR PS	Amber	Indicates that one of the server power supplies has failed. • OFF – Indicates steady state; no service action is required. • STEADY ON – Indicates service action required; service the power supply.
Overtemp		Amber	OFF – Normal operation; no service action required. STEADY ON – The system is experiencing an overtemperature warning condition. **Note -** This is a warning indication, not a fatal overtemperature. Failure to correct this might result in the system over heating and shutting down unexpectedly.

1.5.2   Server Fan LEDs

Each fan module has one bicolored, status LED. These LEDs are located on the server side wall adjacent to the fan modules and are visible when the top cover fan door is open. See TABLE 1-6.

TABLE 1-6   Server Fan Status LEDs

LED Name	Icon	Color	State Meaning
Fan Status	None	Bicolored: Amber/Green	• Amber – There is a fan fault. • Green – Fan is properly installed and functioning correctly. No fan errors detected.

1.5.3 Storage and Boot Drive LEDs

There are three LEDs on each drive. See TABLE 1-7.

TABLE 1-7 Server Front Storage and Boot Disk Drive LEDs

LED Name	Icon	Color	State Meaning
Activity	OK	Green	• OFF – Power is off or installed drive is not recognized by the system. • STEADY ON – The drive is engaged and is receiving power. • STANDBY BLINK – There is disk activity. LED blinks on and off to indicate activity.
Service Required	⚠	Amber	• OFF - Normal operation. • STEADY ON – The system has detected a fault with the storage drive.
Ready to Remove		Blue	The storage drive can be removed safely during a hot-plug operation.

1.5.4 Power Supply LEDs

There are three LEDs on each power supply. These LEDs are visible from the rear of the server. See TABLE 1-8.

TABLE 1-8 Server Power Supply LEDs

LED Name	Icon	Color	State Meaning
DC OK	OK	Green	• STEADY ON – Normal operation. DC output voltage is within specification. • OFF: 12V power is disabled.
Service Required	⚠	Amber	• OFF – Normal operation; no service action required. • STEADY ON – The power supply (PS) has detected a PS fan failure, PS overtemperature, PS over current, or PS over/under voltage.
AC OK	~AC	Green	• OFF – No AC power is present. • STEADY ON – Normal operation. Input power is above minimum specification.

1.5.5 Motherboard LEDs

The motherboard and modules that are installed on the motherboard contain several LEDs, which are described in the following sections:

Note – A super capacitor provides sufficient power for the motherboard LEDs to be lit for up to 15 minutes after the removal of the server's top cover. After 15 minutes, the capacitor might be discharged enough so that lighting the fault LEDs is not possible.

1.5.5.1 DDR3 DIMM Fault LEDs

Each of the 18 DDR3 DIMM slots on the motherboard has an amber fault LED associated with it. If ILOM determines that a DIMM is faulty, pressing the Fault Remind button on the motherboard signals the service processor to light the fault LED(s) associated with the faulted DIMM(s).

1.5.5.2 CPU Fault LEDs

The motherboard includes a fault LED adjacent to each of the two CPU sockets. These LEDs indicate when a CPU is faulty. For example, if on reboot the BIOS detects that there are uncorrectable CPU errors recorded in the MCA registers apparently left over from the previous boot, then the BIOS and ILOM work together to record and diagnose these errors. If it is determined that a CPU is faulty, pressing the Fault Remind button on the motherboard signals the service processor to light the fault LED(s) associated with the faulted CPU(s).

1.5.5.3 Fault Remind Super Capacitor Power LED

This LED is located next to the Fault Remind button and is powered from the super capacitor that powers the fault LEDs on the motherboard. This LED lights to indicate to the user that the fault remind circuitry is working properly in cases where no components have failed and, as a result, none of the component fault LEDs illuminate.

1.5.5.4 Connector Board 12V Power LEDs

The connector board has two LEDs (CR7 and CR8) that light green when +12 volts is being applied to the connector board. These LEDs are located to the left of the fan board connector on the connector board. For the location of the fan board connector, see TABLE 5-1 and FIGURE 5-9.

1.5.5.5 Power distribution Board 5V Power LED

The power distribution board (PDB) 5V power LED (CR0601) lights green when +5 volts is being applied to the PDB. This LED is located to the right of the motherboard ribbon cable connector when viewing the PDB from the front of the server.

1.5.5.6 3.3V_STANDBY OK LED

The service instructions for all internal components require that all AC power be removed from the power supplies prior to the server's top cover being removed. This green LED is located on the motherboard near the rear of the server and it lights to inform a service technician that the motherboard is receiving standby power from at least one of the power supplies. This indicator is provided to help prevent service actions on the server's internal components while the AC line-cords are installed and power is being supplied to the server.

Preparing to Service the System

This chapter describes how to prepare the server for servicing.

The following topics are covered:

2.1   Safety Information

This section describes important safety information that you need to know prior to removing or installing parts in the Sun Fire X4270 M2 Server.

Caution – Hazardous voltage present. Never attempt to run the server with the cover removed.

Caution – Equipment damage possible. The covers must be in place for proper airflow.

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions, warnings, and instructions marked on the equipment and described in the *Important Safety Information for Sun Hardware Systems* (821-1590).

- Follow all cautions, warnings, and instructions marked on the equipment and described in the *Sun Fire X4170 M2 and X4270 M2 Servers Safety and Compliance Guide*.

- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.

- Follow the electrostatic discharge safety practices as described in this chapter.

2.2   Required Tools

The Sun Fire X4270 M2 Server can be serviced with the following tools:

- Antistatic wrist strap
- Antistatic mat
- 4 mm Hex wrench
- No. 2 Phillips screwdriver
- Straight-edge screw driver
- Stylus or pencil (to power the server on and off and to press the CLEAR CMOS button)

2.3   Obtaining the Chassis Serial Number

To obtain support for your server, you need your chassis serial number. The chassis serial number is located on a sticker on the front of the server and on another sticker on the top of the server.

2.4 Powering On and Off the Server

Refer to the following topics in this section to power on and off a server:

- Section 2.4.1, "Power On the Server" on page 2-3
- Section 2.4.2, "Power Off the Server" on page 2-4
- Section 2.4.3, "Power Off the Server Using the ILOM SP Command-Line Interface" on page 2-4

2.4.1 Power On the Server

Note – The following procedure assumes that the power cord is connected to the server and power is being supplied to the server's power supply, and that the server has been previously powered on according to the installation instructions in the *Sun Fire X4170 M2 and X4270 M2 Servers Installation Guide*.

1. **Verify that the server is in the standby power state.**

   In the standby power state, the OK/Power LED on the front panel of the server blinks (0.1 second on, 2.9 seconds off). The standby power state indicates that the server SP is active but the server host is powered off.

   For the location of the OK/Power LED, see FIGURE 1-1.

2. **Apply full power to the server SP and host.**

   For example:

   - Local server power-on. Press and release the recessed Power button on the front panel of the server.

     For the location of the Power button on the server, see FIGURE 1-1.

   - **ILOM SP web interface power-on**. Log in to the ILOM web interface for the server SP and select: `Remote Control->Remote Power Control`, then select `Power On` from the Select Action list box.

   - **ILOM SP CLI power on**. Log in to the SP ILOM CLI and type: **`start /SYS`**

   The Power/OK LED illuminates a SLOW BLINK while the system is executing its BIOS firmware. The Power/OK LED illuminates STEADY ON when the BIOS firmware completes and the operating system boot begins.

2.4.2 Power Off the Server

To remove main power from the server, use one of the methods shown in the following table.

TABLE 2-1   Shutdown Procedures

Shutdown	Method
Graceful shutdown	Press and release the Power button on the front panel (FIGURE 1-1). Pressing the power button causes Advanced Configuration and Power Interface (ACPI)-enabled operating systems to perform an orderly shutdown of the operating system. Servers not running ACPI-enabled operating systems will shut down to standby power mode immediately. **Note -** Some operating systems might prompt the user for confirmation of the shutdown before actually turning off the system.
Emergency shutdown	Press and hold the Power button for at least five seconds until the main power is off and the server enters standby power mode (FIGURE 1-1). ⚠ **Caution -** All applications and files will be closed abruptly without saving changes. File system corruption might occur.
ILOM SP CLI shutdown	See Section 2.4.3, "Power Off the Server Using the ILOM SP Command-Line Interface" on page 2-4.

⚠ **Caution –** To completely power off the server, you must disconnect the AC power cords from the back panel of the server.

2.4.3 Power Off the Server Using the ILOM SP Command-Line Interface

You can use the ILOM service processor (SP) to perform a graceful shutdown of the server and ensure that all of your data is saved and the server is ready for restart.

1. Log in as root. Type:

ssh root@*host* (Where host is either a hostname, when using DNS, or the ip address of the server SP.)

Password: *root_password* (The default password is changeme.)

The ILOM command-line interface (CLI) prompt appears (->).

Depending on the type of problem, you might want to view server status or log files, or run diagnostics before you shut down the server.

2. **Notify affected users that the server will be shut down.**

3. **Save any open files and quit all running programs.**

   Refer to your application documentation for specific information.

4. **Power down the server. Type:**

   -> **stop /SYS** (for a Graceful shutdown as defined in)

   -> **stop -f/SYS** (for an Emergency Shut as defined in)

   For additional information, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection.

2.5 About the BIOS

The Basic Input/Output System (BIOS) has a Setup Utility stored in the BIOS flash memory. The Setup Utility reports system information and can be used to configure the BIOS settings. The configurable data is provided with context-sensitive help and is stored in the system's battery-backed CMOS RAM. If the configuration stored in the CMOS RAM is invalid, the BIOS settings return to their default optimal values.

There are seven menus in the BIOS Setup Utility, which appear in this order: Main, Advanced, PCI, Boot, Security, Chipset, and Exit. To navigate the menus or options listed on the menu, use the arrow keys. The options or fields that you can configure on a menu appear in color. For further instructions on how to navigate and change settings in the BIOS Setup Utility, refer to the online instructions provided on the menu.

For additional information about the BIOS operations and menu options available on your server, refer to the following sections:

2.5.1 BIOS Booting and Setup Considerations

Refer to the following sections for information when booting the BIOS and other set up considerations:

- Section 2.5.1.1, "Default BIOS Power-On Self-Test (POST) Events" on page 2-6
- Section 2.5.1.2, "BIOS POST F1 and F2 Errors" on page 2-7
- Section 2.5.1.3, "How BIOS POST Memory Testing Works" on page 2-10
- Section 2.5.1.4, "Ethernet Port Device and Driver Naming" on page 2-11
- Section 2.5.1.5, "Ethernet Port Booting Priority" on page 2-12
- Section 2.5.1.6, "Hardware Prefetchers" on page 2-12

2.5.1.1 Default BIOS Power-On Self-Test (POST) Events

At system startup, the BIOS performs a power-on self-test that checks the hardware on your server to ensure that all components are present and functioning properly. TABLE 2-2 identifies the events that can occur during BIOS POST, as well as specifies whether these events can prevent the host from powering-on.

TABLE 2-2 BIOS POST Events

Event	Cause	Boot continues on host?
User password violation	Attempt to enter password fails three times	No
Setup password violation	Attempt to enter password fails three times	No
Correctable ECC	Memory Correctable ECC (error correction code) error detected	Does not apply
Uncorrectable ECC	Memory Uncorrectable ECC error detected	Does not apply
No system memory	No physical memory detected in the system	No
No usable system memory	All installed memory has experienced an unrecoverable failure	No
Hard disk controller failure	No disk controller found	Yes
Keyboard failure	Keyboard cannot be initialized	Yes
Boot media failure	No removable boot media is found	Yes
No video device	No video controller is found	No
Firmware (BIOS) ROM corruption	BIOS checksum fails and the boot block is not corrupted	No
System restart	System boot initiated	Yes

TABLE 2-2   BIOS POST Events *(Continued)*

Event	Cause	Boot continues on host?
Initiated by hard reset	Boot process started by hard reset	Yes
Memory initialization	Memory sizing is occurring System firmware progress	Does not apply
Primary processor initialization	Primary CPU initialization System firmware progress	Does not apply
Initiated by warm reset	Boot process started by warm reset	Does not apply
Embedded controller management	Management controller initialization	Does not apply
Secondary processor(s) initialization	Secondary CPU initialization asserted System firmware progress	Does not apply
Video initialization	When BIOS initializes keyboard	Does not apply
Keyboard controller initialization	When BIOS initializes keyboard	Does not apply
Option ROM initialization	BIOS initializes Option ROMs System firmware progress	Does not apply
Option ROM space exhausted	BIOS cannot copy an option to the memory	Yes
User initiated system set up	User initiated access to BIOS Setup Utility System firmware progress	Does not apply
User initiated boot to OS	System boot initiated System firmware progress	Does not apply
No bootable media	Nothing to boot from	No
PXE server not found	Boot error - PXE server not found F12 key was pressed but BIOS fails to boot from PXE server	No
ACPI Power state	Soft-off power applied	Does not apply

2.5.1.2   BIOS POST F1 and F2 Errors

Each power-on-self-test (POST) diagnostic is a low-level test designed to pinpoint faults in a specific hardware component. If the POST diagnostic discloses an F1 or F2 error, it typically reports the following information about the error:

■ Type of error detected

■ When or where the error occurred

TABLE 2-3 lists some of the F1 and F2 error messages that could appear during the POST diagnostics along with instructions for how to possibly resolve the error reported.

TABLE 2-3 BIOS POST F1 and F2 Error Messages

BIOS POST Error Message	Error Type	Resolution
Uncorrectable Error Detected on Last Boot:IOH(0) Protocol Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) QPI [x] Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the fault management function and the SP event log in ILOM for more details. **Note -** Where QPI [x] equals 0 for QPI Link 0 or 1 for QPI Link 1.
Uncorrectable Error Detected on Last Boot:IOH(0) PCI-E [x] Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the fault management function and the SP event log in ILOM for more details. **Note -** Where PCI-E [x] port number can range from 1 to 10 depending on the PCI root port on IOH.
Uncorrectable Error Detected on Last Boot:IOH(0) ESI Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the fault management function and the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) Thermal Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the fault management function and the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) DMA Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the SP event log for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) Miscellaneous Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the fault management function and the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) VTd Error (Please Check SP Log for more Details)	IOH error	• Press F1 to continue. • Check the SP event log in ILOM for more details.
BMC Not Responding	ILOM error	• Press F1 to continue. **Note -** This error message might display if during the SP/BIOS communication an internal error occurs. This error might require you to restart the SP.

TABLE 2-3 BIOS POST F1 and F2 Error Messages *(Continued)*

BIOS POST Error Message	Error Type	Resolution
• Primary Slave Hard Disk Error • Primary Master Hard Disk Error • Secondary Master Hard Disk Error • Secondary Slave Hard Disk Error	IDE/ATAPI error	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** These type of error messages are displayed when the BIOS is attempting to configure IDE/ATAPI devices in POST.
Timer Error	8254 timer error	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** This type of error typically indicates an error while programming the count register of channel 2 of the 8254 timer. This could indicate a problem with system hardware.
RAM R/W test failed	Memory test failure	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** This type of error typically indicates that the RAM read/write test failed.
KBC BAT Test failed	Keyboard controller basic assurance test error	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** Keyboard controller BAT test failed. This error might indicate a problem with keyboard controller initialization.
Display memory test failed	Video display error	• Press F1 to continue. • Check the SP event log in ILOM for more details.
CMOS Battery Low	CMOS battery error	• Press F2 to enter BIOS Setup Utility to load system defaults. • Check the SP event log in ILOM for more details. • If necessary, replace CMOS battery.
• CMOS Checksum Bad • CMOS Date/Time Not Set	CMOS error	• Press F2 to enter BIOS Setup Utility to load system defaults. • Check the SP event log in ILOM for more details.

TABLE 2-3   BIOS POST F1 and F2 Error Messages *(Continued)*

BIOS POST Error Message	Error Type	Resolution
Password check failed	Password check error	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** This type of error indicates that the password entered does not match the password specified in the BIOS Setup Utility. This condition might occur for both Supervisor and User password verification.
Keyboard/Interface Error	Keyboard controller error	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** This type of error indicates that the Keyboard Controller failure. This error might indicate a problem with system hardware.
S.M.A.R.T error on the drive	S.M.A.R.T device error	• Press F1 to continue. • Check the SP event log in ILOM for more details. **Note -** Self-Monitoring, Analysis, and Reporting Technology (S.M.A.R.T.) failure messages might indicate the need to replace the storage device.

2.5.1.3   How BIOS POST Memory Testing Works

The BIOS POST memory testing is performed as follows:

1. The first megabyte of DRAM is tested by the BIOS before the BIOS code is copied from ROM to DRAM.

2. After exiting out of DRAM, the BIOS performs a simple memory test (where a write/read of every location with the pattern 55aa55aa is performed).

Note – The simple memory test is performed only if Quick Boot is not enabled from the Boot Settings Configuration screen. Enabling Quick Boot causes the BIOS to skip the memory test.

---

3. The BIOS polls the memory controllers for both correctable and non-correctable memory errors and logs those errors into the SP.

4. The message, BMC Responding appears at the end of POST.

2.5.1.4 Ethernet Port Device and Driver Naming

The server supports four 10/100/1000BASE-T Gigabit Ethernet ports on the rear of the chassis. For port locations, see FIGURE 1-2.

The device naming for the Ethernet interfaces is reported differently by different interfaces and operating systems. See TABLE 2-4 for the physical (BIOS) and logical (operating system) naming conventions used for each interface.

TABLE 2-4   Logical Port Naming

Interface	NET0	NET1	NET2	NET3
BIOS	slot 108	slot 109	slot 110	slot 111
Solaris 10 10/09	igb0	igb1	igb2	igb3
RHEL 5.4 (64-bit)	eth0[*]	eth1	eth2	eth3
Oracle Linux 5.4 (64-bit)	eth0[†]	eth1	eth2	eth3
SLES 10 SP3 (64-bit) and SLES 11 (64-bit)	eth0[‡]	eth1	eth2	eth3
Windows 2008	net1	net2	net3	net4
Oracle VM 2.2.1	xenbr0	xenbr1	xenbr2	xenbr3
VMware ESX 4.0 and ESXi 4.0	vmnic#[**]	vmnic#	vmnic#	vmnic#

[*] If you are using the XEN kernel in RHEL 5, there will be XEN bridge devices associated with each logical port. The ports for these bridge devices will be named xenbr$n$, where n is 0-3.

[†] If you are using the XEN kernel in Oracle Linux 5, there will be XEN bridge devices associated with each logical port. The ports for these bridge devices will be named xenbr$n$, where n is 0-3.

[‡] If you are using the XEN kernel in SLES 10 or SLES 11, there will be XEN bridge devices associated with each logical port. The ports for these bridge devices will be named xenbr$n$, where n is 0-3.

[**] For VMware, the Ethernet port that the user assigns to the service console will be vmnic0. Other ports are mapped by ascending order of the PCI bus enumerations.

2.5.1.5 Ethernet Port Booting Priority

The order in which the BIOS detects the Ethernet ports during boot time, and the corresponding drivers that control those ports, are listed below:

1. NET 0 (INTEL NIC 0)
2. NET 1 (INTEL NIC 1)
3. NET 2 (INTEL NIC 2)
4. NET 3 (INTEL NIC 3)

2.5.1.6 Hardware Prefetchers

Hardware prefetchers work well in workloads that traverse array and other regular data structures. The hardware prefetcher option is disabled by default and should be disabled when running applications that perform aggressive software prefetching or for workloads with limited cache. For example, memory-intensive applications with high bus utilization could see a performance degradation if hardware prefetching is enabled.

2.5.2 BIOS Setup Utility Menus

TABLE 2-5 provides descriptions for the seven top-level BIOS setup menus.

TABLE 2-5 BIOS Setup Menus Summary

Menu	Description
Main	General product information, including BIOS type, processor, memory, and time/date.
Advanced	Configuration information for the CPU, memory, IDE, Super IO, trusted computing, USB, PCI, MPS and other information.
PCI	Configure the server to clear NVRAM during system boot.
Boot	Configure the boot device priority (storage drives and the DVD-ROM drive).
Security	Set or change the user and supervisor passwords.
Chipset	View the configuration of server chipsets.
Exit	Save changes and exit, discard changes and exit, discard changes, or load optimal or fail-safe defaults.

See Section B.2, "BIOS Setup Utility Menu Screens" on page B-3 for examples of each of these screens.

FIGURE 2-1 identifies the sub-menus that you can access from each of the seven top-level BIOS menus.

FIGURE 2-1 BIOS Configuration Utility Menu Tree
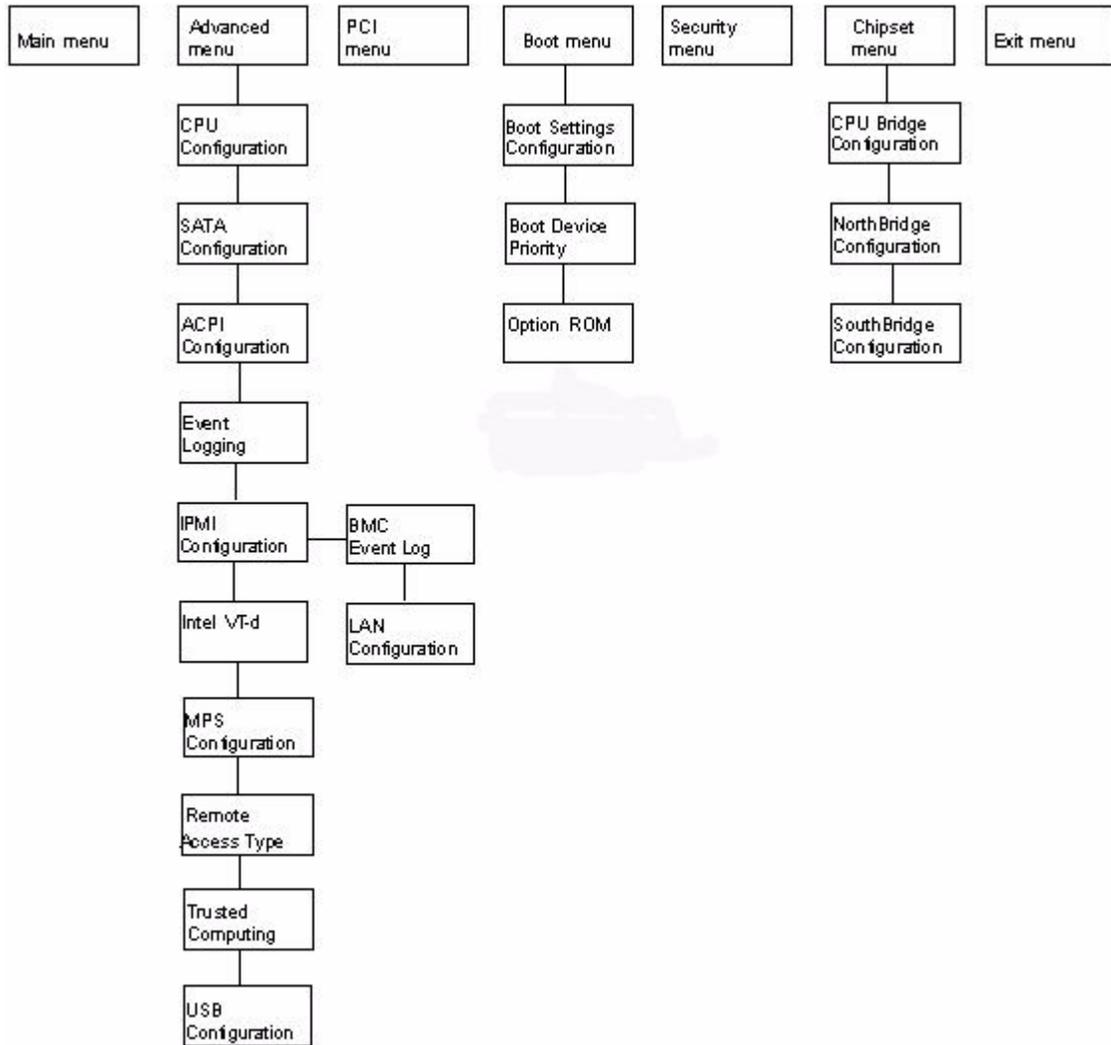
For an example of the options that are available on the BIOS Setup Utility menus, see Appendix B.

2.5.3 BIOS Setup Utility Hot Keys

TABLE 2-6 provides a description of the BIOS Setup Utility hot keys and the corresponding serial connection key combinations.

TABLE 2-6 BIOS Setup Utility Hot Keys and the Corresponding Serial Connection Key Combinations

Sun ILOM Remote Console Keys	Serial Connection Hot Key Combinations	Function
F1	Ctrl+Q (Press and hold the Ctrl key and type Q)	Access the BIOS Setup Utility if there is an error during the boot process
F2	Ctrl+E	Enter BIOS Setup Utility while the system is performing the power-on self test (POST)
F7	Ctrl+D	Discard changes but do not exit
F8	Ctrl+P	Select the BBS Popup menu, which allows you to select a boot device
F9	Ctrl+O	Load optimal BIOS defaults
F10[*]	Ctrl+S	Save changes and exit
F12	Ctrl+N	Boot the server from the network (PXE boot)

* F10 is not supported on the Oracle ILOM Remote Console; instead, use the arrow keys to navigate to the Exit menu and press Enter.

2.5.4 Accessing the BIOS Setup Utility Menus

You can access BIOS Setup Utility screens from the following interfaces:

- Use a USB keyboard, mouse, and VGA monitor connected directly to the server.
- Use a terminal (or terminal emulator connected to a computer) through the serial port on the back panel of the server.
- Connect to the server using the Oracle ILOM Remote Console.

The following procedure describes the steps for accessing the BIOS Setup Utility menus.

2.5.4.1   Access BIOS Setup Utility Menus

1. Power-on or power-cycle the server.

The Boot Option screen appears (FIGURE 2-2).

FIGURE 2-2   Boot Option Screen
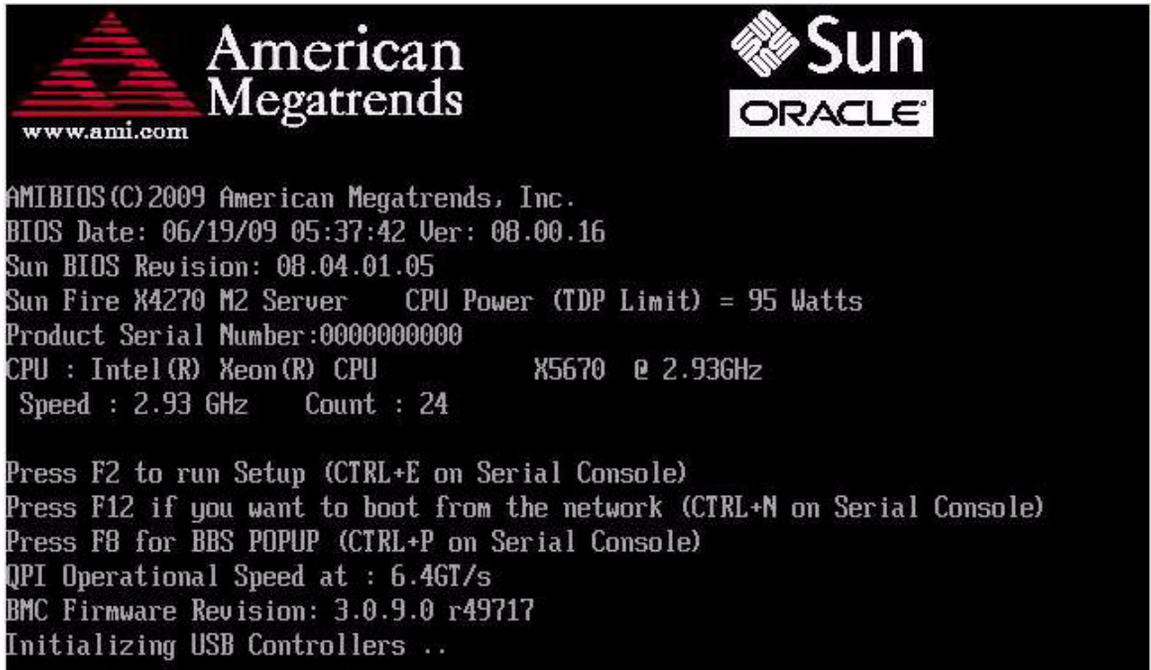
2. To enter the BIOS Setup Utility, do the following:

a. Wait for the last line of the screen output to change to `Initializing USB Controllers..Done`

This will take several seconds.

b. When `Done` **appears, immediately press the F2 key.**

Note – If there is an error during the boot process, you can press F1 to access the BIOS Setup Utility.

The BIOS Setup Utility dialog appears (FIGURE 2-3).

FIGURE 2-3   BIOS Setup Utility: Main - System Overview


```
                        BIOS SETUP UTILITY
  Main     Advanced    PCI    Boot    Security   Chipset    Exit

  System Overview                                 Use [ENTER], [TAB]
  _____        or [SHIFT-TAB] to
                                                  select a field.
  AMIBIOS
  Build Date:10/03/08
  ID       :07.01.26.00                           Use [+] or [-] to
                                                  configure system Time.
  Processor
  Genuine Intel(R) CPU        @ 0000 @ 2.67GHz
  Speed    :2666MHz
  Count    :16

  System Memory
  Size     :4088MB                                ←     Select Screen
                                                  ↑↓    Select Item
  System Time             [16:45:54]              +-    Change Field
  System Date             [Thu 10/30/2008]        Tab   Select Field
                                                  F1    General Help
  ▶ Serial Number Information                     (CTRL+Q from remote kbd)
                                                  F10   Save and Exit
                                                  (CTRL+S from remote kbd)

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```

3. **Use the left and right arrow keys to select the different menu options.**

4. **As you select each menu option, the top-level screen for that menu option appears.**

5. **To select an option on a top-level screen, use the up and down arrow keys to scroll up and down the options presented.**

   Only options that can be modified are highlighted when you press the up and down arrow keys.

   - If a field can be modified, as you select the option, user instructions for modifying the option appear in the right column of the screen.

   - If a field is a link to a sub-screen, instructions to press the **Enter** key to access the sub-screen appear in the right column.

6. **Modify the setup field and press the Esc key to save the changes and exit the screen.**

   Some screens present a confirmation dialog box that enables unwanted changes to be retracted.

7. **On sub-screens that only provide configuration information and cannot be modified, press the Esc key to exit the screen.**

8. **To continue modifying other setup parameters, repeat** Step 3 **through** Step 7**. Otherwise, go to** Step 9**.**

9. **Press and release the right arrow key until the Exit menu screen appears.**

10. **Follow the instructions on the Exit menu screen to save or discard your changes and exit the BIOS Setup Utility.**

2.5.5 Configuring Support for TPM

If you intend to use the Trusted Platform Module (TPM) feature set that is provided in Windows 2008, you must configure the server to support this feature.

TPM enables you to administer the TPM security hardware in your server. For additional information about implementing this feature, refer to the Windows Trusted Platform Module Management documentation provided by Microsoft.

2.5.5.1 Configure TPM Support in BIOS

1. **Access the BIOS Setup Utility menus.**

   For instructions, see Section 2.5.4.1, "Access BIOS Setup Utility Menus" on page 2-15.

   When BIOS is started, the Main BIOS Setup Utility top-level, System Overview screen appears (FIGURE 2-4).

FIGURE 2-4   Main - System Overview screen


```
                        BIOS SETUP UTILITY
 Main    Advanced    PCI    Boot    Security    Chipset    Exit

 System Overview                                    Use [ENTER], [TAB]
                                                    or [SHIFT-TAB] to
 AMIBIOS                                            select a field.
 Build Date:10/03/08
 ID        :07.01.26.00                             Use [+] or [-] to
                                                    configure system Time.
 Processor
 Genuine Intel(R) CPU        @ 0000 @ 2.67GHz
 Speed     :2666MHz
 Count     :16

 System Memory                                      ←    Select Screen
 Size      :4088MB                                  ↑↓   Select Item
                                                    +-   Change Field
 System Time            [16:45:54]                  Tab  Select Field
 System Date            [Thu 10/30/2008]            F1   General Help
                                                    (CTRL+Q from remote kbd)
 ▶ Serial Number Information                        F10  Save and Exit
                                                    (CTRL+S from remote kbd)

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```

2. In the BIOS Setup Utility screen, select the Advanced menu option.

The Advanced Settings screen appears (FIGURE 2-5).

FIGURE 2-5   Advanced Settings Screen


```
                        BIOS SETUP UTILITY
 Main    Advanced    PCI    Boot    Security    Chipset    Exit

 Advanced Settings                                  Configure settings
                                                    related to Trusted
 WARNING: Setting wrong values in below sections    Computing innovations
          may cause system to malfunction.

 ▶ CPU Configuration
 ▶ On-board SATA Configuration
 ▶ ACPI Configuration
 ▶ Event Log Configuration
 ▶ IPMI Configuration
 ▶ Intel VT-d Configuration
 ▶ MPS Configuration
 ▶ Remote Access Configuration                      ←    Select Screen
 ▶ Trusted Computing                                ↑↓   Select Item
 ▶ USB Configuration                                Enter Go to Sub Screen
                                                    F1   General Help
                                                    (CTRL+Q from remote kbd)
                                                    F10  Save and Exit
                                                    (CTRL+S from remote kbd)
                                                    ESC  Exit

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```

3. **In the Advanced Settings screen, select Trusted Computing and press Enter.**

   The Trusted Computing screen appears (FIGURE 2-6).

FIGURE 2-6   Trusted Computing Screen
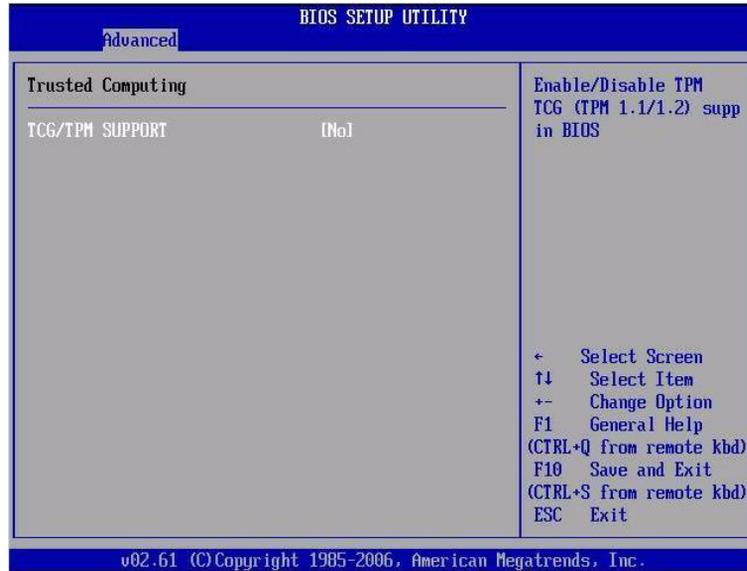
4. **In the Trusted Computing screen, select the TCG/TPM Support.**

   A pop-up dialog box appears.

5. **In the pop-up dialog box, set the TCG/TPM Support option to Yes and click Ok.**

Note – Even if the TCG/TPM Support was already set to Yes in the screen shown above, continue on and complete the remaining steps of this procedure to ensure that all TPM configuration requirements are satisfied.

   The updated Trusted Computing screen appears and shows that the TCG/TPM Support setting has changed to Yes (FIGURE 2-7).

FIGURE 2-7   Trusted Computing Screen Showing TCG/TPM Support Enabled

---
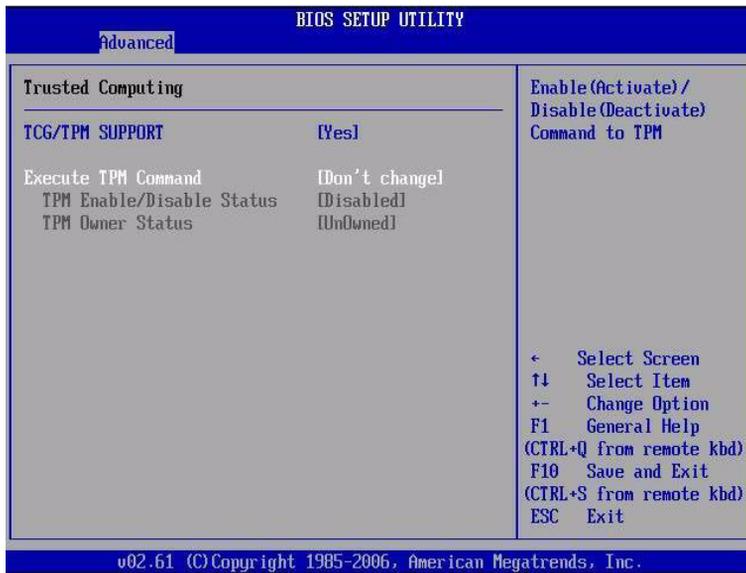
Note – In the above screen, the Execute TPM Command setting shows the default, `Don't Change.`

---

6. **In the Trusted Computing screen, select the Execute TPM Command option setting.**

   A pop-up dialog box appears.

7. **In the pop-up tab, set the Execute TPM Command option to Enabled and click Ok.**

   The updated Trusted Computing screen appears and shows that the Execute TPM Command setting has changed to `Enabled` (FIGURE 2-8).

FIGURE 2-8 Execute TPM Command – Setting Enabled


```
                          BIOS SETUP UTILITY
      Advanced

  Trusted Computing                                 Enable(Activate)/
                                                    Disable(Deactivate)
  TCG/TPM SUPPORT              [Yes]                 Command to TPM

  Execute TPM Command         [Enabled]
    TPM Enable/Disable Status [Disabled]
    TPM Owner Status          [UnOwned]




                                                    ←    Select Screen
                                                    ↑↓   Select Item
                                                    +-   Change Option
                                                    F1   General Help
                                                    (CTRL+Q from remote kbd)
                                                    F10  Save and Exit
                                                    (CTRL+S from remote kbd)
                                                    ESC  Exit

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```

8. **Press F10 to save the changes and exit the BIOS Setup Utility.**

9. **To verify that TPM support is configured, do the following:**

   a. **Reboot the server.**

   b. **To enter the BIOS Setup Utility, press the F2 key while the system is performing the power-on self-test (POST).**

      When BIOS is started, the Main BIOS Setup Utility top-level screen appears (FIGURE 2-4).

   c. **Select Advanced --> Trusted Computing and press Enter.**

      The updated Trusted Computing screen appears (FIGURE 2-9).

      Confirm that the TCG/TPM Support setting is set to Yes and the TPM Enabled/Disable Status is set to Enabled.

FIGURE 2-9   Updated TPM Enabled/Disabled Status Setting
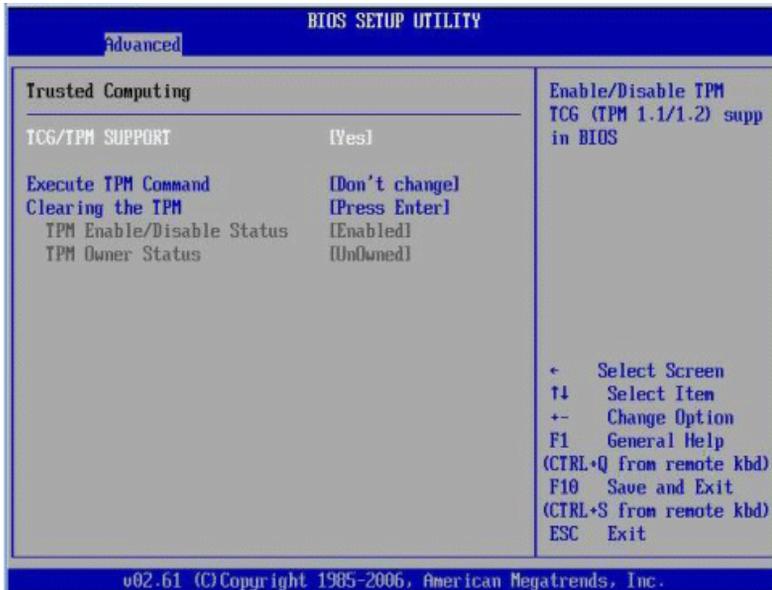
10. **Press F10 to exit BIOS.**

    This completes the TPM configuration.

2.5.6   Configuring SP LAN Settings

You can assign an IP address for the server SP from the BIOS Setup Utility on the IPMI LAN configuration menu. Alternatively, you can also specify the LAN settings for the SP using Oracle ILOM. For instructions for setting the IP address in Oracle ILOM, see the Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection.

For instructions on configuring SP LAN settings using the BIOS Setup Utility, see the following sections:

■ Section 2.5.6.1, "Configure LAN Settings for SP" on page 2-23
■ Section 2.5.6.2, "Viewing or Setting the Oracle ILOM SP IP Address Using the BIOS Setup Utility" on page 2-24

2.5.6.1 Configure LAN Settings for SP

1. **Access the BIOS Setup Utility menus.**

   For instructions, see Section 2.5.4.1, "Access BIOS Setup Utility Menus" on page 2-15.

2. **In the BIOS Setup Utility menus, use the arrow keys (or Tab key) to navigate to the Advanced menu.**

3. **In the Advanced menu, select IPMI Configuration.**

4. **In the IPMI Configuration menu, select LAN Configuration.**

   The LAN Configuration screen appears (FIGURE 2-10).

FIGURE 2-10 BIOS Setup Utility: Advanced – LAN Configuration

```
                          BIOS SETUP UTILITY
      Advanced

 LAN Configuration.                                Enter channel number
 _____  for SET LAN Config
                                                    Command.
 Channel Number                  [01]               Proper value below 16.
 IP Assignment                   [Static]

 Current IP address in BMC:      010.008.145.168
 Current MAC address in BMC:     00.14.4F.CA.B2.F4
 Current Subnet Mask in BMC:     255.255.255.000
 Current Gateway in BMC:         010.008.145.254
 Current Active Management Port  NET0

 Refresh
                                                    ←    Select Screen
 IP Address                      [010.008.145.168]  ↑↓    Select Item
 Subnet Mask                     [255.255.255.000]  Enter Update
 Default Gateway                 [010.008.145.254]  F1    General Help
                                                    (CTRL+Q from remote kbd)
 Active Management Port          [NET MGT]          F10   Save and Exit
                                                    (CTRL+S from remote kbd)
 Commit                                             ESC   Exit

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```

5. **In the LAN Configuration screen, use the arrow keys to select and specify the appropriate LAN configuration settings.**

6. **Press F10 to save the changes and exit the BIOS.**

2.5.6.2 Viewing or Setting the Oracle ILOM SP IP Address Using the BIOS Setup Utility

1. **Power on the server (or restart the server if it is running).**

2. **When the BIOS splash screen or text prompt appears during the power-on self-test (POST) operation, press F2 to access the BIOS Setup Utility.**

3. **Using the left and right arrow keys on the keyboard, navigate to the Advanced tab.**

   The Advanced Settings screen appears (FIGURE 2-5).

4. **Using the up and down arrow keys, select the** `IPMI Configuration` **option and press Enter to go to the subscreen.**

   The IPMI Configuration subscreen appears.

5. **Using the up and down arrow keys, select the** `Set LAN Configuration` **option and press Enter.**

   The LAN Configuration subscreen appears and shows the current ILOM SP IP address.

6. **To set the IP address:**

   a. **Select** `Set LAN Configuration`**, then use the arrow keys to select settings.**

   b. **Specify the appropriate settings, then proceed to Step 7.**

7. **Select** `Commit` **and press Enter.**

8. **Allow about five seconds for the Commit to complete, then select** `Refresh` **and press Enter.**

9. **Select** `Refresh` **a second time and press Enter to confirm that the IP address information has been set.**

10. **Press F10 to save any changes you made and to exit the BIOS Setup Utility.**

2.5.7 Configuring Option ROM Settings in BIOS

The BIOS Option ROM is 128 Kbytes. Of these 128 Kbytes, approximately 80 Kbytes are used by the VGA controller, the disk controller, and the network interface card. Approximately 48 Kbytes remain to be shared by the Option ROMs on all bootable PCI-Express plug-in cards.

2.5.7.1 Enable or Disable Option ROM Settings

1. **Access the BIOS Setup Utility menus.**

   For instructions, see Section 2.5.4.1, "Access BIOS Setup Utility Menus" on page 2-15.

2. **In the BIOS Setup Utility menus, use the arrow keys (or Tab key) to navigate to the Boot menu.**

   The Boot menu appears (FIGURE 2-11).

FIGURE 2-11 BIOS Setup Utility: Boot - Option ROM Configuration
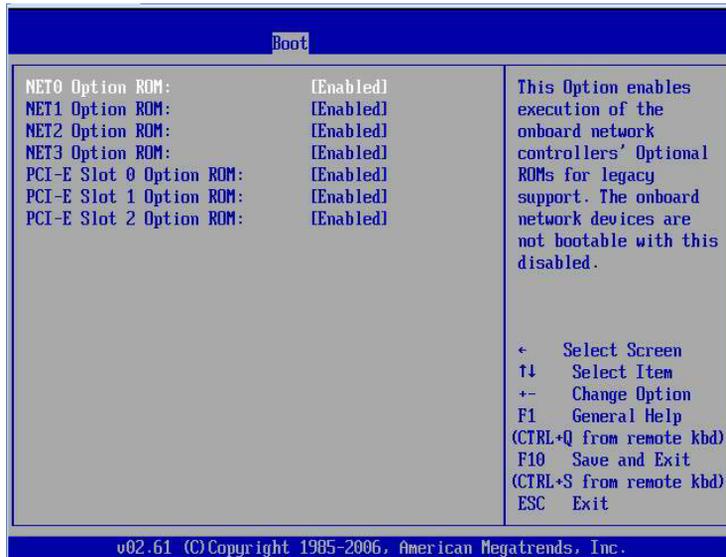
3. **In the Boot menu listing the Option ROM settings, highlight the applicable Option ROM setting to modify, then press Enter.**

   A dialog box appears listing the available settings.

4. **In the dialog box, do one of the following:**

   - Select `Enabled` to enable the Option ROM setting.
   - Select `Disabled` to disable the Option ROM setting.

5. **Press F10 to save the changes and exit the BIOS.**

2.5.8 Updating the BIOS Firmware

The BIOS is updated whenever you update the Oracle ILOM SP firmware. For instructions about updating the firmware, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection.

2.6 Extending the Server to the Maintenance Position

The following components can be serviced with the server in the maintenance position:

■ Storage drives

■ Fan modules

■ Power supplies

■ Fan board

■ DDR3 DIMMs

■ PCIe risers

■ PCIe cards

■ Disk Backplane

■ Motherboard battery

If the server is installed in a rack with extendable slide rails, use this procedure to extend the server to the maintenance position.

2.6.1 Extend the Server to the Maintenance Position

1. **Verify that no cables will be damaged or will interfere when the server is extended.**

   Although the cable management arm (CMA) that is supplied with the server is hinged to accommodate extending the server, you should ensure that all cables and cords are capable of extending.

2. **From the front of the server, release the two slide release latches (**FIGURE 2-12**).**

   Squeeze the green slide release latches to release the slide rails.

FIGURE 2-12 Slide Release Latches
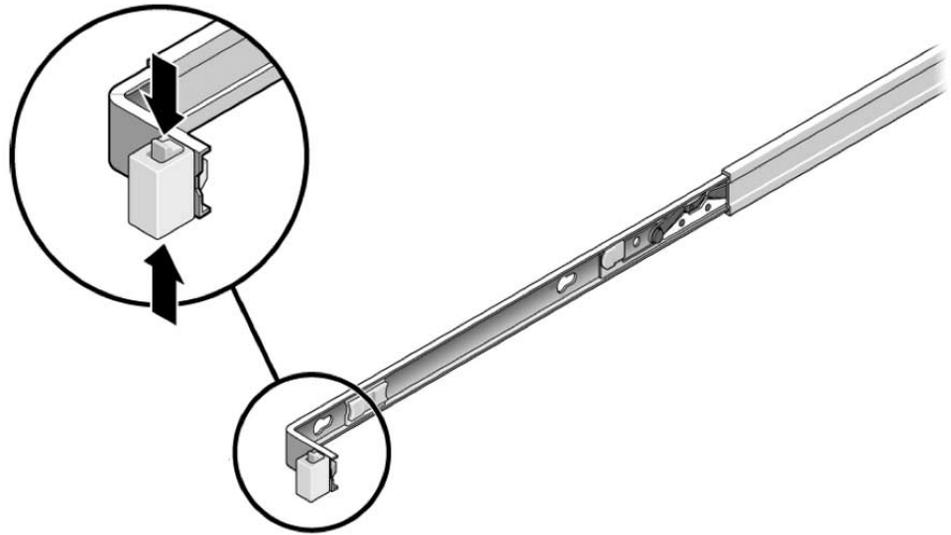
3. **While squeezing the slide release latches, slowly pull the server forward until the slide rails latch.**

   The server is now in the extended maintenance position.

2.7 Removing the Server From the Rack

The server must be removed from the rack to service the following components:

- Motherboard
- CPUs
- Power distribution board
- SAS expander board
- Front panel light-pipe assemblies
- Power Supply Backplane
- Rear-mounted boot drive assembly

2.7.1   Remove Server From the Rack

⚠ **Caution –** **The server weighs 65 lb (29.54 kg).** If necessary, use two people to dismount and carry the chassis.

1. **Disconnect all the cables and power cords from the server.**

2. **Extend the server to the maintenance position.**

   See Section 2.6.1, "Extend the Server to the Maintenance Position" on page 2-26.

3. **Press the metal lever that is located on the inner side of the rail to disconnect the cable management arm (CMA) from the rail assembly (**FIGURE 2-13**).**

   The CMA is still attached to the cabinet, but the server chassis is now disconnected from the CMA.

FIGURE 2-13 Metal Lever and Cable Management Arm
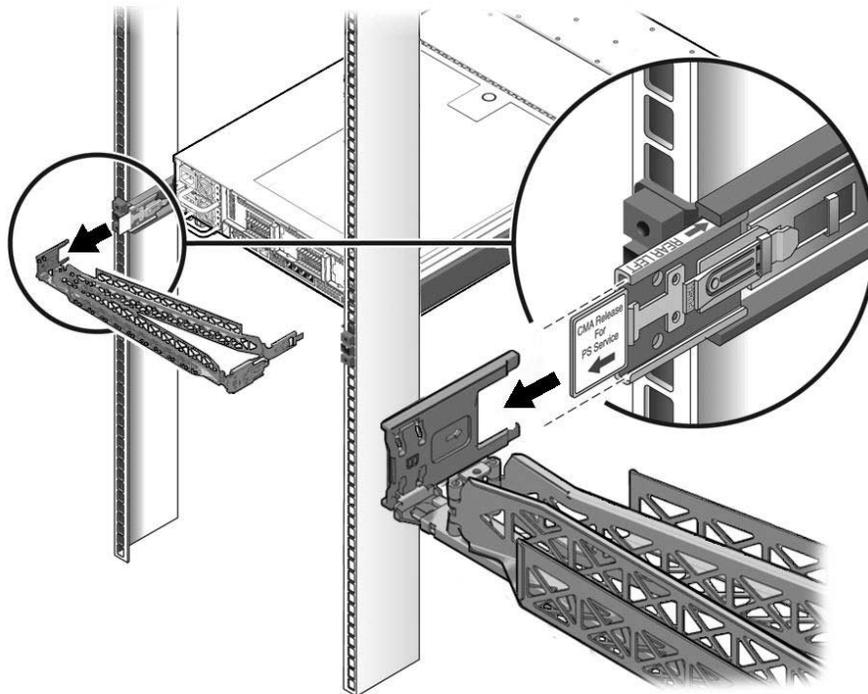
4. **From the front of the server, pull the release tabs forward and pull the server forward until it is free of the rack rails (**FIGURE 2-14**).**

   A release tab is located on each rail.

FIGURE 2-14   Release Tabs and Slide Assembly
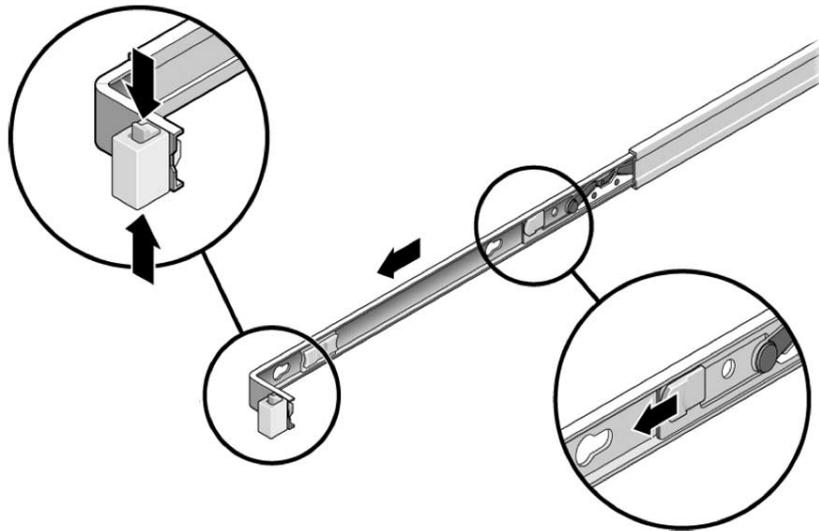
5. Set the server on a sturdy work surface.

2.8   Using Server Filler Panels

Each server is shipped with module-replacement filler panels for CPUs, storage drives, DDR3 memory modules (DDR3 DIMMs), PCIe cards, and power supplies. These filler panels are installed at the factory and must remain in the server until you replace them with a purchased option.

As needed, consult the following sections when removing and replacing a server component:

- Section 2.8.1, "Filler Panel Purpose" on page 2-29
- Section 2.8.2, "Filler Panel Removal and Installation" on page 2-30

2.8.1   Filler Panel Purpose

A filler panel is an empty metal or plastic enclosure that does not contain any functioning system hardware or cable connectors. These panels must remain in any unused module slots (CPU, storage drives, DDR3 DIMMs, PCIe cards, power

supplies) to ensure proper airflow throughout the system. If you remove a filler panel and continue to operate your system with an empty module slot, the operating performance of your system could decline.

2.8.2   Filler Panel Removal and Installation

Before you can install a optional server component into the server, you must remove the filler panel from the location into which you intend to install the component. When you remove a CPU, storage drive, DDR3 DIMM, PCIe card, or a power supply from the server, you must install either a replacement for component removed or a filler panel.

TABLE 2-7 describes how to remove and install server filler panels.

TABLE 2-7   Server Filler Panel Removal and Installation Procedures

Filler Panel Type	Removal Procedure	Install Procedure
DDR3 DIMM	1. Locate the DDR3 DIMM filler panel to be removed from the motherboard. 2. Simultaneously press down on both ejector levers at the ends of the memory module slot. 3. Lift the filler panel straight up to remove it from the memory module socket.	1. Locate the vacant DDR3 DIMM slot on the motherboard. 2. Ensure that ejector levers at both ends of the DDR3 DIMM slot are in a fully opened position. 3. Align the filler panel with the empty slot, then gently press the filler panel into the slot until both ejector levers close, locking the filler panel in place.
CPU **Note -** CPUs should only be removed or installed by Oracle qualified service personnel.	1. To remove the CPU filler panel in the socket, pull the release lever away from the socket into a fully opened position. 2. Lift the bail and then gently lift the filler panel straight up and out of the CPU socket.	1. Ensure that the CPU socket release lever and bail are in a fully opened position. 2. Gently insert the filler panel onto the exposed pins in the CPU socket. 3. After the filler panel is fully seated in the socket, close the bail onto the top of the filler panel, then pivot the release lever down and into the locked position at the side of the socket.

TABLE 2-7 Server Filler Panel Removal and Installation Procedures *(Continued)*

Filler Panel Type	Removal Procedure	Install Procedure
Storage Drive	1. Locate the disk drive filler panel to be removed from the server. 2. To unlatch the disk drive filler panel, press the release lever button then tilt the lever up into a fully opened position. 3. To remove the filler panel from the slot, hold the opened release lever and gently slide the filler panel toward you.	1. Locate the vacant disk drive module slot in the server, then ensure that the release lever on the filler panel is fully opened. 2. Slide the filler panel into the vacant slot by pressing the middle of the filler panel faceplate with your thumb or finger. The release lever will lower as it makes contact with the chassis. Do not slide the filler panel in all the way. Leave the filler panel out approximately 0.25 to 0.50 inch (6 to 12 mm) from the opening 3. Using your thumb or finger, press on the middle of the filler panel faceplate until the release lever engages with the chassis. 4. Close the release lever until it clicks into place and is flush with the front of the server.
PCI Slot	1. Remove the server top cover. 2. Remove the PCI slot filler panel from the location into which you intend to install the PCIe card.	1. Remove the server top cover. 2. Press the PCI filler panel into the vacant PCI slot.
Power supply	1. To release the filler panel side latches, use your fingers to press and hold both sides of the filler panel away from the sides of the power supply bay. 2. Using fingers on your other hand, grasp the lip at the bottom of the filler panel and pull it out of the power supply bay.	1. Position the filler panel in the power supply bay so that the closed end is facing inward and the lip that is used to remove the filler panel is in the bottom position. 2. Press the filler panel into the power supply bay until it is flush with the power supply bay.

2.9   Performing Electrostatic Discharge and Antistatic Prevention Measures

2.9.1   Electrostatic Discharge Safety Measures

Electrostatic discharge (ESD) sensitive devices, such as the motherboards, PCIe cards, storage drives, and memory cards, require special handling.

Caution – Circuit boards and storage drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothing or the work environment can destroy the components located on these boards and drives. Do not touch the components along their connector edges.

Caution – You must disconnect both power supplies before servicing any of the components documented in this chapter.

2.9.1.1 Using an Antistatic Wrist Strap

Wear an antistatic wrist strap and use an antistatic mat when handling components such as storage drive assemblies, circuit boards, or PCIe cards. When servicing or removing server components, attach an antistatic strap to your wrist and then to a metal area on the chassis. Following this practice equalizes the electrical potentials between you and the server.

Note – An antistatic wrist strap is not included in the Accessory Kit for the Sun Fire X4270 M2 Server. However, antistatic wrist straps are still included with options and components.

2.9.1.2 Using an Antistatic Mat

Place ESD-sensitive components on an antistatic mat.

2.9.2 Using ESD Handling Precautions

1. **Prepare an antistatic surface to set parts on during the removal, installation, or replacement process.**

   Place ESD-sensitive components such as the printed circuit boards on an antistatic mat. The following items can be used as an antistatic mat:

   - Antistatic bag used to wrap an Oracle replacement part
   - Oracle ESD mat, part number 250-1088
   - A disposable ESD mat (shipped with some replacement parts or optional system components)

2. **Attach an antistatic wrist strap.**

When servicing or removing server components, attach an antistatic strap to your wrist and then to a metal area on the chassis.

2.10 Removing the Server's Top Cover

The top cover and fan door are integrated.

⚠️ **Caution –** If the top cover is removed without first removing the AC power cords, then not only will the server host shutdown, but also this condition will be flagged as a system fault (that is, the fault LEDs will light). In this situation, the SP will need to be power-cycled (remove/reinsert AC power cords) before the server can be properly returned to service.

Note – Servicing some components requires that the top cover be removed.

2.10.1 Remove Top Cover

1. **Disconnect the AC power cords are disconnected from the server power supplies.**

2. **Unlatch the fan module door (**FIGURE 2-15 **[1]).**

Press the two green release buttons on the sides of the fan module door to release the door. Rotate the fan module door to the open position and hold it there.

FIGURE 2-15 Removing the Top Cover
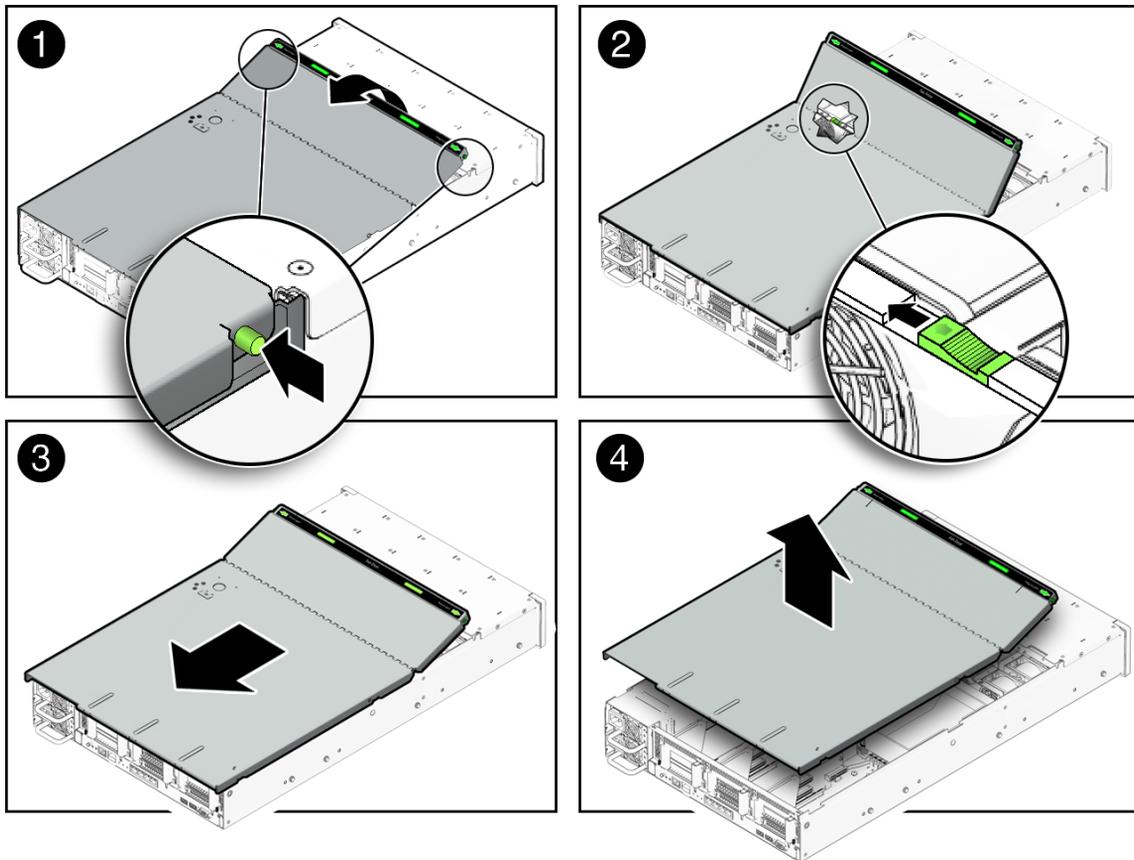
3. **Release the top cover [2].**

   Locate the green tab to the right (facing the front of the server) and to the rear of the fan modules and slide the tab to the right-most position [2].

4. **Slide the top cover toward the rear of the server about a 0.5 inch (12 mm) [3].**

5. **Lift up and remove the top cover [4].**

2.11 Removing the Front Cover From a Server with 2.5-Inch Storage Drives

Before you can remove the server's disk backplane, you must first remove the server's front cover.

Note – This procedure only applies to the server with 2.5-inch storage drives.

Note – Servicing some components requires that the server's front cover be removed.

2.11.1 Remove Server Front Cover

1. **Disconnect the AC power cords are disconnected from the server power supplies.**

2. **Remove the server's top cover.**

   See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

3. **Remove the server's front cover (**FIGURE 2-16**).**

   a. **Press the two levers on the back of the cover inward toward each other and hold [1]**

   b. **Slide the front cover toward the rear of the server about a 0.25 inch (6 mm) [1].**

   c. **Grasp the rear of the cover and lift it up and off the server [2].**

FIGURE 2-16 Removing the Front Cover
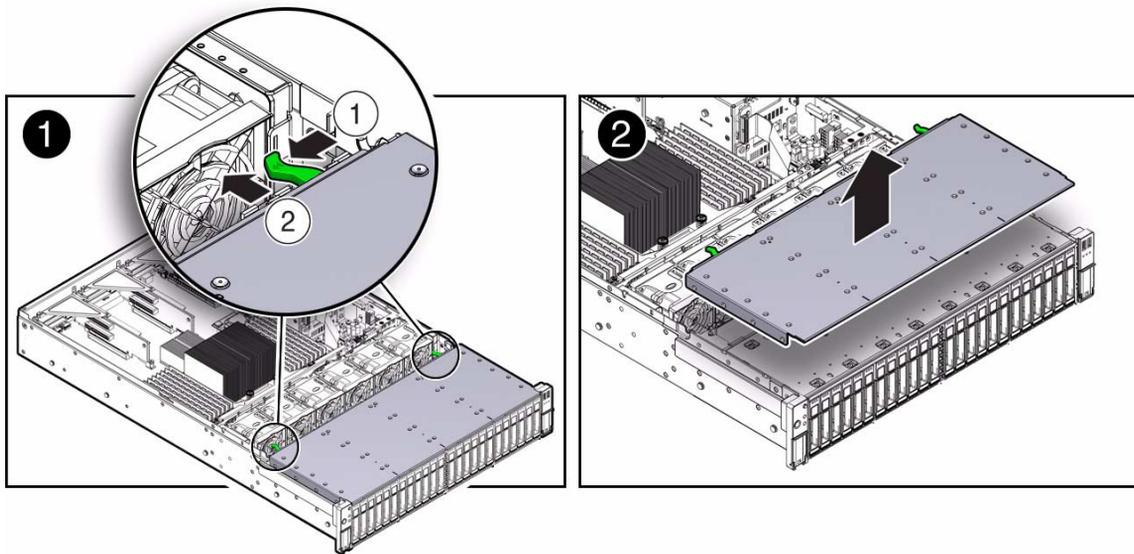
CHAPTER **3**

Servicing Customer-Replaceable Devices

This chapter describes how to replace the hot-swappable and hot-pluggable customer-replaceable units (CRUs) in the Sun Fire X4270 M2 Server.

The following topics are covered in this section:

- Section 3.1, "Hot-Pluggable Versus Hot-Swappable Devices" on page 3-1
- Section 3.2, "Servicing Storage Drives and Boot Drives" on page 3-2
- Section 3.3, "Servicing Fan Modules" on page 3-11
- Section 3.4, "Servicing Power Supplies" on page 3-16

3.1 Hot-Pluggable Versus Hot-Swappable Devices

Devices that are hot-pluggable, unlike hot-swappable devices, require actions in addition to physical removal and replacement.

3.1.1 Hot-Pluggable Devices

Hot-pluggable devices are those devices that you can remove and install while the server is running. However, you must perform one or more administrative tasks before and/or after installing the hardware (for example, mounting a storage drive).

In the Sun Fire X4270 M2 Server, storage drives are hot-pluggable. To hot-plug a drive you must take the drive offline (to prevent any applications from accessing it, and to remove the logical software links to it) before you can safely remove it. See Section 3.2, "Servicing Storage Drives and Boot Drives" on page 3-2.

3.1.2 Hot-Swappable Devices

Hot-swappable devices are those devices that can be removed and installed while the server is running without requiring any administrative tasks (for example, fan modules and power supplies).

In the Sun Fire X4270 M2 Server, the following devices are hot-swappable:

- Fan modules. See Section 3.3, "Servicing Fan Modules" on page 3-11.
- Power supplies. See Section 3.4, "Servicing Power Supplies" on page 3-16.

Note – The chassis-mounted storage and boot drives can be hot-swappable, depending on how they are configured. See Section 3.2, "Servicing Storage Drives and Boot Drives" on page 3-2.

3.2 Servicing Storage Drives and Boot Drives

The following topics are covered in this section:

3.2.1 Server Storage Drive and Boot Drive Locations

FIGURE 3-2 shows the physical drive locations for the Sun Fire X4270 M2 Server with twelve 3.5-inch hard disk drives.

FIGURE 3-1   Server Front Panel With Twelve 3.5-inch Drives
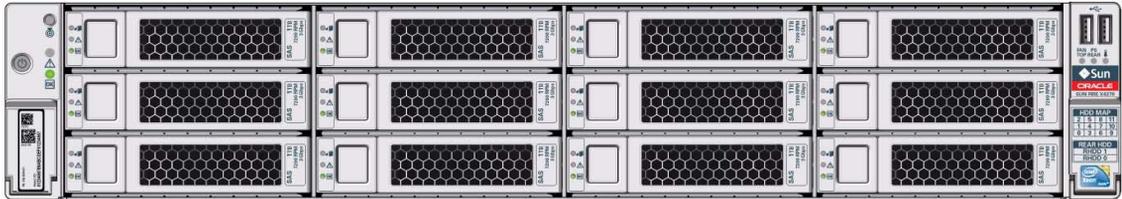
Figure Legend

HDD2	HDD5	HDD8	HDD11
HDD1	HDD4	HDD7	HDD10
HDD0	HDD3	HDD6	HDD9

FIGURE 3-2 shows the physical drive locations for the Sun Fire X4270 M2 Server with twelve 3.5-inch hard disk drives.

FIGURE 3-2   Server Front Panel With Twelve 2.5-Inch Drives

Figure Legend

H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
0	1	2	3	4	5	6	7	8	9	1	1	1	1	1	1	1	1	1	1	2	2	2	2
										0	1	2	3	4	5	6	7	8	9	0	1	2	3

FIGURE 3-3 shows the physical boot drive locations in the rear of the Sun Fire X4270 M2 Server.

FIGURE 3-3   Server Rear Panel Boot Drive Locations

Figure Legend

1 RHDD
0 RHDD

3.2.2 Storage Drive and Boot Drive Status LED Reference

FIGURE 3-4 shows the drive status LEDs.

FIGURE 3-4 Storage and Boot Drive Status LEDs
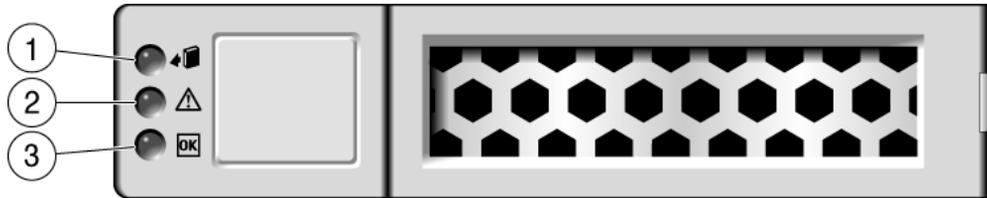
TABLE 3-1 Storage and Boot Drive Status LED Descriptions

Legend	LED	Symbol	Color	Lights When...
1	OK to Remove		Blue	The storage drive can be removed safely during a hot-plug operation.
2	Service Action Required		Amber	The system is running and the storage drive is faulty. The front and rear panel Service Action Required LEDs are also lit if the system detects a storage drive fault.
3	OK/Activity		Green	Data is being read from or written to the storage drive.

3.2.3 Remove Storage Drive

Storage drives can be hot-plugged or cold-plugged (removed when power is off). Storage drives in the server might be hot-pluggable, depending on the storage drive configuration.

To hot-plug a drive, you must take the drive offline (to prevent any applications from accessing it, and to remove the logical software links to it) before you can safely remove it.

1. Identify the storage drive you wish to remove.

The amber Service Action Required LED might be lit. For specific drive locations, see Section 3.2.1, "Server Storage Drive and Boot Drive Locations" on page 3-3.

2. **Determine whether the storage drive can be hot-plugged or cold-plugged.**

   The following conditions might prevent you from hot-plugging a drive. You must power off the server, if the storage drive:

   - Contains the operating system, and the operating system is not mirrored on another drive.
   - Cannot be logically isolated from the online operations of the server.

3. **Do one of the following:**

   - To hot-plug a drive, unconfigure the storage drive, as required.

     You must take the drive offline before you can safely remove it. This removes the logical software links to the drive and prevents any applications from accessing it. For information on how to take a storage drive offline, see TABLE 3-2.

TABLE 3-2 Storage Drive Removal Configuration Information

HBA Controller Type	Refer to...
For Sun Storage	• LSI MegaRAID SAS Software User's Guide located at: `http://www.lsi.com/support/sun/` **Note -** Open the book PDF file and search on "drive offline."
For LSI MegaRAID Storage Manager (MSM)	• *Sun LSI 106x RAID User's Guide* (820-4933). **Note -** Open the book PDF file and search on "drive offline."

   - To cold-plug a drive, power off the server.

     You must power off the server before you can safely remove the storage drive. Complete one of the procedures described in Section 2.4.2, "Power Off the Server" on page 2-4.

4. **On the drive you plan to remove, push the storage drive release button to open the latch (**FIGURE 3-5 **[1]).**

5. **Grasp the latch [2] and pull the drive out of the drive slot [3].**

Caution – The latch is not an ejector. Do not bend it too far to the right. Doing so can damage the latch.

Caution – Whenever you remove a storage drive, you should replace it with another storage drive or a filler panel before you power on the server; otherwise the server might overheat due to improper airflow.

FIGURE 3-5 Removing the Storage Drive
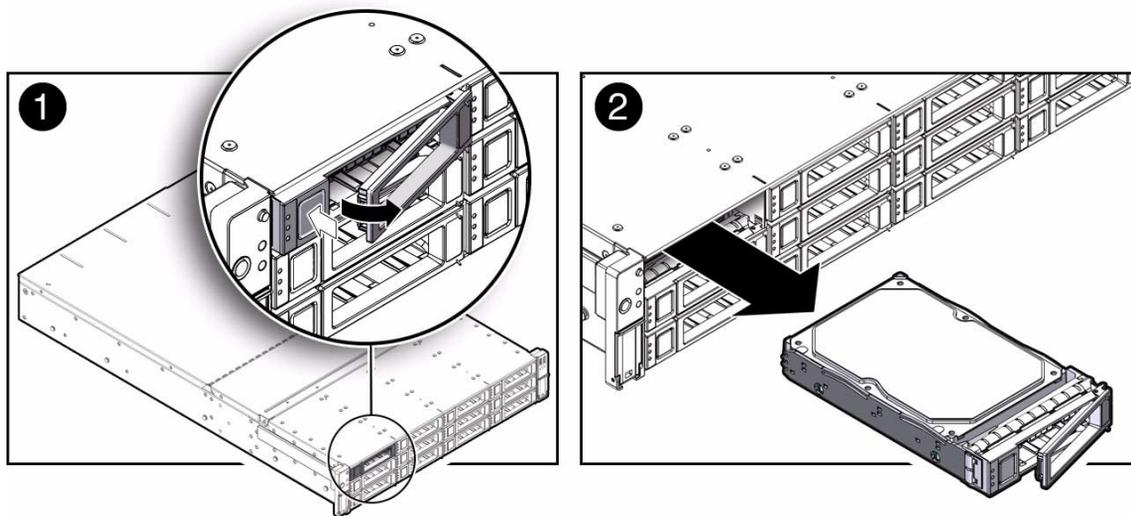
3.2.4 Install Storage Drive

Installing a storage drive into a server is a two-step process. You must first install a storage drive into the drive slot, and then configure that drive to the server.

1. **If necessary, remove the blank panel from the chassis.**

   The server might have covering unoccupied storage drive slots.

2. **Determine the drive slot location for the replacement storage drive.**

   If you removed an existing storage drive from a slot in the server, you must install the replacement drive in the same slot as the drive that was removed. Storage drives are physically addressed according to the slot in which they are installed. See FIGURE 3-2 for storage drive locations.

3. **Slide the drive into the drive slot until it is fully seated (**FIGURE 3-6**).**

FIGURE 3-6   Installing a Storage Drive
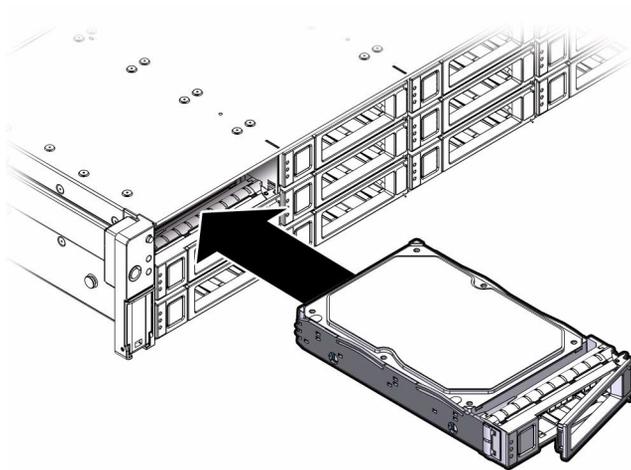
4. **Close the latch to lock the drive in place.**

5. **Do one of the following:**

   - **If you have hot-plugged the drive,** configure the storage drive.

.

For configuration information, refer to TABLE 3-3.

TABLE 3-3   Storage Drive Installation Configuration Information

HBA Controller Type	Refer to...
For Sun Storage	• LSI MegaRAID SAS Software User's Guide located at: http://www.lsi.com/support/sun/ **Note -** Open the book PDF file and search on "drive offline."
For LSI MegaRAID Storage Manager (MSM)	• *Sun LSI 106x RAID User's Guide* (820-4933). **Note -** Open the book PDF file and search on "drive offline."

- **If you have cold-plugged the drive:**

  Restore power to the server. Complete the procedure described in Section 6.5, "Powering On the Server" on page 6-7.

3.2.5   Remove Boot Drive

1. **Identify the Boot drive you want to remove.**

   The amber Service Action Required LED might be lit. For specific drive locations, see FIGURE 3-3.

2. **Remove the boot drive (**FIGURE 3-7**).**

   a. **On the drive that you want to remove, push the boot drive release button to open the latch [1].**

   b. **Grasp the boot drive latch and pull the drive out of the drive slot [2].**

Caution – The boot drive latch is not an ejector. Do not bend it too far to the right. Doing so can damage the latch.

Caution – Whenever you remove a boot drive, you should replace it with another boot drive or a filler panel before you power on the server; otherwise the server might overheat due to improper airflow.

FIGURE 3-7   Removing a Rear-Mounted Boot Disk Drive
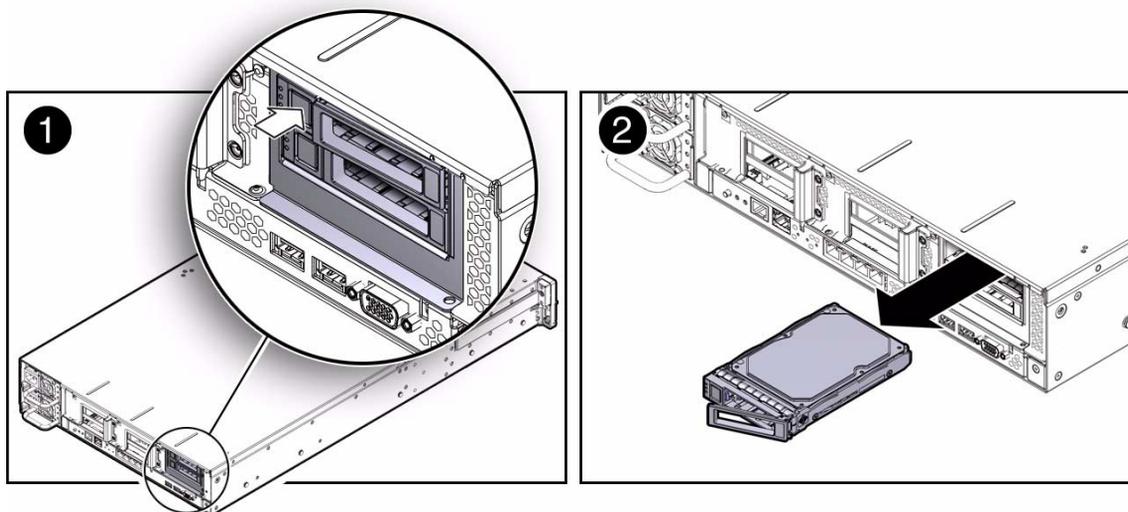
3.2.6   Install Boot Drive

1. **If necessary, remove the blank drive filler panel.**

   The system may have blank filler panels covering unoccupied drive slots.

2. **Determine the drive slot location for the replacement drive.**

   If you removed an existing drive from a slot in the system, you must install the replacement drive in the same slot as the drive that was removed. Drives are physically addressed according to the slot in which they are installed. See FIGURE 3-2 for drive locations.

3. **Slide the drive into the drive slot until it is fully seated (**FIGURE 3-8 **[1]).**

FIGURE 3-8 Installing a Rear-Mounted Boot Drive
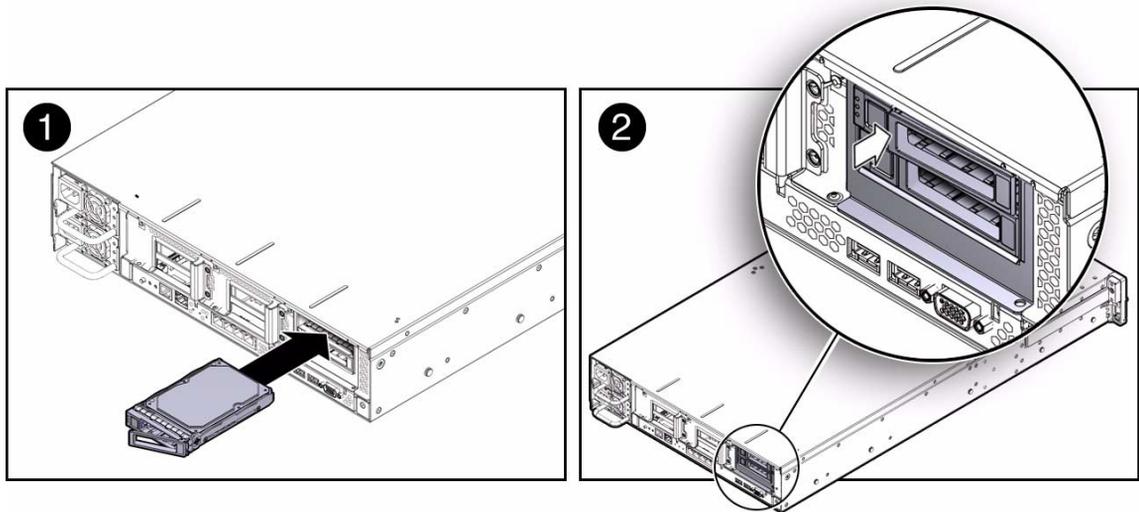
4. **Close the drive latch to lock the drive in place [2].**

3.3 Servicing Fan Modules

The following topics are covered in this section:

3.3.1 About Server Fans

The fan modules are located under the top cover door. Each fan module contains two fans mounted in an integrated, hot-swappable customer-replaceable unit (CRU). The server has six pairs of fan modules that provide N+1 cooling redundancy.

Caution – While the fan modules do provide some cooling redundancy, if a fan module fails, replace it as soon as possible to maintain server availability.

3.3.2 Detecting Fan Module Failure

The following LEDs indicate the status of the fan modules:

- Service Action Required LEDs - located on the front and rear of the server.
- TOP FAN LED - located on the front of the server
- Fan status LEDs located on the server side wall. See Section 3.3.3, "Fan Module Status LEDs" on page 3-12 for more information on the fan module status LED.

The system Overtemp LED might light if a fan fault causes an increase in system operating temperature. See Section 1.5, "Server Status Indicators and LEDs" on page 1-10 for more information about identifying and interpreting system LEDs.

3.3.3 Fan Module Status LEDs

Each fan module has one status LED. These LEDs are located on the server side wall adjacent to the fan modules (FIGURE 3-9).

See Section 1.5, "Server Status Indicators and LEDs" on page 1-10 for more information about system status LEDs.

TABLE 3-4 describes fan status LED.

TABLE 3-4   Fan Module Status LED

LED	Color	State Meaning
Fan Status	Bicolored: Amber/ Green	Amber – The fan module is faulty. The front TOP FAN LED and the front and rear panel Service Action Required LEDs are also lit if the system detects a fan module fault. Green – Indicates that the fan module is correctly installed and operating within specification.

3.3.4 Remove Fan Module

Caution – Hazardous moving parts. Unless the power to the server is completely shut down, the only service permitted in the fan compartment is the replacement of the fan modules.

1. **Extend the server into the maintenance position.**

   See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

2. **To access the fans, open the top cover fan door.**

   Press the two green release buttons on the sides of the fan door to release the door. Rotate the fan door to the open position and hold it there.

Note – Close the top cover door within 60 seconds to maintain adequate airflow to properly cool the server. Leaving the door open for more than 60 seconds, while the server is running, might cause the server to overheat and shut down.

3. **Identify the faulty fan module with a corresponding Fan status LED lit amber.**

   The Fan LEDs are located on the server side wall (FIGURE 3-9.)

4. **Using your thumb fingers, grasp the fan module and lift it straight up and out of the fan power board (**FIGURE 3-9**).**

Caution – When removing a fan module, do not rock it back and forth. Rocking a fan module might damage to the fan board connectors.

Caution – When changing the fan modules, note that only the fan modules can be removed or replaced. Do not service any other components in the fan compartment unless the system is shut down and the power cords are removed.

FIGURE 3-9   Location of Fan Status LEDs and Fan Module Removal
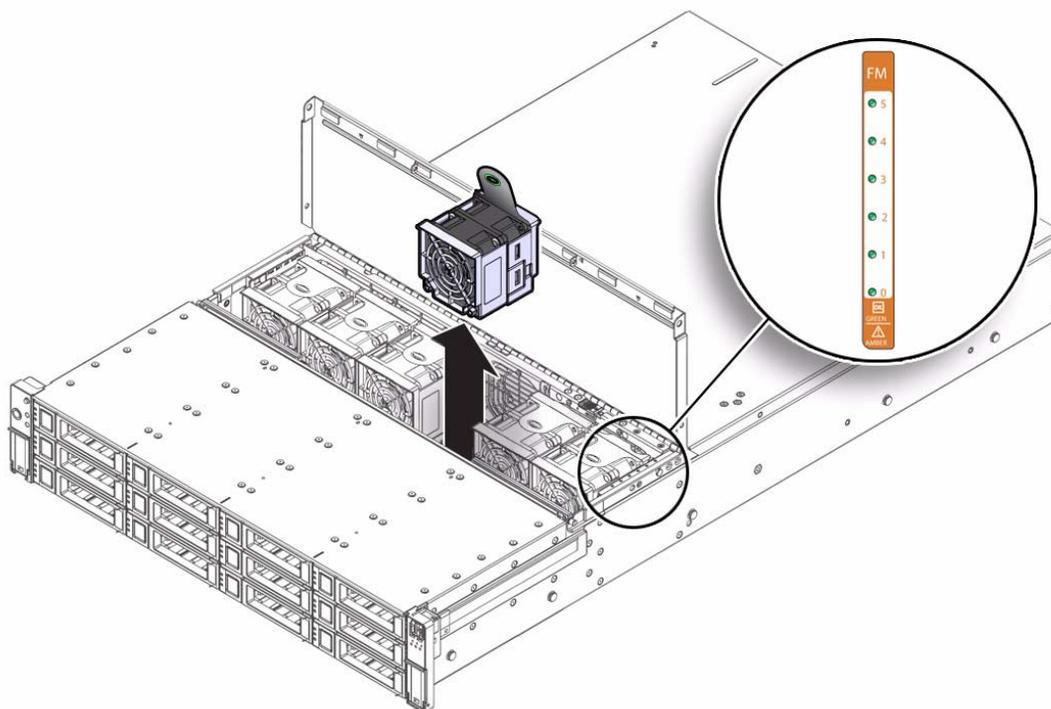
3.3.5   Install Fan Module

1. **With the top cover door open, install the replacement fan module into the server** (**).**

   a. **Grasp the fan module with your thumb and fingers and position it so that the connector on the underside of the fan module aligns with connector on the fan power board.**

   b. **Apply firm, downward pressure to the fan module to fully seat it into the fan power board.**

FIGURE 3-10 Installing a Fan Module
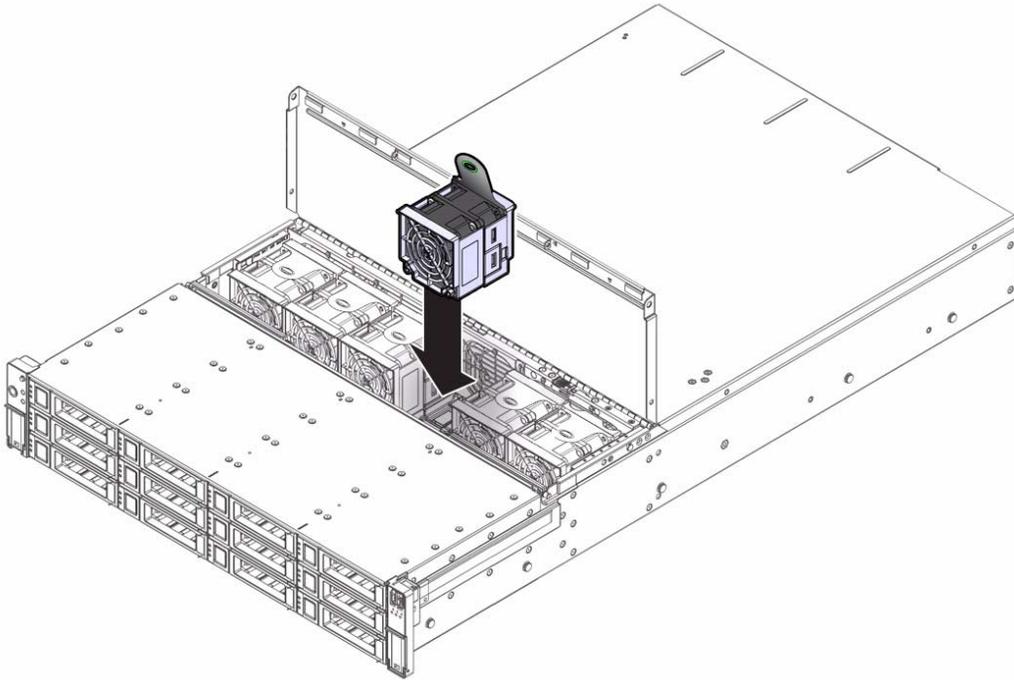
2. **Verify that the Fan Fault status LED for the replaced fan module is lit green** (FIGURE 3-9).

3. **Close the top cover door.**

4. **Verify that the Top Fan LED and the Service Action Required LED on the server's front panel are extinguished.**

    See Section 1.2, "Server Chassis Overview" on page 1-3 and Section 1.5, "Server Status Indicators and LEDs" on page 1-10 for more information about identifying and interpreting system LEDs.

5. **Return the server to the normal rack position.**

    See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

3.4 Servicing Power Supplies

If your server is equipped with two power supplies, then the power supplies are hot-swappable. This is because the power supplies are redundant, that is, the server only needs one power supply to operate. Redundant power supplies enable you to remove and replace a power supply without shutting the server down, provided that the other power supply is online and working.

Note – If a power supply fails and you do not have a replacement available, to ensure proper airflow, leave the failed power supply installed in the server. For instructions for installing filler panels, see Section 2.8.2, "Filler Panel Removal and Installation" on page 2-30.

See Section 3.4.2, "Power Supply Status LEDs" on page 3-16 for specific information about power supply status LEDs.

The following topics are covered:

- Section 3.4.1, "Detecting Power Supply Failure" on page 3-16
- Section 3.4.2, "Power Supply Status LEDs" on page 3-16
- Section 3.4.3, "Remove Power Supply" on page 3-18
- Section 3.4.4, "Install Power Supply" on page 3-19

3.4.1 Detecting Power Supply Failure

The following LEDs are lit when a power supply fault is detected:

- Front and rear Service Action Required LEDs
- Rear PS Failure LED on the front of the server
- Failure LED on the faulty power supply

See Section 1.3, "Server Front Panel Features" on page 1-6 and Section 1.5, "Server Status Indicators and LEDs" on page 1-10 for more information about identifying and interpreting system LEDs.

3.4.2 Power Supply Status LEDs

Each power supply contains status LEDs that are visible on the back of the server (FIGURE 3-11). TABLE 3-5 provides a description of these LEDs.

FIGURE 3-11 Power Supply Status LEDs
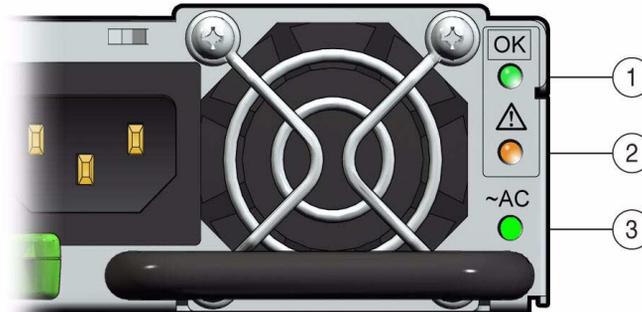
TABLE 3-5 Power Supply Status LEDs

Legend	LED	Symbol	Color	Lights When...
1	OK	OK	Green	DC power is available. The power supply is producing DC power within specifications.
2	Service Action Required	⚠	Amber	The power supply is faulty. The front REAR PS LED and the front and rear panel Service Action Required LEDs the are also lit if the system detects a power supply fault.
3	AC power present	~AC	Green	The power supply is plugged in and AC power is available, regardless of system power state.

3.4.3 Remove Power Supply

Caution – **Hazardous voltages are present.** To reduce the risk of electric shock and danger to personal health, follow the instructions.

1. **Identify which power supply (0 or 1) requires replacement.**

   A lit Service Action Required LED on a power supply indicates that a failure was detected.

2. **Gain access to the rear of the server where the faulty power supply is located.**

3. **Release the cable management arm (CMA) (**FIGURE 3-12**).**

   The CMA is located at the rear of the server rack.

FIGURE 3-12 Releasing the Cable Management Arm
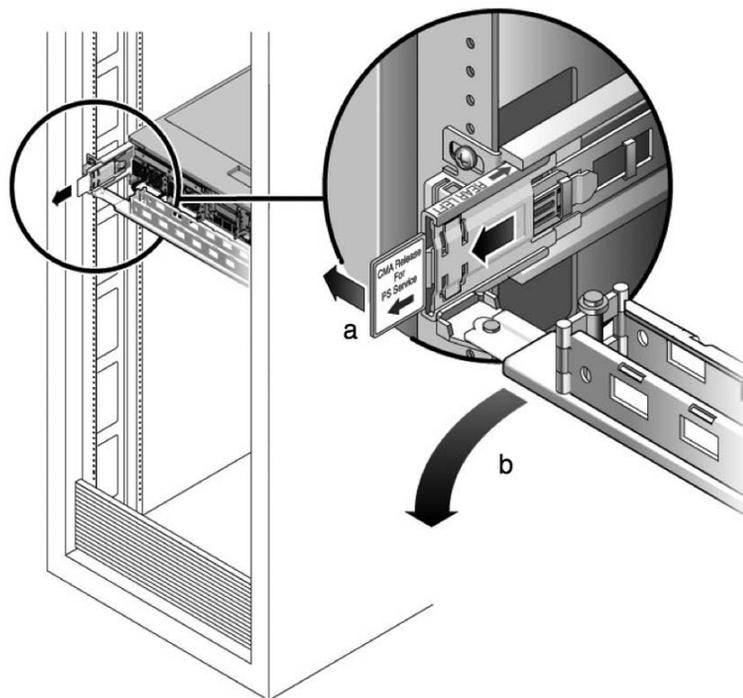
   a. **Press and hold the CMA release tab.**

   b. **Rotate the cable management arm out of the way so that you can access the power supply.**

4. **Disconnect the power cord from the faulty power supply.**

5. **Grasp the power supply handle and press the release latch (**FIGURE 3-13 **[1]).**

6. **Pull the power supply out of the chassis [2].**

FIGURE 3-13 Removing a Power Supply
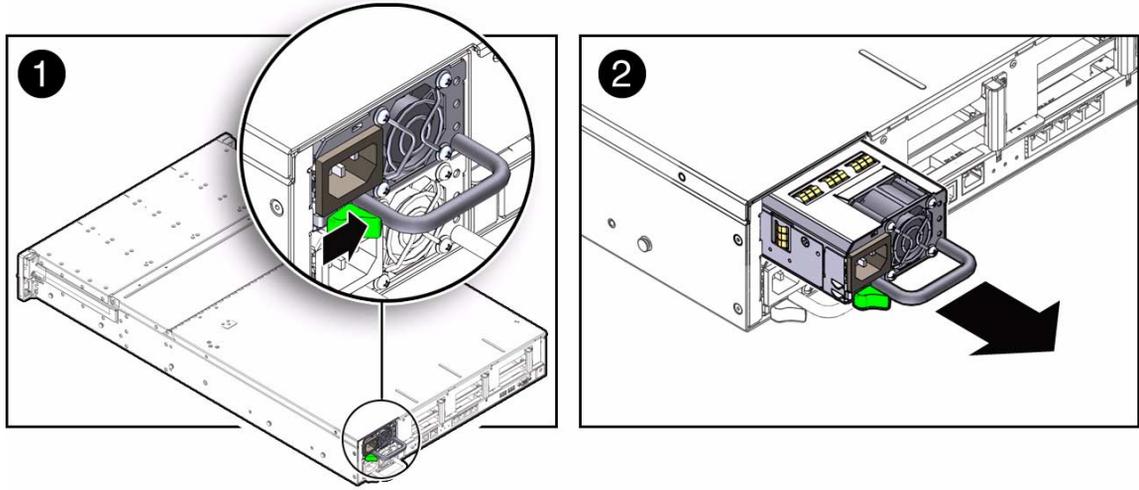
3.4.4   Install Power Supply

1. **Align the replacement power supply with the empty power supply chassis bay.**

2. **Slide the power supply into the bay until it is fully seated.**

3. **Reconnect the power cord to the power supply.**

   Verify that the AC Present LED is lit.

4. **Close the CMA, inserting the end of the CMA into the rear left rail bracket (**FIGURE 3-12**).**

5. **Verify that the following LEDs are extinguished:**

   - On power supply: Service Action Required LED
   - On the front of the chassis: Service Action Required and REAR PS LEDs
   - On the rear of the chassis: Service Action Required LED

Note – See Section 1.4, "Server Back Panel Features" on page 1-9 for more information about identifying and interpreting system LEDs.

Servicing Motherboard Components

This chapter describes how to replace the motherboard and its components in the Sun Fire X4270 M2 Server.

Note – Before performing any of the procedures in this chapter, perform the procedures described in Chapter 2, Preparing to Service the System.

The following topics are covered in this chapter:

- Section 4.1, "Motherboard Component Locations" on page 4-2
- Section 4.2, "Servicing Memory Modules (DIMMs)" on page 4-3
- Section 4.3, "Servicing the Air Baffle" on page 4-13
- Section 4.4, "Servicing PCIe Risers" on page 4-17
- Section 4.5, "Servicing PCIe Cards" on page 4-20
- Section 4.6, "Servicing the Server Battery" on page 4-25
- Section 4.7, "Servicing CPUs" on page 4-27
- Section 4.8, "Servicing the Motherboard" on page 4-36
- Section 4.9, "Resetting Passwords and Clearing CMOS NVRAM" on page 4-40

Caution – Hazardous voltage present. Never attempt to run the server with the cover removed.

Caution – Equipment damage possible. The cover must be in place for proper airflow.

4.1　Motherboard Component Locations

The motherboard components that are replaceable are shown in FIGURE 4-1.

FIGURE 4-1　Location of Motherboard Components
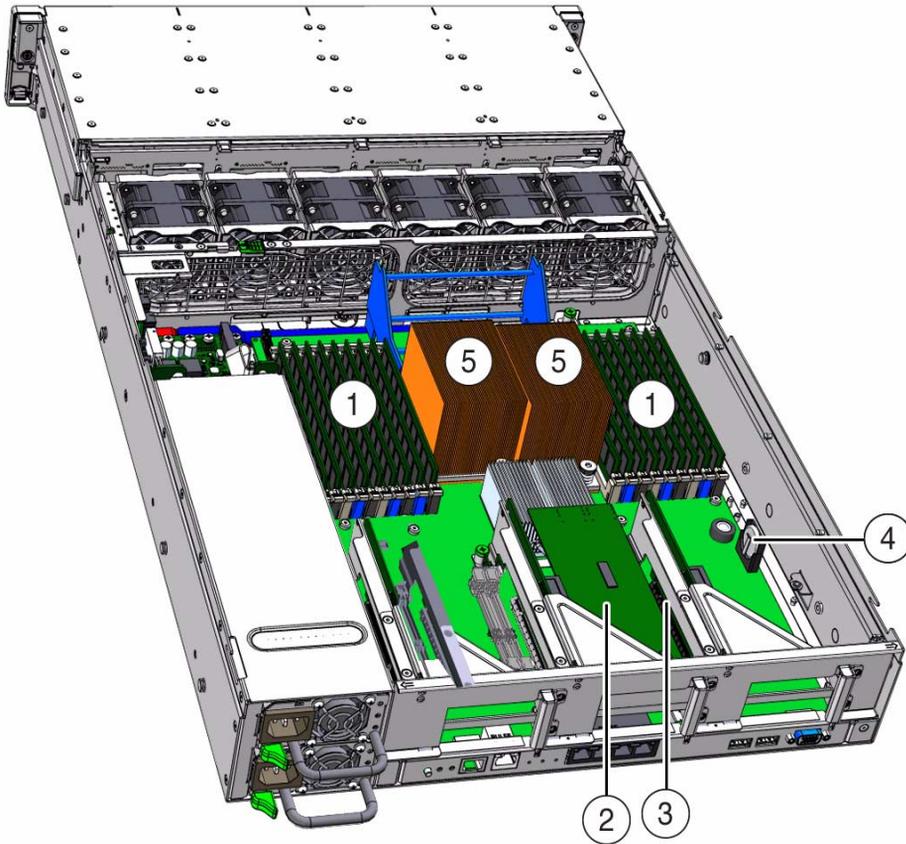
Figure Legend

1	Memory DIMMs	**4**	Battery
2	PCIe Card	**5**	CPUs
3	PCIe Riser		

4.2   Servicing Memory Modules (DIMMs)

Caution – These procedures require that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

Caution – Ensure that all power is removed from the server before removing or installing DIMMs, or damage to the DIMMs might occur. You must disconnect all power cables from the system before performing this procedure.

The Sun Fire X4270 M2 Server supports a variety of DIMM configurations that can include quad-rank (QR) DIMMs, dual-rank (DR) DIMMs, or single-rank (SR) DIMMs. When replacing or upgrading a DIMM on the server you should consider the following:

- DIMM and CPU physical layout.

    For details, see Section 4.2.1, "DIMM and CPU Physical Layout" on page 4-4.

- DIMM population rules.

    For details, see Section 4.2.2, "DIMM Population Rules" on page 4-5.

- DIMM rank classification labels.

    For details, see Section 4.2.3, "DIMM Rank Classification Labels" on page 4-7.

- Locations of Faulty DIMMs Using ILOM Versus BIOS.

    For details, see Section 4.2.4, "Locations of Faulty DIMMs Using ILOM Versus BIOS" on page 4-7.

- Inconsistencies between DIMM fault LEDs and the BIOS mapping of faulty DIMMs.

    For details, see Section 4.2.5, "Inconsistencies Between DIMM Fault LEDs and the BIOS Mapping of Faulty DIMMs" on page 4-8.

- Instructions for removing a faulty DIMM.

    For details, see Section 4.2.6, "Remove Faulty DIMMs" on page 4-8.

- Instructions for installing a DIMM.

    For details, see Section 4.2.7, "Install DDR3 DIMMs" on page 4-11.

- Memory Error Correction and Parity.

    For details, see Section 4.2.8, "Error Correction and Parity" on page 4-13.

4.2.1   DIMM and CPU Physical Layout

The physical layout of the DIMMs and CPUs is shown in FIGURE 4-2 and TABLE 4-1.

FIGURE 4-2   CPU and DIMM Physical Layout
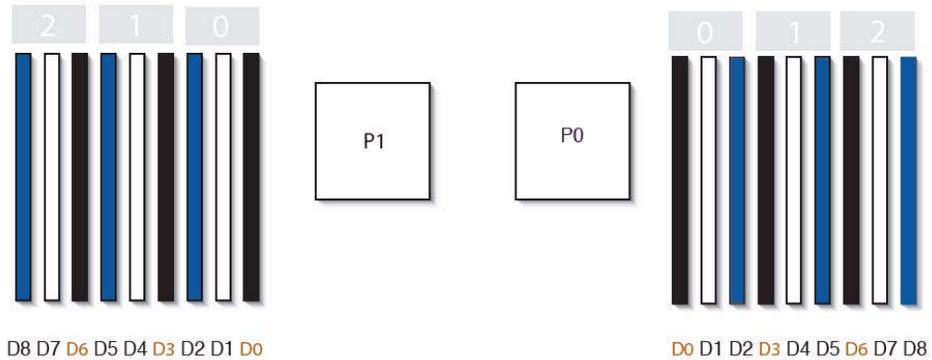
TABLE 4-1   CPUs and DIMMs Physical Layout

CPUs and DIMMs	Physical Layout
CPU 0 location	P0
CPU 1 location	P1

TABLE 4-1 CPUs and DIMMs Physical Layout

CPUs and DIMMs	Physical Layout
Channel locations for CPU 0	
Three channels per CPU with each channel containing three color-coded DIMM slots (black, white, and blue).	
Channel locations for CPU 1	
Three channels per CPU with each channel containing three color-coded DIMM slots (blue, white and black).	
DIMM slot numbering per CPU; with D8 as the farthest slot away from CPU.	P0: D0 D1 D2 D3 D4 D5 D6 D7 D8 P1: D8 D7 D6 D5 D4 D3 D2 D1 D0

4.2.2 DIMM Population Rules

The DIMM population rules for the servers are as follows:

1. Do not populate any DIMM sockets next to an empty CPU socket. Each processor contains a separate memory controller.

2. Each CPU can support a maximum of:
   - Nine dual-rank (DR) or single-rank (SR) DIMMs; *or*
   - Six quad-rank (QR) DIMMs with two per memory channel; *or*
   - Three QR DIMMs with one per channel and three DR or SR DIMMs.

3. Each CPU can support single DIMMs or two DIMMs per channel.

4. Each CPU can support a single DIMM in channel 0, or one DIMM each in channels 0 and 1.

5. A server CPU will support both 1.35v and 1.5v DIMMs, but will default to the higher voltage.

6. Populate DIMMs by location according to the following rules:
   - Populate the DIMM slots for each memory channel that are the farthest from the CPU first.

     For example, populate D8/D5/D2 first; then D7/D4/D1 second; and finally, D6/D3/D0. See FIGURE 4-2.

- Populate QR DIMMs first, followed by SR or DR DIMMs.
  - Populate QR DIMMs in blue sockets (D8/D5/D2) first then white sockets (D7/D4/D1). See FIGURE 4-2.

    Note that QR DIMMs are supported only in white sockets if adjacent blue socket contains a QR DIMM.
  - Populate QR, SR, or DR DIMMs in sets of three for each CPU, one per memory channel. See FIGURE 4-2.

7. For maximum performance, apply the following rules:

- The best performance is ensured by preserving symmetry. For example: adding 3x of same kind of DIMMs, one per memory channel; and, if the server has two CPUs, ensuring that both CPUs have the same size of DIMMs populated in the same manner.

- In certain configurations, DIMMs will run slower than their individual maximum speed. See TABLE 4-2 for further details.

TABLE 4-2 Memory Considerations and Limitations

1	DIMMs are available in two speeds: 1066 MHz and 1333 MHz
2	DIMM speed rules are as follows: 3x of the same kind of DIMMs per channel = 800 MHz 2x of the same kind of DIMMs per channel = 1333 MHz (for single-rank and dual-rank DIMMs) or = 800 MHz (for quad-rank DIMMs) 1x of the same kind of DIMMs per channel = 1333 MHz (if using 1333 MHz DIMMs)[*] 1x of the same kind of DIMMs per channel = 1066 MHz (if using 1066 MHz DIMMs)
3	The system operates all memory only as fast as the slowest DIMM configuration.

* This DIMM configuration requires CPUs supporting 1333 MHz.

4.2.3 DIMM Rank Classification Labels

DIMMs come in a variety of ranks: single, dual, or quad. Each DIMM is shipped with a label identifying its rank classification. TABLE 4-3 identifies the corresponding rank classification label shipped with each DIMM.

TABLE 4-3   DIMM Classification Labels

Rank Classification	Label
Quad-rank DIMM	4Rx4
Dual-rank DIMM	2Rx4
Single-rank DIMM	1Rx4

4.2.4 Locations of Faulty DIMMs Using ILOM Versus BIOS

ILOM and BIOS use different formats to identify the location of a faulty DIMM.

- For ILOM, the format is Px/Dx, where x is 0 or 1 for CPUs, and 0 to 8 for DIMMs.
- For BIOS, the format is CPUx/CHANNELx/DIMMx, where x is 0 or 1 for CPUs, and 0 to 2 for channels and DIMMs.

TABLE 4-4 shows the mapping of faulty DIMM locations as reported by ILOM and BIOS.

TABLE 4-4   Mapping of Faulty DIMM Locations for ILOM and BIOS

ILOM Mapping for CPU0	BIOS Mapping for CPU0	ILOM Mapping for CPU1	BIOS Mapping for CPU1
P0/D0	CPU0/CHANNEL0/DIMM0	P1/D0	CPU1/CHANNEL0/DIMM0
P0/D1	CPU0/CHANNEL0/DIMM1	P1/D1	CPU1/CHANNEL0/DIMM1
P0/D2	CPU0/CHANNEL0/DIMM2	P1/D2	CPU1/CHANNEL0/DIMM2
P0/D3	CPU0/CHANNEL1/DIMM0	P1/D3	CPU1/CHANNEL1/DIMM0
P0/D4	CPU0/CHANNEL1/DIMM1	P1/D4	CPU1/CHANNEL1/DIMM1
P0/D5	CPU0/CHANNEL1/DIMM2	P1/D5	CPU1/CHANNEL1/DIMM2
P0/D6	CPU0/CHANNEL2/DIMM0	P1/D6	CPU1/CHANNEL2/DIMM0
P0/D7	CPU0/CHANNEL2/DIMM1	P1/D7	CPU1/CHANNEL2/DIMM1
P0/D8	CPU0/CHANNEL2/DIMM2	P1/D8	CPU1/CHANNEL2/DIMM2

4.2.5 Inconsistencies Between DIMM Fault LEDs and the BIOS Mapping of Faulty DIMMs

When a single DIMM is marked as faulty by ILOM (for example, `fault.memory.intel.dimm.training-failed` is listed in the SP Event Log), BIOS might map out the entire memory channel that contains the faulty DIMM as failing, that is, up to three DIMMs. As a result, the memory available to the operating system is reduced.

However, when the Fault Remind button is pressed, only the fault LED associated with the faulty DIMM lights. The fault LEDs for the other two DIMMs in the memory channel remain off. Therefore, you can correctly identify the faulty DIMM.

When the faulty DIMM is replaced and the DIMM fault is cleared using ILOM, the memory available to the operating system returns to normal. For instructions for clearing DIMM faults, see the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun Fire X4170 M2 and X4270 M2 Servers* (821-0489).

4.2.6 Remove Faulty DIMMs

Note – The DDR3 memory DIMMs are customer-replaceable units (CRUs) and do not require an authorized service provider for replacement.

---

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cord (or cords) from the server power supply (or supplies).**

   See Section 2.4.2, "Power Off the Server" on page 2-4.

   b. **Extend the server into the maintenance position.**

   See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

   c. **Attach an antistatic wrist strap.**

   See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

   d. **Remove the top cover.**

   See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **Remove the faulty DDR3 DIMM(s).**

a. **To identify the location of the faulty DDR3 DIMMS, press the Fault Remind button on the motherboard (**FIGURE 4-3**).**

Note – When the Fault Remind button is pressed, a LED located next to the Fault Remind button lights green to indicate that there is sufficient voltage present in the fault remind circuit to light any fault LEDs that were set due to a failure. If this LED fails to light when you press the Fault Remind button, it is likely that the capacitor powering the fault remind circuit has lost its charge. This can happen if the Fault Remind button is pressed for a long time with fault LEDs lit or if power has been removed from the server for more than 15 minutes.

FIGURE 4-3 Fault Remind Button
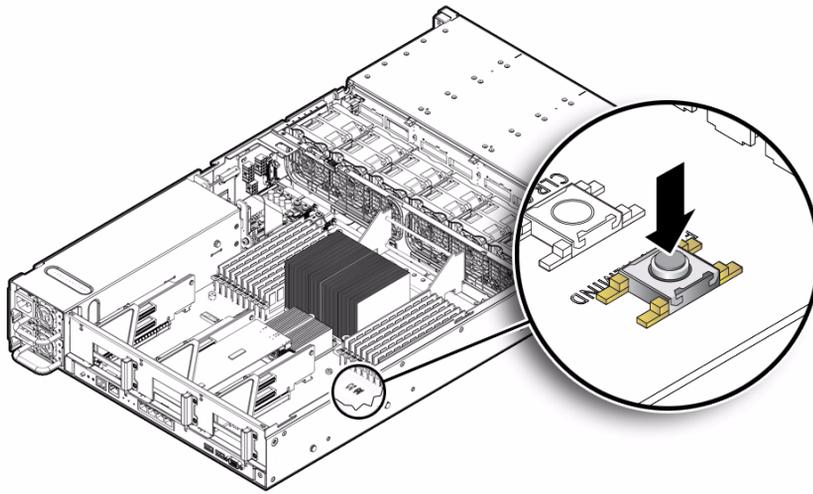
b. **Note the location of faulty DDR3 DIMMs.**

   Faulty memory DIMMs are identified with a corresponding amber LED on the motherboard (FIGURE 4-4).

   - If DIMM fault LED is off: DIMM is operating properly.
   - If DIMM fault LED is on (amber): DIMM is faulty and should be replaced.

FIGURE 4-4   Memory DIMM Fault LED Locations
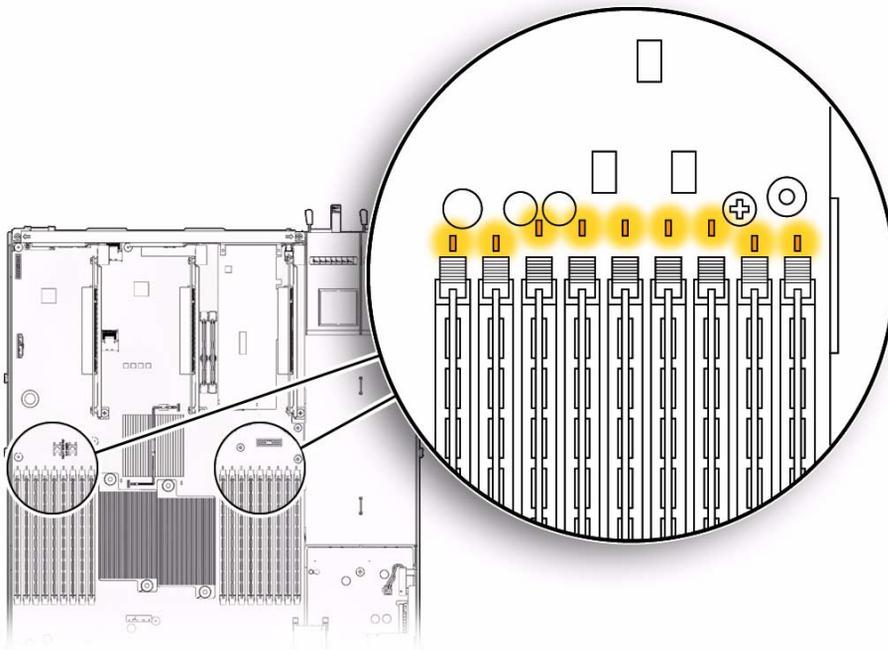
c. **To remove the faulty DIMM do the following:**

   i. **Rotate both DIMM slot ejectors outward as far as they will go.**

      The DIMM is partially ejected from the socket (FIGURE 4-5).

   ii. **Carefully lift the DIMM straight up to remove it from the socket.**

d. **Replace each faulty DIMM with either another DIMM of the same rank size (quad rank, dual rank, or single rank) or a DIMM filler panel.**

   For DIMM replacement instructions, see Section 4.2.7, "Install DDR3 DIMMs" on page 4-11.

> ⚠ **Caution –** If you are not immediately inserting a replacement DIMM into the empty DIMM socket, insert a DIMM filler panel in the socket to ensure adequate cooling and reduce the possibility of a system shutdown. For instructions for installing a DDR3 filler panel, see Section 2.8.2, "Filler Panel Removal and Installation" on page 2-30.

FIGURE 4-5 DIMM Socket Release and Alignment
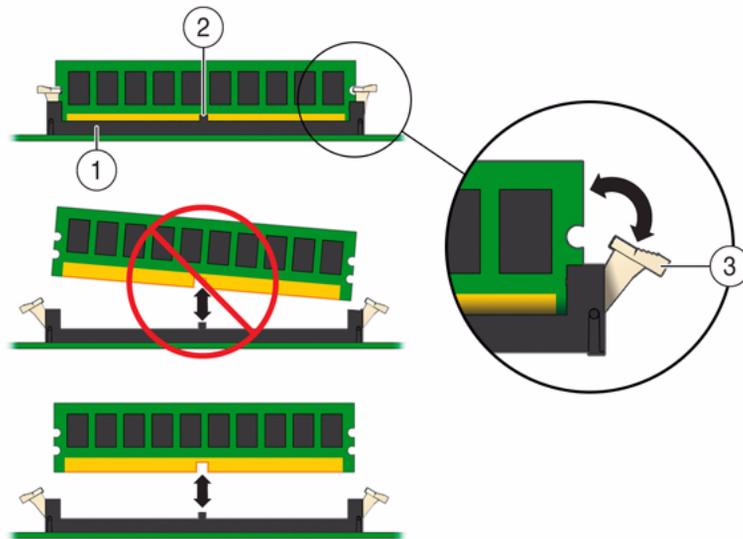
Figure Legend

1	DIMM connector slot
2	DIMM connector key
3	DIMM ejector lever

4.2.7   Install DDR3 DIMMs

1. **Unpack the replacement DDR3 DIMMs and place them on an antistatic mat.**

2. **Ensure that the replacement DIMMs match the sizes as the DIMMs they are replacing.**

   You must not replace a dual-rank DIMM with a quad-rank DIMM and vice versa. If you violate this rule, the performance of the server might be adversely affected. For DIMM population rules, see Section 4.2.2, "DIMM Population Rules" on page 4-5.

3. **Install the DIMMs**

   a. **Ensure that the ejector tabs are in the open position.**

   b. **Line up the replacement DIMM with the connector (**FIGURE 4-6**).**

      Align the notch in the DIMM with the key in the connector. The notch ensures that the DIMM is oriented correctly.

FIGURE 4-6 Installing DIMMs
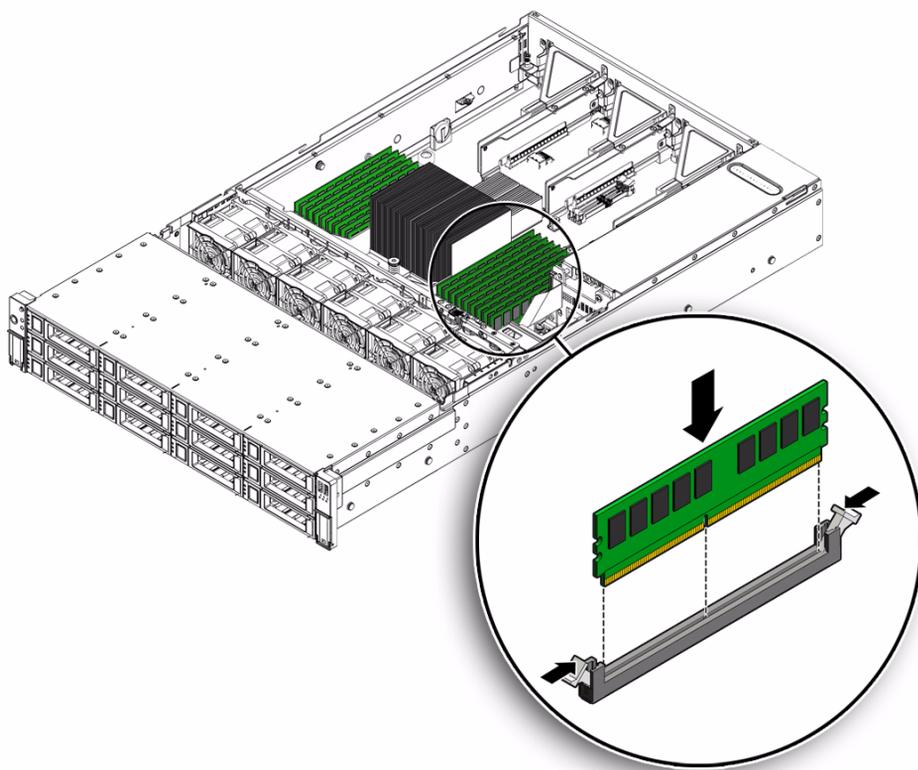
c. **Push the DIMM into the connector until the ejector tabs lock the DIMM in place.**

If the DIMM does not easily seat into the connector, verify that the notch in the DIMM is aligned with the key in the connector as shown in FIGURE 4-6. If the notch is not aligned, damage to the DIMM might occur.

4. **Repeat** Step 3 **until all replacement DIMMs are installed.**

5. **Return the server to operation.**

a. **Install the top cover.**

See Section 6.2, "Installing the Server Top Cover" on page 6-2.

b. **Return the server to the normal rack position.**

See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

    c. Reconnect the power cord (or cords) to the server power supply (or supplies) and power on the server.

    See Section 6.5, "Powering On the Server" on page 6-7.

    Verify that the AC Present LED is lit.

6. Use ILOM to clear DDR3 DIMM faults.

For instructions for clearing DIMM faults, see the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun Fire X4170 M2 and X4270 M2 Servers* (821-0489).

4.2.8   Error Correction and Parity

The server's processor provides parity protection on its internal cache memories and error-correcting code (ECC) protection of the data. The system can detect and log to the ILOM event log the following types of errors:

- Correctable and uncorrectable memory ECC errors
- Uncorrectable CPU internal errors

Advanced ECC corrects up to 4 bits in error on nibble boundaries, as long as they are all in the same DRAM. If a DRAM fails, the DIMM continues to function.

For instructions for clearing DIMM faults, see the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun Fire X4170 M2 and X4270 M2 Servers* (821-0489).

4.3   Servicing the Air Baffle

You must remove the air baffle when removing and installing the motherboard on Sun Fire X4270 M2 Server.

Caution – To prevent the system from overheating, ensure that the air baffle is correctly installed before powering on the server.

Caution – Ensure that all power is removed from the server before removing or installing DIMMs, or damage to the DIMMs might occur. You must disconnect all power cables from the system before performing this procedure.

4.3.1 Open Air Baffle

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cord (or cords) from the server power supply (or supplies).**

      See Section 2.4.2, "Power Off the Server" on page 2-4.

   b. **Extend the server to the maintenance position.**

      See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

   c. **Attach an antistatic wrist strap.**

      See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

   d. **Remove the top cover.**

      See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **Open the air baffle as shown in** FIGURE 4-7**.**

   Grasp the air baffle at the bottom and lift it up and out of the way.

FIGURE 4-7 Opening the Air Baffle
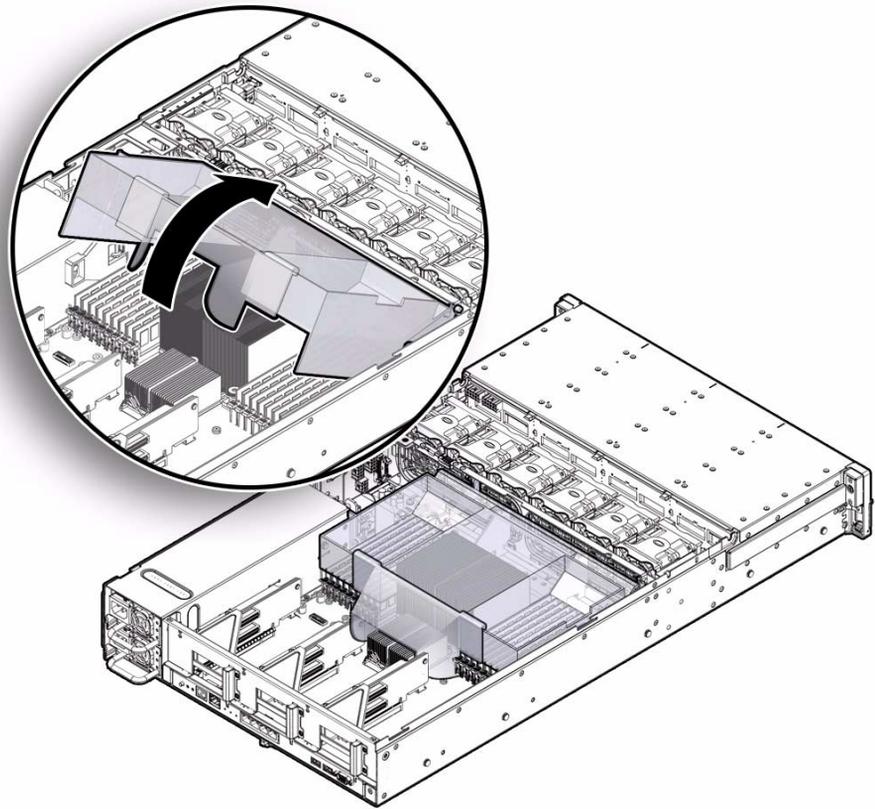
4.3.2 Remove Air Baffle

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cord (or cords) from the server power supply (or supplies).**

   See Section 2.4.2, "Power Off the Server" on page 2-4.

   b. **Extend the server to the maintenance position.**

   See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

c. **Attach an antistatic wrist strap.**

See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

d. **Remove the top cover.**

See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **Remove the air baffle (FIGURE 4-8).**

   a. **Press the air baffle connectors [1] outward.**

   b. **Lift the air baffle up and out of the server [2].**

FIGURE 4-8 Removing the Air Baffle
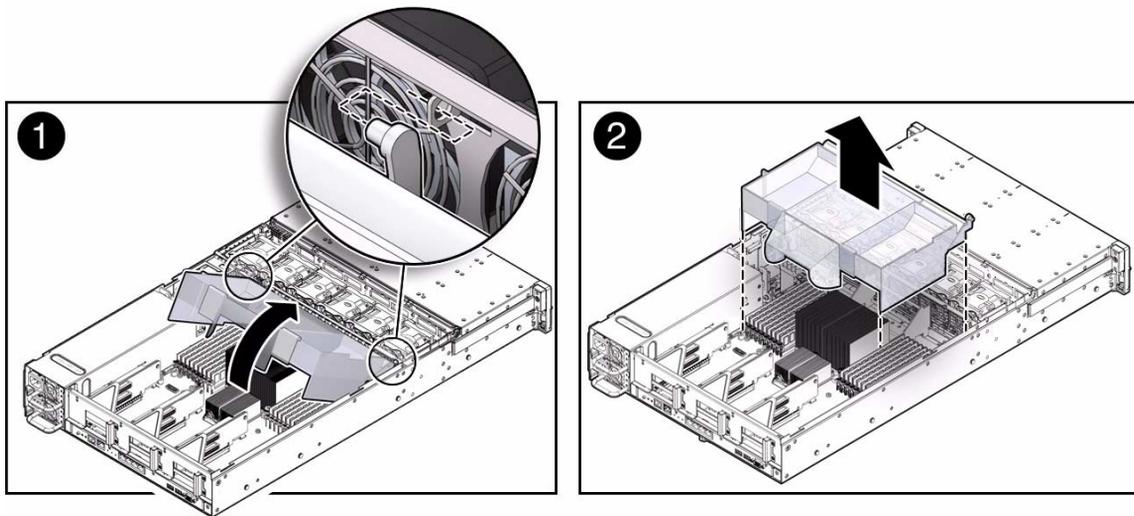
4.3.3   Install Air Baffle

⚠ **Caution –** When the server is in operation, ensure that the air baffle is correctly installed to prevent the system from overheating.

1. **Install the air baffle into the chassis.**

   a. **Press the air baffle connectors outward.**

   b. **Insert the air baffle in to the server, and lower it to its down position.**

2. **Return the server to operation.**

   a. **Install the top cover.**

      See Section 6.2, "Installing the Server Top Cover" on page 6-2.

   b. **Return the server to the normal rack position.**

      See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

   c. **Reconnect the power cord (or cords) to the server power supply (or supplies) and power on the server.**

      See Section 6.5, "Powering On the Server" on page 6-7.

      Verify that the AC Present LED is lit.

4.4 Servicing PCIe Risers

PCIe cards are installed on vertical risers. You must remove the relevant riser to remove and replace a PCIe card. You must remove all three PCIe risers when replacing the motherboard.

Caution – These procedures require that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

Caution – Ensure that all power is removed from the server before removing or installing risers. You must disconnect the power cables before performing this procedure.

The following topics are covered in this section:

- Section 4.4.1, "Remove PCIe Riser" on page 4-17
- Section 4.4.2, "Install PCIe Riser" on page 4-19

4.4.1 Remove PCIe Riser

1. **Prepare the server for service.**

a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

See Section 2.4.2, "Power Off the Server" on page 2-4.

b. **Extend the server to the maintenance position.**

See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

c. **Attach an antistatic wrist strap.**

See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

d. **Remove the top cover.**

See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **If you are servicing a PCIe card, locate its position in the system.**

3. **Disconnect any data cables connected to the cards on the PCIe riser being removed.**

Label the cables to ensure proper connection later.

4. **Remove the back panel PCI crossbar (**FIGURE 4-9**).**

a. **Loosen the two captive Phillips screws on the end of the PCI crossbar [1].**

b. **Lift the PCI crossbar up and back to remove it from the chassis [1].**

5. **Remove the PCIe riser from the system (**FIGURE 4-9**).**

a. **Loosen the captive screw holding the riser to the motherboard [2].**

b. **Lift up the riser and any PCIe cards that are attached to it as a unit [2].**

The server can have up to three PCIe risers. Each riser can support two PCIe cards.

FIGURE 4-9   Removing a PCIe Riser
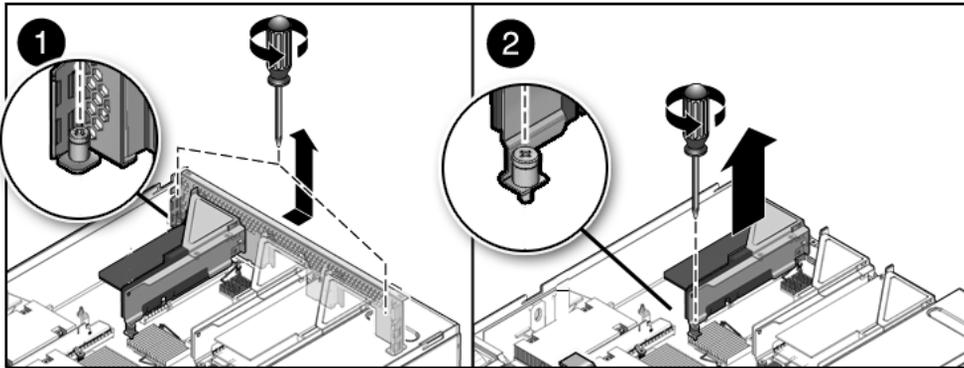
4.4.2   Install PCIe Riser

1. **Lower the PCIe riser and any cards attached to it into the system (**FIGURE 4-10 **[1]).**

   Slide the back of the riser into the motherboard back panel stiffener.

2. **Tighten the screw that secures the riser to the motherboard [1].**

3. **Install the back panel PCI crossbar [2].**

   Slide the crossbar down over the PCIe risers. Secure the PCI crossbar to the chassis with two captive Phillips screws.

FIGURE 4-10 Installing a PCIe Riser
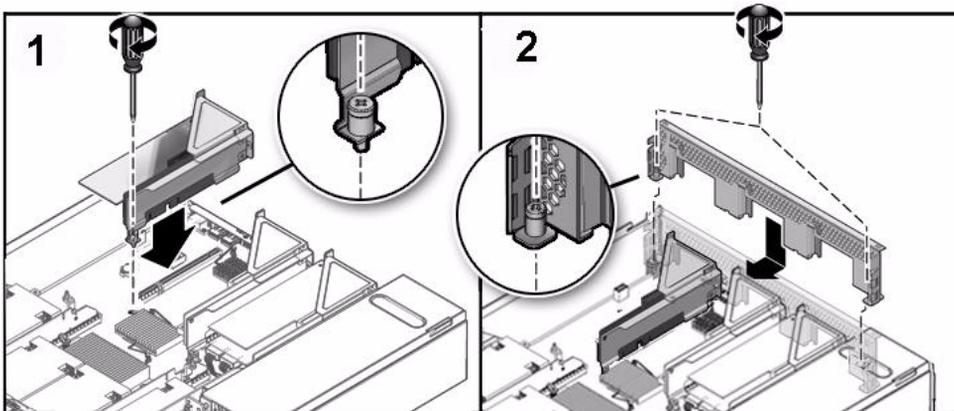
4. **Return the server to operation.**

   a. **Install the server top cover.**

      See Section 6.2, "Installing the Server Top Cover" on page 6-2.

   b. **Return the server to the normal rack position.**

      See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

   c. **Connect any data cables you removed to service the PCIe cards.**

   d. **Reconnect the power cord (or cords) to the power supply (or supplies).**

      See Section 6.5, "Powering On the Server" on page 6-7.

      Verify that the AC Present LED is lit.

5. **Use ILOM to clear the server PCIe riser fault.**

   For instructions for clearing an PCIe riser faults, see the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun Fire X4170 M2 and X4270 M2 Servers* (821-0489).

4.5 Servicing PCIe Cards

See Section 4.5.2, "PCIe Card Configuration Guidelines" on page 4-22 for PCIe card configuration guidelines.

Caution – These procedures require that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid damage, ensure that you follow antistatic practices as described in Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

Caution – Ensure that all power is removed from the server before removing or installing expansion cards. You must disconnect the power cables before performing these procedures.

The following topics are covered in this section:

■ Section 4.5.1, "Supported PCIe Cards" on page 4-21

■ Section 4.5.2, "PCIe Card Configuration Guidelines" on page 4-22

■ Section 4.5.3, "Remove a PCIe Card" on page 4-23

■ Section 4.5.4, "Install a PCIe Card" on page 4-24

4.5.1 Supported PCIe Cards

See TABLE 4-5 for a list of PCIe option cards supported and the applicable installation guide.

TABLE 4-5 Supported PCIe HBA Cards and Applicable Installation Guides

| PCIe Card Name and Module Number	Description	Refer to...
Sun Storage 6 Gb SAS RAID PCIe HBA, Internal (SGX-SAS6-R-INT-Z)*	This card connects to internal storage devices, that is, devices that are physically located inside the system chassis and supports RAID.	The "Hardware Installation and Removal" chapter in the *Sun Storage 6 Gb SAS PCIe RAID HBA, Internal Installation Guide For HBA Models SGX-SAS6-R-INT-Z and SG-SAS6-R-INT-Z* (820-7885)
Sun Storage 6 Gb SAS RAID PCIe HBA, External (SGX-SAS6-R-EXT-Z)	Connects to external storage devices and supports RAID.	The "Hardware Installation and Removal" chapter in the *Sun Storage 6 Gb SAS PCIe RAID HBA, External Installation Guide For HBA Models SGX-SAS6-R-EXT-Z and SG-SAS6-R-EXT-Z* (820-7886)
Sun Storage 6 Gb SAS PCIe HBA, Internal (SGX-SAS6-INT-Z)	Connects to internal storage devices, that is, devices that are physically located inside the system chassis. **Note -** This PCIe card *does not* support RAID.	The "Hardware Installation and Removal" chapter in the *Sun Storage 6 Gb SAS PCIe HBA, Internal Installation Guide For HBA Models SGX-SAS6-INT-Z and SG-SAS6-INT-Z* (820-7889)
Sun Storage 6 Gb SAS PCIe HBA, External (SGX-SAS6-EXT-Z)	Connects to external storage devices. **Note -** This PCIe card *does not* support RAID.	The "Hardware Installation and Removal" chapter in the *Sun Storage 6 Gb SAS PCIe HBA, External Installation Guide For HBA Models SGX-SAS6-EXT-Z and SG-SAS6-EXT-Z* (820-7890)

* If this HBA card is installed in the server, the ambient temperature requirement for the server is reduced from 35º C (95º F) to 32º C (89.6º F).

Note – Some of the SAS PCIe option cards listed in TABLE 4-5 might not be available for purchase at the time of this publication. To determine which SAS PCIe option cards are supported and available for purchase on the Sun Fire X4270 M2 Server, go to the following web site and navigate to the appropriate page: http://www.oracle.com/goto/x4270m2.

4.5.2　PCIe Card Configuration Guidelines

The PCI expansion system can be configured using a variety of PCIe cards. The server supports up to six PCIe cards. See TABLE 4-6 for PCIe card configuration restrictions.

TABLE 4-6　PCIE Card Configuration Restrictions

PCIe Card Name	Part Number (Factory Integration/X-Option)	PCIe Slot Restriction
SAS-2 8-port Internal (2x4), 6Gb, RAID PCIe Gen 2 HBA	SG-SAS6-R-INT-Z/ SGX-SAS6-R-INT-Z	This card can only be installed in PCIe slot 3.
SAS-2 8-Port (2x4) Internal, 6Gb, PCIe Gen 2 HBA	SG-SAS6-EXT-Z/ SGX-SAS6-EXT-Z	This card can only be installed in PCIe slot 3.
96-GB, Flash-based, PCIe Card	TA-FAS-S3IE96GB/ XTA-FAS-S3IE96GB	Restrictions on this card vary depending the power rating of the CPU installed in the server. • If the CPU(s) is 80 watts or less, this card can only be installed in PCIe slots 0, 1, 2. 4, or 5. • If the CPU(s) is 95 watts or more, this card can only be installed in PCIe slots 0, 2, or 5.

You install the PCIe cards on the server's vertical PCIe risers, which are adjacent to the PCI slots. For the location of the PCIe slots, see FIGURE 1-3 and FIGURE 1-4.

In addition to the PCIe card, the PCIe card installation kit includes applicable option card installation information that you should reference for additional installation instructions.

Note – Some of the SAS PCIe option cards listed in TABLE 4-6 might not be available for purchase at the time of this publication. To determine which SAS PCIe option cards are supported and available for purchase on the Sun Fire X4270 M2 Server, go to the following web site and navigate to the appropriate page: http://www.oracle.com/goto/x4270m2.

4.5.3   Remove a PCIe Card

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

      See Section 2.4.2, "Power Off the Server" on page 2-4.

   b. **Extend the server to the maintenance position.**

      See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

   c. **Attach an antistatic wrist strap.**

      See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

   d. **Remove the top cover.**

      See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **Locate the PCIe card that you want to remove, and note its corresponding riser board.**

   See Section 1.4, "Server Back Panel Features" on page 1-9 for more information about PCIe slots and their locations.

3. **If necessary, make a note of where the PCIe cards are installed.**

4. **Unplug all data cables from the PCIe card.**

   To disconnect the cables from the PCIe card, press the latch, push in toward the connector, and then pull out the cable to remove it.

   Note the location of all cables for reinstallation later.

5. **Remove the PCIe riser.**

   See Section 4.4.1, "Remove PCIe Riser" on page 4-17.

6. **Carefully remove the PCIe card from the riser board connector.**

7. **Place the PCIe card on an antistatic mat.**

⚠ **Caution –** If you are not immediately inserting a replacement PCIe card into the empty slot in the PCIe riser, insert a PCIe card filler panel in the slot to ensure adequate cooling and reduce the possibility of a system shutdown. For instructions for installing a PCIe filler panel, see Section 2.8.2, "Filler Panel Removal and Installation" on page 2-30.

4.5.4　Install a PCIe Card

1. **Unpack the replacement PCIe card and place it on an antistatic mat.**

2. **Locate the proper PCIe slot for the card you are replacing.**

3. **If necessary, review the PCIe card guidelines to plan your installation.**

   See Section 4.5.2, "PCIe Card Configuration Guidelines" on page 4-22 for additional information.

4. **If necessary, remove the PCIe riser.**

   See Section 4.4.1, "Remove PCIe Riser" on page 4-17 for PCIe riser removal instructions.

5. **If necessary, remove the PCI filler panel from the PCIe riser.**

6. **Insert the PCIe card into the correct slot on the PCIe riser.**

7. **Install the PCIe riser.**

   See Section 4.4.2, "Install PCIe Riser" on page 4-19 for PCIe riser installation instructions.

8. **Reconnect the cables to the PCIe card that you unplugged during the removal procedure.**

9. **Return the server to operation.**

   a. **Install the top cover.**

      See Section 6.2, "Installing the Server Top Cover" on page 6-2.

   b. **Return the server to the normal rack position.**

      See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

   c. **Connect any required data cables to the PCIe card.**

      Route data cables through the cable management arm.

   d. **Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.**

      See Section 6.5, "Powering On the Server" on page 6-7.

      Verify that the AC Present LED is lit.

10. **Use ILOM to clear the server PCIe card fault.**

    For instructions for clearing an PCIe card faults, see the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun Fire X4170 M2 and X4270 M2 Servers* (821-0489).

11. **To determine if additional steps are required to complete the installation of the PCIe card, see the hardware installation guide for the type of PCIe card you installed.**

    See TABLE 4-5 for a listing of the PCIe host bus adapter (HBA) cards supported by the server and references to the applicable installation guide.

4.6 Servicing the Server Battery

The battery maintains system time when the server is powered off and a time server is unavailable. If the server fails to maintain the proper time when the server is powered off and not connected to a network, replace the battery.

Caution – Ensure that all power is removed from the server before removing or installing the battery. You must disconnect the power cables from the system before performing these procedures.

4.6.1 Remove Battery

1. **Prepare the server for service.**

    a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

       See Section 2.4.2, "Power Off the Server" on page 2-4.

    b. **Extend the server to the maintenance position.**

       See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

    c. **Attach an antistatic wrist strap.**

       See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

    d. **Remove the top cover.**

       See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **Remove the battery.**

    a. **Place you finger between the battery and side wall of the server chassis and push the battery away from the side wall (**FIGURE 4-11**).**

b. Twist the battery (either clockwise or counter-clockwise) and lift it out.

FIGURE 4-11   Removing the Battery
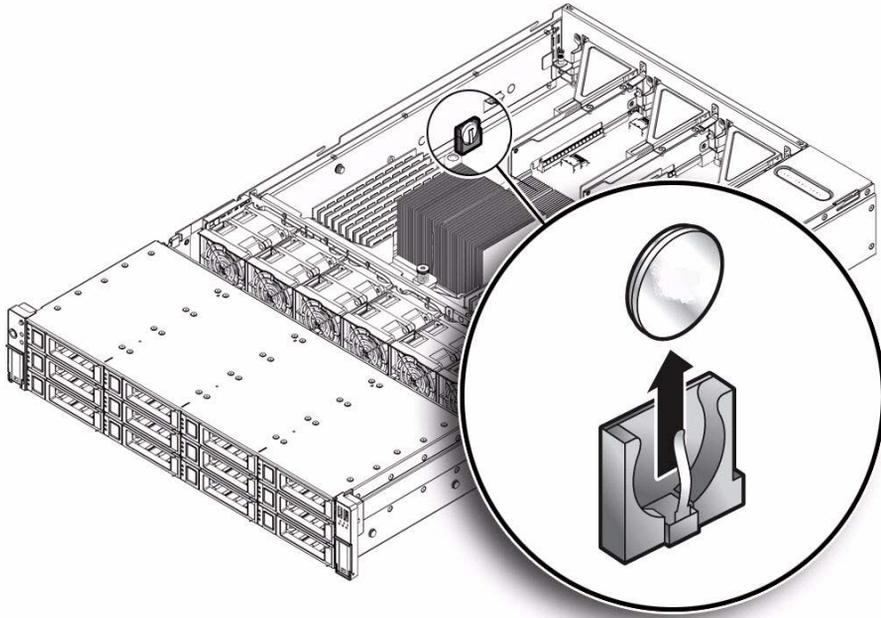
4.6.2   Install Battery

1. **Unpack the replacement battery and place it on an antistatic mat.**

2. **Press the new battery into the battery holder with the positive side (+) facing the server chassis side wall.**

3. **If the service processor is configured to synchronize with a network time server using the Network Time Protocol (NTP), the ILOM clock will be reset as soon as the server is powered on and connected to the network. Otherwise, proceed to the next step.**

4. **If the service processor is not configured to use NTP, you must reset the ILOM clock using the ILOM CLI or the web interface.**

   For instructions, see the Sun Integrated Lights Out Manager (ILOM) 3.0 Documentation Collection.

5. **Return the server to operation.**

a. **Install the top cover.**

See Section 6.2, "Installing the Server Top Cover" on page 6-2.

b. **Return the server to the normal rack position.**

See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

c. **Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.**

See Section 6.5, "Powering On the Server" on page 6-7.

Verify that the AC Present LED is lit.

4.7 Servicing CPUs

The following topics are covered:

- Section 4.7.1, "Remove CPU" on page 4-27
- Section 4.7.2, "Install CPU" on page 4-31

Caution – The CPU should be serviced only by an Oracle qualified service technician.

Caution – Ensure that all power is removed from the server before removing or installing a CPU. You must disconnect the power cables from the system before performing these procedures.

4.7.1 Remove CPU

1. **Prepare the server for service.**

a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

See Section 2.4.2, "Power Off the Server" on page 2-4.

b. **Extend the server to the maintenance position.**

See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

c. **Attach an antistatic wrist strap.**

See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

d. **Remove the top cover.**

See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **Remove the CPU (**FIGURE 4-13**).**

⚠ **Caution –** The CPU should be serviced only by an Oracle qualified service technician.

a. **To identify the location of the faulty CPU, press the Fault Remind button on the motherboard (**FIGURE 4-3**).**

The fault LED for the faulty CPU lights. The CPU fault LEDs are located next to the CPUs (FIGURE 4-12).

Note – When the Fault Remind button is pressed, a LED located next to the Fault Remind button lights green to indicate that there is sufficient voltage present in the fault remind circuit to light any fault LEDs that were set due to a failure. If this LED fails to light when you press the Fault Remind button, it is likely that the capacitor powering the fault remind circuit has lost its charge. This can happen if the Fault Remind button is pressed for a long time with fault LEDs lit or if power has been removed from the server for more than 15 minutes.

FIGURE 4-12 CPU Fault LEDs Locations
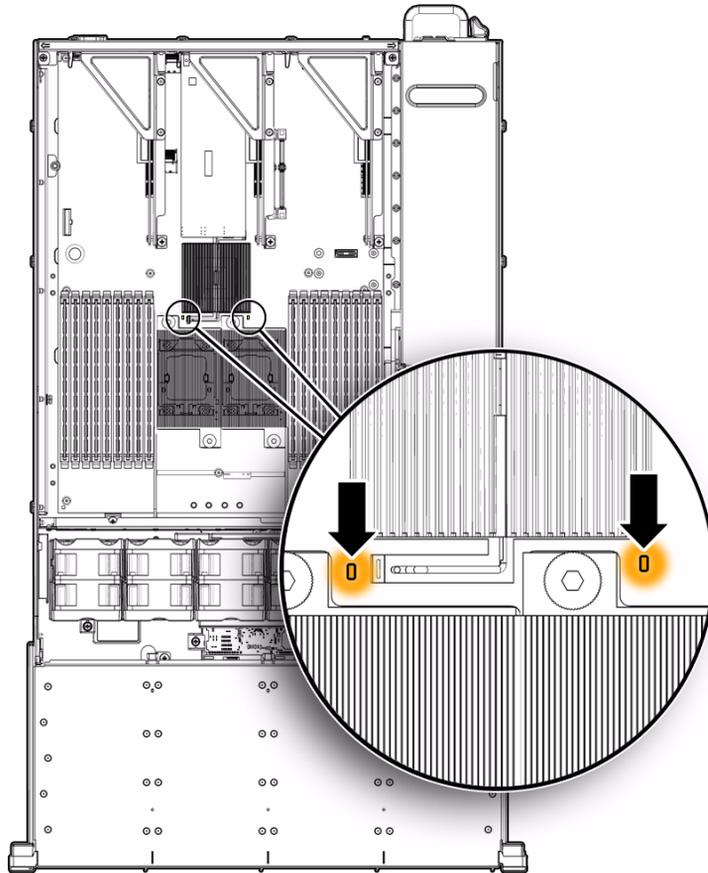
- If CPU LED is off: CPU is operating properly.
- If CPU LED is on (amber): CPU is faulty and should be replaced.

CPU0 is closest to power supply bay (FIGURE 4-13 [1]).

b. **Using an Hex wrench, unscrew the two screws in the heatsink for the faulty CPU (**FIGURE 4-13**[2]).**

Turn the screws alternately one and one half turns until they are fully removed.

c. **Twist the heatsink slightly to break the grease seal, lift off the heatsink and place it upside down on a flat surface to prevent the thermal grease from contaminating other components.**

d. **Use an alcohol pad to clean the thermal grease from both the bottom of the heatsink and the top of the CPU**

Be very careful not to get the thermal grease on your fingers.

Caution – Failure to clean the heatsink and the CPU prior to removing the CPU could result in the accidental contamination of the CPU socket or other components. Also, be careful not to get the grease on your fingers as this could result in contamination of components.

    e. **Disengage the CPU release lever by pushing down and moving it to the side away from the CPU, and then rotating the lever upward [3].**

    f. **Open the pressure frame and carefully remove the CPU [4].**

Caution – Whenever you remove a CPU, you should replace it with another CPU or a filler panel and reinstall the CPU heat sink; otherwise the server might overheat due to improper airflow. For instructions for installing a CPU filler panel, see Section 2.8.2, "Filler Panel Removal and Installation" on page 2-30.

FIGURE 4-13 Removing the CPU
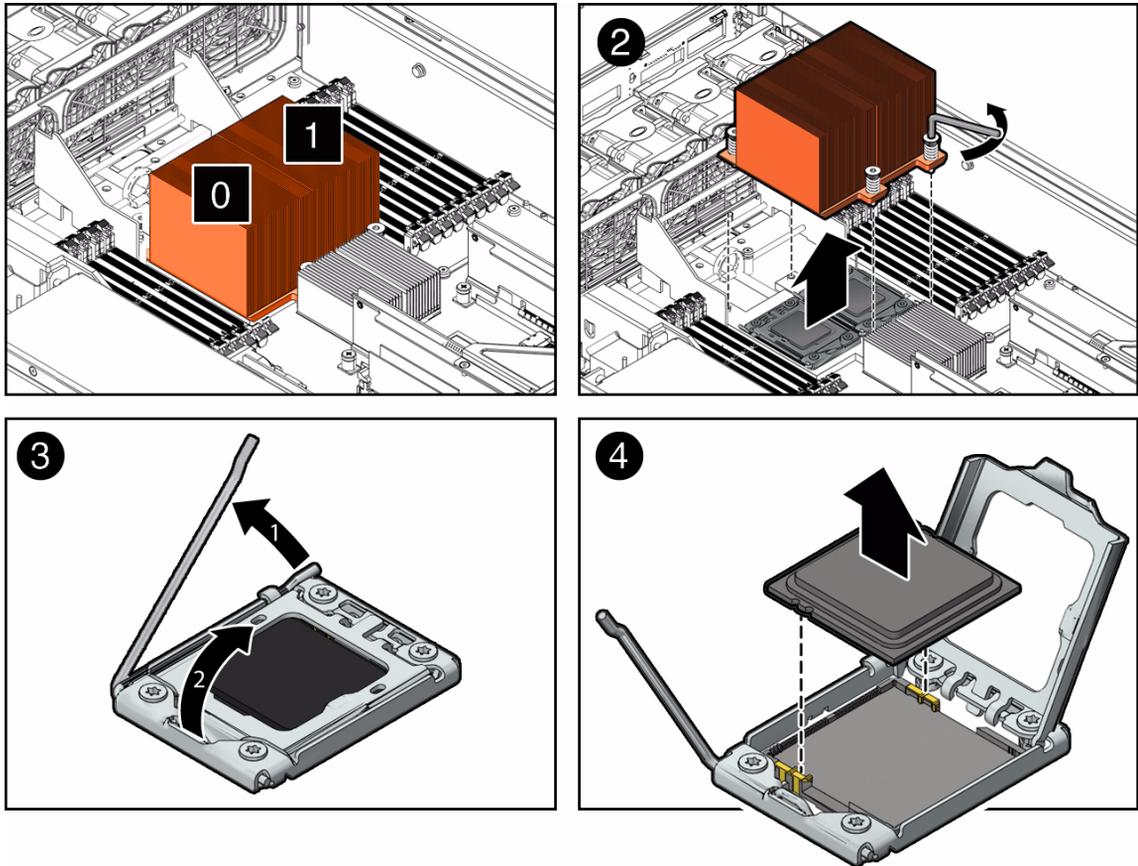
4.7.2   Install CPU

Two procedures are provide here for installing the CPU:

- A procedure to use when you replace a CPU that has failed.

  See Section 4.7.2.1, "Replace Faulty CPU" on page 4-32

- A procedure for installing a second CPU in a server that previously had only one CPU, that is, upgrading your server from a single CPU to two CPUs.

  See Section 4.7.2.2, "Upgrade Server to Two CPUs" on page 4-34

4.7.2.1 Replace Faulty CPU

Caution – The CPU should be serviced only by an Oracle qualified service technician.

1. **Attach an antistatic wrist strap.**

   See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

2. **Unpack the replacement CPU and place it on an antistatic mat.**

3. **Install the CPU (FIGURE 4-14).**

   a. **Properly orient the CPU with the socket alignment tabs and carefully place the CPU into the socket [1].**

      Ensure that the orientation is correct as damage might result if the CPU pins are not aligned correctly.

Caution – Installing the CPU Whenever you remove a CPU, you should replace it with another CPU or a filler panel and reinstall the CPU heat sink; otherwise the server might overheat due to improper airflow. For instructions for installing a CPU filler panel, seeSection 2.8.2, "Filler Panel Removal and Installation" on page 2-30.

FIGURE 4-14 Installing the CPU.
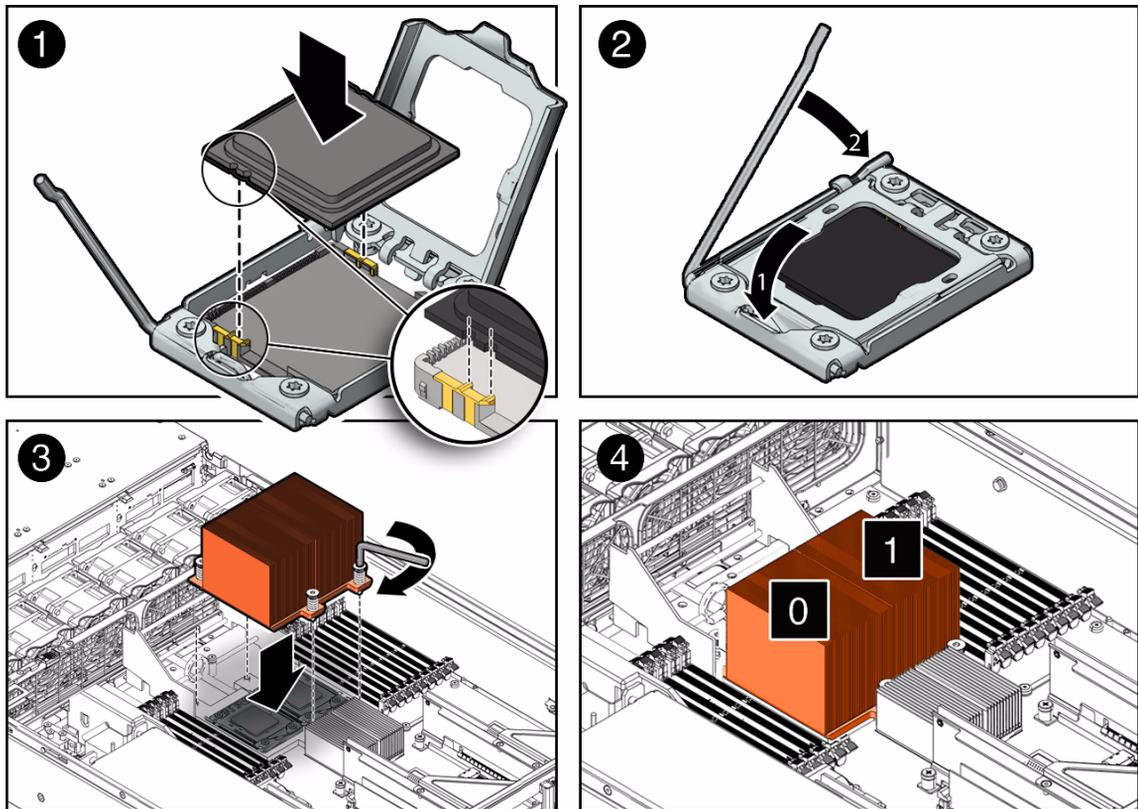
b. **Lower the pressure frame [2].**

   Ensure that the pressure frame sits flat around the periphery of the CPU.

c. **Engage the release lever by rotating it downward and slipping it under the catch [2].**

d. **Use the syringe (supplied with the new or replacement CPU) to apply approximately 0.1 ml of thermal grease to the center of the top of the CPU. Do not distribute the grease.**

e. **Inspect the heatsink for dust and lint. Clean if necessary.**

f. **Orient the heatsink so that the two screws line up with the mounting studs and so that the heatsink is aligned with the other heatsink, that is, the front of the heatsink should align with the front of the other heatsink [3].**

g. **Carefully position the heatsink on the CPU, aligning it with the mounting posts to reduce movement after it makes initial contact with the layer of thermal grease [3].**

Caution – If the heatsink assembly is moved too much during its installation, the layer of thermal grease may not be distributed evenly, leading to component damage.

     h. **Tighten the screws alternately one-half turn until fully seated [3].**

4. **Return the server to operation.**

     a. **Install the top cover.**

     See Section 6.2, "Installing the Server Top Cover" on page 6-2.

     b. **Install the server into the rack.**

     See Section 6.3, "Reinstalling the Server in the Rack" on page 6-4.

     c. **Return the server to the normal rack position.**

     See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

     d. **Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.**

     See Section 6.5, "Powering On the Server" on page 6-7.

     Verify that the AC Present LED is lit.

5. **Use ILOM to clear the server CPU fault.**

     For instructions for clearing CPU faults, see the *Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun Fire X4170 M2 and X4270 M2 Servers* (821-0489).

4.7.2.2   Upgrade Server to Two CPUs

The server is shipped with at least one preinstalled CPU. The server can support a maximum of two CPUs. If you ordered a second CPU to upgrade the server to two CPUs, the kit contains a CPU chip and a heatsink with the thermal grease pre-applied.

Caution – CPU options should be installed only by a Sun qualified service technician.

1. **Attach an antistatic wrist strap.**

     See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

2. Unpack the CPU kit.

The kit includes a CPU chip and a heatsink with the thermal grease pre-applied.

3. Install the CPU (FIGURE 4-14**).**

a. Properly orient the CPU with the socket alignment tabs and carefully place the CPU into the socket [1].

Ensure that the orientation is correct as damage might result if the CPU pins are not aligned correctly.

b. Lower the pressure frame [2].

Ensure that the pressure frame sits flat around the periphery of the CPU.

c. Engage the release lever by rotating it downward and slipping it under the catch [2].

d. Orient the heatsink so that the two screws line up with the mounting studs and so that the heatsink is aligned with the other heatsink, that is, the front of the heatsink should align with the front of the other heatsink [3].

⚠ **Caution –** When handling the heatsink, be careful not get the thermal grease on your fingers so as not to transfer the grease to other server components. To do so could cause component contamination and/or damage.

e. Carefully position the heatsink on the CPU, aligning it with the mounting posts to reduce movement after it makes initial contact with the layer of thermal grease [3].

⚠ **Caution –** If the heatsink assembly is moved too much during its installation, the layer of thermal grease may not be distributed evenly, leading to component damage.

f. Tighten the screws alternately one-half turn until fully seated [3].

4. Return the server to operation.

a. Install the top cover.

See Section 6.2, "Installing the Server Top Cover" on page 6-2.

b. Install the server into the rack.

See Section 6.3, "Reinstalling the Server in the Rack" on page 6-4.

c. Return the server to the normal rack position.

See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5

d. Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.

See Section 6.5, "Powering On the Server" on page 6-7.

Verify that the AC Present LED is lit.

4.8   Servicing the Motherboard

Caution – Ensure that all power is removed from the server before removing or installing the motherboard assembly. You must disconnect the power cables from the system before performing these procedures.

Caution – These procedures require that you handle components that are sensitive to electrostatic discharge. This discharge can cause server components to fail. To avoid damage, ensure that you follow the antistatic practices as described in Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

Caution – This procedure requires removing the server from the rack. The server is heavy. Two people are required to remove it from the rack.

4.8.1   Remove Motherboard

1. Prepare the server for service.

a. Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).

See Section 2.4.2, "Power Off the Server" on page 2-4.

b. Remove the server from the rack.

See Section 2.7, "Removing the Server From the Rack" on page 2-27.

c. Attach an antistatic wrist strap.

See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

d. **Remove the top cover from the server.**

See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **Remove the plastic air baffle.**

See Section 4.3.2, "Remove Air Baffle" on page 4-15.

3. **Disconnect the SAS storage drive cables from the SAS PCIe card or the on-board SATA connectors located on the motherboard.**

⚠ **Caution –** The SAS storage drive cables are delicate. Ensure they are safely out of the way when servicing the motherboard.

---

4. **Remove the following components from the motherboard:**
   - Memory DIMMS. For instructions, see Section 4.2.6, "Remove Faulty DIMMs" on page 4-8.
   - PCIe risers and attached PCIe cards. For instructions, see Section 4.4.1, "Remove PCIe Riser" on page 4-17.
   - CPUs. For instructions, see Section 4.7.1, "Remove CPU" on page 4-27.

5. **Remove the motherboard (**FIGURE 4-15**).**

   a. **Disconnect the power distribution board ribbon cable [1].**

   b. **Remove the four screws that secure the motherboard to the bus bar [2].**

   Use a No. 2 Phillips screwdriver.

   c. **Loosen the green captive screw on the front of the motherboard that secures the motherboard to the chassis [2].**

   d. **Using the finger loop just below the four screws that secure the motherboard to the bus bar, carefully slide the motherboard to the rear of the chassis, and lift it out of the chassis [2].**

   e. **Place the motherboard on an antistatic mat.**

FIGURE 4-15 Removing the Motherboard Assembly
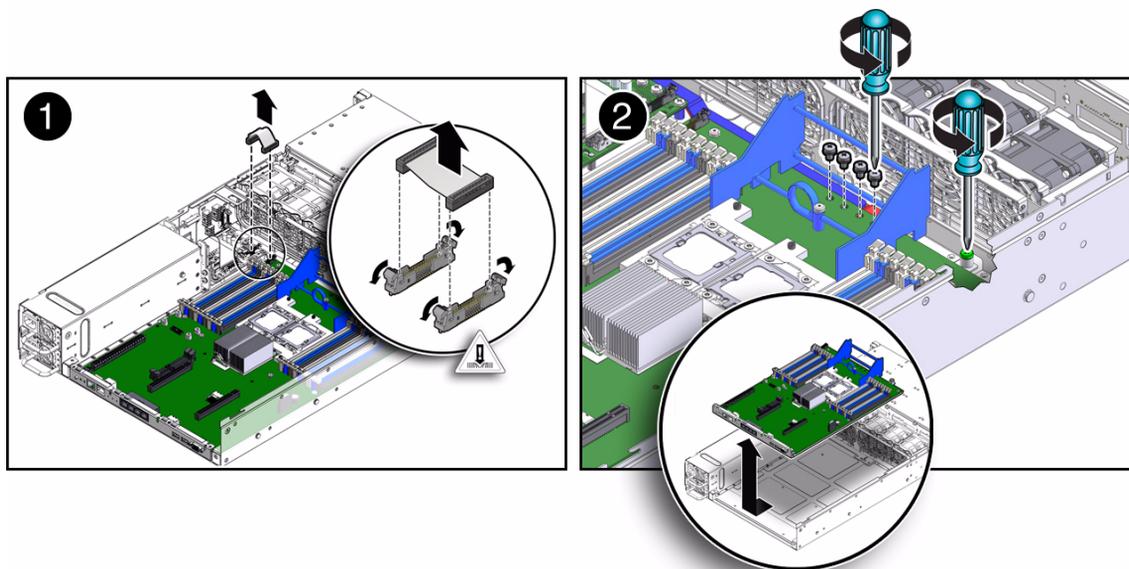
4.8.2   Install Motherboard

1. **Attach an antistatic wrist strap.**

   See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

2. **Install the motherboard (FIGURE 4-16).**

   a. **Using the thumb loop on the replacement motherboard, lift and place the motherboard into the chassis [1].**

      Position the motherboard carefully.

   b. **Install the four Phillips screws that secure the motherboard to the bus bar [1].**

   c. **Tighten the green captive screw on the front of the motherboard that secures the motherboard to the chassis [1].**

FIGURE 4-16 Installing the Motherboard
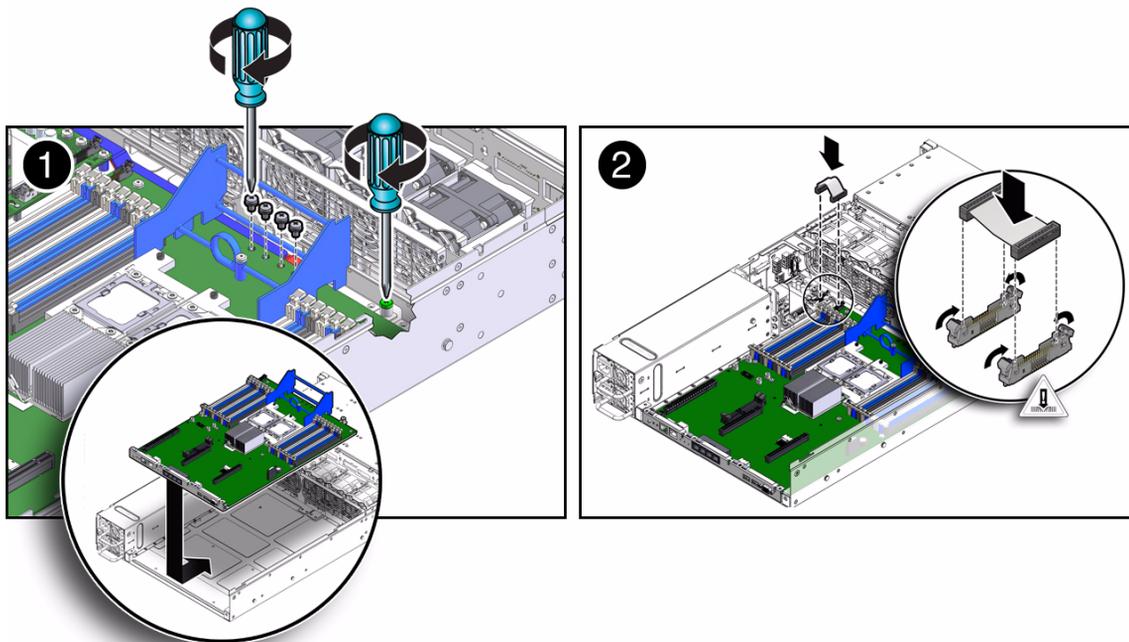
3. **If you are replacing the motherboard because it failed and needed to be replaced, you can now reinstall the reusable components.**

   Reusable motherboard components are as follows:

   - Memory DIMMS. For instructions, see Section 4.2.7, "Install DDR3 DIMMs" on page 4-11.

Note – Only install the DIMMs in the slots (connectors) from which they were removed.

   - PCIe risers and attached PCIe cards. For instructions, see Section 4.4.2, "Install PCIe Riser" on page 4-19.
   - CPUs. For instructions, see Section 4.7.2, "Install CPU" on page 4-31.

4. **Carefully connect the power distribution board ribbon cable to the motherboard (**FIGURE 4-16 **[2]).**

   Ensure that it is seated properly.

5. **Reconnect the SAS storage drive cables to the SAS PCIe card or the on-board SATA connectors located on the motherboard.**

⚠

Caution – The storage drive data cables are delicate. Carefully connect them and ensure that they are seated properly when servicing the motherboard.

6. **Install the air baffle.**

   See Section 4.3.3, "Install Air Baffle" on page 4-16.

7. **Return the server to operation.**

   a. **Install the top cover.**

      See Section 6.2, "Installing the Server Top Cover" on page 6-2.

   b. **Install the server into the rack.**

      See Section 6.3, "Reinstalling the Server in the Rack" on page 6-4.

   c. **Return the server to the normal rack position.**

      See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

   d. **Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.**

      See Section 6.5, "Powering On the Server" on page 6-7.

      Verify that the AC Present LED is lit.

Note – When you replace the motherboard, it is not necessary to clear motherboard faults.

4.9 Resetting Passwords and Clearing CMOS NVRAM

⚠

Caution – These procedures require that you handle components that are sensitive to electrostatic discharge. This discharge can cause server components to fail. To avoid damage, ensure that you follow the antistatic practices as described in Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

The following topics are covered:

- Section 4.9.1, "Overview" on page 4-41

- Section 4.9.2, "Reset the BIOS Password and Clear the CMOS NVRAM Using the CLR CMOS Button" on page 4-41

4.9.1 Overview

You can clear the CMOS NVRAM and BIOS password by pressing the CLR CMOS button, which is located on the motherboard. You can also reset the BIOS passwords from the BIOS Setup Utility.

4.9.2 Reset the BIOS Password and Clear the CMOS NVRAM Using the CLR CMOS Button

1. **Prepare the server for operation.**

   a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

   See Section 2.4.2, "Power Off the Server" on page 2-4.

   b. **Extend the server to the maintenance position.**

   See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

   c. **Attach an antistatic wrist strap.**

   See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

   d. **Remove the top cover from the server.**

   See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **Use a stylus to press and release the CLR CMOS button (**FIGURE 4-17**).**

FIGURE 4-17 Location of the CLR CMOS Button
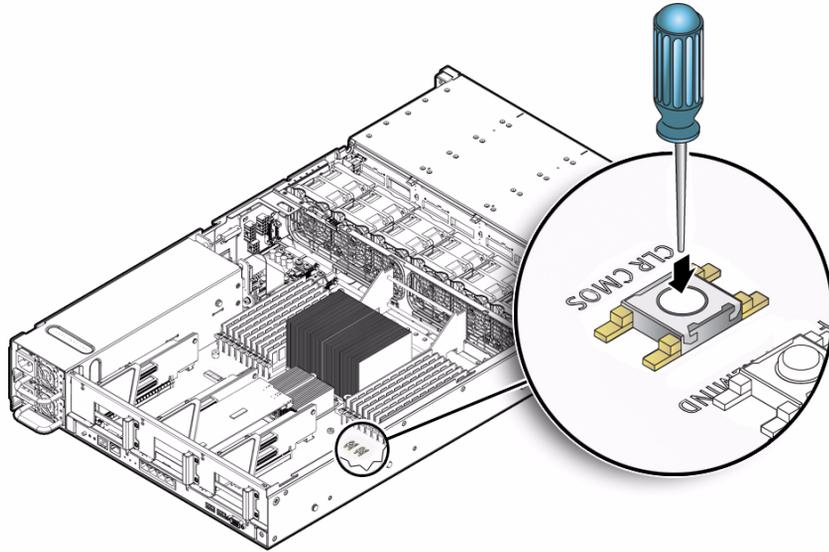
3. **Install the top cover.**

   See Section 6.2, "Installing the Server Top Cover" on page 6-2.

4. **Return the server to the normal rack position.**

   See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

5. **Power on the server and boot until a message appears that indicates that NVRAM has been cleared.**

   See Section 6.5, "Powering On the Server" on page 6-7.

   The BIOS password is reset to the default and the CMOS NVRAM is cleared.

   Verify that the AC Present LED is lit.

Servicing Infrastructure Components

This chapter describes how to replace cold-swappable, field-replaceable units (FRUs) in the Sun Fire X4270 M2 Server.

The following topics are covered:

Caution – Hazardous voltage present. Never attempt to run the server with the cover removed.

Caution – Equipment damage possible. The covers must be place for proper airflow.

5.1 Infrastructure Component Locations

The infrastructure components that are replaceable are shown in FIGURE 5-1.

FIGURE 5-1 Location of Infrastructure Components
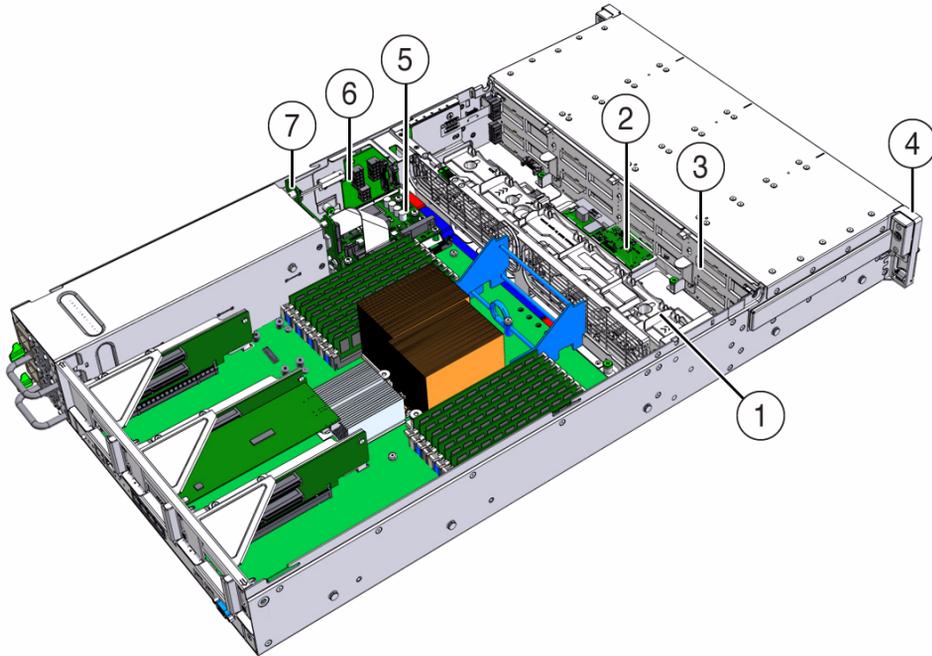
Figure Legend

1	Fan Board	**5**	Power Distribution Board
2	SAS Expander Board	**6**	Connector Board
3	Disk Backplane	**7**	Power Supply Backplane
4	Front control Panel Light Pipe Assembly		

5.2 Servicing the SAS Expander Board

⚠️ **Caution –** Ensure that all power is removed from the server before removing or installing the SAS expander board. You must disconnect the power cables before performing these procedures.

5.2.1 Remove the SAS Expander Board

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

      See Section 2.4.2, "Power Off the Server" on page 2-4.

   b. **Extend the server to the maintenance position.**

      See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

   c. **Attach an antistatic wrist strap.**

      See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

   d. **Remove the top cover.**

      See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

   e. **If you are removing the SAS expander board from a server with 2.5-inch storage drives, remove the server's front cover.**

      See Section 2.11, "Removing the Front Cover From a Server with 2.5-Inch Storage Drives" on page 2-35.

2. **Remove fan modules 1 through 4, leaving fan modules 0 and 5 in place.**

   See Section 3.3.4, "Remove Fan Module" on page 3-13.

3. **Remove the SAS expander board (**FIGURE 5-2**).**

   a. **Locate the SAS expander board [1].**

   b. **To gain access the SAS expander board, press the latch release on the disk expander access door on the fan board and open the door [2].**

c. Loosen the two green Phillips screws that secure the SAS expander board bracket to the server's chassis [3].

d. Grasp the sides of the bracket and slide it toward the rear of the server chassis to disengage the SAS expander board from the disk backplane [4].

e. Turn the bracket over and disconnect the SAS cables connected to the underside of the SAS expander card [5].

Note – The SAS expander card and its holding bracket are replaced as a unit.

f. Place the SAS expander board with its bracket on an antistatic mat.

FIGURE 5-2   Removing the SAS Expander Board (Servers With 3.5-Inch Storage Drives)
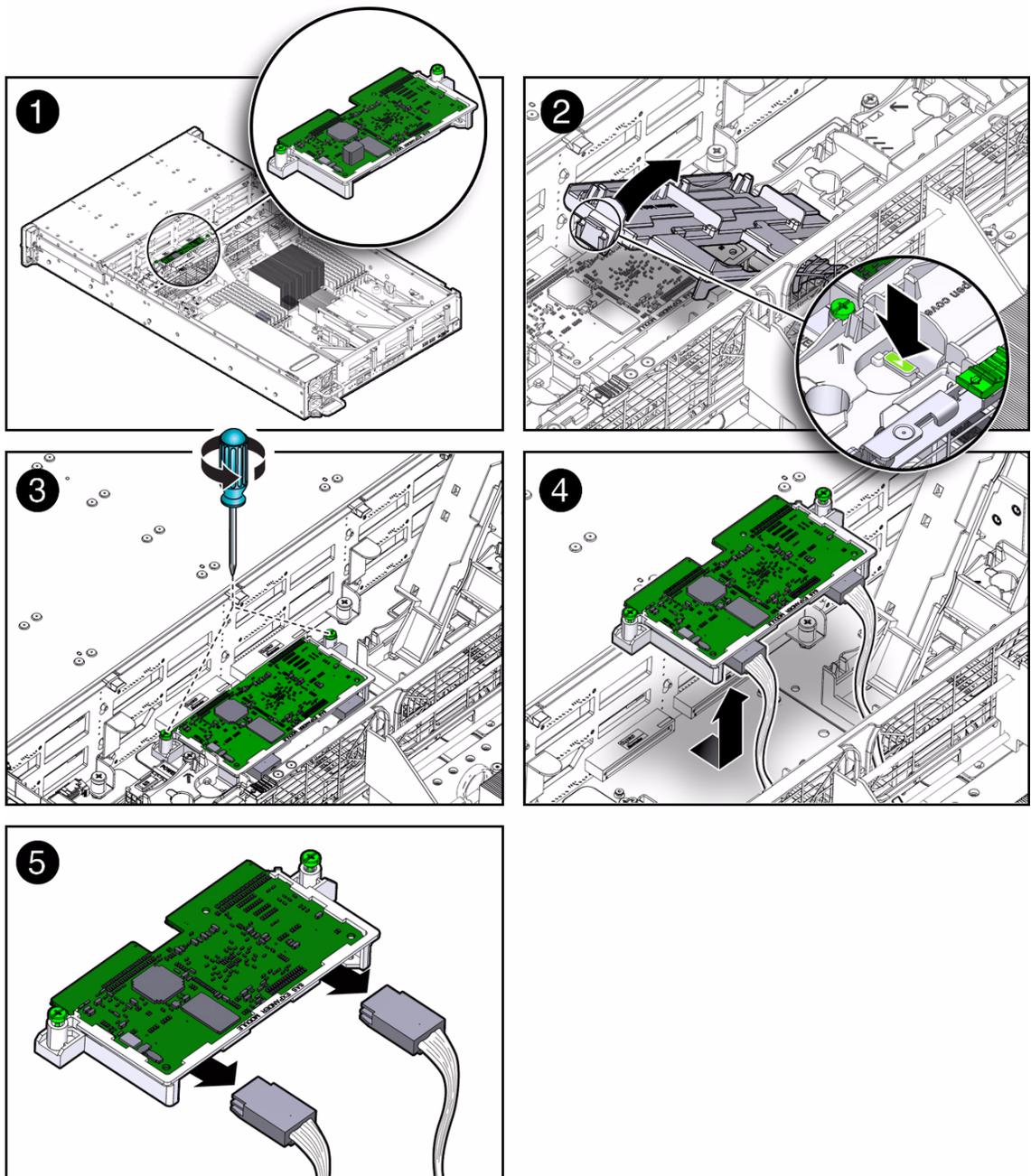
5.2.2   Install SAS Expander Board

1. **Install the SAS expander board (**FIGURE 5-2**).**

   a. **Connect the SAS cables to the underside of the SAS expander board [5].**

      If there is only one SAS cable, always connect it to the right port.

   b. **Lower the SAS expander board into the server chassis and slide it forward into the connectors on the disk backplane [4].**

   c. **Install the two green Phillips screw to secure the SAS expander board to the chassis [3].**

   d. **Close SAS expander board access door on the fan board [2].**

2. **Reinstall the fan modules.**

   See Section 3.3.5, "Install Fan Module" on page 3-14.

3. **Return the server to operation.**

   a. **If you removed the server's front cover, reinstall it.**

      See Section 6.1, "Installing the Front Cover Onto a Server with 2.5-Inch Storage Drives" on page 6-1

   a. **Install the top cover.**

      See Section 6.2, "Installing the Server Top Cover" on page 6-2.

   b. **Return the server to the normal rack position.**

      See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

   c. **Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.**

      See Section 6.5, "Powering On the Server" on page 6-7.

      Verify that the AC Present LED is lit.

5.3   Servicing the Fan Board

You must remove the fan board to access the storage drive data cable in the Sun Fire X4270 M2 Server.

Caution – Ensure that all power is removed from the server before removing or installing fan board. You must disconnect the power cables before performing this procedure.

5.3.1   Remove Fan Board

1. Prepare the server for service.

    a. Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).

    See Section 2.4.2, "Power Off the Server" on page 2-4.

    b. Extend the server to the maintenance position.

    See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

    c. Attach an antistatic wrist strap.

    See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

    d. Remove the top cover.

    See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. Remove the fan modules.

See Section 3.3.4, "Remove Fan Module" on page 3-13.

3. If you are removing the fan board from a server with 2.5-inch storage drives, remove the server's front cover.

See Section 2.11.1, "Remove Server Front Cover" on page 2-35

4. Remove the SAS expander module

    See Section 5.2.1, "Remove the SAS Expander Board" on page 5-3

5. Remove the fan board (FIGURE 5-3**).**

    a. Disconnect the fan power cable from the fan board [1].

    b. Disconnect the signal cable from the fan board [2].

    c. Remove the two green captive screws that secure the fan board to the chassis [3].

    d. Slide the fan board forward to disengage it from the mushroom standoffs and lift it up and out of the server [4].

e. Place the fan board on an antistatic mat.

FIGURE 5-3 Removing the Fan Board
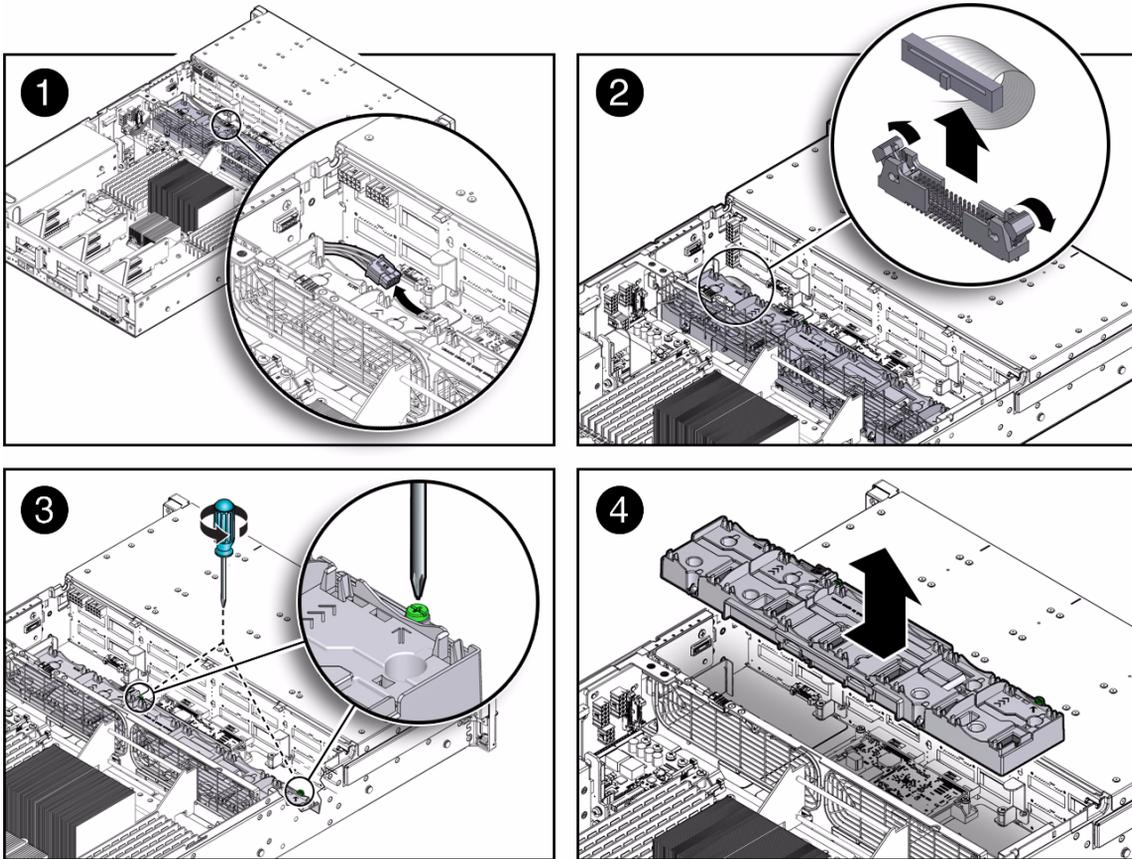
5.3.2 Install Fan Board

1. **Install the fan board (**FIGURE 5-3**).**

    a. **Lower the fan board into place in the chassis floor and slide it toward the rear of the server to engage the mushroom standoffs [4].**

    b. **Secure the fan board to the chassis with the two green captive screws [2].**

a. **Connect the signal cable to the fan board [2].**

    b. **Reconnect the fan power cable [1].**

2. **Install the SAS expander module.**

   Section 5.2.2, "Install SAS Expander Board" on page 5-6.

3. **Reinstall the fan modules.**

   See Section 3.3.5, "Install Fan Module" on page 3-14.

4. **If you removed the fan board from a server with 2.5-inch storage drives, install the server's front cover.**

   See Section 6.1.1, "Install the Server Front Cover" on page 6-2.

5. **Return the server to operation.**

    a. **Install the top cover.**

       See Section 6.2, "Installing the Server Top Cover" on page 6-2.

    b. **Return the server to the normal rack position.**

       See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

    c. **Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.**

       See Section 6.5, "Powering On the Server" on page 6-7.

       Verify that the AC Present LED is lit.

5.4   Servicing the Disk Backplane

Caution – Ensure that all power is removed from the server before removing or installing the storage backplane. You must disconnect the power cables before performing this procedure.

5.4.1   Remove Disk Backplane

1. **Prepare the server for service.**

a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

See Section 2.4.2, "Power Off the Server" on page 2-4.

b. **Extend the server to the maintenance position.**

See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

c. **Attach an antistatic wrist strap.**

See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

d. **Remove the top cover.**

See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

e. **Unseat the storage drives.**

See Section 3.2.3, "Remove Storage Drive" on page 3-5.

2. **Remove the fan modules.**

See Section 3.3.4, "Remove Fan Module" on page 3-13.

3. **Remove the storage SAS expander board.**

See Section 5.2.1, "Remove the SAS Expander Board" on page 5-3.

4. **If you are removing the disk backplane from a server with 2.5-inch storage drives, remove the server's front cover.**

See Section 2.11, "Removing the Front Cover From a Server with 2.5-Inch Storage Drives" on page 2-35.

Note – On server's with 2.5-inch disk drives, your must remove the server's front cover to access and remove the disk backplane.

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5. **If you are removing the disk backplane from a server with 3.5-inch storage drives, perform the following steps:**

a. **Remove the server's fan board.**

See Section 5.3, "Servicing the Fan Board" on page 5-6.

b. **Remove the cable cover (**FIGURE 5-4**).**

To remove the cable cover, lift it up approximately 4mm, slide it forward, and lift it up and out of the server.
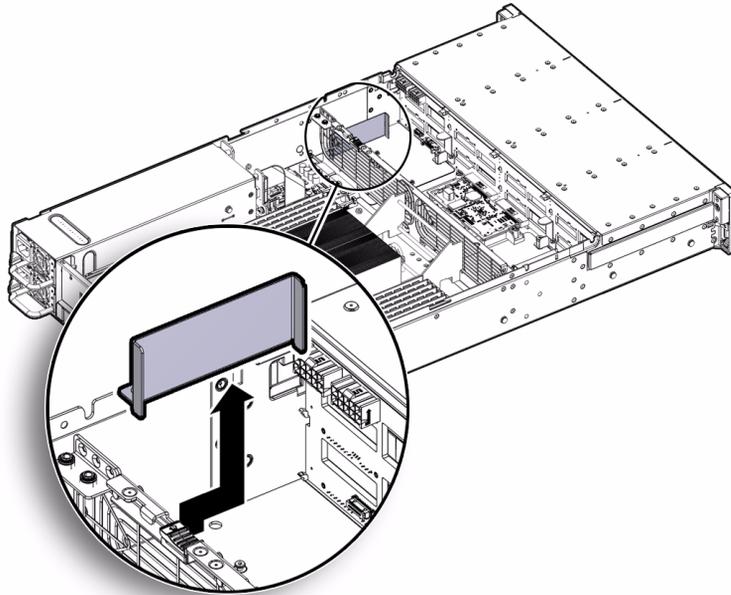
6. **Remove the disk backplane (**FIGURE 5-5**).**

   a. **Disconnect the two power cables [1].**

   b. **Disconnect the front panel light pipe cables [2].**

      There are two light pipe cables, one on either side of the backplane.

   c. **Remove the backplane signal cable [2].**

   d. **Loosen the two green No. 2 Phillips screws that secure the disk backplane to the server chassis [3]**.

   e. **Using the green disk backplane handles, pull the backplane up and out of the server [4].**

   f. **Place the disk backplane on an antistatic mat.**

FIGURE 5-5 Removing the Disk Backplane
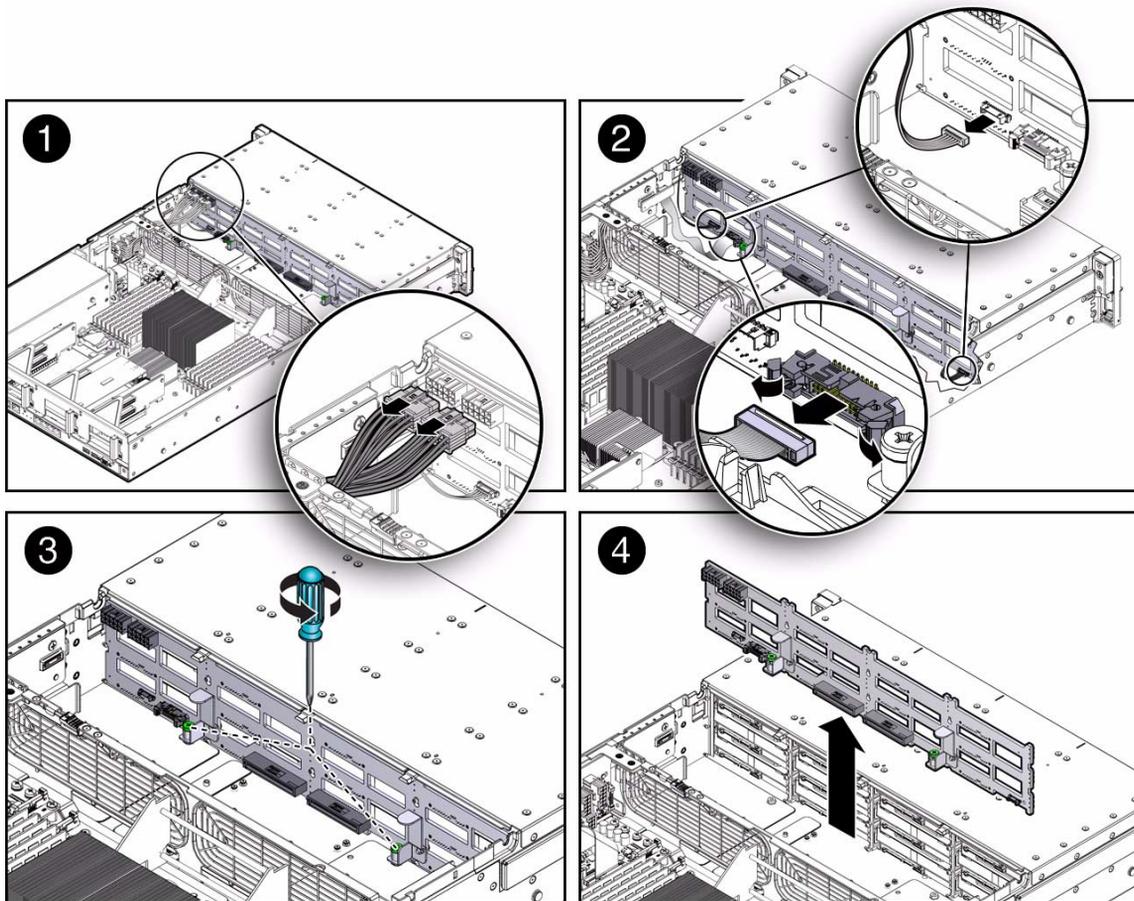
5.4.2   Install Disk Backplane

1. **Install the disk backplane (**FIGURE 5-5**).**

   a. **Position the backplane under the retention hooks on the storage drive cage.**

      To position the disk backplane under the retention hooks, tilt the top of the backplane forward.

   b. **Install the two green, No. 2 Phillips screws that secure the disk backplane to the server chassis [3].**

   c. **Connect the signal cable to the disk backplane [2].**

d. Connect the two light pipe cables to the disk backplane [2].

There are two light pipe cables, one on either side of the backplane.

e. Connect the two power cables to the disk backplane [1].

2. **Install the SAS expander board.**

See Section 5.2.2, "Install SAS Expander Board" on page 5-6.

3. **Install the fan modules.**

See Section 3.3.5, "Install Fan Module" on page 3-14.

4. **If you removed the disk backplane from a server with 2.5-inch storage drives, install the server's front cover.**

See Section 6.1.1, "Install the Server Front Cover" on page 6-2.

5. **Return the server to operation.**

a. If you removed the server's front cover, reinstall it.

See Section 6.1, "Installing the Front Cover Onto a Server with 2.5-Inch Storage Drives" on page 6-1.

b. Install the top cover.

See Section 6.2, "Installing the Server Top Cover" on page 6-2.

c. Re-seat the storage drives.

See Section 3.2.4, "Install Storage Drive" on page 3-8.

d. Return the server to the normal rack position.

See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

e. Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.

See Section 6.5, "Powering On the Server" on page 6-7.

Verify that the AC Present LED is lit.

5.5   Servicing the Front Panel LED Modules

The server has two LED modules, one on each side of the server's front panel.

■ The module in the right side of the front panel supports LEDs and two USB ports.

■ The module on the left side supports LEDs only.

> **Caution –** Ensure that all power is removed from the server before removing or installing a LED module. You must disconnect the power cables before performing this procedure.

5.5.1   Remove the Right LED/USB Module

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

   See Section 2.4.2, "Power Off the Server" on page 2-4.

   b. **Extend the server to the maintenance position.**

   See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

   c. **Attach an antistatic wrist strap.**

   See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

   d. **Remove the top cover.**

   See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

   e. **If you are removing the LED Module from a server with 2.5-inch storage drives, remove the server's front cover.**

   See Section 2.11, "Removing the Front Cover From a Server with 2.5-Inch Storage Drives" on page 2-35.

2. **Remove the right LED/USB Module** (FIGURE 5-7).

   a. **Disconnect the LED/USB flex cable from the connector board [1].**

   b. **Disconnect the LED cable from the disk backplane [1].**

   c. **Disconnect the LED cable from the LED/USB flex cable [2].**

   d. **Loosen the No. 2 Phillips screw that secures the LED/USB module to the server front panel [3].**

   e. **Slide the LED/USB module back and away from the server's front panel [3].**

   f. **Guide the LED/USB flex cable out through the chassis side wall [4].**

FIGURE 5-6   Removing the Right LED/USB Module
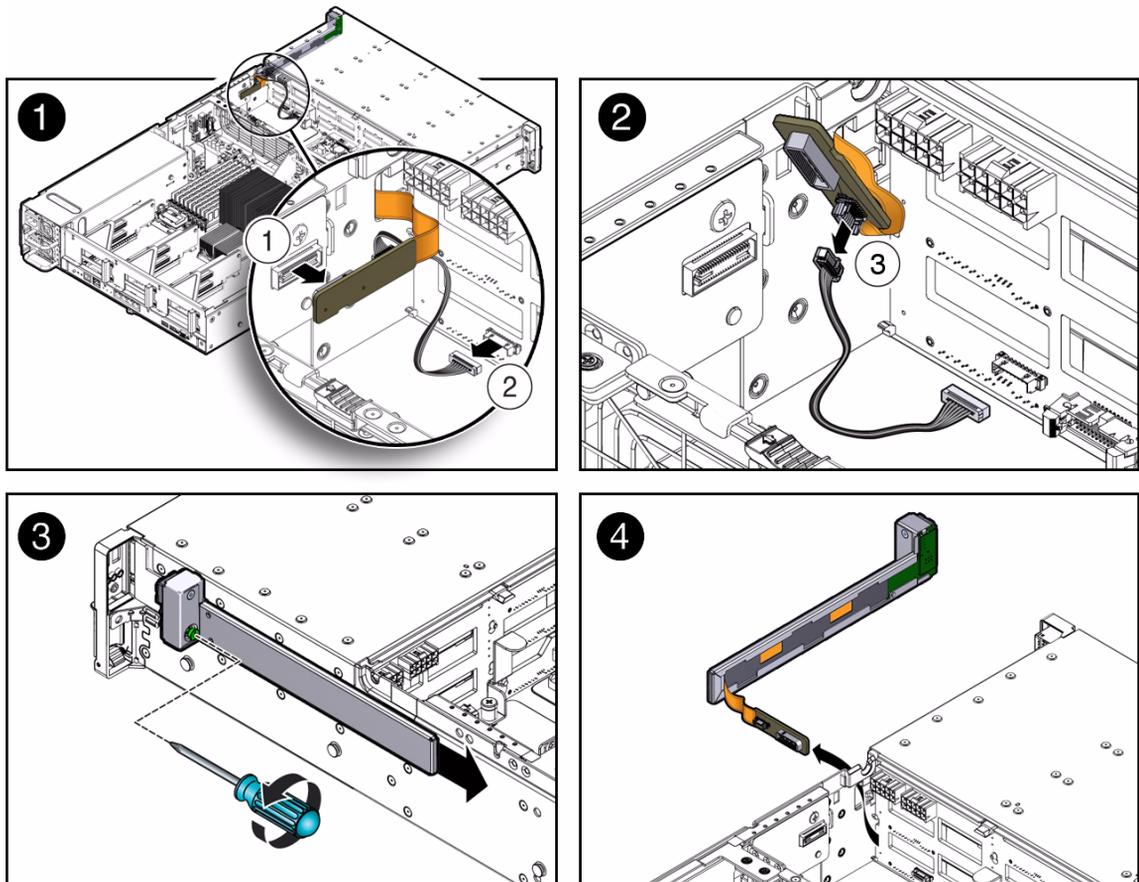
5.5.2   Install the Right LED/USB Module

1. **Install the right LED/USB module (FIGURE 5-7).**

    a. **Insert the LED/USB flex cable in through the opening chassis side wall [4].**

    b. **Position the LED/USB module on the server's front panel [3].**

    c. **Tighten the No. 2 Phillips screw that secures the LED/USB module to the server front panel [3].**

    d. **Connect the LED cable to the LED/USB flex cable [2].**

    e. **Connect the LED cable to the disk backplane [1].**

f. Connect the LED/USB flex cable to the connector board [1].

2. **If you removed the left LED module from a server with 2.5-inch storage drives, install the server's front cover.**

   See Section 6.1.1, "Install the Server Front Cover" on page 6-2.

3. **Return the server to operation.**

   a. **Install the top cover.**

      See Section 6.2, "Installing the Server Top Cover" on page 6-2.

   b. **Return the server to the normal rack position.**

      See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

   c. **Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.**

      See Section 6.5, "Powering On the Server" on page 6-7.

      Verify that the AC Present LED is lit.

5.5.3 Remove the Left LED Module

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

      See Section 2.4.2, "Power Off the Server" on page 2-4.

   b. **Extend the server to the maintenance position.**

      See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

   c. **Attach an antistatic wrist strap.**

      See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

   d. **Remove the top cover.**

   See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

   e. **If you are removing the LED Module from a server with 2.5-inch storage drives, remove the server's front cover.**

      See Section 2.11, "Removing the Front Cover From a Server with 2.5-Inch Storage Drives" on page 2-35.

2. **Remove the left LED Module** (FIGURE 5-7)**.**

a. Remove the No. 2 Phillips screw that secures the LED module to the server front panel [1].

b. Disconnect the LED module cable from the disk backplane and gently pull it through the side wall of the server chassis [2].

c. Remove the LED module from the server front panel [2].

FIGURE 5-7   Removing the Left LED Module
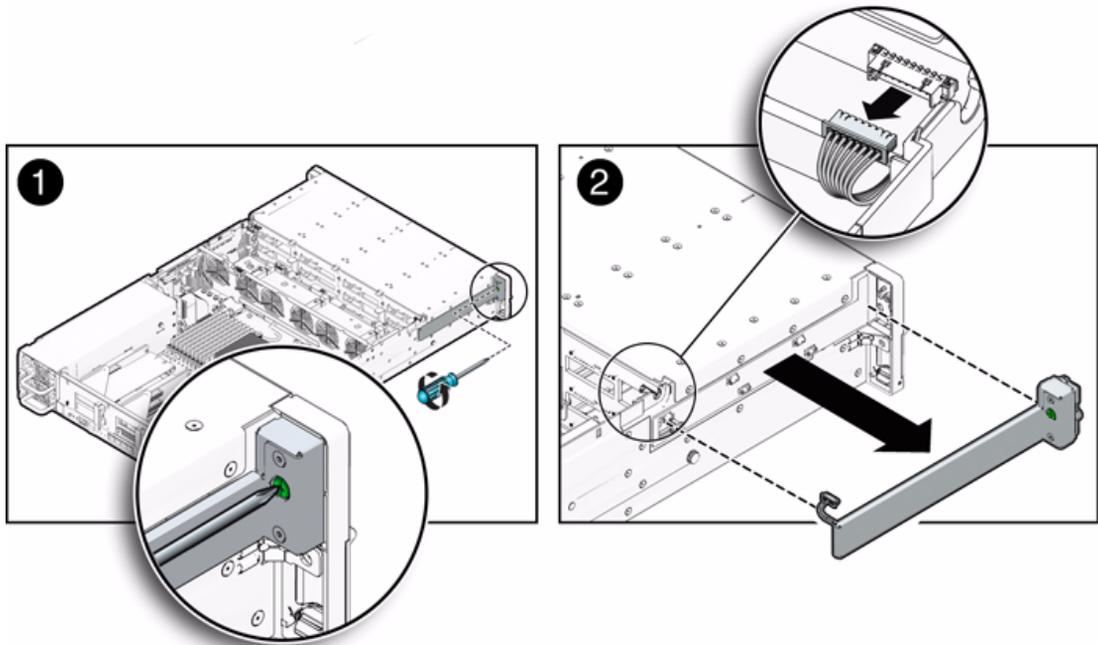
5.5.4   Install the Left LED Module

1. **Install the left LED module (****).**

   a. **Push the front control panel light pipe assembly cable connector through the server's chassis side wall [2].**

   b. **Position the light pipe assembly on the side of the server and tighten the No. 2 Phillips screw to secure the light panel to server front panel ([1]).**

   c. **Connect the light pipe assembly connector to the disk backplane [2].**

2. **If you removed the left LED module from a server with 2.5-inch storage drives, install the server's front cover.**

    See Section 6.1.1, "Install the Server Front Cover" on page 6-2.

3. **Return the server to operation.**

    a. **Install the top cover.**

        See Section 6.2, "Installing the Server Top Cover" on page 6-2.

    b. **Return the server to the normal rack position.**

        See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

    c. **Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.**

        See Section 6.5, "Powering On the Server" on page 6-7.

        Verify that the AC Present LED is lit.

5.6 Servicing the Power Distribution Board

On the Sun Fire X4270 M2 Server, you do not need to remove the motherboard to service the power distribution board.

⚠ **Caution –** The server supplies power to the power distribution board even when the server is powered off. To avoid personal injury or damage to the server, you must disconnect the power cords before servicing the power distribution board.

5.6.1 Remove Power Distribution Board

1. **Prepare the server for service.**

    a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

        See Section 2.4.2, "Power Off the Server" on page 2-4.

    b. **Extend the server to the maintenance position.**

        See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

c. **Attach an antistatic wrist strap.**

   See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

d. **Remove the top cover.**

   See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **Remove the power distribution board (**FIGURE 5-8**).**

   a. **Disconnect the power supply ribbon cable from the power distribution board [1].**

   b. **Disconnect the top cover interlock cable from the power distribution board [2].**

   c. **Disconnect the motherboard ribbon cable from the power distribution board [2].**

   d. **Remove the four No. 2 Phillips screws securing the power distribution board to the chassis [3].**

   e. **Remove the five No. 2 Phillips screws securing the power distribution board to the bus bar [3].**

   f. **To disconnect the power distribution board from the connector board, slide the power distribution board away from the chassis wall [4].**

   g. **Lift the power distribution board up and out of the chassis [4].**

3. **Place the power distribution board on an antistatic mat.**

FIGURE 5-8 Removing the Power Distribution Board
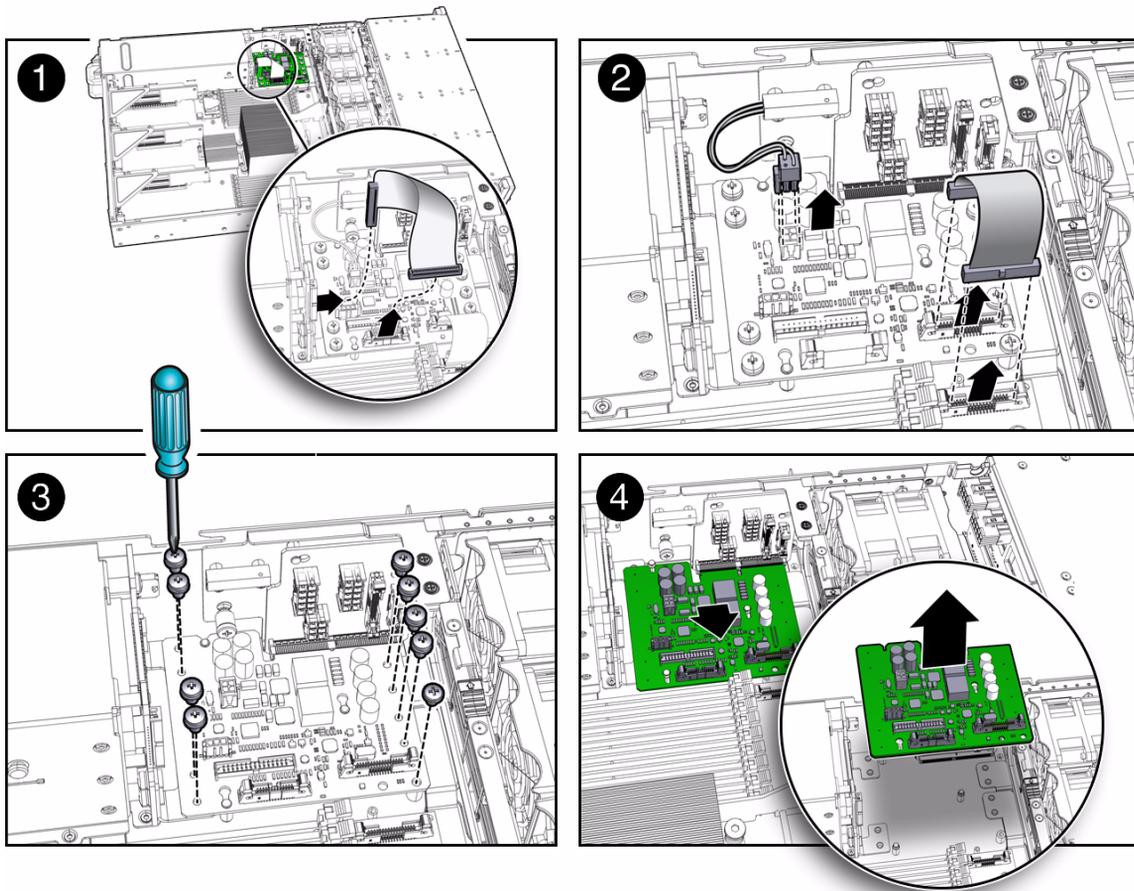
5.6.2 Install Power Distribution Board

1. **Install the power distribution board (**FIGURE 5-8**).**

    a. **Lower the power distribution board into the chassis [4].**

    The power distribution board fits over a series of mushroom standoffs in the floor of the chassis.

    b. **Slide the power distribution board toward the chassis wall until it plugs into the connector board [4].**

c. Install five No. 2 Phillips screws to secure the power distribution board to the bus bar [3].

d. Install the four No. 2 Phillips screws to secure the power distribution board to the chassis [3].

e. Connect the power supply ribbon cable to the power distribution board [2].

f. Connect the top cover interlock cable to the power distribution board [2].

g. Connect the motherboard ribbon cable to the power distribution board [1].

2. Return the server to operation.

a. Install the top cover.

See Section 6.2, "Installing the Server Top Cover" on page 6-2.

b. Return the server to the normal rack position.

See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

c. Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.

See Section 6.5, "Powering On the Server" on page 6-7.

Verify that the AC Present LED is lit.

5.7 Servicing the Connector Board

Caution – The system supplies power to the connector board even when the server is powered off. To avoid personal injury or damage to the server, you must disconnect power cords before servicing the connector board.

5.7.1 Remove Connector Board

1. Prepare the server for service.

a. Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).

See Section 2.4.2, "Power Off the Server" on page 2-4.

b. Extend the server to the maintenance position.

See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

c. Attach an antistatic wrist strap.

See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

d. Remove the top cover.

See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. Remove the power distribution board.

You must remove the power distribution board before you can remove the connector board.

See Section 5.6.1, "Remove Power Distribution Board" on page 5-18.

3. Remove the connector board (FIGURE 5-9).

a. Locate and identify the cable connectors on the connector board [1].

TABLE 5-1 describes the connectors highlighted by the numbered call outs in panel 1 of FIGURE 5-9.

TABLE 5-1   Connector Descriptions

Legend	Description
1	Disk backplane power cable connectors (2)
2	Fan board power cable connector
3	Fan board ribbon cable connector
4	Disk backplane ribbon cable connector
5	Right LED/USB module flex cable connector

b. Disconnect the three power cable connectors from the connector board [2].

There are two power cable connectors for the disk backplane and one power cable connector for the fan board.

c. Disconnect the fan signal cable from the connector board [3].

d. Disconnect the disk backplane signal cable from the connector board [4].

e. Remove the two straight-edge screws that secure the connector board bracket to the server's mid wall [5].

FIGURE 5-9 Removing the Connector Board
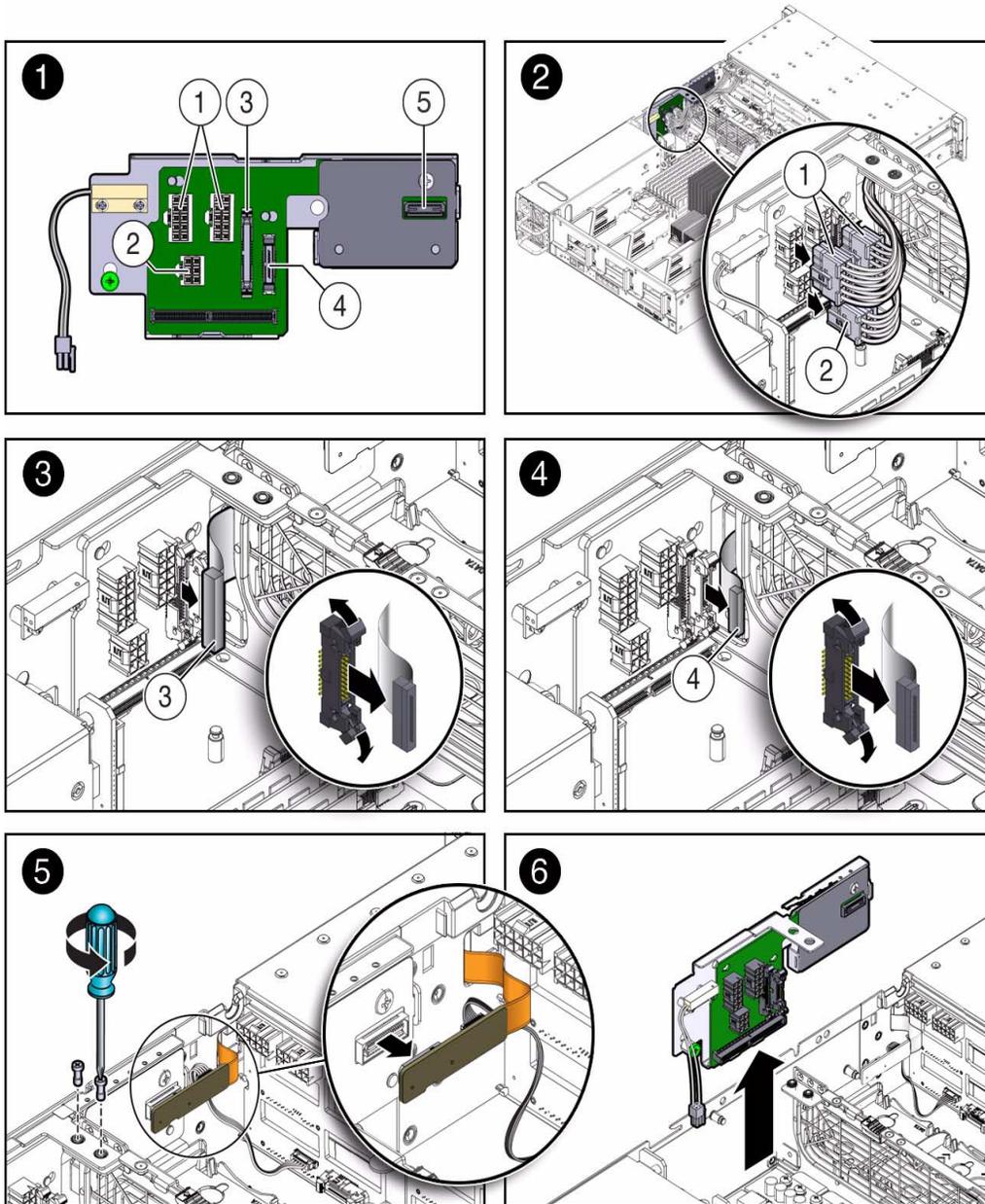
f. **Remove the two green captive screws that secure the connector board bracket to the server's chassis side wall.**

The green captive screws are located on either side of the midwall. You must remove two fan modules to gain easy access the captive screw on the fan side of the midwall.

g. **Lift the bracket with connector board up and out of the chassis [6].**

h. **Remove the Phillips screw that secures the connector board to its bracket and slide the connector board to the left to disengage it the from the mushroom standoffs.**

i. **Place the connector board on an antistatic mat.**

5.7.2   Install Connector Board

4. **Install the connector board (**FIGURE 5-9**).**

a. **Position the connector board over the mushroom standoffs on the bracket and slide the connector board to the right to engage the mushroom standoffs.**

b. **To secure the connector board to its bracket, install the Phillips screw.**

c. **Position the connector board and its bracket into the server, and secure it to the server's mid wall with the two straight-edge, captive screws [5].**

d. **To secure the connector board and its bracket to the server' chassis side wall, tighten the two green captive screws.**

e. **Reinstall the fans that you removed to access one of the green captive screws.**

f. **Reconnect the backplane signal cable to the connector board [4].**

g. **Reconnect the fan signal cable to the connector board [3].**

h. **Reconnect the fan power cable to the connector board [2].**

i. **Reconnect the two backplane power cables to the connector board [2].**

5. **Install the power distribution board.**

See Section 5.6.2, "Install Power Distribution Board" on page 5-20.

6. **Return the server to operation.**

a. **Install the top cover.**

See Section 6.2, "Installing the Server Top Cover" on page 6-2.

b. Return the server to the normal rack position.

See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

c. Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.

See Section 6.5, "Powering On the Server" on page 6-7.

Verify that the AC Present LED is lit.

5.8 Servicing the Power Supply Backplane

Caution – The server supplies power to the power supply backplane even when the server is powered off. To avoid personal injury or damage to the server, you must disconnect power cords before servicing the power supply backplane.

5.8.1 Remove Power Supply Backplane

1. Prepare the server for service.

a. Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).

See Section 2.4.2, "Power Off the Server" on page 2-4.

b. Remove the server from the rack.

See Section 2.7, "Removing the Server From the Rack" on page 2-27.

c. Attach an antistatic wrist strap.

See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

d. Remove the top cover.

See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. Remove the power supplies.

See Section 3.4.3, "Remove Power Supply" on page 3-18.

3. Remove the power distribution board.

See Section 5.6.1, "Remove Power Distribution Board" on page 5-18.

4. **Remove the power supply backplane (**FIGURE 5-10**).**

   a. **Disconnect the power supply ribbon cable from the power supply backplane [1].**

   b. **Remove the Phillips screw that secures the power supply backplane to the server's chassis [1].**

   c. **Lift the power supply backplane up and forward to clear the mushroom standoffs and lift it out of the chassis [2].**

5. **Place the power supply backplane on an antistatic mat.**

FIGURE 5-10 Removing the Power Supply Backplane
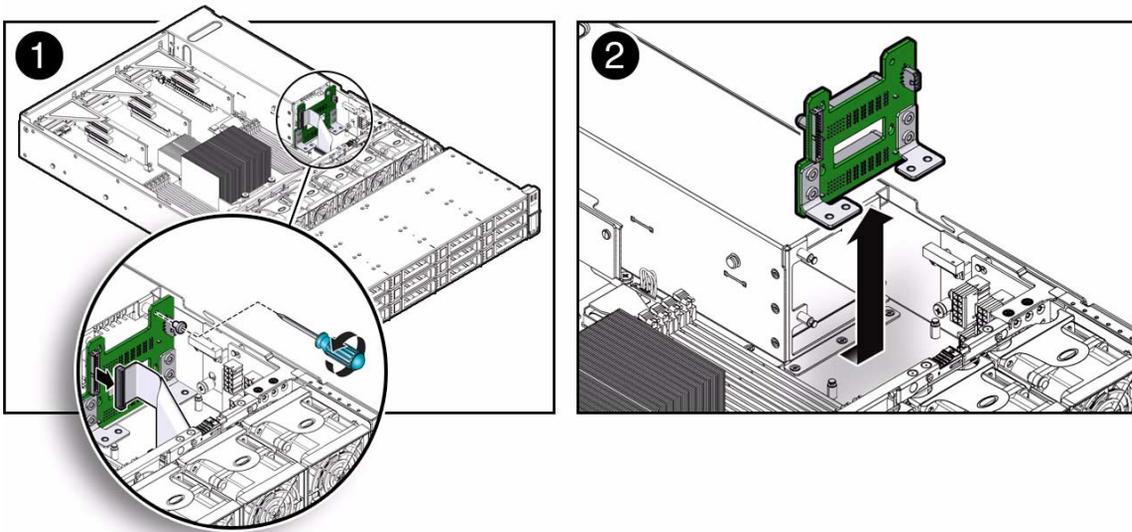
5.8.2   Install Power Supply Backplane

6. **Install the power supply backplane (**FIGURE 5-10**).**

   a. **Position the power supply backplane over the mushroom standoffs on the bracket and slide it down to engage the mushroom standoffs [2].**

   b. **To secure the power supply backplane to the server chassis, install the Phillips screw [1].**

   c. **Reconnect the power supply ribbon cable to the power supply backplane [1].**

7. **Install the power distribution board.**

   See Section 5.6.2, "Install Power Distribution Board" on page 5-20.

8. **Install the power supplies.**

   See Section 3.4.4, "Install Power Supply" on page 3-19.

9. **Return the server to operation.**

   a. **Install the top cover.**

      See Section 6.2, "Installing the Server Top Cover" on page 6-2.

   b. **Return the server to the normal rack position.**

      See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

   c. **Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.**

      See Section 6.5, "Powering On the Server" on page 6-7.

      Verify that the AC Present LED is lit.

5.9 Servicing the Rear-Mounted Boot Disk Drive Cage

⚠ **Caution –** The server supplies power to the rear-mounted boot disk drive cage even when the server is powered off. To avoid personal injury or damage to the server, you must disconnect the power cords before servicing the rear-mount drive cage.

5.9.1 Remove Rear-Mounted Boot Disk Drive Cage

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

      See Section 2.4.2, "Power Off the Server" on page 2-4.

   b. **Extend the server to the maintenance position.**

      See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

c. **Attach an antistatic wrist strap.**

See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

d. **Remove the top cover.**

See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **Remove the rear-mounted boot disk drive cage (**FIGURE 5-11**).**

a. **Loosen the two captive Phillips screws on the ends of the PCI crossbar [1].**

b. **Grasp both ends of the PCI crossbar and pull it to the rear to disengage it from the chassis and then lift it up and out of the chassis [1].**

c. **Disconnect the two SATA cables connectors from the rear of the boot disk drive cage [2].**

d. **Disconnect the power cable from the rear of the boot disk drive cage [2].**

e. **Remove the two green captive screws that secure the boot disk drive cage to the server chassis [3].**

f. **Lift the cage up and out of the chassis [4].**

3. **Place the cage on an antistatic mat.**

FIGURE 5-11 Removing the Rear-Mounted Boot Disk Drive Cage
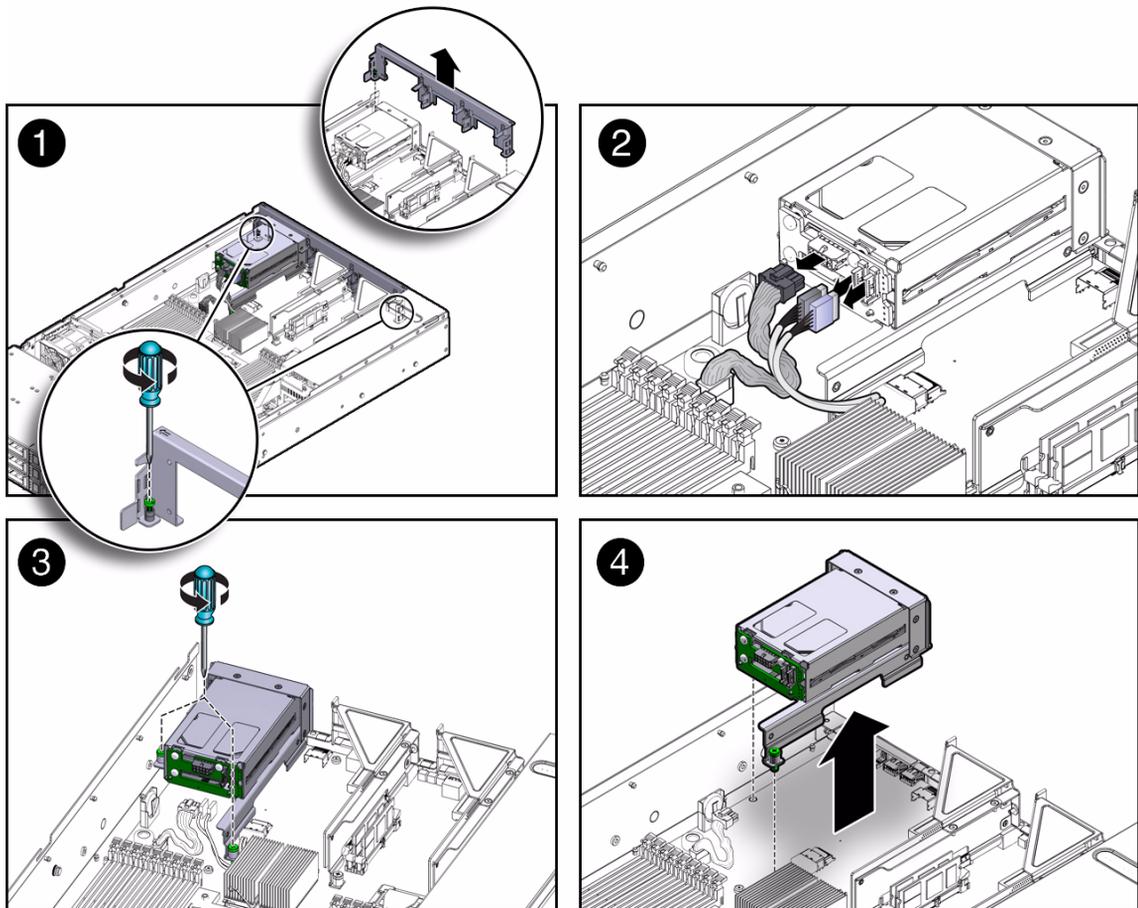
5.9.2   Install the Rear-Mounted Boot Disk Drive Cage

1. **Install the rear-mounted boot disk drive cage (**FIGURE 5-11**).**

   a. **Lower the boot disk drive cage into the server chassis [4].**

   b. **Tighten the two green captive that secure the cage to the chassis [3].**

   c. **Reconnect the boot disk drive cage power cable connector [2].**

   d. **Reconnect the two SATA cable connectors to the disk drive cage [2].**

    e. **Lower the PCI crossbar down into the chassis and then move it forward to engage the chassis and the rear-mounted components [1].**

    f. **Tighten the two captive Phillips screws that secure the PCI crossbar to the chassis [1].**

2. **Return the server to operation.**

    a. **Install the top cover.**

    See Section 6.2, "Installing the Server Top Cover" on page 6-2.

    b. **Return the server to the normal rack position.**

    See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

    c. **Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.**

    See Section 6.5, "Powering On the Server" on page 6-7.

    Verify that the AC Present LED is lit.

5.10 Servicing Cables

The following topics are covered:

- Section 5.10.1, "Remove Storage Drive Cable in a SAS Configuration" on page 5-30
- Section 5.10.2, "Install Storage Drive Cable in a SAS Configuration" on page 5-34
- Section 5.10.3, "Remove Power Distribution Board Cable" on page 5-34
- Section 5.10.4, "Install Power Distribution Board Cable" on page 5-35

Caution – The system supplies power to the cables even when the server is powered off. To avoid personal injury or damage to the server, you must disconnect power cords before servicing the cables.

5.10.1 Remove Storage Drive Cable in a SAS Configuration

1. **Prepare the server for service.**

a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

   See Section 2.4.2, "Power Off the Server" on page 2-4.

b. **Extend the server to the maintenance position.**

   See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

c. **Attach an antistatic wrist strap.**

   See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

d. **Remove the top cover.**

   See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **Determine the applicable cabling configuration diagram for your server.**

   ■ FIGURE 5-12 shows the cable configuration in a server without the rear-mounted disk drive cage installed.

   ■ FIGURE 5-13 shows the cable configuration in a server with the rear-mounted disk drive cage installed.

FIGURE 5-12 Removing Storage Drive Cables in a Server Without the Rear-mounted Disk
Drive Cage Installed
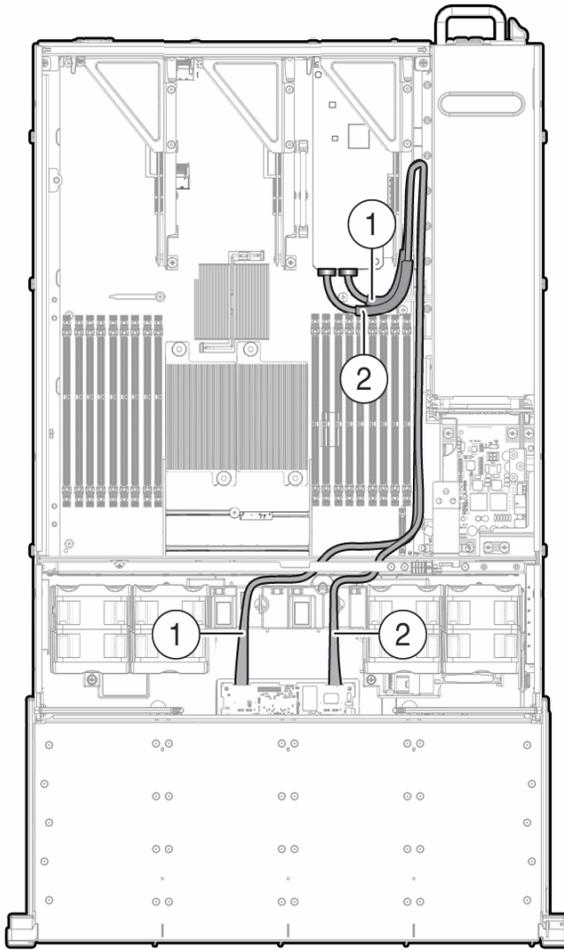
Note – In the above figure, FIGURE 5-12, the numbered call outs (1, 2) highlight that
the cable that connects to the left connector [1] on the SAS expander board (as viewed
from the from the front of the server) connects to right connector [1] on the HBA
card, and vice versa.

FIGURE 5-13 Removing Storage Drive Cable From a Server With the Rear-Mounted Disk Drive Cage Installed
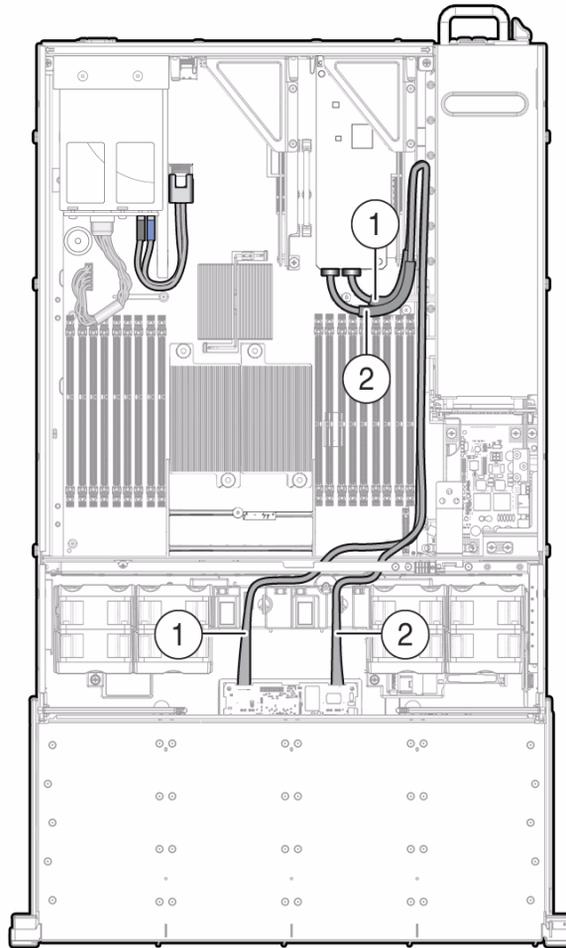


Note – In the above figure, FIGURE 5-13, the numbered call outs (1, 2) highlight that the cable that connects to the left connector [1] on the SAS expander board (as viewed from the from the front of the server) connects to right connector [1] on the HBA card, and vice versa.

3. **Disconnect the SAS cables from the PCIe card.**

   a. **Untwist the cable tie down to release the cables.**

b. **To disconnect the cables from the HBA PCIe card, press the latch, push in toward the connector, and then pull out to remove the cables.**

4. **Remove the SAS expander board and disconnect the SAS cables.**

   See Section 5.2.1, "Remove the SAS Expander Board" on page 5-3.

5. **Remove the SAS cables from the server.**

   Be careful not to snag the cables on the server components.

5.10.2   Install Storage Drive Cable in a SAS Configuration

1. **Reconnect the SAS cables to the SAS expander board.**

   See Section 5.2.2, "Install SAS Expander Board" on page 5-6.

2. **Route the cables through the server as shown in the applicable cabling diagram (FIGURE 5-12 or FIGURE 5-13).**

3. **Plug the cable connectors into the connectors on the HBA card from which the SAS cables were removed.**

4. **Press the cables in the cable tie down and secure the cable with the tie down.**

5. **Return the server to operation.**

   a. **Install the top cover.**

      See Section 6.2, "Installing the Server Top Cover" on page 6-2.

   b. **Return the server to the normal rack position.**

      See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

   c. **Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.**

      See Section 6.5, "Powering On the Server" on page 6-7.

      Verify that the AC Present LED is lit.

5.10.3   Remove Power Distribution Board Cable

1. **Prepare the server for service.**

   a. **Power off the server and disconnect the power cord (or cords) from the power supply (or supplies).**

      See Section 2.4.2, "Power Off the Server" on page 2-4.

    b. **Extend the server to the maintenance position.**

       See Section 2.6, "Extending the Server to the Maintenance Position" on page 2-26.

    c. **Attach an antistatic wrist strap.**

       See Section 2.9, "Performing Electrostatic Discharge and Antistatic Prevention Measures" on page 2-31.

    d. **Remove the top cover.**

       See Section 2.10, "Removing the Server's Top Cover" on page 2-33.

2. **Remove the power distribution board cable (**FIGURE 4-15**).**

    a. **Release the latches on either side of the connector on the power distribution board and pull the cable straight up to disconnect it from the connector [1].**

    b. **Release the latches on either side of the connector on the motherboard, and pull the cable straight up to disconnect it from the connector [1].**

5.10.4   Install Power Distribution Board Cable

The power distribution board cable distributes power from the power distribution board to the motherboard.

1. **Open the latches on the power distribution board connector (**FIGURE 4-16 **[1]).**

2. **Ensure that the key on the cable connector lines up with the slot on the board connector [1].**

3. **Push the cable connector into the power distribution board connector until seated and the latches close [1].**

   When cable connector is properly seated the latches should be above the connector housing.

4. **Carefully align the motherboard connector to the motherboard pin field [1].**

5. **Gently press the connector down until seated. If you feel significant resistance, stop and check the pin alignment.**

6. **Return the server to operation.**

    a. **Install the top cover.**

       See Section 6.2, "Installing the Server Top Cover" on page 6-2.

    b. **Return the server to the normal rack position.**

       See Section 6.4, "Returning the Server to the Normal Rack Position" on page 6-5.

c. Reconnect the power cord (or cords) to the power supply (or supplies) and power on the server.

See Section 6.5, "Powering On the Server" on page 6-7.

Verify that the AC Present LED is lit.

CHAPTER **6**

Returning the Server to Operation

This chapter describes how to return the Sun Fire X4270 M2 Server to operation after you have performed service procedures.

The following topics are covered in this chapter:

Caution – Hazardous voltage present. Never attempt to run the server with the covers removed.

Caution – Equipment damage possible. Covers must be in place for proper airflow.

6.1 Installing the Front Cover Onto a Server with 2.5-Inch Storage Drives

Note – This procedure only applies to servers with 2.5-inch storage drives.

**Note –** Servicing some components requires that the server's front cover be removed.

6.1.1 Install the Server Front Cover

1. Position the front cover over the front of the server so that there is about a 0.25 inch (6 mm) of clearance between the front edge of the cover and the front of the server [1].

2. Slide the front cover toward the front of the server until the release levers on the back of the front cover are fully engaged [2].

The release levers will click when they are fully engaged.

FIGURE 6-1   Installing the Front Cover
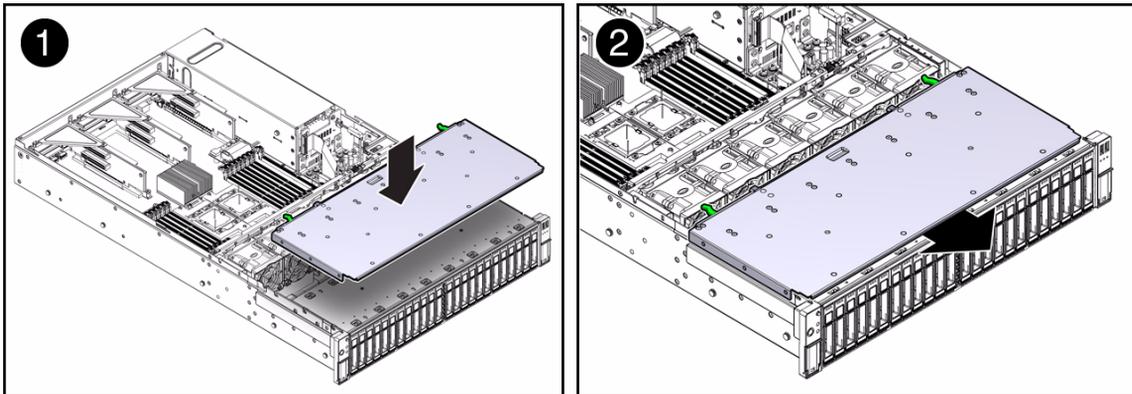


6.2 Installing the Server Top Cover

If you removed the top cover, perform the following procedure to replace it.

6.2.1 Install the Server Top Cover

1. Place the top cover on the chassis (FIGURE 6-2 [1]).

a. **Set the cover down so that it hangs over the rear of the server by about 1 inch (25.4 mm).**

b. **Ensure that the rear interlocks on both sides of the top cover engage the slots on both sides of the server's chassis.**

FIGURE 6-2   Installing the Top Cover on the Sun Fire X4270 M2 Server
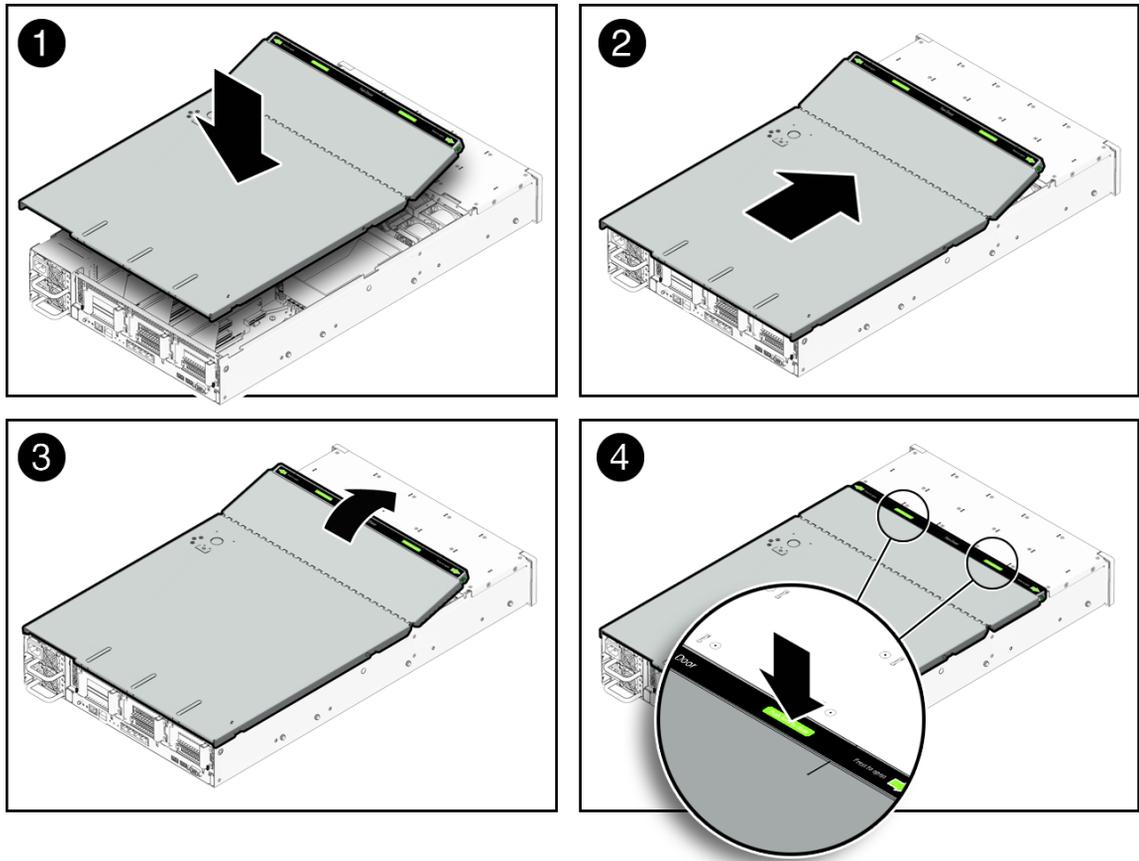
2. **Slide the top cover forward until it seats [2].**

3. **Close the fan cover [3].**

4. **Press down on the cover at the locations labeled to close the cover completely [4].**

6.3 Reinstalling the Server in the Rack

If you removed the server chassis from the rack, perform these steps.

Caution – The servers are heavy. Two people might be required to carry the chassis and install it in the rack.

6.3.1 Reinstall Server in Rack

1. **Push the slide-rails into the slide-rail assemblies in the rack as far as possible.**

2. **Raise the server so that the rear ends of the mounting brackets are aligned with the slide-rail assemblies that are mounted in the rack (FIGURE 6-3).**

3. **Insert the mounting brackets into the slide-rails, then push the server into the rack until the mounting brackets encounter the slide-rail stops (approximately 12 inches, or 30 cm).**

   The server is now in the extended maintenance position.

FIGURE 6-3   Returning the Server to the Rack
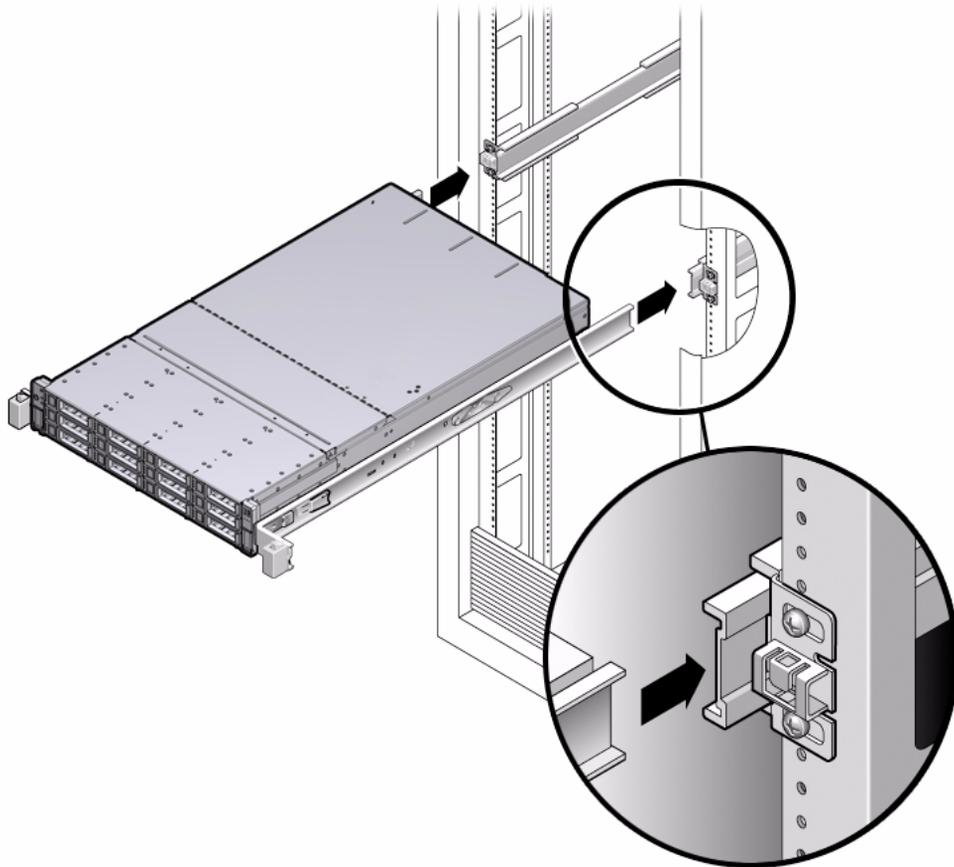
6.4   Returning the Server to the Normal Rack Position

If you extended the server to the maintenance position, use this procedure to return the server to the normal rack position.

6.4.1　Return the Server to the Normal Rack Position

1. Release the slide rails from the fully extended position by pushing the release tabs on the side of each rail (FIGURE 6-4**).**

FIGURE 6-4　Release Tabs on Rails
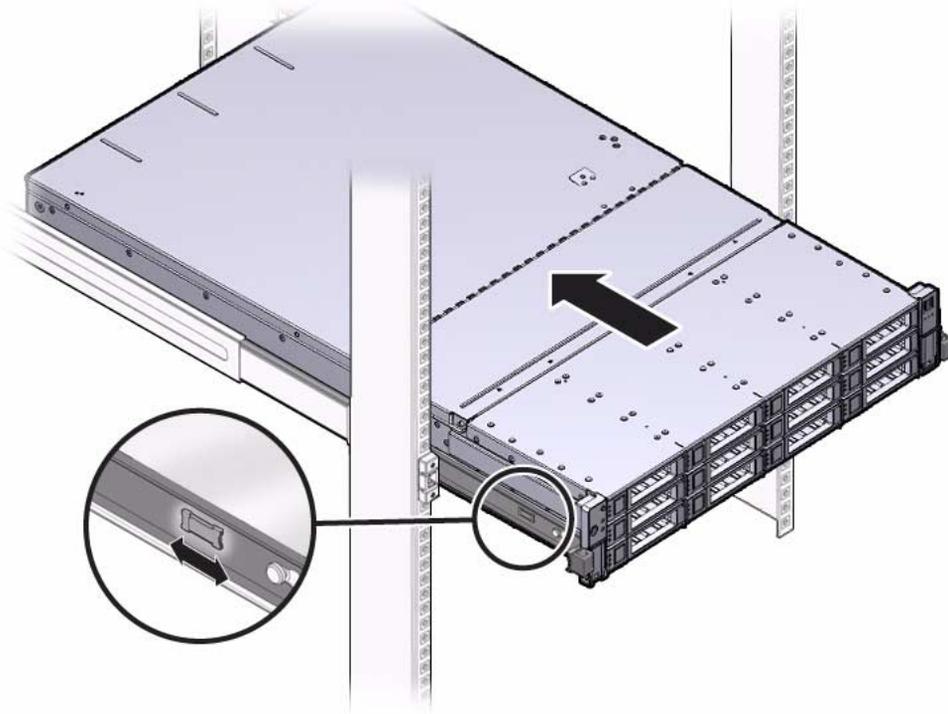
2. Simultaneously push and hold the slide-rail release buttons on each mounting bracket while you push the server into the rack.

Ensure that the cables do not get in the way.

3. Continue pushing until the slide-rail locks (on the front of the mounting brackets) engage the slide-rail assemblies.

You will hear an audible click when the server is in the normal rack position.

4. Reconnect the cables to the back of the server.

If the cable management arm (CMA) is in the way, disconnect the left CMA release and swing the CMA open.

5. Reconnect the CMA.

Swing the CMA closed and latch it to the left rack rail.

6.5 Powering On the Server

Before powering on your server for the first time, follow the installation and cabling instructions provided in the *Sun Fire X4170 M2 and X4270 M2 Servers Installation Guide* (821-0481), which is optionally shipped with the system and is also available online at:

http://docs.sun.com/app/docs/prod/sf.x4270m2#hic

To connect power cords and apply power to the server:

1. Connect the power cord (or cords) to the power supply (or supplies) on the server's rear panel (FIGURE 6-5**).**

FIGURE 6-5   Rear Panel Power Supplies

2. Verify that standby power is on.

In standby power mode, the Power/OK LED on the front panel next to the Power button flashes. See FIGURE 1-1 for the location of the Power/OK LED.

3. Press and release the recessed Power button on the server front panel.

When the main power is applied to the server, the Power/OK LED lights and remains lit, as shown in FIGURE 1-1.

CHAPTER **7**

Troubleshooting the Server and Restoring ILOM Defaults

This chapter introduces the diagnostic tools you can use to troubleshoot or monitor the performance of your server. It also includes information about how to restore the service processor (SP) password and serial connection defaults in Oracle Integrated Lights Out Manager (ILOM), as well as how to restore your ILOM SP firmware.

Note – Oracle integrated Lights Out Manager formerly was called Sun Integrated Lights Out Manager.

7.1 Troubleshooting the Server

The server and its accompanying software and firmware contain many diagnostic tools and features that can help you:

- Isolate problems when a failure occurs on a replaceable unit (CRU)
- Monitor the status of a functioning system
- Exercise the system to disclose more subtle problems that might be hardware related

Oracle provides a suite of diagnostic tools, each of which has its own specific strengths and applications. For more information about which tool might be best to use for your purpose, and where to locate information about these tools, see:

7.1.1 Oracle Diagnostic Tools

Oracle provides a wide selection of diagnostic tools for use with your server. These tools range from the SunVTS™ software, a comprehensive validation test suite, to log files in ILOM that might contain clues helpful in identifying the possible sources of a problem, and the fault management function in ILOM that enables you to identify a faulted component as soon as the fault occurs.

The diagnostic tools range from standalone software packages, to firmware-based tests like power-on self-test (POST), U-Boot tests, or Pc-Check tests, to hardware LEDs that tell you when the system components are operating.

TABLE 7-1 summarizes the variety of diagnostic tools that you can use when troubleshooting or monitoring your server.

TABLE 7-1   Summary of Oracle Diagnostic Tools

Diagnostic Tool	Type	What It Does	Accessibility	Remote Capability
Integrated Lights Out Manager (ILOM)	SP firmware	Monitors environmental conditions, generates alerts, performs fault isolation, and provides remote console access.	Can function on standby power and when the operating system is not running.	Designed for remote and local access.
Preboot Menu	SP firmware	Enables you to restore some of ILOM defaults (including firmware) when ILOM is not accessible.	Can function on standby power and when operating system is not running.	Local access, but can be accessed remotely from a console running terminal emulation software.
LEDs	Hardware and SP firmware	Indicate status of overall system and particular components.	Available any time when system power is available.	Local, but sensor and indicators are accessible from ILOM web interface or command-line interface (CLI).
POST	Host firmware	Tests core components of system: CPUs, memory, and motherboard I/O bridge integrated circuits.	Runs on startup. Available when the operating system is not running.	Local, but can be accessed through ILOM Remote Console.
U-Boot	SP firmware	Initializes and test aspects of the service processor (SP) prior to booting the ILOM SP operating system. Tests SP memory, SP, network devices and I/O devices.	Can function on standby power and when operating system is not running.	Local or remote access through a serial connection.

TABLE 7-1 Summary of Oracle Diagnostic Tools *(Continued)*

Diagnostic Tool	Type	What It Does	Accessibility	Remote Capability
Pc-Check	SP firmware	DOS-based utility that tests all motherboard components (CPU, memory, and I/O), ports, and slots.	Can function on standby power and when operating system is not running.	Remote access through Oracle ILOM Remote Console.
Oracle Solaris commands	Operating system software	Displays various kinds of system information.	Display various kinds of system information.	Local, and over network
SunVTS	Diagnostic tool standalone software	Exercises and stresses the system, running tests in parallel.	Requires operating system. Install SunVTS software separately.	View and control over network

7.1.2 Diagnostic Tool Documentation

TABLE 7-2 identifies where you can find more information about Oracle diagnostic tools.

TABLE 7-2 Summary of Documentation for Oracle Diagnostic Tools

Diagnostic Tool	Where to Find Information
ILOM	• Oracle ILOM 3.0 Documentation Collection. • *Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun Fire X4170 M2 and X4270 M2 Servers* Locate the latest version of these guides at: http://docs.sun.com/app/docs/prod/sf.x4270m2#hic
Preboot Menu	• Section 7.2, "Using the Preboot Menu Utility" on page 7-5
LEDs; or System indicators and sensors	• Section 1.3, "Server Front Panel Features" on page 1-6 • Section 1.4, "Server Back Panel Features" on page 1-9 • Oracle ILOM 3.0 Documentation Collection. • *Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for Sun Fire X4170 M2 and X4270 M2 Servers* Locate the latest version of these guides at: http://docs.sun.com/app/docs/prod/sf.x4270m2#hic
POST	• Section 2.5.1.1, "Default BIOS Power-On Self-Test (POST) Events" on page 2-6 • Section 2.5.1.2, "BIOS POST F1 and F2 Errors" on page 2-7

TABLE 7-2 Summary of Documentation for Oracle Diagnostic Tools *(Continued)*

Diagnostic Tool	Where to Find Information
U-Boot or Pc-Check	• *Oracle x64 Servers Diagnostics Guide* Locate the latest copy of this guide at: http://docs.sun.com/app/docs/prod/sf.x4270m2#hic
Oracle Solaris commands	Locate the latest Oracle Solaris command information for Solaris 10 at: http://docs.sun.com/app/docs/doc/817-0550/eqxqt?a=view
SunVTS	Download the SunVTS software at: • http://sunsolve.com Locate the latest documentation for SunVTS at: http://www.sun.com/oem/products/vts/index.html

7.2 Using the Preboot Menu Utility

You can use the Preboot Menu utility installed on your server to make changes to some of the ILOM settings while ILOM is not currently running. The Preboot Menu also enables you to reset ILOM to its default settings, as well as restore the SP firmware image on your system.

For more information about how to use the Preboot Menu Utility, see these sections:

- Section 7.2.1, "Accessing the Preboot Menu" on page 7-5
- Section 7.2.2, "Restoring ILOM to Default Settings" on page 7-10
- Section 7.2.3, "Restoring ILOM Access to the Serial Console" on page 7-11
- Section 7.2.4, "Restoring the SP Firmware Image" on page 7-12
- Section 7.2.5, "Preboot Menu Command Summary" on page 7-14

7.2.1 Accessing the Preboot Menu

To access the Preboot Menu, you must reset the SP and interrupt the boot process. You can interrupt the ILOM boot process by either:

- Using the Locate button on the local server.

  For details about the requirements for this local access method, see Section 7.2.1.1, "Prerequisites for Accessing the Preboot Menu" on page 7-6.

Or

- Typing **xyzzy** during a pause in the ILOM boot process from a remote serial terminal.

For details about the requirements for this remote access method, see
Section 7.2.1.1, "Prerequisites for Accessing the Preboot Menu" on page 7-6.

Some Preboot Menu settings must be configured first, and until they are, you must
use the Locate button method to access the Preboot Menu.

For detailed instructions for accessing the Preboot Menu from a local or remote
connection, see the following sections:

- Section 7.2.1.1, "Prerequisites for Accessing the Preboot Menu" on page 7-6
- Section 7.2.1.2, "Access the Preboot Menu" on page 7-7
- Section 7.2.1.3, "Edit Preboot Menu for Remote Serial Access" on page 7-8

7.2.1.1 Prerequisites for Accessing the Preboot Menu

Ensure that the applicable requirements are met prior to accessing the Preboot Menu
from either a local or remote connection.

- For local access to the Preboot Menu (using Locate button)

  You must connect a terminal or computer running terminal emulation software to
  the server.

  For more information about how to attach local devices to the server, see the *Sun
  Fire X4170 M2 and X4270 M2 Servers Installation Guide* (821-0481).

  For instructions for accessing the Preboot Menu by using the Locate button, see
  Section 7.2.1.2, "Access the Preboot Menu" on page 7-7.

- For remote access to the Preboot Menu (typing **xyzzy** during the ILOM boot
  process)

  Prior to accessing the Preboot Menu remotely, you must set the `bootdelay` and
  `check_physical_presence` settings in the Preboot Menu to enable remote
  access. To configure these settings for the first time, you need to:

  a. Access the Preboot Menu using the Locate button on the local server as
     described in Section 7.2.1.2, "Access the Preboot Menu" on page 7-7.

  b. Edit the settings in the Preboot Menu to enable remote access as described in
     Section 7.2.1.3, "Edit Preboot Menu for Remote Serial Access" on page 7-8.

  c. Use a remote serial terminal or console running terminal emulation software to
     access the Preboot Menu remotely.

Note – You cannot use an SSH, or a remote KVMS session to access the Preboot
Menu remotely.

7.2.1.2 Access the Preboot Menu

1. **Ensure that the requirements in** **are met.**

2. **Reset ILOM.**

   For example:

   - From the server SP ILOM, enter the command:

     ```
     -> reset /SP
     ```

   ILOM reboots and messages begin scrolling on the screen.

3. **To interrupt the ILOM boot process, perform one of the following actions when the SP is resetting:**

   - Press and hold the Locate button on the server front panel, until the Preboot Menu appears.

   Or

   - Type in **xyzzy** when you see the message:

     ```
     Booting linux in n seconds...
     ```

Note – You cannot interrupt the ILOM boot process by typing **xyzzy** until you have configured the settings as described in .

The ILOM Preboot Menu appears.

```
Booting linux in 10 seconds...

                        ILOM Pre-boot Menu
                        -----------------
Type "h" and [Enter] for a list of commands, or "?" [Enter] for
command-line key bindings.  Type "h cmd" for summary of 'cmd'
command.

Warning: SP will warm-reset after 300 seconds of idle time.
  Set 'bootretry' to -1 to disable the time-out.

Preboot>
```

4. **You can perform any of the following tasks or type** boot **to exit the Preboot Menu.**

   - Enable remote access to the Preboot Menu.

     For instructions, see .

- Restore ILOM settings to their defaults.

    For instructions, see Section 7.2.2.1, "Resetting ILOM Configuration Using the Preboot Menu" on page 7-10.

- Restore the serial connection between ILOM and a host console.

    For instructions, see Section 7.2.3.1, "Restore Access to the Serial Console Using the Preboot Menu" on page 7-11.

- Restore the SP firmware image.

    For instructions, see Section 7.2.4.2, "Restore the SP Firmware Image Using the Preboot Menu" on page 7-13.

- Review the commands supported in the Preboot Menu.

    For command details, see Section 7.2.5, "Preboot Menu Command Summary" on page 7-14.

7.2.1.3   Edit Preboot Menu for Remote Serial Access

1. **Access the Preboot Menu as described in** Section 7.2.1.2, "Access the Preboot Menu" on page 7-7**.**

2. **At the** `Preboot>` **prompt, type** `edit`**.**

    The Preboot Menu enters edit mode.

    In edit mode, the Preboot Menu displays its selections one-by-one, offering you a chance to change each one.

    - To change a setting, type the new value, then press Enter.
    - To skip to the next setting, press Enter.

3. **Press Enter to move through the settings until the** `bootdelay` **setting appears.**

4. **To change the** `bootdelay` **setting, type** 3, 10**, or** 30**, then press Enter.**

    This value (3, 10, or 30) specifies the number of seconds the SP boot process delays while waiting for your input.

    The Preboot Menu redisplays the `bootdelay` setting with the new value.

5. **Press Enter to return to Preboot Menu selections.**

    The Preboot Menu selections appear.

6. **Press Enter to move through the settings until the** `check_physical_presence` **setting appears.**

    To change the `check_physical_presence` setting, type `no`, then press Enter.

    The Preboot Menu displays the `check_physical_presence` setting with the new value.

7. **Press Enter for the new value to take effect.**

   The Preboot Menu asks you to confirm your changes.

   ```
   Enter 'y[es]' to commit changes: [no]
   ```

8. **Type** y **to save your changes and exit the edit session.**

   If you want to exit the edit session without saving your changes, type n.

9. **To exit the Preboot Menu, type boot.**

   The following example shows an edit session where the
   check_physical_presence settings are changed.

Note – For a list of other settings you can edit in the Preboot Menu, see
Section 7.2.1.4, "Edit Mode Settings in Preboot Menu" on page 7-10.

```
Preboot> edit
Press Enter by itself to reach the next question.
Press control-C to discard changes and quit.
Values for baudrate are {[ 9600 ]| 19200 | 38400 | 57600 | 115200 }.
 Set baudrate?               [9600]
Values for serial_is_host are {[ 0 ]| 1 }.
 Set serial_is_host?         [0]
Values for bootdelay are { -1 | 3 | 10 | 30 }.
 Set bootdelay?              [3] 10
 Set bootdelay?              [10]
Values for bootretry are { -1 | 30 | 300 | 3000 }.
 Set bootretry?              [-1]
Values for diags_mode are {[ Normal ]| Quick | Extended | Skip }.
 Set diags_mode?             [Normal]
Values for preferred are {[ 0 ]| 1 }.
 Set preferred?              [<not set>]
Values for preserve_conf are {[ yes ]| no }.
 Set preserve_conf?          [yes]
Values for check_physical_presence are {[ yes ]| no }.
 Set check_physical_presence? [yes] no
 Set check_physical_presence? [no]
 Enter 'y[es]' to commit changes: [no] y
Summary: Changed 2 settings.
Preboot>
```

7.2.1.4 Edit Mode Settings in Preboot Menu

In addition to changing the settings required in the Preboot Menu to enable remote access, you can also change other edit mode settings in the Preboot Menu. For a list of these settings, see TABLE 7-3.

TABLE 7-3 Edit Mode Preboot Menu Command Settings

Setting	Description
baudrate	Sets the baudrate of the serial port. Selections include 9600,19200, 38400, 57600, and 115200.
serial_is_host	If this is set to 0, the serial port connects to ILOM. If this is set to 1, the serial port connects to the host. For more details, see Section 7.2.3, "Restoring ILOM Access to the Serial Console" on page 7-11.
bootdelay	The number of seconds the ILOM boot process waits for the user to enter **xyzzy** before booting the SP. Selections include 3, 10, or 30.
bootretry	The number of seconds the Preboot Menu waits for user input before timing out and booting the SP. Set to -1 to disable the timeout.
diags_mode	Sets the diagnostic level executed when the server powers on.
preferred	Unused
preserve_conf	Setting this to no duplicates the function of the unconfig ilom_conf command, which resets many ILOM configuration settings.
check_physical _presence	If this is set to Yes, you must press and hold the Locate button to interrupt the SP boot process. If it is set to No, the boot process prompts you to interrupt it. See Section 7.2.1.3, "Edit Preboot Menu for Remote Serial Access" on page 7-8 for details.

7.2.2 Restoring ILOM to Default Settings

You can use the Preboot Menu to restore ILOM settings to their defaults.

7.2.2.1 Resetting ILOM Configuration Using the Preboot Menu

1. Access the Preboot Menu as described in Section 7.2.1.2, "Access the Preboot Menu" on page 7-7**.**

2. At Preboot Menu prompt, type:

```
Preboot> unconfig ilom_conf
Setting 'preserve_conf' to 'no' for the next boot of ILOM.
```

3. **Reset the SP by typing:**

   Preboot> **boot**

   The Preboot Menu exits and the SP restarts.

   After restarting the ILOM SP, the value for ILOM settings revert to their defaults.

7.2.3 Restoring ILOM Access to the Serial Console

In the event that the serial connection between ILOM and a host becomes unavailable, you can restore access to the serial port connection by reconfiguring the host as the external serial port owner in either the ILOM web interface or CLI, or in the Preboot Menu.

To determine which interface is best to use when restoring the serial connection between ILOM and a host console, consider the following:

- If a network connection is available, you should use the ILOM web interface or CLI to restore ILOM's access to the serial console.

  For instructions, see the ILOM 3.0 Documentation Collection.

- If a network connection is unavailable, you should use the procedure in Section 7.2.3.1, "Restore Access to the Serial Console Using the Preboot Menu" on page 7-11 to restore ILOM access to the serial console.

7.2.3.1 Restore Access to the Serial Console Using the Preboot Menu

1. **Access the Preboot Menu as described in** Section 7.2.1, "Accessing the Preboot Menu" on page 7-5**.**

2. **At the** Preboot> **prompt, type** edit**.**

   The Preboot Menu enters edit mode.

   In edit mode, the Preboot Menu displays its selections one-by-one, offering you a chance to change each one.

   - To change a setting, type the new value, then press Enter.
   - To skip to the next setting, press Enter.

3. **Press Enter to move through the settings until the** serial_is_host **setting appears.**

   To change the serial_is_host setting, type **0**, and then press Enter.

   The Preboot Menu appears with the new value for the serial_is_host setting.

4. **Press Enter to display the Preboot Menu selections.**

   The Preboot Menu settings appear.

5. **Press Enter to scroll through the settings until the Preboot Menu asks you to confirm your changes.**

   ```
   Enter 'y[es]' to commit changes: [no]
   ```

6. **Type y to confirm your change and exit the edit session.**

   The Preboot Menu displays this message:

   ```
   Summary: Changed 1 settings
   Preboot>
   ```

7. **To exit the Preboot Menu, type:**

   ```
   boot
   ```

7.2.4 Restoring the SP Firmware Image

If ILOM is available, you should always use the ILOM web interface or CLI to restore (update) the firmware image. For instructions about how to restore the SP firmware image using either the ILOM web interface or CLI, refer to the ILOM 3.0 Documentation Collection. If ILOM is unavailable, you can use the Preboot Menu or IPMIflash to restore the ILOM firmware image.

Note – If you are unable to access ILOM to update the SP firmware image using either the ILOM interfaces or IPMIflash, you should contact a service representative for assistance.

⚠ **Caution –** To restore the SP firmware image using the Preboot Menu, you must be a qualified service technician.

To use the Preboot Menu to restore the SP firmware image on the server, see the following sections:

- Section 7.2.4.1, "Prerequisite for Restoring SP Firmware Using Preboot Menu" on page 7-12
- Section 7.2.4.2, "Restore the SP Firmware Image Using the Preboot Menu" on page 7-13

7.2.4.1 Prerequisite for Restoring SP Firmware Using Preboot Menu

The following requirements must be met prior to restoring the SP firmware on your server using the Preboot Menu.

- You must be a qualified service technician to perform this procedure.

■ You must have a valid `.flash` firmware image file on a TFTP server.

Note – Restore the SP firmware using the Preboot Menu requires a `.flash` file instead of a `.pkg` file that is typically used to update the SP using the ILOM interfaces.

7.2.4.2   Restore the SP Firmware Image Using the Preboot Menu

1. **Access the Preboot Menu as described in** Section 7.2.1, "Accessing the Preboot Menu" on page 7-5.

Caution – The use of the `net flash` command is reserved for use by service personnel only.

---

2. **At the** `Preboot>` **prompt, type:**

   net flash *IPaddress path/name***.flash**

   Where:

   ■ *IPaddress* is the IP address of a TFTP server

   ■ *path* is the path to the file relative to `/tftpboot`

   ■ *name* is the first part of the .flash file file name

   For example:

   net flash 10.8.173.25 images/system-rom.flash

   After a series of messages, the Preboot Menu prompt appears.

   `Preboot>`

3. **At the** `Preboot>` **prompt**, **type the** `reset` **command to restart the SP.**

   For example:

   `Preboot>` **reset**

   The Preboot Menu exits and ILOM restarts.

7.2.5 Preboot Menu Command Summary

TABLE 7-4 identifies the Preboot Menu commands.

TABLE 7-4 Preboot Menu Commands

Command	Description
boot	Boots ILOM. The Preboot Menu exits and ILOM restarts. **Note -** This command executes a modified boot sequence that does not offer the choice to select the diagnostic level, or to interrupt the boot sequence and return to the Preboot Menu. To execute the normal boot sequence, use the reset warm command instead.
vers	Displays version information including the hardware type, board revision, ILOM revision, revisions of Preboot software (PBSW) and recovery U-Boot. Shows the checksum integrity of the images, and the preference between redundant images.
help	Displays a list of commands and parameters.
show	Displays a list of SP settings.
edit	Starts an interactive dialog that prompts and changes settings one-by-one. See Section 7.2.1.3, "Edit Preboot Menu for Remote Serial Access" on page 7-8 for details.
diag	Runs the U-Boot diagnostic tests in manual mode. See the *Oracle X64 Servers Diagnostics Guide* (820-6750) for more on U-Boot diagnostic tests.
host	Initiates various activities related to the host. • clearcmos – Clears CMOS and BIOS passwords. • console – Connects SP console to host serial console. **Note -** Type Ctrl \ q to quit. • show – Shows information about the host state. • enable-on – Enables the front-panel Power button, which is usually disabled unless ILOM is running. **Caution -** If you start the host when ILOM is off, the BIOS does not send error events, or power messages to the SP. This can cause the server to lose power. • hard-off – Turns the host off.

TABLE 7-4   Preboot Menu Commands *(Continued)*

Command	Description
net	`{ config	dhcp	ping	flash }`  • `config` – Starts a dialog that enables you to change the ILOM network settings. • `dhcp` – Changes the network addressing from static to DHCP. **Note -** You must set `ipdiscovery = dhcp` using the `net config` command first.  • `ping` – Sends a ping. • `flash` – Downloads an ILOM firmware image. See Section 7.2.4, "Restoring the SP Firmware Image" on page 7-12 for details. Type the **help net** *command* for more details on these commands.
reset	`{warm	cold}`  • `warm` – Resets the SP without affecting a running host. • `cold` – Resets the SP and the host. It has the effect of powering off the server.
unconfig	`{ ilom_conf	most	all }`  Causes ILOM to erase any configuration information and returns the values to defaults the next time ILOM boots.  • `ilom_conf` – Resets configuration settings but preserves SP network and `baudrate`, `preferred`, and `check_physical_presence`. • `most`– Resets the SP data storage, but preserves SP `network` and `baudrate`, `preferred`, and `check_physical_presence` settings. • `all` – Resets all SP data storage and settings. Booting ILOM restores other defaults. **Note -** None of these options erases the dynamic FRU PROMs.

Connector Pinouts

This appendix provides reference information about the Sun Fire X4270 M2 Server back panel ports and pin assignments.

Topics covered in this appendix include:

- Section A.1, "Serial Management Port Connector" on page A-2
- Section A.2, "Network Management Port Connector" on page A-3
- Section A.3, "Video Connector" on page A-4
- Section A.4, "USB Connectors" on page A-5
- Section A.5, "Gigabit Ethernet Connectors" on page A-6

For the locations of the back panel ports on the servers, see FIGURE 1-3 and FIGURE 1-4.

A.1   Serial Management Port Connector

The serial management connector (labeled SER MGT) is an RJ-45 connector located on the back panel. This port is the default connection to the system console.

FIGURE A-1   Serial Management Connector Diagram

Figure Legend

1	Request to Send	**5**	Ground
2	Data Terminal Ready	**6**	Receive Data
3	Transmit Data	**7**	Data Set Ready
4	Ground	**8**	Clear to Send

A.2 Network Management Port Connector

The network management connector (labeled NET MGT) is an RJ-45 connector located on the motherboard and can be accessed from the back panel. This port needs to be configured prior to its use.

FIGURE A-2   Network Management Connector Diagram
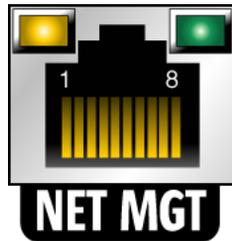
Figure Legend

1	Transmit Data +	**5**	Common Mode Termination
2	Transmit Data –	**6**	Receive Data –
3	Receive Data +	**7**	Common Mode Termination
4	Common Mode Termination	**8**	Common Mode Termination

A.3 Video Connector

The video connector (VGA) is an HD-15 connector that can be accessed from the back panel.

FIGURE A-3 Video Connector Diagram
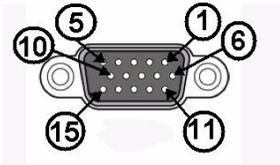
Figure Legend

1	Red Video		**9**	[KEY]
2	Green Video		**10**	Sync Ground
3	Blue Video		**11**	Monitor ID - Bit 1
4	Monitor ID - Bit 2		**12**	Monitor ID - Bit 0
5	Ground		**13**	Horizontal Sync
6	Red Ground		**14**	Vertical Sync
7	Green Ground		**15**	N/C (Reserved)
8	Blue Ground			

A.4   USB Connectors

Two Universal Serial Bus (USB) ports are located on the motherboard and can be accessed from the server back panel.

FIGURE A-4   USB Connector Diagram
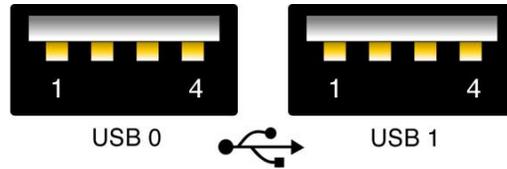
Figure Legend

USB 0-1	+5 V (fused)	USB 1-1	+5 V (fused)
USB 0-2	USB0/1-	USB 1-2	USB2/3-
USB 0-3	USB0/1+	USB 1-3	USB2/3+
USB 0-4	Ground	USB 1-4	Ground

A.5 Gigabit Ethernet Connectors

Four RJ-45 Gigabit Ethernet connectors (NET0, NET1, NET2, NET3) are located on the system motherboard and can be accessed from the back panel. The Ethernet interfaces operate at 10 Mbit/sec, 100 Mbit/sec, and 1000 Mbit/sec.

FIGURE A-5 Gigabit Ethernet Connector Diagram

Figure Legend

1	Transmit/Receive Data 0 +	**5**	Transmit/Receive Data 2 –
2	Transmit/Receive Data 0 –	**6**	Transmit/Receive Data 1 –
3	Transmit/Receive Data 1 +	**7**	Transmit/Receive Data 3 +
4	Transmit/Receive Data 2 +	**8**	Transmit/Receive Data 3 –

Configuring BIOS Settings

This appendix describes how to view and/or modify the Basic Input/Output System (BIOS) settings on the server. The BIOS Setup Utility reports system information and can be used to configure the server BIOS settings.

Note – The BIOS menus shown in this appendix are examples. The BIOS version numbers, menu information, and menu selections are subject to change over the life of the product.

BIOS has a Setup Utility stored in the BIOS flash memory. The configured data is provided with context-sensitive Help and is stored in the system's battery-backed CMOS RAM. If the configuration stored in the CMOS RAM is invalid, the BIOS settings default to the original state specified at the factory.

The following topics are covered:

- Section B.1, "BIOS Setup Screens Overview" on page B-2
- Section B.2, "BIOS Setup Utility Menu Screens" on page B-3

For information on accessing BIOS, see Section 2.5, "About the BIOS" on page 2-5.

B.1 BIOS Setup Screens Overview

TABLE B-1 contains summary descriptions of the top-level BIOS setup screens.

TABLE B-1   BIOS Setup Screens Summary

Screen	Description	See This Section
Main	General product information, including BIOS type, processor, memory, and time/date.	Section B.2.1, "BIOS Main Menu Screens" on page B-4
Advanced	Configuration information for the CPU, memory, IDE, Super IO, trusted computing, USB, PCI, MPS and other information.	Section B.2.2, "BIOS Advanced Menu Screens" on page B-5
PCI	Configure the server to clear NVRAM during system boot.	Section B.2.3, "BIOS PCI Menu Screen" on page B-6
Boot	Configure the boot device priority (storage drives and the DVD-ROM drive).	Section B.2.4, "BIOS Boot Menu Screens" on page B-7
Security	Set or change the user and supervisor passwords.	Section B.2.5, "BIOS Security Menu Screen" on page B-8
Chipset	View the configuration of server chipsets.	Section B.2.6, "BIOS Chipset Menu Screens" on page B-9
Exit	Save changes and exit, discard changes and exit, discard changes, or load optimal or fail-safe defaults.	Section B.2.7, "BIOS Exit Menu Screen" on page B-10

See Section B.2, "BIOS Setup Utility Menu Screens" on page B-3 for examples of each of these screens.

B.2 BIOS Setup Utility Menu Screens

This section shows samples of the BIOS Setup Utility screens. All screens reflect the optimal defaults at startup.

Note – The screens shown are examples. The version numbers and the screen content and selections shown are subject to change over the life of the product.

The following topics are covered:

B.2.1 BIOS Main Menu Screens

The BIOS Main screens provide general product information, including BIOS, processor, system memory, and system time/date. FIGURE B-1 shows the BIOS Main top-level screen.

FIGURE B-1   BIOS Setup Utility: Main – System Overview
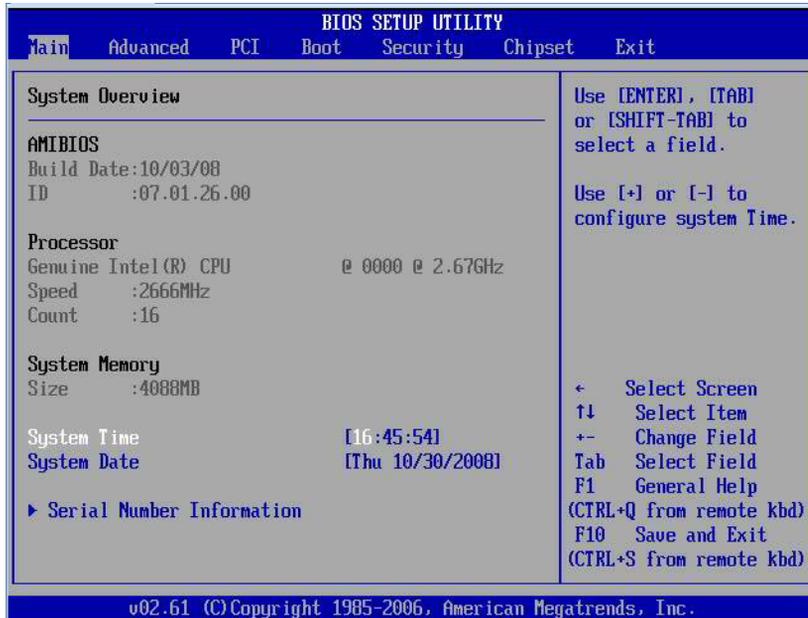
B.2.2 BIOS Advanced Menu Screens

The BIOS Advanced screens provide detailed configuration information for the CPU, memory, IDE, Super IO, trusted computing, USB, PCI, MPS and other system information. FIGURE B-2 shows the BIOS Advanced top-level screen.

FIGURE B-2 BIOS Setup Utility: Advanced – Advanced Settings
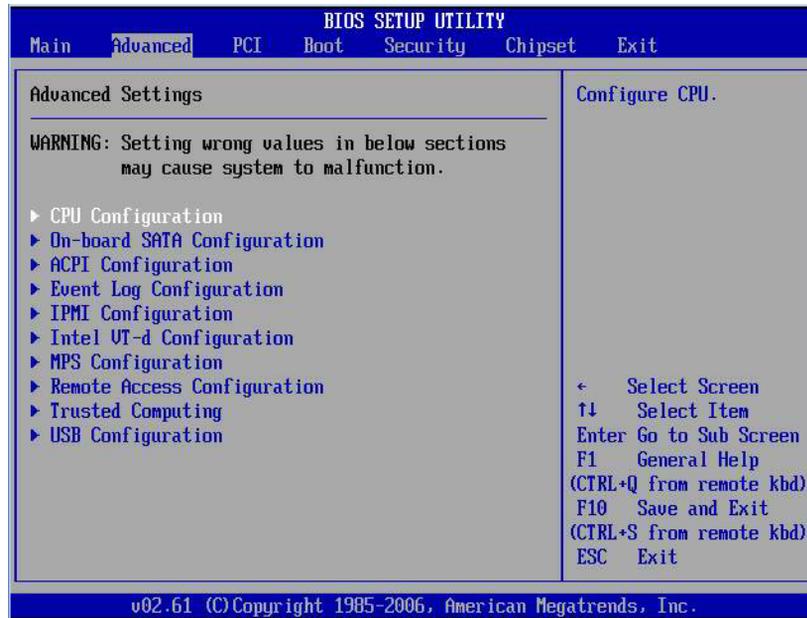
B.2.3 BIOS PCI Menu Screen

The BIOS PCI screen enables you to configure the server to clear NVRAM during system boot. FIGURE B-3 shows the BIOS PCI screen.

FIGURE B-3 BIOS Setup Utility: PCI – Advanced PCI Settings
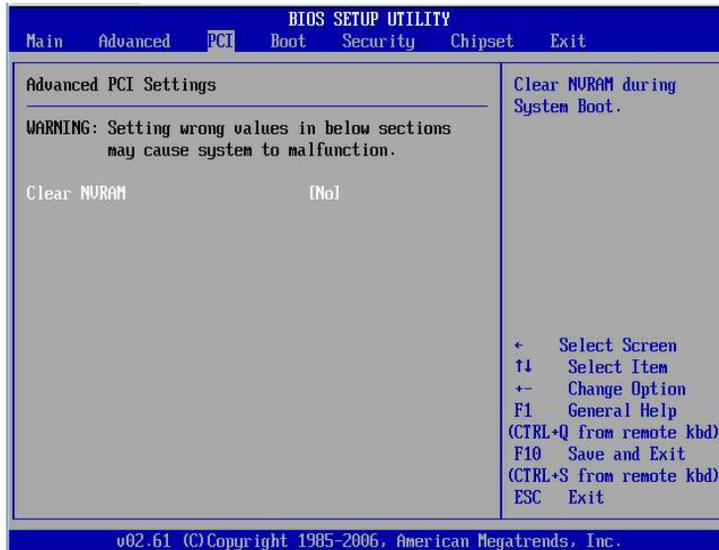
B.2.4 BIOS Boot Menu Screens

The BIOS Boot screens enable you to configure the boot device priority (storage drives and the DVD-ROM drive). FIGURE B-4 shows the BIOS Boot top-level screen.

FIGURE B-4 BIOS Setup Utility: Boot – Boot Settings

B.2.5 BIOS Security Menu Screen

The BIOS Security screen enables you to set or change the supervisor and user passwords. FIGURE B-5 shows the BIOS Security screen.

FIGURE B-5 BIOS Setup Utility: Security – Security Settings

```
                         BIOS SETUP UTILITY
   Main    Advanced    PCI    Boot    Security    Chipset    Exit

   Security Settings                              Install or Change the
                                                  password.
   Supervisor Password :Not Installed
   User Password       :Not Installed

   Change Supervisor Password
   Change User Password




                                                  ←     Select Screen
                                                  ↑↓    Select Item
                                                  Enter Change
                                                  F1    General Help
                                                  (CTRL+Q from remote kbd)
                                                  F10   Save and Exit
                                                  (CTRL+S from remote kbd)
                                                  ESC   Exit

          v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```

B.2.6 BIOS Chipset Menu Screens

The BIOS Chipset screens enable you to set the chipset parameters. FIGURE B-6 shows the BIOS Chipset top-level screen.

FIGURE B-6   BIOS Setup Utility: Chipset – Advanced Chipset Settings
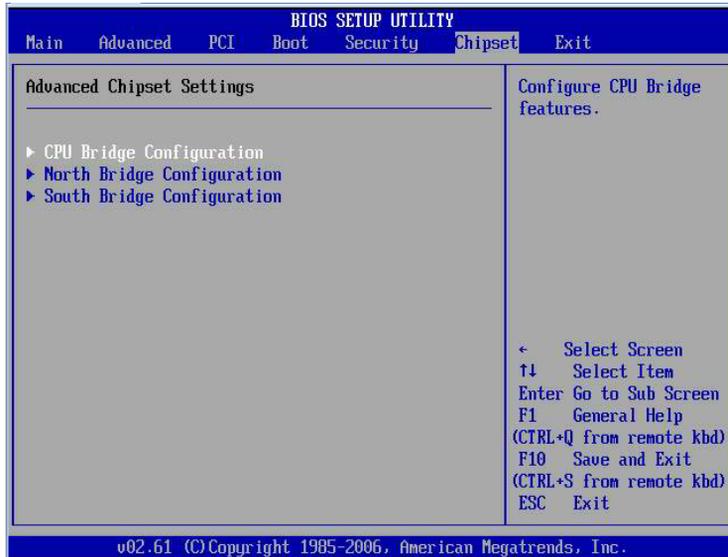
B.2.7 BIOS Exit Menu Screen

The BIOS Exit options enable you to save changes and exit, discard changes and exit, discard changes, or load optimal defaults. FIGURE B-7 shows the BIOS Exit screen.

FIGURE B-7 BIOS Setup Utility: Exit – Exit Options - Save Changes and Exit
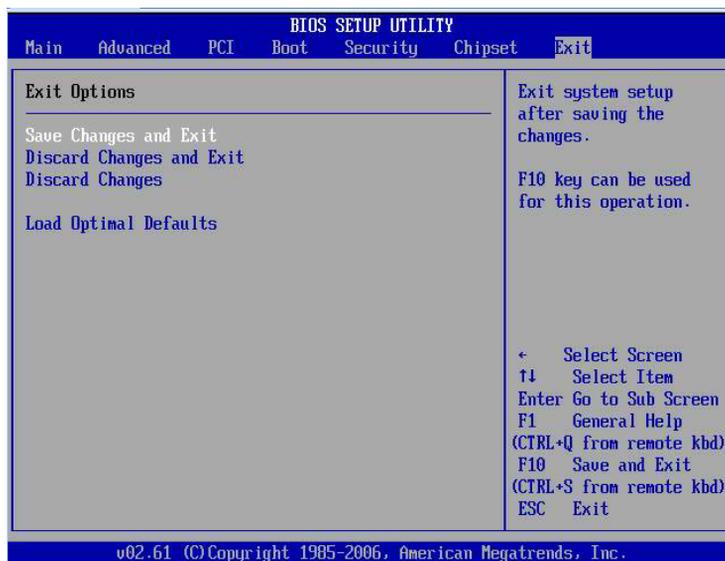
▼ Executing a BIOS Exit Option

1. **Use the up and down arrow keys to scroll up and down the BIOS Exit options.**

2. **Press Enter to select the option.**

   A confirmation dialog box appears that enables you to save the changes and exit the Setup Utility or cancel the exit option (FIGURE B-8).

Note – The confirmation dialog box is only shown below for the Save Changes and Exit option screen. The other exit confirmation screens work in a similar way.

FIGURE B-8   BIOS Setup Utility: Exit – Save Configuration Changes and Exit Confirmation

Index