

Sun Fire X4640 Server Service Manual



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Contents

Using This Documentation	5
Product Downloads	5
About This Documentation (PDF and HTML)	6
We Welcome Your Comments	6
Change History	6
Sun Fire X4640 Server Service Manual Overview	9
Controlling Power and Performing Hardware Reset	11
About Power Modes	11
Powering the Server On and Off	12
Controlling Server Power Remotely	13
Resetting the Server Using the Reset Switch (SW2)	16
Removing and Installing Components	19
Important Safety Information	20
Antistatic Procedures and Precautions	20
Tools Required for Servicing the Sun Fire X4640 Server	21
Preparing the Server for Service and Operation	22
Removal and Replacement Procedures	29
List of Customer Replaceable Units and Field Replaceable Units	30
Identifying Components	31
Replacing the CMOS Battery (CRU)	33
Replacing or Adding a Hard Drive (CRU)	35
Replacing a CPU Module and Filler Card (CRU)	39
Replacing or Adding DIMMs (CRU)	46
Replacing or Adding PCI Cards (CRU)	50
Replacing or Adding a Power Supply (CRU)	53
Replacing the Fan Tray (CRU)	57
Replacing the Service Processor Board (FRU)	61
Replacing the DVD Module (FRU)	65

Replacing the Power Distribution Board (FRU)	70
Replacing the Fan Tray Carriage (FRU)	78
Replacing the Front Panel Indicator Board (FRU)	84
Replacing the Front I/O Board (FRU)	88
Replacing a Hard Disk Backplane (FRU)	92
Replacing the Motherboard (FRU)	96
Updating Field-Replaceable Unit Information	107
How to Update the Server CPLDs	109
Configuring the System Using the BIOS Setup Utilities	111
BIOS and the BIOS Setup Utility	111
How to Configure the System BIOS	112
BIOS Setup Utility Screens	113
BIOS and Service Processor Updates	144
LSI BIOS Configuration Utility	145
Sun Fire X4640 Server References and Specifications	147
Sun Fire X4640 Server Features and Components	147
Sun Fire X4640 Server Front and Back Panel Features and Components	149
Sun Fire X4640 Server Specifications	151
Sun Fire X4640 Server Motherboard Jumpers and Switches	153
Sun Fire X4640 Server External LED Locations and Meanings	156
Locating the Sun Fire X4640 Server System Serial Number	158
Index	161

Using This Documentation

- “Product Downloads” on page 5
- “About This Documentation (PDF and HTML)” on page 6
- “We Welcome Your Comments” on page 6
- “Change History” on page 6

Product Downloads

You can find downloads for all Oracle x86 servers and server modules (blades) on My Oracle Support (MOS). On MOS you can find two types of downloads:

- Software release bundles specific to the rackmount server, server module, modular system (blade chassis), or NEM. These software release bundles include Oracle ILOM, Oracle Hardware Installation Assistant and other platform software and firmware.
- Standalone software common across multiple types of hardware. This includes the Hardware Management Pack and Hardware Management Connectors.

▼ Get Software and Firmware Downloads

- 1 Go to <http://support.oracle.com>.
- 2 Sign in to My Oracle Support.
- 3 At the top of the page, click the Patches and Updates tab.
- 4 In the Patch Search box, click Product or Family (Advanced Search).
- 5 In the Product field, type a full or partial product name, for example, Sun Fire X4640 until a list of matches is displayed and select the product of interest.
- 6 In the Release pull-down list, click the Down arrow.
- 7 In the window that appears, click the triangle (>) by the product folder icon to show the choices and then select the release of interest and click Close.

- 8 In the Patches Search box, click Search.**
A list of product downloads (listed as patches) appears.
- 9 Select the Patch name of interest, for example, 12980209, for the Sun Fire X4640 1.3.1 Firmware.**
- 10 In the right-side pane that appears, click Download.**

About This Documentation (PDF and HTML)

This documentation set is available in both PDF and HTML. The information is presented in topic-based format (similar to online help) and therefore does not include chapters, appendices or section numbering.

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Change History

The following changes have been made to the documentation set.

- October 2009, initial publication
- January 2010, two documents revised
 - Service Manual - Revised DIMM population rules and addressed illustration issues
 - Product Notes - Revised software information and fixed bugs
- April 2010, one document revised
 - Installation Guide - Revised power specifications
- December 2010, two documents revised
 - Service Manual - Revised motherboard FRUID update instructions
 - Product Notes - Revised software information and fixed bugs
- January 2012, two documents revised
 - Service Manual — Added CPLD reset procedure.
 - Product Notes — Revised software information
- September 2012, one document revised
 - Product Notes — Revised software information
- March 2013, one document revised

- Service Manual — Revised information on replacing a motherboard or SP.

Sun Fire X4640 Server Service Manual Overview

This document contains information and procedures for maintaining and servicing Oracle's Sun Fire X4640 server. The table below describes how this content is organized.

Description	Link
Procedures for powering the server on and off, powering the server remotely, and resetting the server	“Controlling Power and Performing Hardware Reset” on page 11
Procedures for the removal and installation of replaceable components	“Removing and Installing Components” on page 19
Information about and procedures for the system BIOS and LSI BIOS setup utilities	“Configuring the System Using the BIOS Setup Utilities” on page 111
Feature and specification information for the Sun Fire X4640 server	“Sun Fire X4640 Server References and Specifications” on page 147

Controlling Power and Performing Hardware Reset

This section contains information and procedures related to powering the server on and off and resetting the server.

Description	Link
A description of the available power modes	“About Power Modes” on page 11
How to power the server on and off	“Powering the Server On and Off” on page 12
How to control server power remotely	“Controlling Server Power Remotely” on page 13
How to reset the server	“Resetting the Server Using the Reset Switch (SW2)” on page 16

About Power Modes

The Sun Fire X4640 server has two power modes, full-power mode and standby-power mode. In full-power mode, power is supplied to all the server components (for example, hard drives, fans, and PCI cards). Full-power mode is the normal operational mode for the server. When the server is in full-power mode, the server boots and the operating system (OS) functions. Full-power mode is achieved by pressing the power-on button on the front of the server when the server is in standby power mode.

Standby-power mode is the non-operating mode. That is, the server is in a low-power or powered-down state and is not capable of booting and starting the OS. In standby power mode, minimum power is supplied only to the components that are required for lights-out management (LOM). Standby power is achieved by connecting the server to an AC supply using the AC power cords. In standby-power mode, power is supplied to the service processor (SP) which allows the SP to boot. To sustain standby power mode, you must *not* press the front panel power button. You can also achieve standby power mode by powering off the server (from an operational mode) using one of the power off methods.

- For powering procedures, see [“Powering the Server On and Off” on page 12](#).
- You can use the front and back panel LEDs to determine the power mode of the server. See [“Front Panel LEDs” on page 156](#).

Powering the Server On and Off

- [“How to Power On the Server” on page 12](#)
- [“How to Power Off the Server” on page 12](#)

▼ How to Power On the Server

- 1 **Verify that the server’s power supplies are connected to an AC power source and that the server is in standby power mode.**

In standby power mode, the Power/OK LED on the front panel blinks, indicating that the service processor is working and the system is ready to be fully powered on to full-power mode.

- 2 **Use a stylus or other nonconducting pointed object to press and release the recessed power button on the server front panel.**

The server performs power-on system tests (POST) and boots to the OS.

- See Also**
- [“About Power Modes” on page 11](#)
 - [“Sun Fire X4640 Server External LED Locations and Meanings” on page 156](#)

▼ How to Power Off the Server

Before You Begin Complete the following steps *before* removing the main cover:

- 1 **To gracefully power off the server from main power mode to standby power mode, use the operating system-specific shutdown procedure for the OS running on your server.**
All operating systems have a shutdown procedure. This shutdown procedure provides a graceful shutdown of the OS, and it should be your first choice for powering off the server.
- 2 **To gracefully power off the server from main power mode to standby power mode using the Power switch, use a stylus or other nonconducting pointed object to quickly press and release the Power button on the front panel.**



Caution – Potential data loss. Pressing and releasing 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 perform an emergency shut down to standby power mode.

When the main power is off and the server is in standby power mode, the Power/OK LED on the front panel blinks, indicating that standby power is still available.



Caution – In standby power mode, power is still directed to some components. To completely power off the server, you must disconnect the AC power cords from the back panel of the server.

- 3 **To perform an emergency shutdown of the server power, press and hold the Power button for four seconds to force main power off and enter standby power mode.**



Caution – Potential Data Loss. Pressing and holding the Power button for four seconds performs an immediate shutdown of the server. The system does not prompt for confirmation, nor are you allowed to save and exit open applications.

- See Also**
- “Sun Fire X4640 Server Front Panel Features and Components” on page 149
 - “Front Panel LEDs” on page 156
 - “About Power Modes” on page 11
 - “Controlling Server Power Remotely” on page 13

Controlling Server Power Remotely

- “How to Use the ILOM Command-Line Interface (CLI) to Control Power” on page 13
- “How to Use the ILOM Web Interface to Control Power” on page 14
- “How to Use IPMITool to Control Power” on page 15

▼ How to Use the ILOM Command-Line Interface (CLI) to Control Power

You can use the ILOM CLI to change the power state of the server. For example, you can perform the following power-related actions:

- Power on the server
- Shut down the OS gracefully and power off to standby power mode
- Perform an immediate power off to standby power mode (emergency shutdown) *without* shutting down the OS gracefully
- Reboot the server by cycling the power

Note – For information about the ILOM CLI, see the *Sun Integrated Lights Out Manager (ILOM) 3.0 CLI Procedures Guide*.

1 Connect to the ILOM CLI.

Use one of the methods described in the following sections:

- “How to Connect to the ILOM Command-Line Interface Through the Serial Management Port” in *Sun ILOM 3.0 Supplement for the Sun Fire X4640 Server*

- “How to Connect to the Command-Line Interface Using SSH” in *Sun ILOM 3.0 Supplement for the Sun Fire X4640 Server*

2 Log in to the ILOM CLI using a user login with administrator privileges.

When you are logged in, the CLI prompt appears.

->

3 To change the power state, enter one of the following commands.

- To power on the server:
-> **start /SYS**
- To gracefully shut down the OS and power off the server to standby power mode:
-> **stop /SYS**
- To perform an immediate power off from full-power mode to standby power mode:
-> **stop -f /SYS**
- To reset the server (cycle power on and off):
-> **reset /SYS**

4 To log out of the CLI, enter the command:

-> **exit**

▼ **How to Use the ILOM Web Interface to Control Power**

You can use the ILOM web interface to remotely change the power state of the server. For example, you can perform the following power-related actions:

- Power on the server.
- Shut down the OS gracefully and power off to standby power mode.
- Perform an immediate power off to standby power mode *without* shutting down the OS gracefully.
- Reboot the server by cycling the power.

Note – For information about the ILOM web interface, see *Sun Integrated Lights Out Manager (ILOM) 3.0 Web Interface Procedures Guide*.

1 Connect to the ILOM web interface.

To connect to the ILOM web interface, see “How to Connect to the ILOM Web Interface” in *Sun ILOM 3.0 Supplement for the Sun Fire X4640 Server*

2 Log in to the ILOM using the web interface and a user login with administrator privileges.

When you are logged in the ILOM web interface main screen appears.

3 From the ILOM main screen, click the Remote Power Control tab.

The Server Power control screen appears. From the Server Power Control screen, you can remotely control the power state of a host server by selecting one of the power-related actions from the Action menu.

4 Select one of the power-related actions and click OK.**5 To log out of the web interface, click Logout.****▼ How to Use IPMItool to Control Power**

Note – IPMItool is OS-based. You might need to install it from the Tools & Drivers CD if the OS does not provide it.

You can use IPMItool to control the power remotely. For example, you can perform the following power-related actions:

- Power on the server.
- Shut down the OS gracefully and power off to standby power mode.
- Perform an immediate power off to standby power mode *without* shutting down the OS gracefully.
- Reboot the server by cycling the power

Note – You can also use IPMItool to run ILOM CLI commands. For more information, see *Sun Integrated Lights Out Manager (ILOM) 3.0 SNMP and IPMI Procedures Guide*.

1 Log in to a host that has an SNMP tool and the ILOM MIBs installed.

For example, enter:

```
ssh username@snmp_manager_ipaddress
```

where *username* is the name of a user with administrator privileges and *snmp_manager_ipaddress* is the IP address of the SNMP Manager.

For more information about IPMItool, see *Sun Integrated Lights Out Manager (ILOM) 3.0 SNMP and IPMI Procedures Guide*.

When you are logged in a prompt appears. For example:

```
$
```

2 To execute a power action, enter one the following commands at the prompt:

- To power on the server:

```
% ipmitool -H 1.2.3.4 -v -I lanplus -U username -P userpassword chassis power on
```

where *username* and *userpassword* are the user name and password of a user on the remote server with administrator privileges.

- To gracefully shut down the OS and power off the server to standby power mode:

```
% ipmitool -H 1.2.3.4 -v -I lanplus -U username -P userpassword chassis power soft
```

where *username* and *userpassword* are the user name and password of a user on the remote server with administrator privileges.

- To perform an immediate power off from full-power mode to standby power mode (not graceful):

```
% ipmitool -H 1.2.3.4 -v -I lanplus -U username -P userpassword chassis power off
```

where *username* and *userpassword* are the user name and password of a user on the remote server with administrator privileges.

- To reset the server (cycle power on and off):

```
% ipmitool -H 1.2.3.4 -v -I lanplus -U username -P userpassword chassis power cycle
```

where *username* and *userpassword* are the user name and password of a user on the remote server with administrator privileges.

Resetting the Server Using the Reset Switch (SW2)

Pressing the Reset switch (SW2 on the motherboard) sends an immediate hard reset command to the CPU modules, resetting the main system (not the service processor) and rebooting the server.



Caution – Potential Data Loss. Pressing the Reset switch performs an immediate reboot of the server. The system does not prompt for confirmation, nor are you allowed to save and exit open applications.

▼ How to Reset the Server Using the Reset Switch (SW2)

The reset switch (SW2) is located on the rear exterior panel of the server.

Before You Begin You need a stylus or some other thin pointed nonconducting object to press the Reset switch.



Caution – Data loss can occur if the system is in an operational or functioning state and the reset button is pressed. The Reset switch performs an immediate reset of the server and does not provide a graceful shutdown of the OS.

- 1 **Access the rear panel of the server and locate the Reset switch (SW2)** (see [“Sun Fire X4640 Server Back Panel Features and Components” on page 150](#)).
- 2 **To reset the server, use a stylus or nonconducting thin pointed object to press the recessed reset switch.**

The system immediately resets and reboots.

- See Also**
- [“Sun Fire X4640 Server Back Panel Features and Components” on page 150](#)
 - [“Powering the Server On and Off” on page 12](#)

Removing and Installing Components

This section contains removal and installation procedures for all customer-replaceable units and field-replaceable units. Additionally, this section contains the important safety and reference information that you need to know to service and maintain the Sun Fire X4640 server.

Description	Link
Important safety information that you need to know before servicing the server	“Important Safety Information” on page 20
Important antistatic information, procedures, and precautions that you need to know before servicing the server	“Antistatic Procedures and Precautions” on page 20
A list of tools required for servicing the server	“Tools Required for Servicing the Sun Fire X4640 Server” on page 21
Procedures for getting the server ready for service and operation	“Preparing the Server for Service and Operation” on page 22
Procedures for the removal and replacement of system components	“Removal and Replacement Procedures” on page 29
A list of customer-replaceable units and field-replaceable units	“List of Customer Replaceable Units and Field Replaceable Units” on page 30
Information about the location of replaceable components within the server	“Identifying Components” on page 31
Procedures for updating server FRU information for components that are tracked by the system	“Updating Field-Replaceable Unit Information” on page 107
Procedure for updating the server CPLDs.	“How to Update the Server CPLDs” on page 109

Important Safety Information

This section describes important safety information that you need to know prior to removing or installing parts in your Sun Fire server.



Caution – Hazardous voltage present. Never attempt to run the server with the covers removed. You *must* disconnect the power supply before servicing any of the components documented in this chapter.



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

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

- Follow all Sun cautions, warnings, and instructions marked on the equipment and described in *Important Safety Information for Sun Hardware Systems* (816-7190).
- Follow all cautions, warnings, and instructions marked on the equipment and described in the *Sun Fire X4640 Server 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 document.

Antistatic Procedures and Precautions

Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other components. Electrostatic discharge (ESD) sensitive devices, such as the motherboards, PCI cards, hard drives, and memory modules, require special handling. Always observe the following precautions before you install a system component



Caution – Component damage. Circuit boards and hard 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 devices. Do not touch the components without antistatic precautions, especially along the connector edges.

- Do not remove a component from its protective packaging until you are ready to install it.
- Wear a wrist strap and attach it to the system chassis ground or to any metal part of the system before handling components or working in the interior compartment of the workstation.
- Use an antistatic mat.

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

▼ How to Use an Antistatic Mat

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

Place static-sensitive components such as the printed circuit boards, memory modules, and CPUs on the antistatic mat. The following items can be used as an antistatic mat:

- Antistatic bag used to wrap a Sun replacement part
- Sun antistatic mat, part number 250-1088
- A disposable antistatic 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 bare metal area on the chassis.

- See Also**
- [“Important Safety Information” on page 20](#)
 - [“Antistatic Procedures and Precautions” on page 20](#)

Tools Required for Servicing the Sun Fire X4640 Server

The Sun Fire X4640 server can be serviced with the following items:

Note – Some procedures require special tools that are not listed here. These special tools are called out in the procedure. Review the procedure before you begin.

- Manual torque driver settable to 7 inch-lbs (0.8 newton-meters) with No. 1 Phillips, No. 2 Phillips, and 7-mm hex bits
- No. 1 Phillips screw driver
- No. 2 Phillips screw driver
- Antistatic wrist strap
- Stylus or other pointed object (used to press the recessed power button)

Preparing the Server for Service and Operation

Procedure	Link
Preparing the server for service	“How to Prepare the Server for Service” on page 22
Removing the server from the rack	“Removing the Server From the Rack” on page 23
Removing the front bezel	“How to Remove the Front Bezel” on page 26
Preparing the server for operation	“How to Prepare the Server for Operation” on page 27
Inserting the server in the rack	“Removing the Server From the Rack” on page 23
Installing the cover	“How to Install the Cover” on page 28
Installing the front bezel	“How to Install the Front Bezel” on page 28

▼ How to Prepare the Server for Service

- 1 Before you begin, review the latest version of the [Sun Fire X4640 Server Product Notes](#) for known issues and late-breaking information about the server and its components.
- 2 Power off the server. See [“How to Power Off the Server” on page 12](#).
- 3 Unplug all AC power cords from the server’s power supplies.
- 4 Turn off all peripheral devices connected to the system.
- 5 Label any peripheral cables and telecommunication lines that must be disconnected in order to remove or service the server.
- 6 Observe antistatic procedures and precautions (see [“Antistatic Procedures and Precautions” on page 20](#)).
- 7 Review the list of required tools. See [“Tools Required for Servicing the Sun Fire X4640 Server” on page 21](#).
- 8 Remove the server from the rack and set it on a flat surface with ample light and space. See [“Removing the Server From the Rack” on page 23](#).

Note – For some procedures, you might be able to service the server without removing it from the rack.

- 9 **To remove the cover, loosen the two captive screws that secure the cover at the rear of the chassis.**



Caution – Electric shock and component damage potential. The intrusion switch (SW1 on the motherboard) prevents power from being applied to the server when the cover is removed. Do *not* defeat the purpose of the switch.

- 10 **Using the indent on the cover for leverage, push the cover toward the rear of the chassis approximately 0.5 inches (12 mm).**
- 11 **Lift the cover straight up by its edges and remove it.**
- 12 **Remove dust from the interior of the server and air vents by brushing it free of components and air vents using a static-free brush and vacuuming it with a vacuum cleaner.**



Caution – Do not use liquid or spray cleaners to clean the interior of the server.

See Also [“Sun Fire X4640 Server Back Panel Features and Components” on page 150](#)

Removing the Server From the Rack

This procedure assumes that you have turned off the server, removed the cable management arm, and removed any cables or cords that would restrict the movement of the server.

See the 4U Express Rail Rackmounting Kit card for illustrations that you should refer to during this procedure. This card is shipped with the slide rail and the cable management arm.

- [“How to Remove the Server From the Rack” on page 23](#)

▼ How to Remove the Server From the Rack

Before You Begin

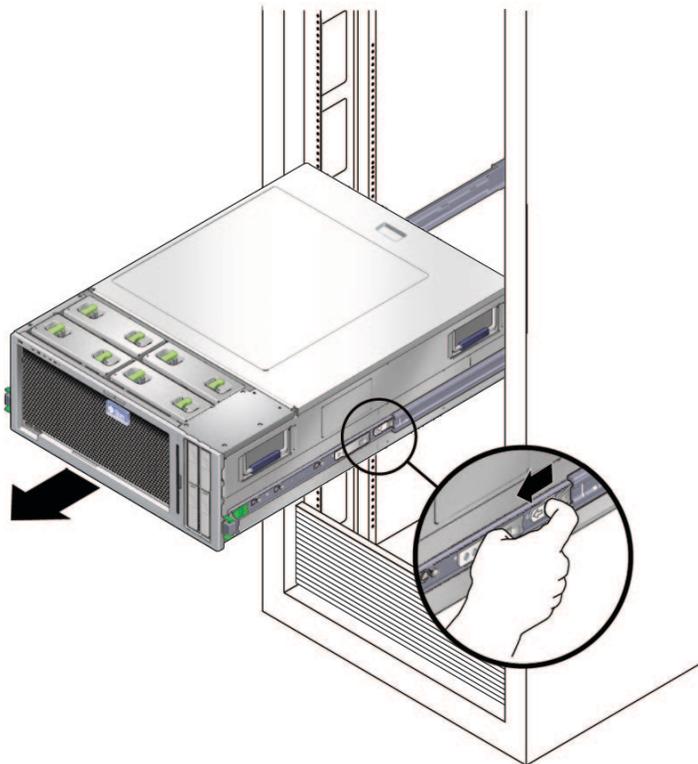


Caution – Tip hazard. If available, extend the anti-tilt legs on the rack *before* you extend the server.



Caution – The Sun Fire X4640 server weighs about 85 pounds (40 kg) when fully loaded with components. To reduce the risk of serious personal injury or equipment damage, use a mechanical lift to remove the sever from the rack.

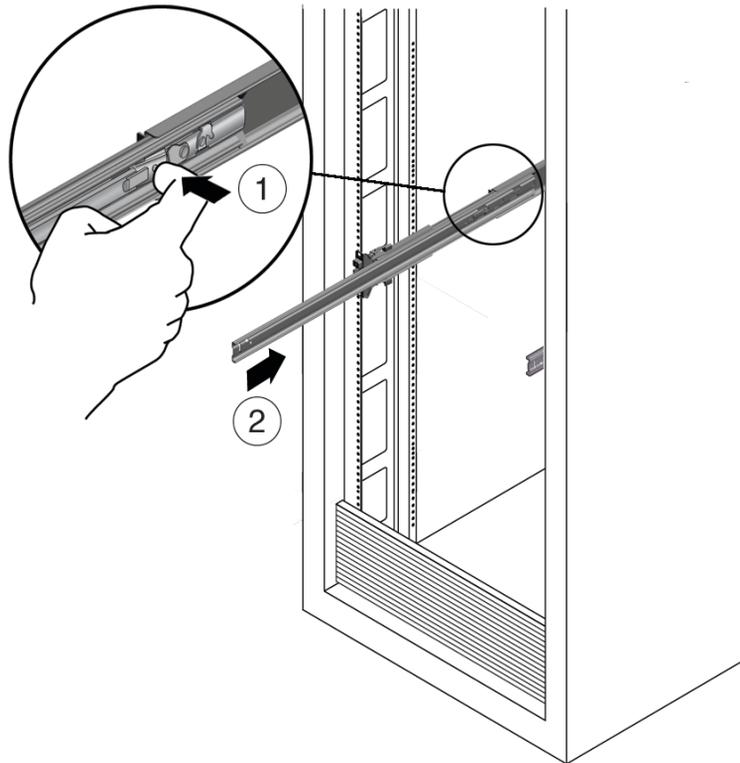
- 1 From the front of the rack, squeeze the slide-rail locks (with green plastic handles) to release the lock and *completely* extend the server from the rack.
- 2 If a lift is not available, remove components to reduce the system’s weight. See [“How to Remove Components to Reduce Weight”](#) in *Sun Fire X4640 Server Installation Guide*.
- 3 Using two hands, slide the gray plastic tabs on the mounting brackets attached to the server *toward* yourself to release the server from the slide rail.



Caution – At this point, the server is now free from the rail, and you need to support the weight of the server by holding the handles.

Note – If you do not have the server completely extended from the rack, you cannot access the gray tabs.

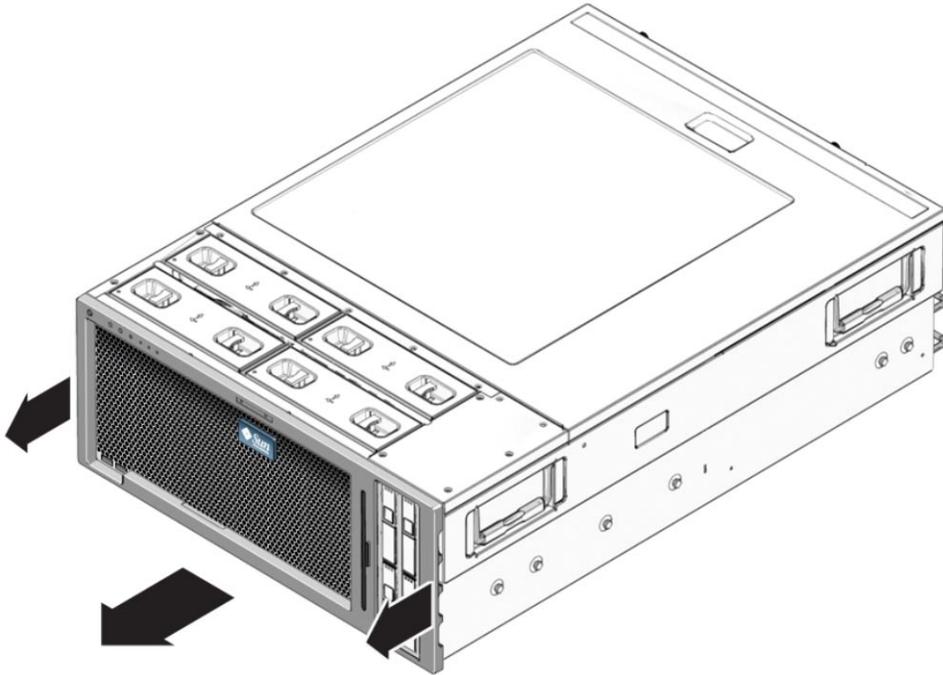
- 4 (Two trained staff) Carefully remove the server from the rack.
- 5 To return the middle section of the slide rail back into the rack:
 - a. Push the gray *metal* tab on the middle section of one slide rail and then slide the rail middle section back into the rack.



- b. Repeat for the other slide rail.
- 6 Remove the slide rails from the rack by doing the following.
 - a. To release the front assembly, push the upper and lower gray plastic tabs on the slide rail attachment assembly toward the rack post.

- 2 Pull the bezel away from the chassis, being careful to evenly release all seven pegs on the bezel from the chassis.

Note – Avoid bending the bezel by gradually pulling it from the middle and both ends simultaneously.



- See Also**
- [“How to Prepare the Server for Service” on page 22](#)
 - [“How to Install the Front Bezel” on page 28](#)

▼ How to Prepare the Server for Operation

Use this procedure to prepare the server for operation.



Caution – Possible component damage. The use of liquids or spray cleaners within the interior of the server can cause component damage. Do not use liquids or spray cleaners to clean the interior of the server.

- 1 Check to ensure that all parts are correctly and securely installed.
- 2 Ensure that all cables are connected and secure within cable tie-downs.
- 3 Remove all tools from the interior of the server.
- 4 Remove dust from the interior of the server and air vents by using a static-free brush and a vacuum or canned compressed air.
Do *not* use liquid or spray cleaners to clean the interior of the server.
- 5 Install the top cover. See [“How to Install the Cover” on page 28](#).
- 6 Install the front bezel. See [“How to Install the Front Bezel” on page 28](#).
- 7 Slide the server into the rack.
- 8 Connect all cables to the server back panel.
- 9 Attach the AC power cords to the server power supplies.
- 10 If you replaced a component, you might need to update the component's FRU information. See [“Updating Field-Replaceable Unit Information” on page 107](#).

▼ How to Install the Cover

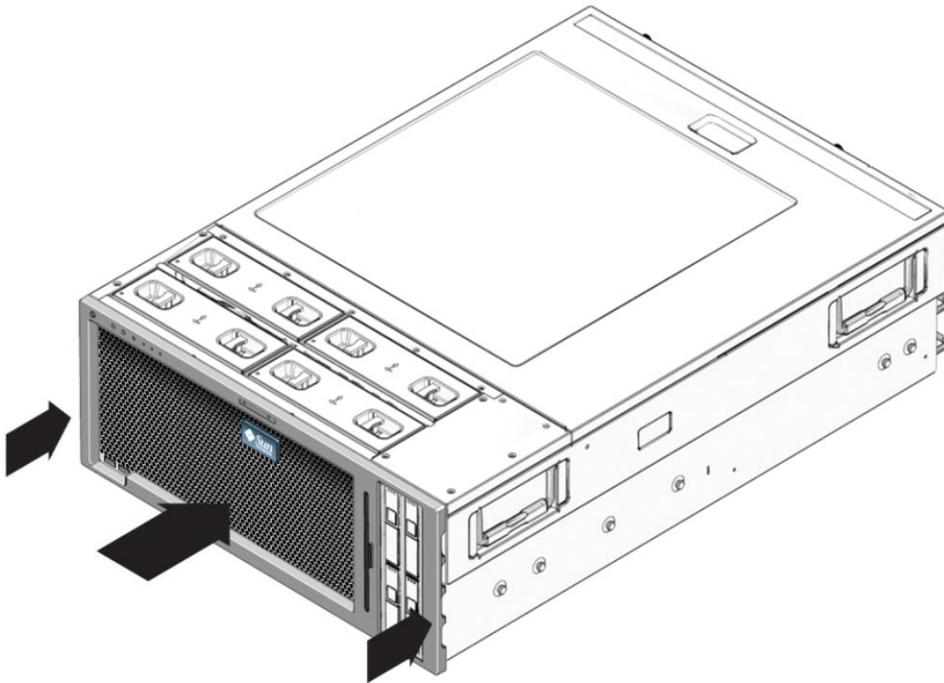
- 1 Set the cover on the chassis so that the tabs on the cover align with the notches in the chassis.
- 2 Slide the cover toward the front of the server about 0.5 inches (12 mm.), ensuring that the front lip on the cover slides into the groove on the chassis.
- 3 Tighten the two captive screws on the back of the cover.

- See Also**
- [“How to Install the Front Bezel” on page 28](#)
 - [“How to Prepare the Server for Operation” on page 27](#)

▼ How to Install the Front Bezel

- 1 Align the seven pegs on the bezel with the corresponding holes in the chassis front.

- 2 Press in on the edges and center of the bezel until the pegs are firmly engaged with the holes in the chassis front and no space is left between the bezel and the chassis.



See Also “How to Prepare the Server for Operation” on page 27

Removal and Replacement Procedures

Use these procedures to remove, install, and replace components.

- “List of Customer Replaceable Units and Field Replaceable Units” on page 30
- “Identifying Components” on page 31
- “Replacing the CMOS Battery (CRU)” on page 33
- “Replacing or Adding a Hard Drive (CRU)” on page 35
- “Replacing a CPU Module and Filler Card (CRU)” on page 39
- “Replacing or Adding DIMMs (CRU)” on page 46
- “Replacing or Adding PCI Cards (CRU)” on page 50
- “Replacing or Adding a Power Supply (CRU)” on page 53
- “Replacing the DVD Module (FRU)” on page 65
- “Replacing the Fan Tray (CRU)” on page 57
- “Replacing the Service Processor Board (FRU)” on page 61
- “Replacing the Power Distribution Board (FRU)” on page 70
- “Replacing the Fan Tray Carriage (FRU)” on page 78

- “Replacing the Front Panel Indicator Board (FRU)” on page 84
- “Replacing the Front I/O Board (FRU)” on page 88
- “Replacing a Hard Disk Backplane (FRU)” on page 92
- “Replacing the Motherboard (FRU)” on page 96
- “Updating Field-Replaceable Unit Information” on page 107

List of Customer Replaceable Units and Field Replaceable Units

The replaceable components in your Sun Fire X4640 server are designated as either field-replaceable units (FRU) or customer-replaceable units (CRU). A part designated as a FRU must be replaced by a Sun-qualified service technician. A part designated as a CRU can be replaced by a person who is not a Sun-qualified service technician.

CRU Components	Replacement Procedures
System CMOS battery	“Replacing the CMOS Battery (CRU)” on page 33
Hard drive	“Replacing or Adding a Hard Drive (CRU)” on page 35
CPU module or filler card	“Replacing a CPU Module and Filler Card (CRU)” on page 39
DIMM	“Replacing or Adding DIMMs (CRU)” on page 46
PCI card	“Replacing or Adding PCI Cards (CRU)” on page 50
Power supply	“Replacing or Adding a Power Supply (CRU)” on page 53
Fan tray	“Replacing the Fan Tray (CRU)” on page 57

FRU Components	Replacement Procedures
Service processor board	“Replacing the Service Processor Board (FRU)” on page 61
DVD module	“Replacing the DVD Module (FRU)” on page 65
Power distribution board	“Replacing the Power Distribution Board (FRU)” on page 70
Fan tray carriage	“Replacing the Fan Tray Carriage (FRU)” on page 78
Front panel indicator board	“Replacing the Front Panel Indicator Board (FRU)” on page 84

FRU Components	Replacement Procedures
Front I/O board	“Replacing the Front I/O Board (FRU)” on page 88
Hard disk backplane	“Replacing a Hard Disk Backplane (FRU)” on page 92
Motherboard	“Replacing the Motherboard (FRU)” on page 96

Identifying Components

The following illustration shows the locations of the components referenced in this chapter.

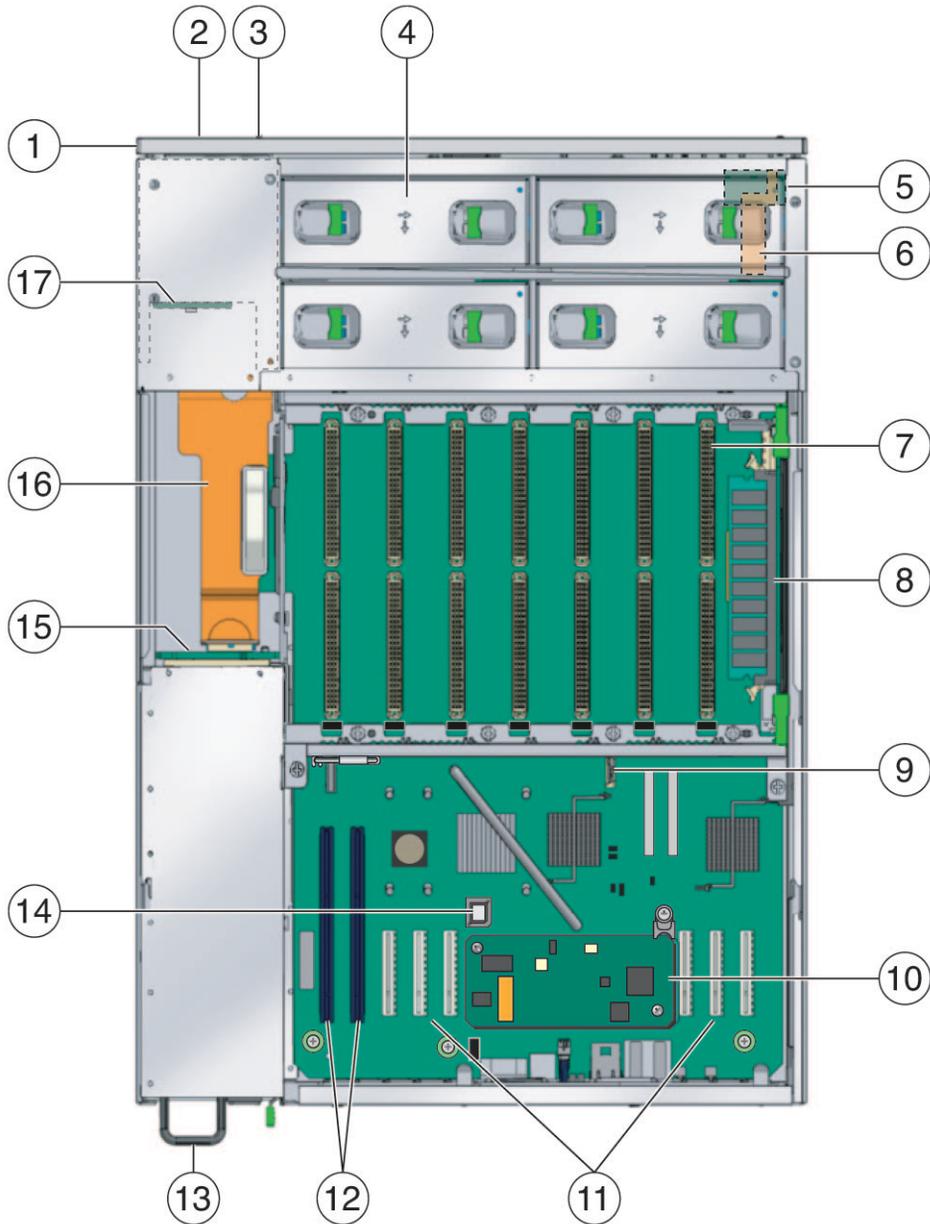


Figure Legend¹

- | | |
|---------------|------------------|
| 1 Front bezel | 9 System battery |
|---------------|------------------|

¹ For a list of FRU and CRU components, see “List of Customer Replaceable Units and Field Replaceable Units” on page 30.

Figure Legend¹

2	Hard drives	10	Service processor board
3	DVD module	11	PCIe slots (6)
4	Fan trays (4)	12	PCI-X slots (2)
5	Front I/O board	13	Power supplies (4)
6	Front flex cable	14	Boot PROM
7	CPU modules slots (8)	15	Power distribution board
8	CPU modules (up to 8)	16	Main flex cable
		17	HD backplane

¹ For a list of FRU and CRU components, see [“List of Customer Replaceable Units and Field Replaceable Units” on page 30.](#)

Replacing the CMOS Battery (CRU)

Use this procedure to replace the system battery when it has failed, or you can use this procedure to reset the battery-backed CMOS-based BIOS settings to the default values. (For more information about resetting the CMOS, see [“Clearing the Sun Fire X4640 Server CMOS Settings” on page 154.](#))



Caution – Replacing the system battery erases all custom BIOS settings and loads the factory default values.

▼ How to Replace the Battery

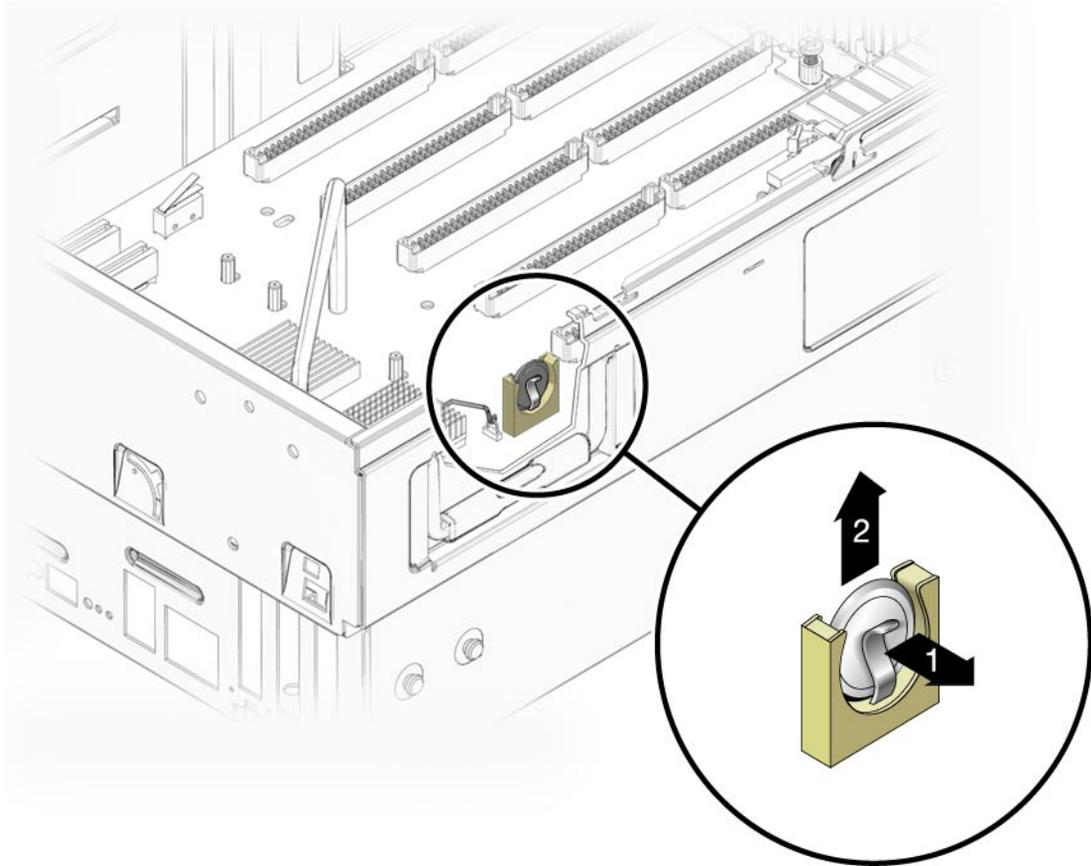
If you are clearing the battery-backed CMOS-based BIOS settings, remove the battery for approximately 30 seconds and then install the battery.

Before You Begin

- Battery type: CR2032

- 1 Prepare the server for service. See [“How to Prepare the Server for Service” on page 22.](#)

- 2 Remove the battery by gently pulling the spring-clip away from the battery face and lifting the battery straight up.



- 3 To install the new battery, align the battery with the holder on the motherboard so that the positive (+) side of the battery is facing toward the center of the chassis.
- 4 Press the battery down fully into the holder until the spring clip snaps around the battery.
- 5 Prepare the server for operation. See [“How to Prepare the Server for Operation”](#) on page 27.

Next Steps Access the system BIOS to customize the server settings. See [“Configuring the System Using the BIOS Setup Utilities”](#) on page 111.

Replacing or Adding a Hard Drive (CRU)

Note – If your server has fewer than four hard drives, the empty drive bays *must* have hard drive fillers installed to ensure proper air flow and server cooling.

Hard drives for the Sun Fire X4640 server are hot-swappable. You can replace hard drives without powering off the server. A single hard drive failure will not cause a data loss if the hard drives are configured as a mirrored RAID 1 volume. The failed hard drive can be hot-swapped, and when a new hard drive is inserted, the contents are automatically rebuilt from the rest of the array with no need to reconfigure the RAID parameters. If the hard drive was configured as a hot-spare, the new hard drive is automatically configured as a new hot-spare to mirror the data from the good hard drive.

However, if you insert a hard drive that was configured with a RAID volume into a server that did not previously have its hard drives configured with RAID volumes, the existing hard drives in the server are converted to RAID volumes during automatic synchronization and data on the existing hard drives are lost. To avoid this problem, use the LSI Configuration Utility to delete the RAID volume from the hard drive *before* removing it.

For information about the implementation and configuration of RAID on this server, see “[LSI BIOS Configuration Utility](#)” on page 145.

- “[How to Remove a Hard Drive](#)” on page 35
- “[Hard Drive Designation](#)” on page 37
- “[How to Install a Hard Drive](#)” on page 38

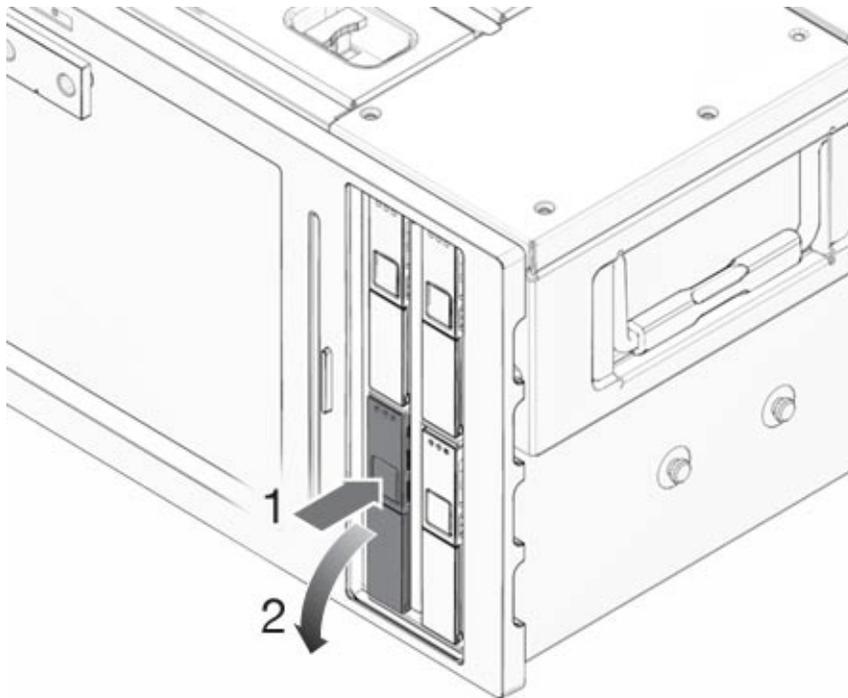
▼ How to Remove a Hard Drive

- Before You Begin**
- Label the hard drives before removing them. If you plan to install the hard drives into the same server, you must return each drive to the slot from which it was removed (its original slot).
 - If you are removing a hard drive configured as a RAID volume and you plan to use the drive again in a non-RAID volume configuration, you must use the HBA's BIOS utility to delete the volume *before* you remove the drive from the server. See “[Replacing or Adding a Hard Drive \(CRU\)](#)” on page 35.

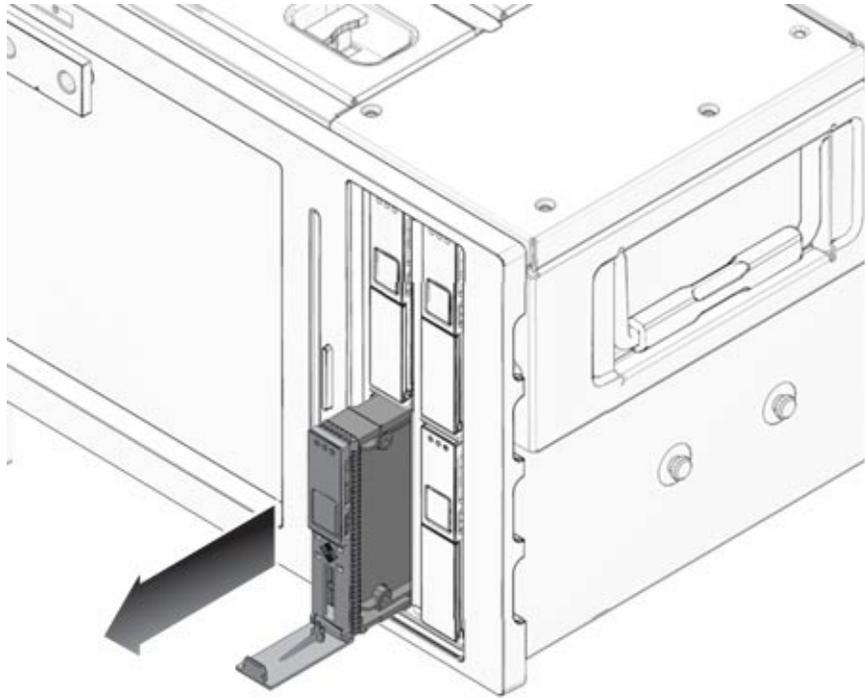


Caution – Potential for data loss. If you install a hard drive that was previously configured with a RAID volume into a server that does not have its hard drives configured as RAID volumes, the existing hard drives in the server are converted to RAID volumes during automatic synchronization. Any data on the existing hard drives in the server is lost. To avoid this problem, use the HBA BIOS utility to delete the RAID volume from the hard drive *before* removing the hard drive from the server.

- 1 If necessary, power off the server. See [“How to Power Off the Server”](#) on page 12.
- 2 If you are replacing a failed hard drive, use the hard drive LEDs to identify the faulty drive. See [“Sun Fire X4640 Server External LED Locations and Meanings”](#) on page 156.
- 3 If you are removing a hard drive that has a RAID volume and you plan to use the drive in a non-RAID volume configuration, use the HBA's BIOS utility to delete the volume before you remove the drive.
- 4 To open the hard drive latch, press the spring-loaded latch release button on the front of the hard drive.



- 5 To remove the hard drive, use the latch to pull the drive out of the slot.



- See Also**
- “Hard Drive Designation” on page 37
 - “How to Install a Hard Drive” on page 38

Hard Drive Designation

The system designations for the server hard drives are as shown here.



▼ How to Install a Hard Drive

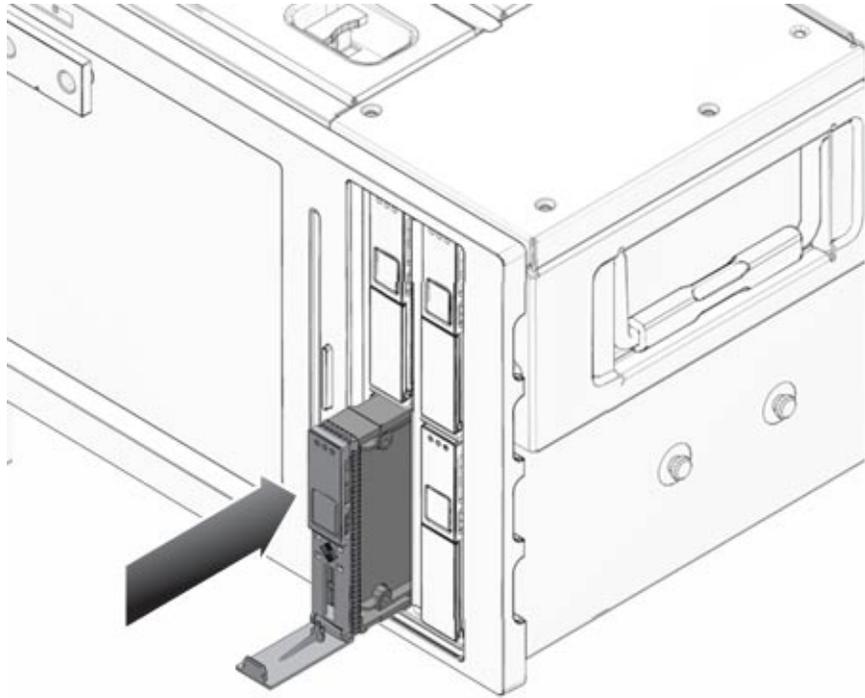
The hard drives for the Sun Fire X4640 server are hot-swappable. You do not need to power off the server to install the drive. If you are installing the original drives (for example, as part of a procedure that requires the removal of the hard drives), you must install the drives in the slot from which they were removed. If the drive is new to the system, it should not contain a RAID volume. Installing a hard drive configured as a RAID volume can change the configuration of the server and result in loss of data. For more information, see [“Replacing or Adding a Hard Drive \(CRU\)”](#) on page 35.



Caution – Possible Data Loss. If you insert a hard drive that has been configured with a RAID volume into a server that did not previously have its hard drives configured with RAID volumes, the existing hard drives in the server are converted to RAID volumes during automatic synchronization and any existing data on the existing hard drives in the server is lost. To avoid this problem, use the LSI Configuration Utility to delete the RAID volume from the hard drive *before* removing it.

- 1 To open the spring-loaded latch, press the latch release button on the front of the hard drive.**
The release latch opens.
- 2 Position the hard drive in the slot with the LEDs at the top and the open latch at the bottom.**
- 3 Slide the hard drive into the slot.**

Note – The hard drive release latch must be opened before installing the hard drive into the hard drive slot.



- 4 Firmly push the hard drive into the slot to engage the internal connector on the hard drive back panel.
- 5 Close the latch release handle until it clicks into place and is secure.

- See Also**
- “How to Remove a Hard Drive” on page 35
 - “Hard Drive Designation” on page 37

Replacing a CPU Module and Filler Card (CRU)

- “How to Remove a CPU Module or Filler Card” on page 40
- “CPU Module Features and Components” on page 41
- “How to Install a CPU Module or Filler Card” on page 44

▼ How to Remove a CPU Module or Filler Card

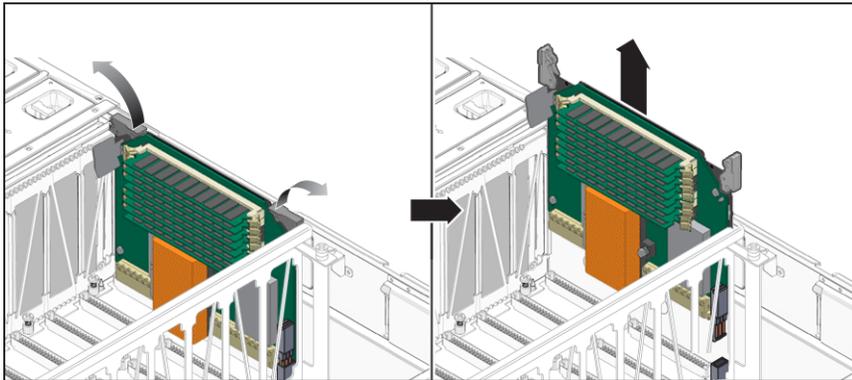
Note – If you are removing the CPU modules with the intent of reinstalling them, and your server contains CPU modules with different DIMM configurations, you must reinstall each module in its original slot.

- 1 Prepare the server for service. See [“How to Prepare the Server for Service”](#) on page 22.
- 2 If your server contains CPU modules with different DIMM configurations, make note of the slot for each module before removing the module.

If you reinstall the same modules, you must return each module to its original slot.

- 3 Simultaneously rotate both plastic levers on the top corners of the module up and outward to an upright position.

This action disengages the module from the connector on the motherboard.

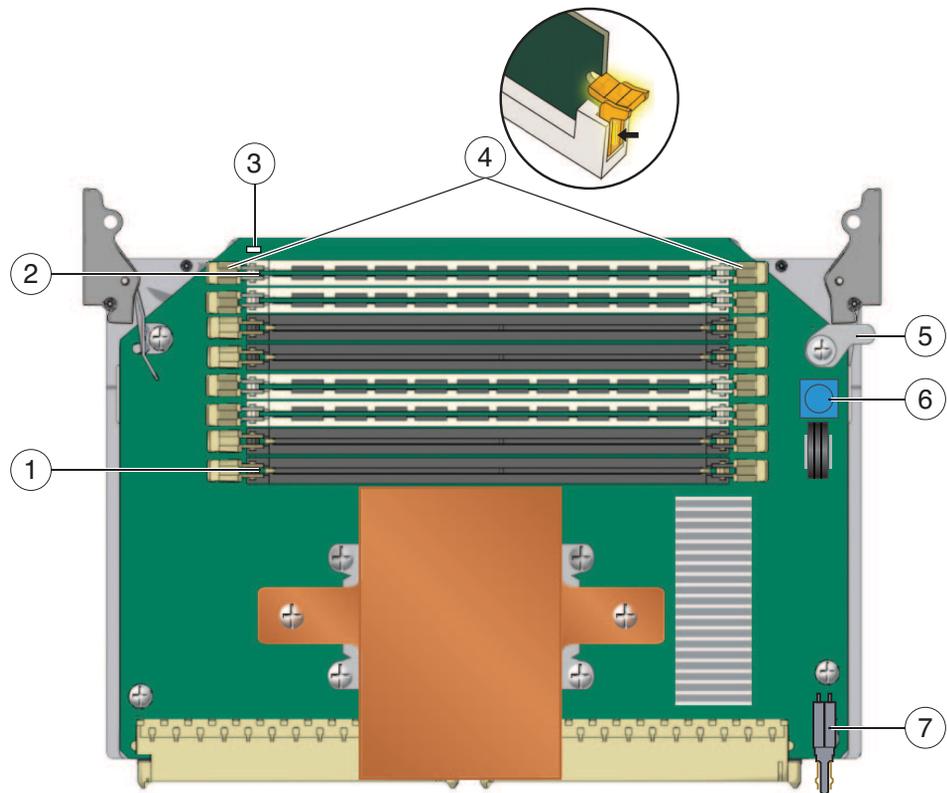


- 4 To remove the module, use the plastic levers to lift it straight up until it is clear of the metal edge guides in the bay.
- 5 Set the CPU module on an antistatic surface.

- See Also**
- [“Replacing or Adding DIMMs \(CRU\)”](#) on page 46
 - [“How to Install a CPU Module or Filler Card”](#) on page 44
 - [“How to Update CPU Module FRU Information”](#) on page 108

CPU Module Features and Components

The CPU module for the Sun Fire X4640 server has a mechanical key located on the upper right side of the module. This key renders the module unique to the Sun Fire X4640 server, and prevents the module from being installed in Sun Fire X4600 and X4600 M2 servers, which use a similar type card. The CPU module for the X4640 server is *not* compatible with X4600 and X4600 M2 servers. Do *not* remove the mechanical key and attempt to install the module in a different model of server. Conversely, CPU modules for the X4600 and X4600 M2 servers are not compatible with the X4640 server. Do not attempt to install an X4600 and X4600 M2 CPU module in an X4640 server. The following illustration shows the features and components of the CPU module.



Legend

- | | |
|---|------------------|
| 1 | DIMM slot DIMM 0 |
| 2 | DIMM slot DIMM 7 |

Legend

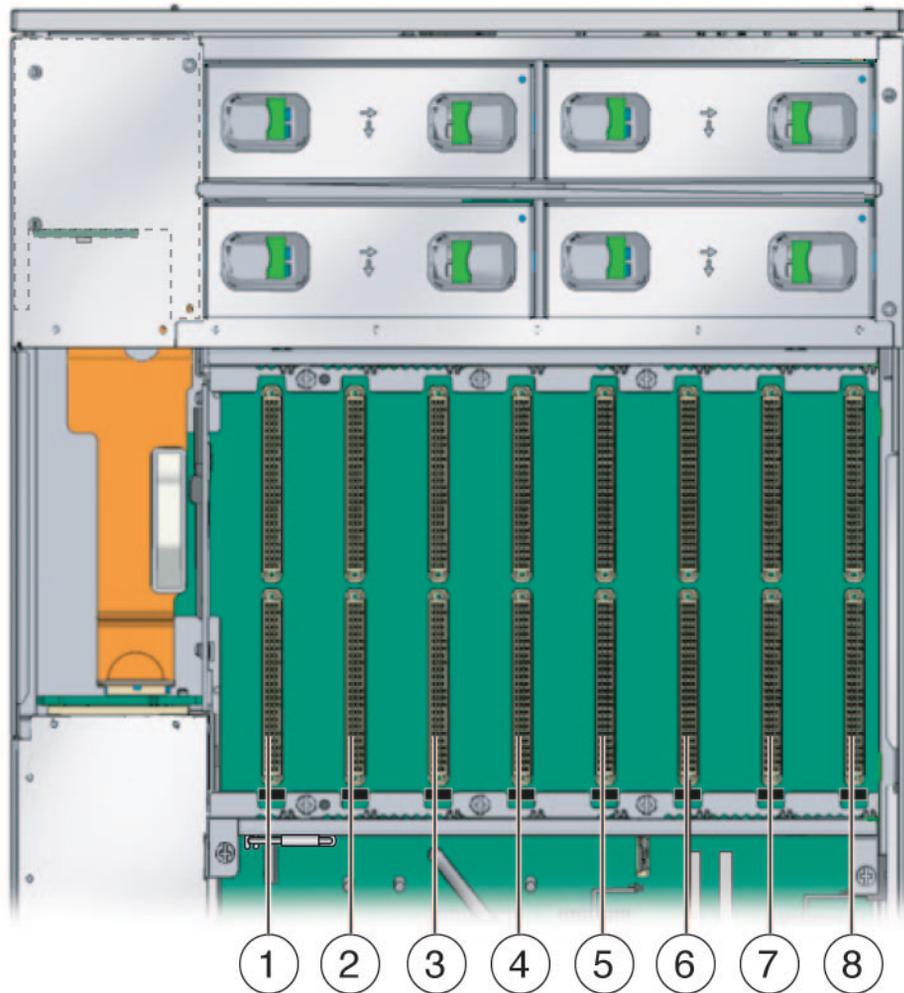
3	CPU module fault LED
4	DIMM fault LEDs (16)
5	Mechanical key (Sun Fire X4640)
6	Fault Remind switch
7	Power connector

CPU Module Slot Designations and Population Rules

- [“CPU Module Slot Designations” on page 42](#)
- [“CPU Module Population Rules” on page 44](#)

CPU Module Slot Designations

When viewing the eight CPU module slots from the rear of the server, the slots are designated alphabetically (A-H) from *left to right*.

**Legend**

Number	Slot	Number	Slot
1	A	5	E
2	B	6	F
3	C	7	G
4	D	8	H

CPU Module Population Rules

The Sun Fire X4640 has eight CPU module slots (see “[CPU Module Slot Designations](#)” on [page 42](#)) and two possible CPU module configurations: 8 modules and 4 modules. No other configurations are supported. The configurations require a specific population sequence. The CPU module naming system (for example, CPU 0, CPU 1, CPU 2) is dependent upon the configuration. CPU module filler cards are required for the four module configuration.

For each configuration populate these slots ¹								
Configuration	H	G	F	E	D	C	B	A
8 modules	CPU 7	CPU 6	CPU 5	CPU 4	CPU 3	CPU 2	CPU 1	CPU 0
4 modules	CPU 3	filler card	filler card	CPU 2	CPU 1	filler card	filler card	CPU 0

¹ CPU module names change depending on the configuration.

▼ How to Install a CPU Module or Filler Card

Note – If you are reinstalling the CPU modules, and your server contains CPU modules with different DIMM configurations, you must reinstall each module in its original slot.

Before You Begin Review the following information:

- “[How to Remove a CPU Module or Filler Card](#)” on [page 40](#)
- “[CPU Module Slot Designations](#)” on [page 42](#)
- “[CPU Module Population Rules](#)” on [page 44](#)
- “[CPU Module Features and Components](#)” on [page 41](#)

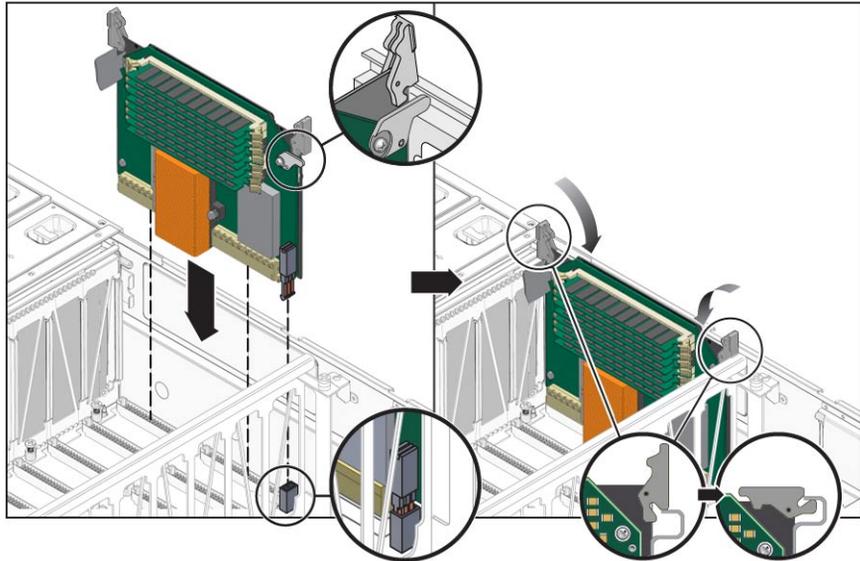
- 1 **Prepare the server for service.** See “[How to Prepare the Server for Service](#)” on [page 22](#).
- 2 **Identify the slot and if necessary remove the CPU module or the filler module** (see “[How to Remove a CPU Module or Filler Card](#)” on [page 40](#)).
- 3 **Ensure that both plastic levers on the top corners of the module are in the fully open, vertical position.**
- 4 **Position the CPU module with the component side facing the center of the server.**
- 5 **Align the module edges with the slot's metal edge guides in the CPU module bay.**



Caution – Risk of component damage. There is risk of damage to the CPU module and the motherboard if the module is improperly inserted into the server. Ensure that the CPU module is properly installed.

- 6 Carefully lower the module until the open levers come in contact with the edge guides and the three connectors are aligned with the motherboard connectors.**

The key aligns with the slot in the edge guide.



- 7 Simultaneously rotate both plastic levers downward until they are flat against the top corners of the module.**

This action engages the three connectors on the CPU module with the three mating connectors on the motherboard.

- 8 Prepare the server for operation. See [“How to Prepare the Server for Operation”](#) on page 27.**

Next Steps [“How to Update CPU Module FRU Information”](#) on page 108

Replacing or Adding DIMMs (CRU)

This section describes the process for removing and adding DIMMs to your Sun Fire X4640 server. The DIMMs are located on the CPU modules. When troubleshooting DIMMs, use the CPU module's on-board DIMM diagnostics. The on-board diagnostics allow you to identify faulty DIMMs. See [“Troubleshooting DIMM Problems”](#) in *Sun Fire X4640 Server Diagnostics Guide*. When replacing or populating DIMMs adhere to the population rules. See [“DIMM Population Rules”](#) on page 47.

- [“How to Remove DIMMs”](#) on page 46
- [“DIMM Population Rules”](#) on page 47
- [“How to Install DIMMs”](#) on page 48

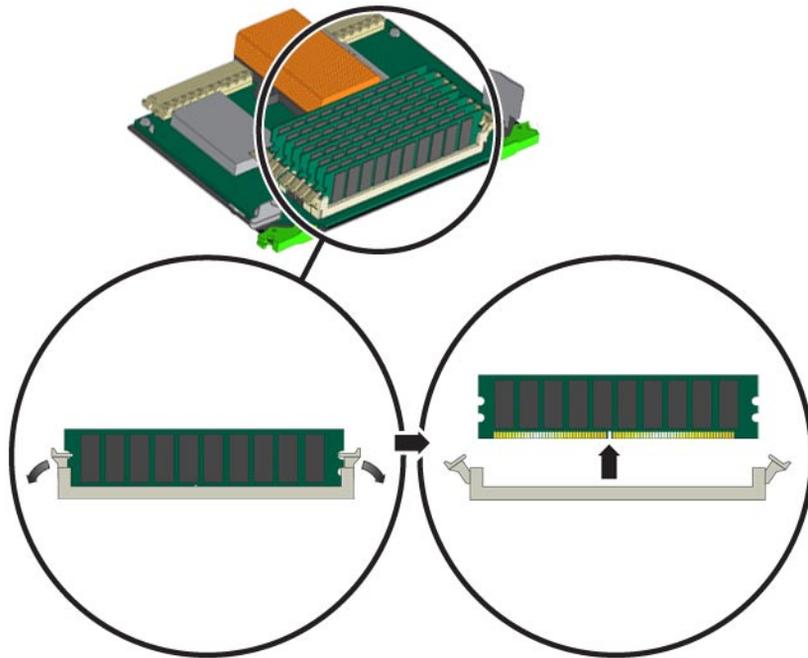
▼ How to Remove DIMMs

- 1 Prepare the server for service. See [“How to Prepare the Server for Service”](#) on page 22.
- 2 Remove the CPU module that contains the DIMM you want to remove. See [“How to Remove a CPU Module or Filler Card”](#) on page 40.
- 3 Set the CPU module on an anti-static surface.

Tip – Use an antistatic mat. See [“How to Use an Antistatic Mat”](#) on page 21.

- 4 Use the CPU module's DIMM diagnostics to locate the DIMM that you want to remove from the CPU module.

- 5 To remove the DIMM, rotate both DIMM slot locking handles outward as far as they will go. This action partially ejects the DIMM from the socket.



- 6 Carefully lift the DIMM straight up to remove it from the socket.

- See Also**
- [“How to Install DIMMs”](#) on page 48
 - [“CPU Module Features and Components”](#) on page 41
 - [“DIMM Population Rules”](#) on page 47

DIMM Population Rules

Use these rules when adding DIMMs to the server.

- The server supports 4 GB and 8 GB DIMMs
- DIMMs must be added in pairs. Slots pairings are color coded.
- All DIMMs controlled by a given CPU should be the same capacity and rank (All supported 4 GB and 8 GB DIMMs are dual-rank). Mixed configurations are supported, but might result in lower memory performance.

- DIMM population must consist of equally loading each CPU with the same configuration. That is, the identical DIMM configuration should be replicated for each CPU in your system.
- DIMM slots are numbered DIMM 0 — DIMM 7 with DIMM 0 residing closest to the CPU (center of the board)
- The following table shows the DIMM slot pairing, pair numbering, and the order of population.

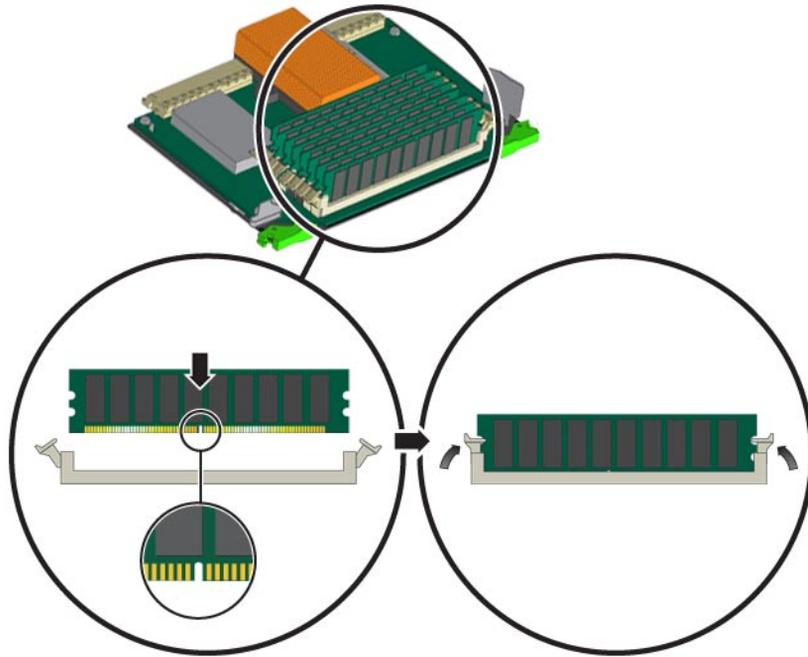
Slot	Color	Pair Number	Population Order
DIMM 7	White	3	First pair
DIMM 6	White	3	
DIMM 5	Black	2	2nd pair
DIMM 4	Black	2	
DIMM 3	White	1	3rd pair
DIMM 2	White	1	
DIMM 1	Black	0	4th pair
DIMM 0	Black	0	

▼ How to Install DIMMs

Before You Begin ■ Review the DIMM population rules in the section [“DIMM Population Rules” on page 47.](#)

- 1 **Prepare the server for service.** See [“How to Prepare the Server for Service” on page 22.](#)
- 2 **Remove the appropriate CPU module.** See [“How to Remove a CPU Module or Filler Card” on page 40.](#)
- 3 **Set the CPU module on an anti-static surface so that the DIMM slots face upward.**

- 4 Ensure that the DIMM slot ejectors at each end of the socket are fully open (rotated outward).



- 5 Align the notch in the bottom edge of the DIMM with the key in the DIMM socket.

Note – Be sure that the DIMM slots are used according to the population rules for the CPU module. See [“DIMM Population Rules” on page 47](#).

- 6 Carefully press down evenly on both top corners of the DIMM until the ejectors snap over the cutouts in the left and right edges of the DIMM.
- 7 Install the CPU module.
- 8 Prepare the server for operation.

- See Also**
- [“DIMM Population Rules” on page 47](#)
 - [“How to Remove DIMMs” on page 46](#)
 - [“CPU Module Features and Components” on page 41](#)

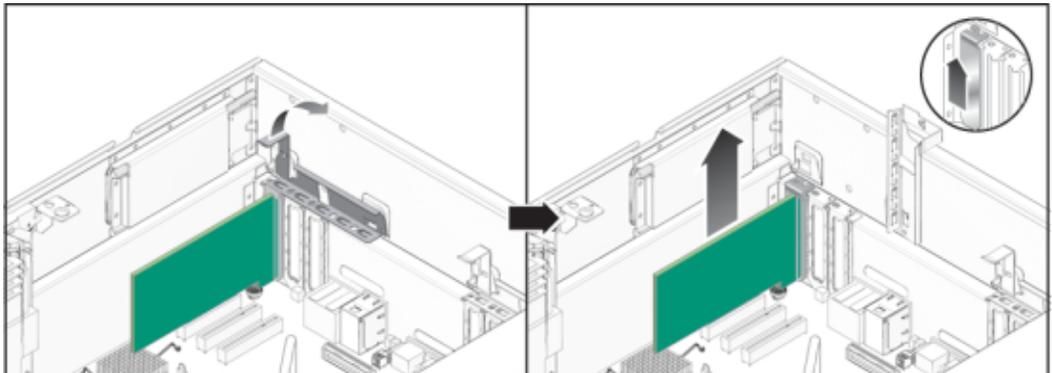
Replacing or Adding PCI Cards (CRU)

This section describes how to remove and add PCI cards for your Sun Fire X4640 server.

- “How to Remove a PCI Card” on page 50
- “PCI Slot Designations” on page 51
- “How to Install a PCI Card” on page 52

▼ How to Remove a PCI Card

- 1 Prepare the server for service. See [“How to Prepare the Server for Service” on page 22.](#)
- 2 Working from the rear of the chassis, push the handle of the locking lever slightly downward and then pivot both PCI slot locking levers upward to release the card.

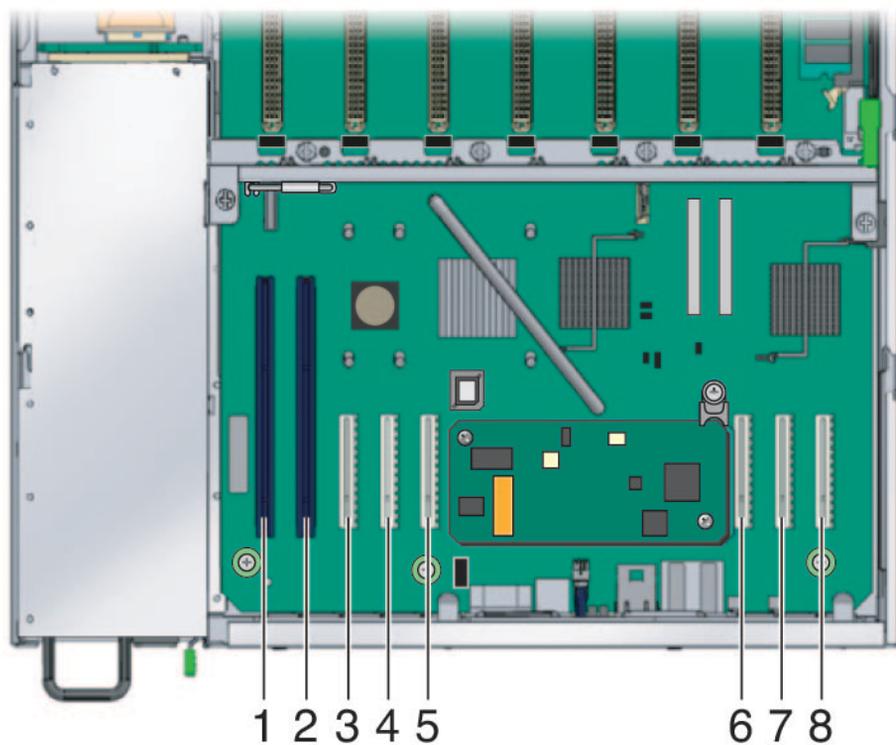


- 3 Pull the PCI card up and out of the PCI slots.
- 4 Pivot the PCI card latches back to their closed positions.
- 5 If necessary, prepare the server for operation. See [“How to Prepare the Server for Operation” on page 27.](#)

- See Also**
- “How to Install a PCI Card” on page 52
 - “Identifying Components” on page 31
 - “PCI Slot Designations” on page 51

PCI Slot Designations

This is the PCI slot arrangement and labeling.

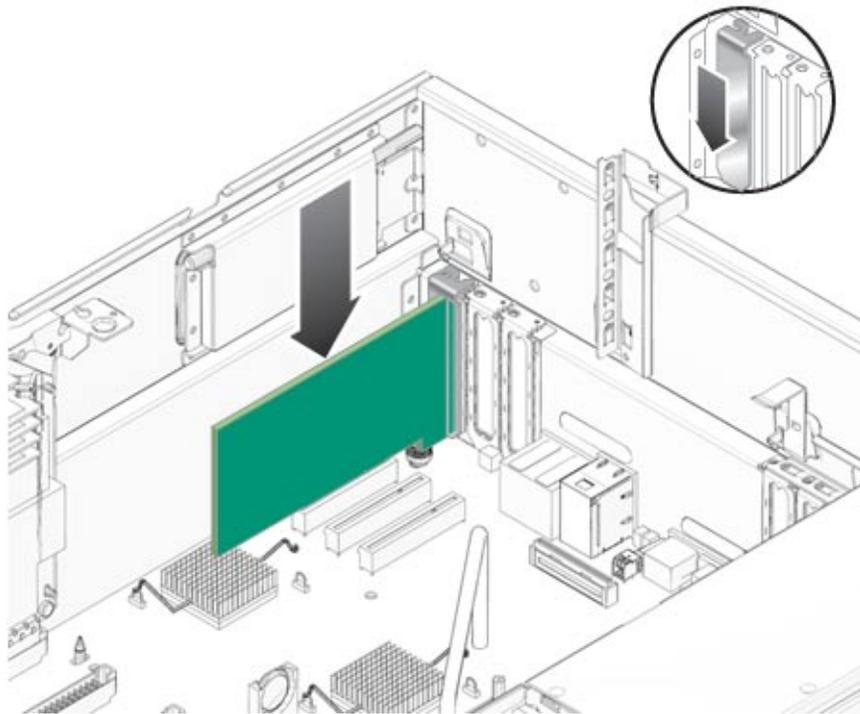


Legend

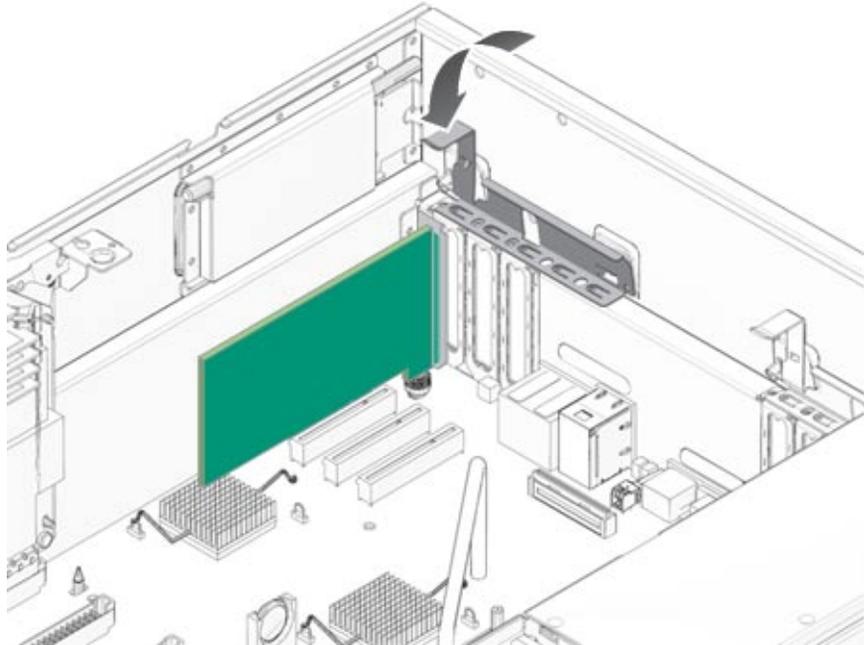
Slot/Type	Number	Slot/Type
1	5	PCI 4/PCIe
2	6	PCI 5/PCIe
3	7	PCI 6/PCIe
4	8	PCI 7/PCIe

▼ How to Install a PCI Card

- 1 Prepare the server for service. See [“How to Prepare the Server for Service”](#) on page 22.
- 2 Working from the rear of the chassis, pivot the PCI card latch to the open position.
- 3 Insert the PCI card into the PCI card slot. Ensure that the PCI card’s rear connector panel engages the tab in the chassis rear panel.



- 4 Pivot the PCI card latch to the closed position until it locks.



- 5 Prepare the server for operation. See [“How to Prepare the Server for Operation”](#) on page 27.

- See Also**
- [“How to Remove a PCI Card”](#) on page 50
 - [“Identifying Components”](#) on page 31
 - [“Boot Device Detection and Priority”](#) on page 135
 - [“PCI Slot Designations”](#) on page 51

Replacing or Adding a Power Supply (CRU)

Note – This component is hot-swappable. The server does not need to be powered off to replace this component.

- [“How to Remove a Power Supply”](#) on page 54
- [“Power Supply Designations and Redundancy”](#) on page 55
- [“How to Install a Power Supply”](#) on page 56

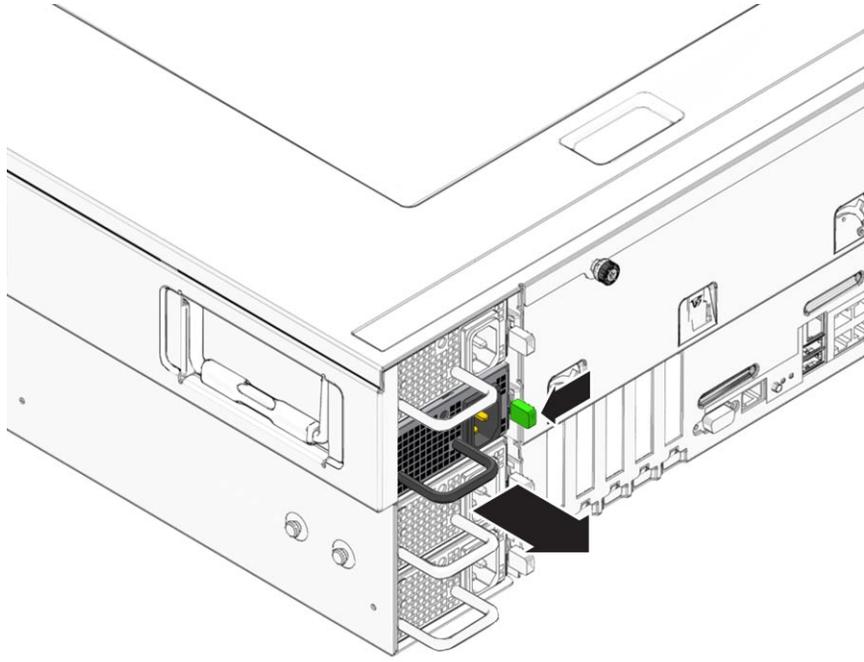
▼ How to Remove a Power Supply

- 1 If the server is in a rack with a cable management arm attached, swivel open the cable management arm to view the power supplies.**
- 2 Identify which power supply you will replace. Each power supply has one fault LED that you can view from the rear of the server:**
 - LED is off: Power supply is operating properly.
 - LED is on (amber): Power supply is faulty and should be replaced.
- 3 Disconnect the AC power cord from the power supply that you are replacing.**

The power supplies are hot-swappable, so you do not have to shut down the server or disconnect the other power supplies.

Note – The Service Action Required LEDs on the front panel and back panel blink when a power supply is unplugged. For the LED locations and descriptions, see [“Front Panel LEDs” on page 156](#).

- 4 Hold the power supply handle and push the thumb latch toward the center of the power supply.



- 5 While continuing to push on the latch, use the handle to pull the power supply and remove it from the chassis.
- 6 If necessary, prepare the server for operation. See [“How to Prepare the Server for Operation” on page 27](#).

- See Also**
- [“Identifying Components” on page 31](#)
 - [“Power Supply Designations and Redundancy” on page 55](#)
 - [“How to Install a Power Supply” on page 56](#)

Power Supply Designations and Redundancy

- [“Power Supply Designations” on page 56](#)
- [“Power Supply Redundancy” on page 56](#)

Power Supply Designations

The system designation of the four power supplies in the server is shown here. Power supplies should be populated from lowest to highest position.



The number of power supplies you install in your server should ensure the highest possible quality of redundancy. For more information about power supply redundancy, see [“Power Supply Redundancy” on page 56](#).

Power Supply Redundancy

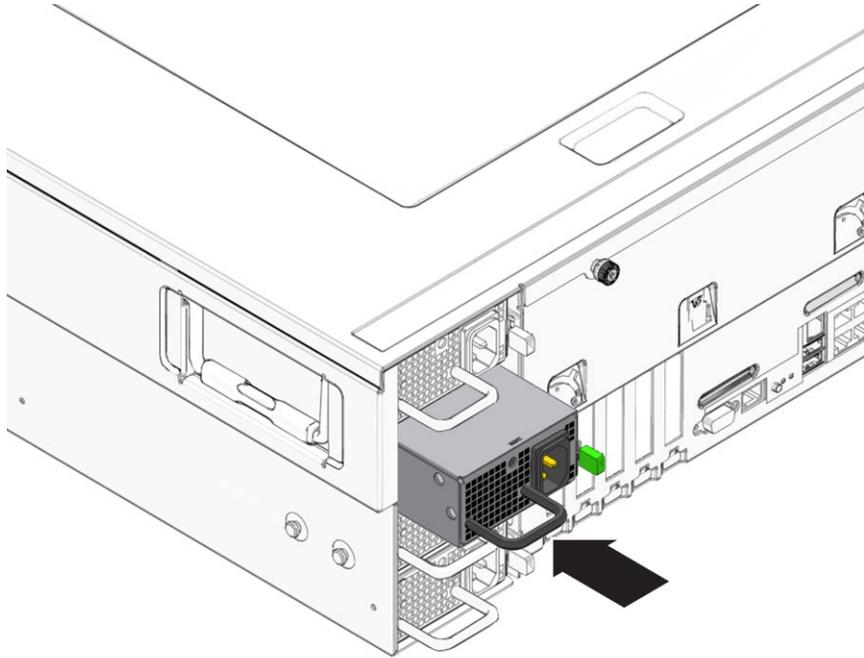
Power supply redundancy is an important feature of the Sun Fire X4640 server. Redundancy allows for continued server operation in the event of a power supply failure. The server has capabilities for up to four power supplies. When configuring your server for power supply redundancy, consider the following guidelines.

Number of PSUs	Slots Populated	Quality of Redundancy
1	PS0	The system will not power on with only one operational power supply.
2	PS0 and PS1	Poor (no redundancy)
3	PS0, PS1, and PS2	Good
4	PS0, PS1, PS2, and PS3	Best

▼ How to Install a Power Supply

- 1 Align the power supply with the empty bay in the chassis.

- 2 Slide the power supply into the bay until it firmly engages the connector on the power distribution board, indicated when the thumb latch on the power supply clicks into place.



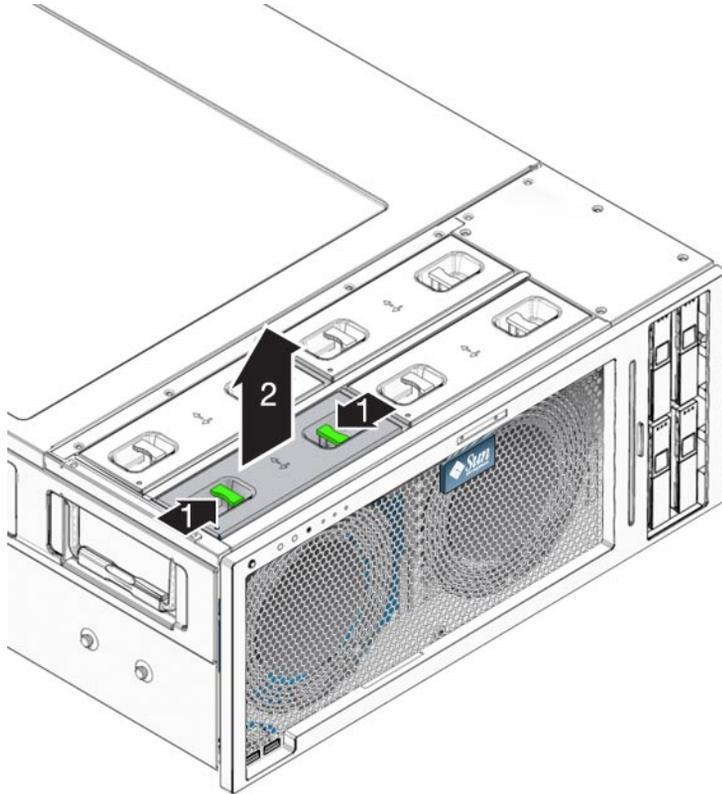
- 3 Connect the AC power cord to the new power supply.
- 4 If necessary, prepare the server for operation. See [“How to Prepare the Server for Operation” on page 27.](#)

Replacing the Fan Tray (CRU)

- [“How to Remove the Fan Tray” on page 58](#)
- [“Fan Tray Designations” on page 58](#)
- [“How to Install the Fan Tray” on page 59](#)

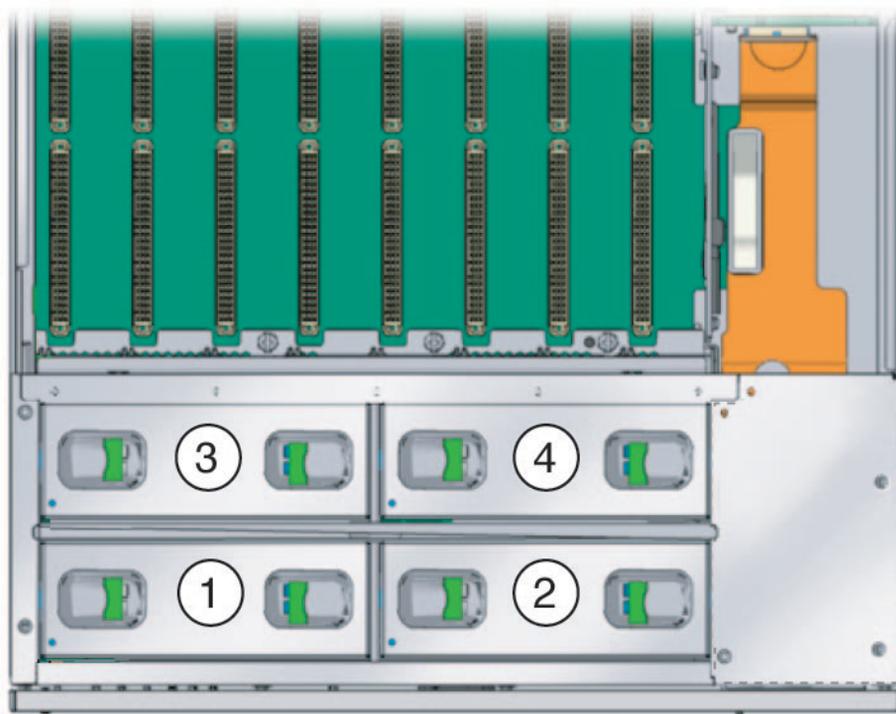
▼ How to Remove the Fan Tray

- 1 Prepare the server for service. See [“How to Prepare the Server for Service”](#) on page 22.
- 2 Locate the fan tray that you want to remove.
- 3 Pinch both plastic securing buttons toward the center of the fan tray, and simultaneously lift the fan tray up and out of the chassis.



- See Also**
- [“How to Install the Fan Tray”](#) on page 59
 - [“Fan Tray Designations”](#) on page 58

Fan Tray Designations



Legend

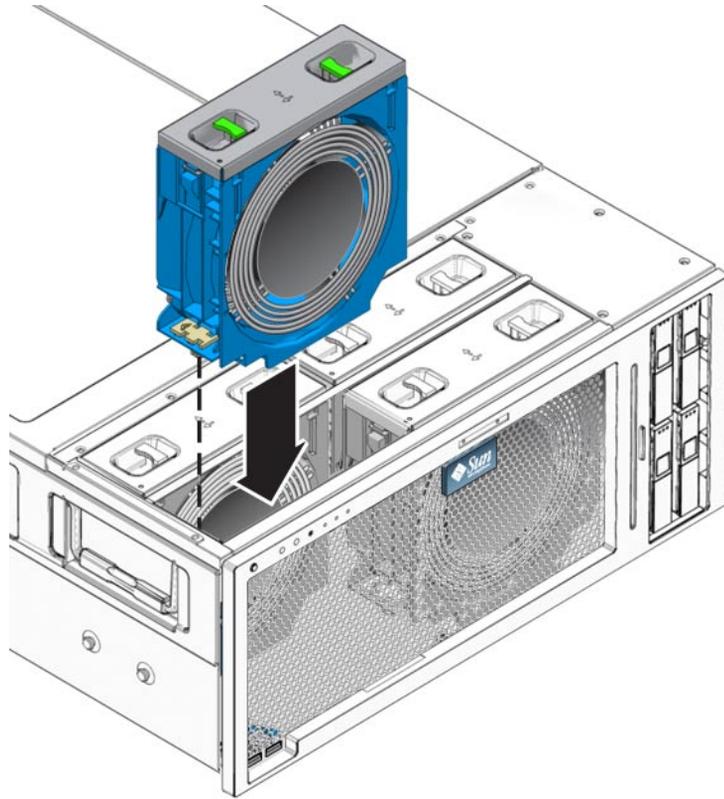
1	FT1
2	FT2
3	FT3
4	FT4

▼ How to Install the Fan Tray

- 1 Prepare the server for service. See [“How to Prepare the Server for Service”](#) on page 22.
- 2 Align the fan tray with the bay in the chassis.

The connector at the bottom of the fan tray should be on the left (as you face the server front) to align with the connector on the motherboard.

- 3 Lower the fan tray into the bay until it comes into contact with the connector on the motherboard.



- 4 Push down gently until the connector is fully engaged and the plastic securing buttons snap into place.
- 5 Prepare the server for operation. See [“How to Prepare the Server for Operation”](#) on page 27.

- See Also**
- [“Fan Tray Designations”](#) on page 58
 - [“How to Remove the Fan Tray”](#) on page 58

Replacing the Service Processor Board (FRU)

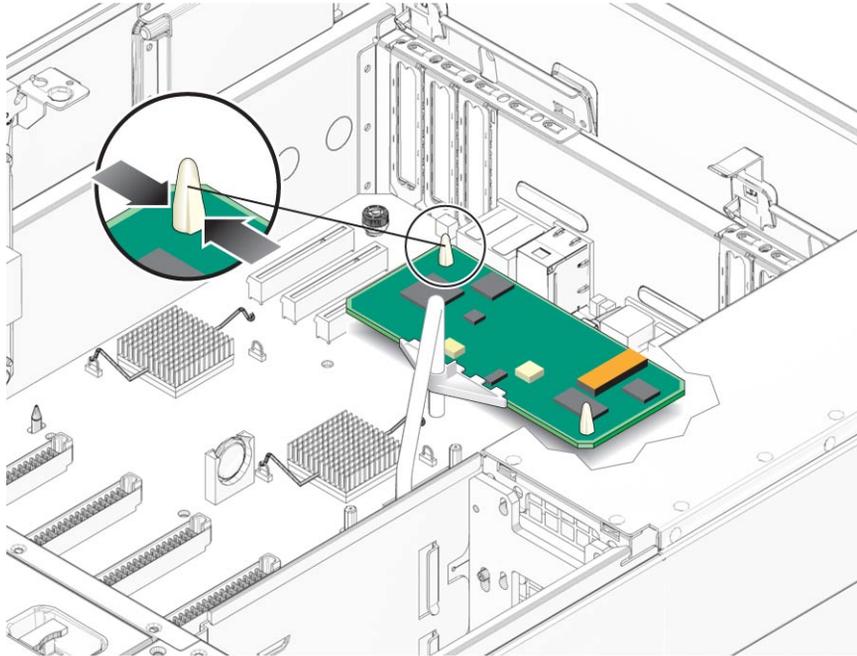
Note – This component is a FRU (field-replaceable unit). Use a qualified Sun trained service person to replace this component.

- “How to Remove the Service Processor Board” on page 61
- “How to Install the Service Processor Board” on page 63

▼ How to Remove the Service Processor Board

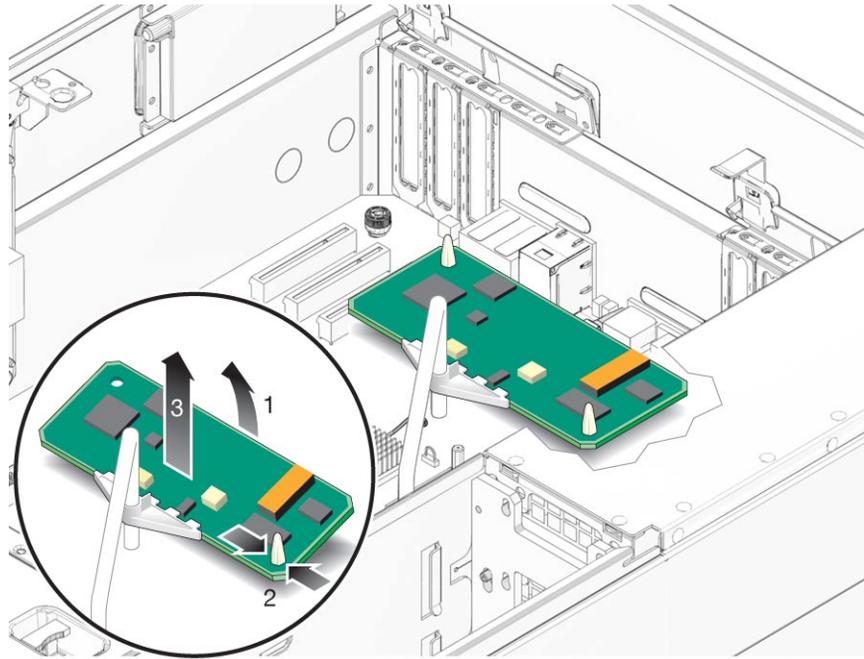
- Before You Begin**
- If you are replacing an SP board that is not dead, obtain the ILOM version and download the system software release package (combined BIOS/ILOM) that incorporates that version. A system software release package can be downloaded from: <http://support.oracle.com>.
 - If you are replacing a dead SP board, obtain the BIOS version and download the system software release package (combined BIOS/ILOM) that incorporates that version. A system software release package can be downloaded from: <http://support.oracle.com>.
- 1 Prepare the server for service. See “How to Prepare the Server for Service” on page 22.

- 2 Pinch the tabs on the white plastic standoff post that is closest to the back panel of the server and simultaneously lift the rear edge the of service processor (SP) board to free it from that rear standoff post and the connector on the motherboard.**



- 3 With the rear edge free, pivot the SP board so that it clears the plastic retainer that is attached to the motherboard handle.**
- 4 Pinch the tabs on the white plastic standoff post that is closest to the front panel of the server, and simultaneously lift the front edge the of SP board to free it from that front standoff post.**

Note – Do not bend the SP board while removing it or installing it.



- See Also**
- “How to Install the Service Processor Board” on page 63
 - “Identifying Components” on page 31

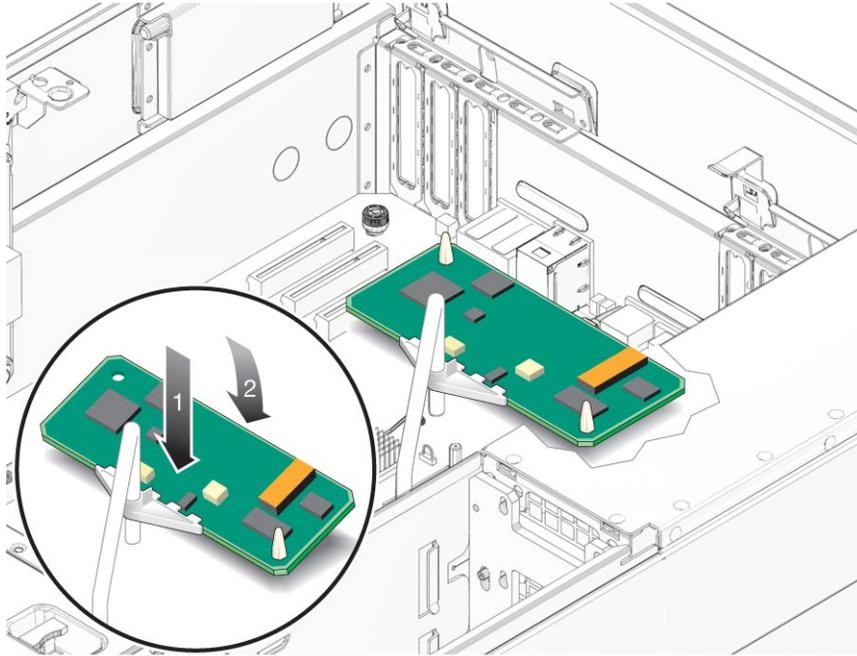
▼ How to Install the Service Processor Board

- Before You Begin**
- If you are replacing a SP board and have not yet removed the old one, see “How to Remove the Service Processor Board” on page 61.
 - If you are installing a new SP board, be sure you have the appropriate system software release package as described in the “Before You Begin” section of “How to Remove the Service Processor Board” on page 61.

- 1 If necessary, prepare the server for service. See “How to Prepare the Server for Service” on page 22.
- 2 If necessary, remove the SP board. See “How to Remove the Service Processor Board” on page 61.
- 3 Position the new SP board so that the connector aligns with the motherboard connector and the white plastic standoffs.

First seat the board on the front standoff.

- 4 To seat the SP board onto the *front* plastic standoff, gently push down on the board's front corner.



- 5 Pivot the SP board so that it seats into the plastic retainer that is attached to the motherboard handle.
- 6 Push the SP board down onto the rear plastic standoff.
- 7 Carefully press down on the rear edge of the SP board to seat its connector into the connector on the motherboard.
- 8 Prepare the server for operation. See [“How to Prepare the Server for Operation” on page 27](#).
- 9 If the SP board is not the same board previously installed in the server, you must use the `servicetool` command to update FRU information. See [“Updating Field-Replaceable Unit Information” on page 107](#).
- 10 Update the system with the BIOS/ILOM firmware package you downloaded earlier (see the [“Before You Begin”](#) information in [“How to Remove the Service Processor Board” on page 61](#)). This will ensure that both the BIOS and ILOM firmware (which are packaged and tested together) are at a supported level.

For information about updating firmware, see “Updating Firmware” in *Sun ILOM 3.0 Supplement for the Sun Fire X4640 Server*.

- See Also**
- “Identifying Components” on page 31
 - “How to Remove the Service Processor Board” on page 61

Replacing the DVD Module (FRU)

The section contains removal and installation instructions for the SATA DVD module in the Sun Fire X4640 server.

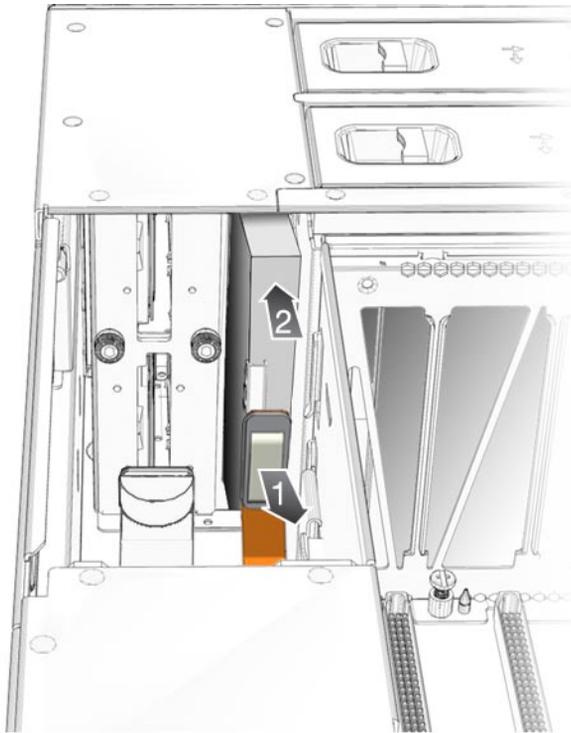
Note – This component is a FRU (field-replaceable unit). Use a qualified Sun trained service person to replace this component.

- “How to Remove the DVD Module” on page 65
- “How to Install the DVD Drive” on page 67

▼ How to Remove the DVD Module

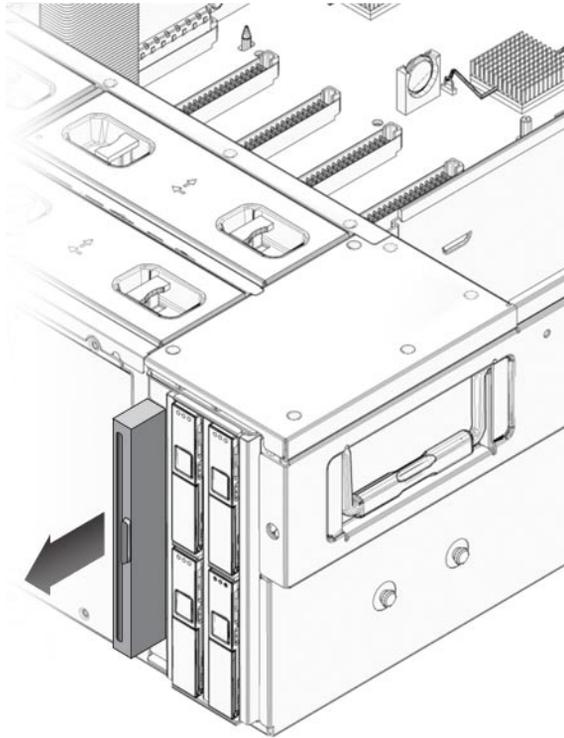
- 1 Remove any disc from the DVD module.
- 2 Prepare the server for service. See “How to Prepare the Server for Service” on page 22.
- 3 Remove the front bezel. See “How to Remove the Front Bezel” on page 26.

- 4 Disconnect the flex cable connector from the rear of the DVD module.



- 5 Push the module from the rear (chassis interior side) until it protrudes from the server front panel.

- 6 From the front of the server, pull the DVD module out of the chassis bay.

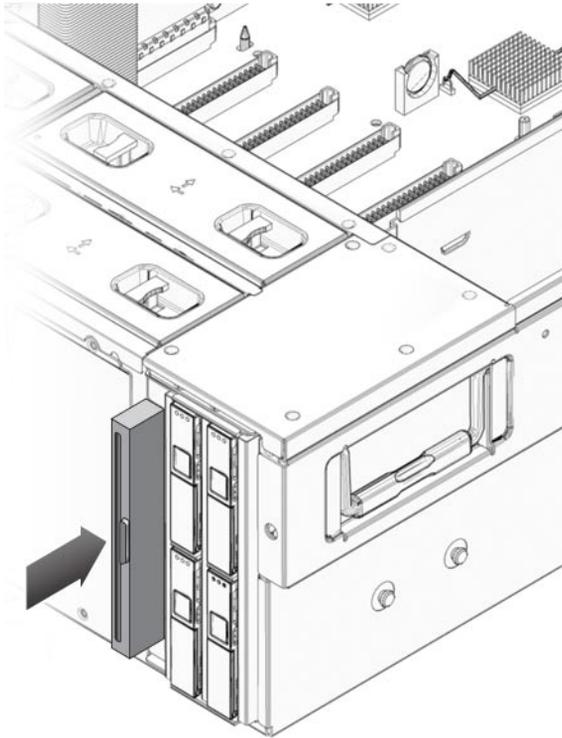


- See Also**
- [“Identifying Components” on page 31](#)
 - [“How to Install the DVD Drive” on page 67](#)

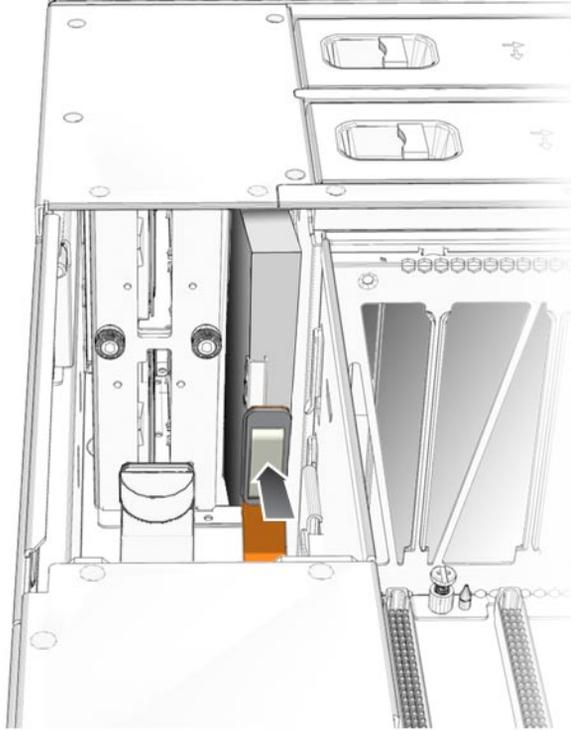
▼ How to Install the DVD Drive

- 1 Prepare the server for service. See [“How to Prepare the Server for Service” on page 22.](#)
- 2 Remove the front bezel. See [“How to Remove the Front Bezel” on page 26.](#)
- 3 Align the new drive with the chassis bay.
The top of the drive should face the center of the chassis..

- 4 Push the drive into the bay until the face of the drive is even with the front of the chassis. Metal spring-clips inside the chassis grip the drive and hold it in place.**



- 5 Reconnect the flex-cable connector to the connector on the rear of the drive.



- 6 Install the front bezel. See [“How to Remove the Front Bezel”](#) on page 26.

Note – When you insert a disc into the vertical slot of the DVD-ROM drive, the label on the disk must face left (toward the chassis center).

- 7 Prepare the server for operation. See [“How to Prepare the Server for Operation”](#) on page 27.

- See Also**
- [“How to Remove the DVD Module”](#) on page 65
 - [“Identifying Components”](#) on page 31

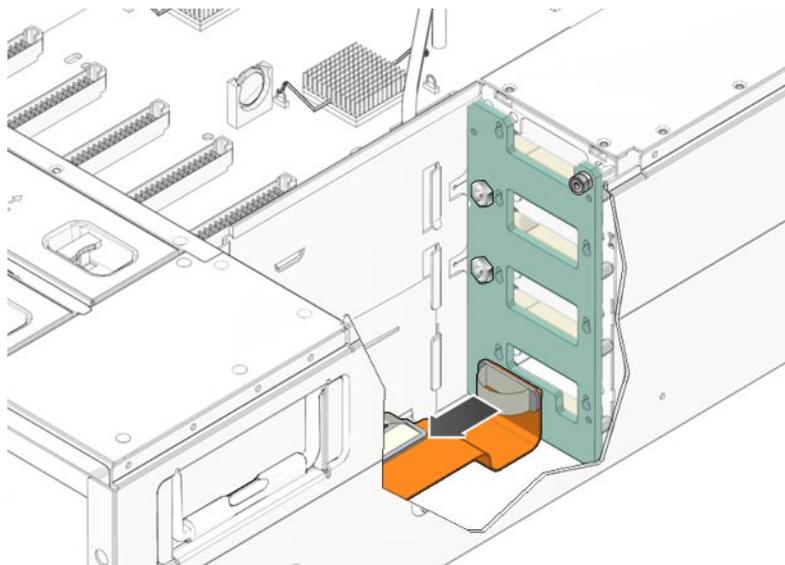
Replacing the Power Distribution Board (FRU)

Note – This component is a FRU (field-replaceable unit). Use a qualified Sun trained service person to replace this component.

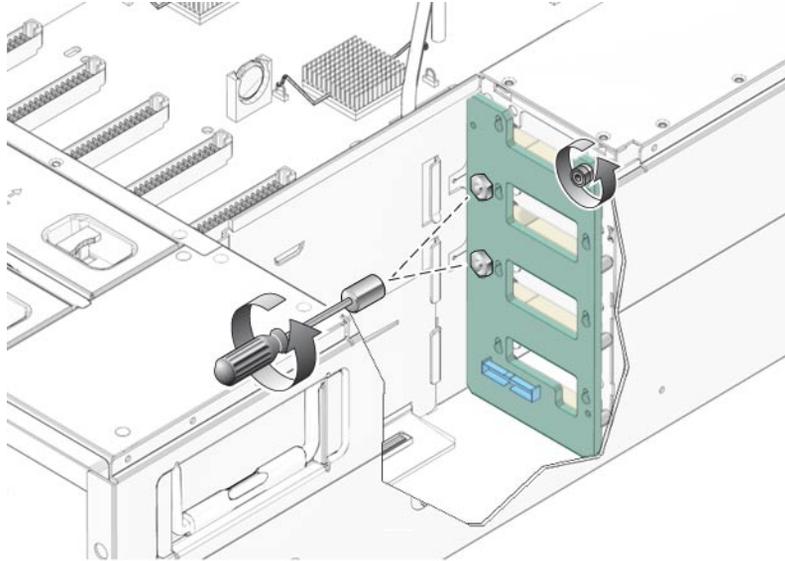
- [“How to Remove the Power Distribution Board” on page 70](#)
- [“How to Install the Power Distribution Board” on page 72](#)

▼ How to Remove the Power Distribution Board

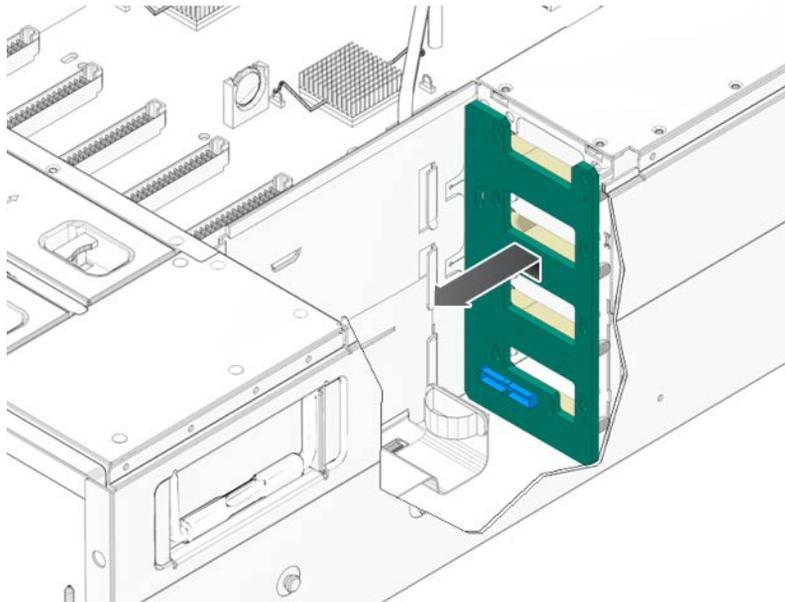
- 1 Prepare the server for service. See [“How to Prepare the Server for Service” on page 22](#).
- 2 Remove all power supplies. See [“How to Remove a Power Supply” on page 54](#)).
- 3 Disconnect the main flex cable connector from the connector on the power distribution board.



- 4 Loosen the captive screws that secure the power distribution board to the chassis.



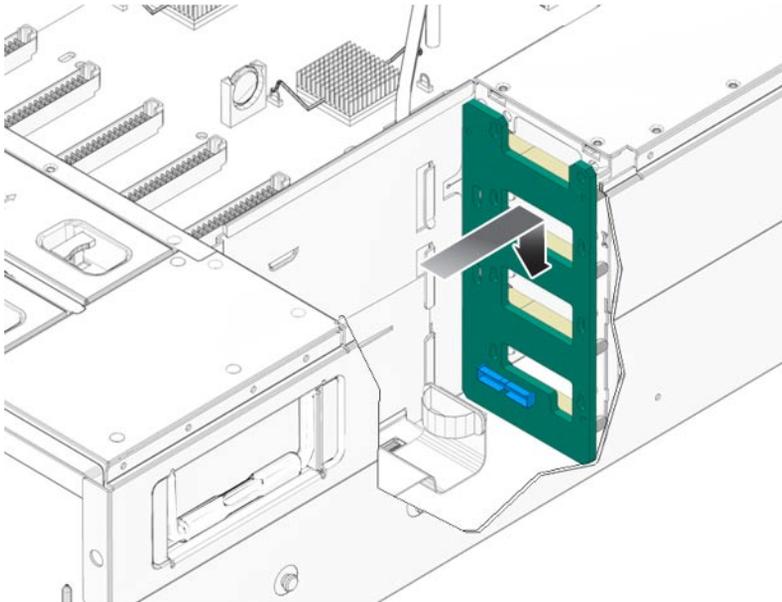
- 5 Remove the two bus-bar nuts that secure the power distribution board to the bus bars.
- 6 Slide the power distribution board upward slightly to free its keyed openings from the chassis standoffs, and then remove it from the chassis.



Next Steps [“How to Install the Power Distribution Board” on page 72](#)

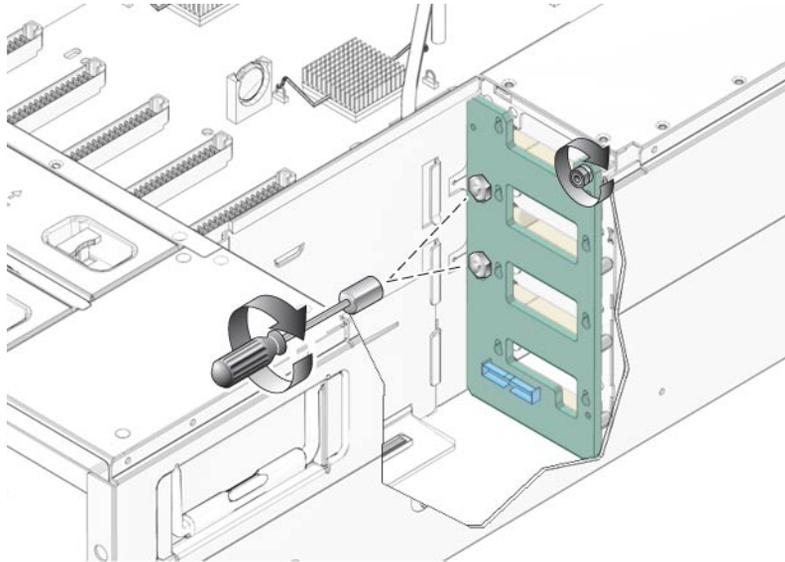
▼ How to Install the Power Distribution Board

- 1 To remove the power distribution board, see [“How to Remove the Power Distribution Board” on page 70.](#)
- 2 Align the new board so that the chassis standoffs protrude through its keyed openings, then slide the power distribution board downward to lock it into place.



- 3 Align the bus-bar post with the openings in the PDB.
- 4 Secure the power distribution board to the bus bars, using the two bus-bar nuts.

Note – Do not torque the nuts to specification, yet.

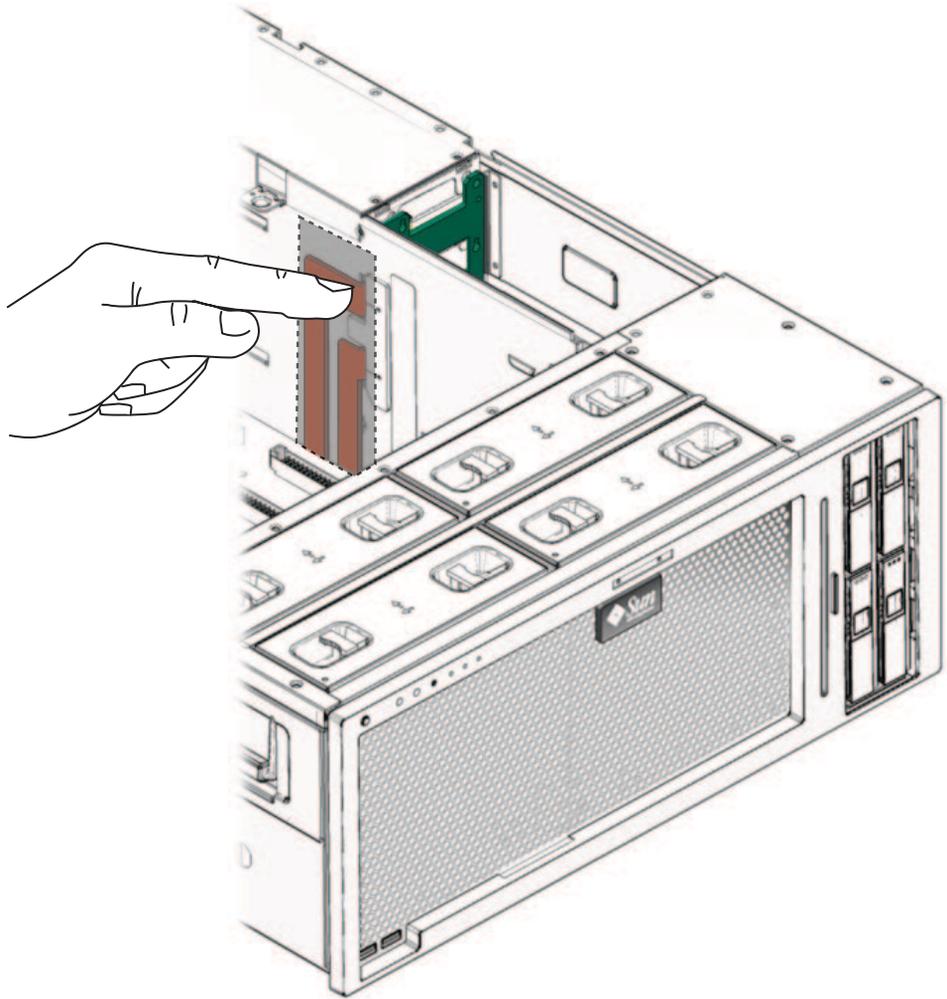


- 5** *Loosen the topmost (negative) bus-bar nut.*
Do *not* loosen the lower (positive) bus-bar nut.

- 6** **Remove enough of the CPU modules or filler cards to provide access to the opposite side of the chassis midwall. See [“How to Remove a CPU Module or Filler Card” on page 40.](#)**
Make note of the CPU module and filler card positions, so you can return them to their original slots.

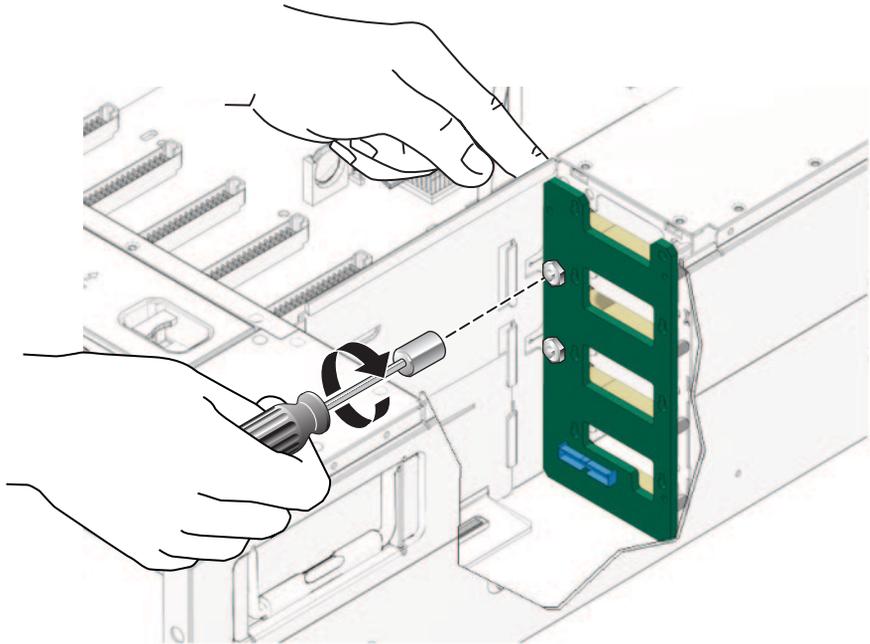
- 7 **Press and hold the negative bus bar against the chassis midwall (on the motherboard side of the midwall).**

This action removes the flex from the bus bar ensuring that the bus bar lies flat against the chassis midwall.



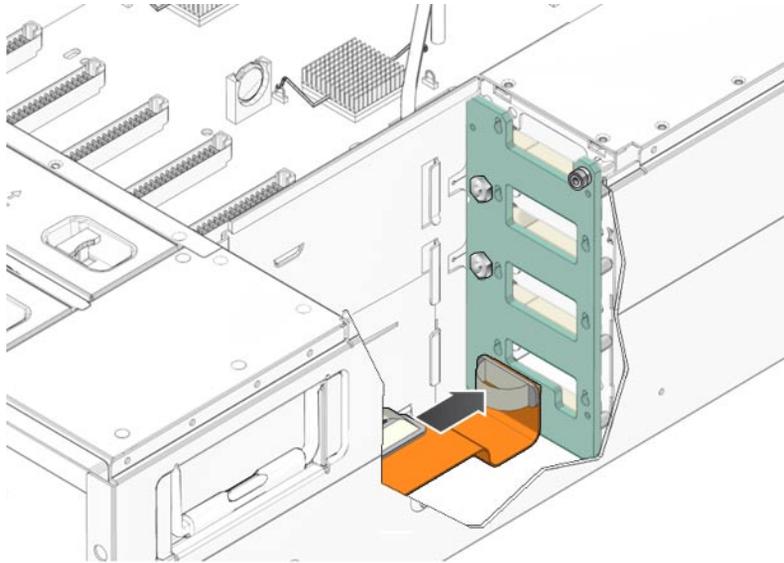
Note – The bus bars might be covered with a mylar insulation. Do *not* remove the insulation. The insulation protects the DIMMs on the CPU module in slot A.

- 8 To secure the negative bus bar flat against the midwall, push on the bus bar and tighten the negative bus-bar nut.



- 9 Use a 3 mil shim stock to verify the minimum clearance between the insulation on the bus bars and the DIMMs on a fully-loaded CPU module. See ["Bus Bar to DIMM Clearance Verification"](#) on page 76.
The DIMMs must *not* contact the insulation on the bus bars.
- 10 Torque both bus-bar nuts to 7 inch-pounds (0.8 newton-meters).
- 11 Tighten the captive screws that secures the power distribution board to the chassis.

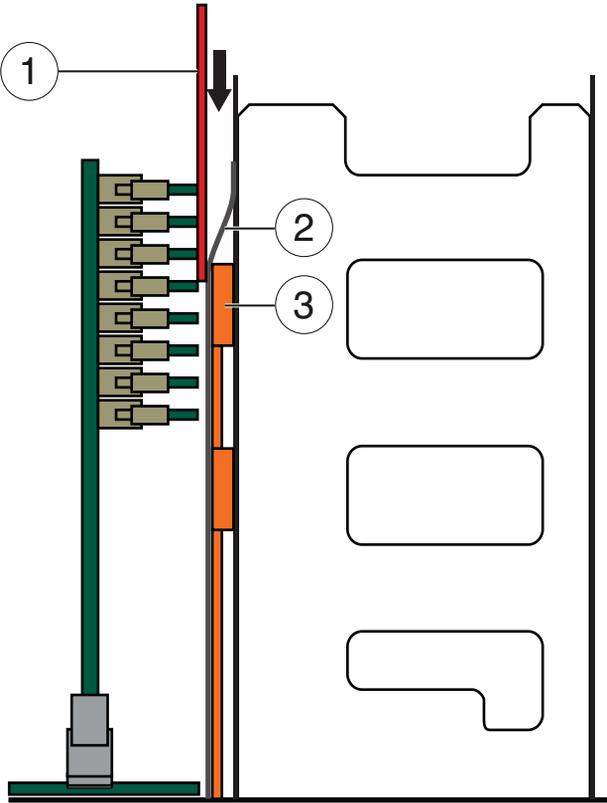
- 12 Reconnect the flex cable connector to the connector on the power distribution board .



- 13 Install all power supplies. See [“How to Install a Power Supply”](#) on page 56.
- 14 Prepare the server for operation. See [“How to Prepare the Server for Operation”](#) on page 27.

Bus Bar to DIMM Clearance Verification

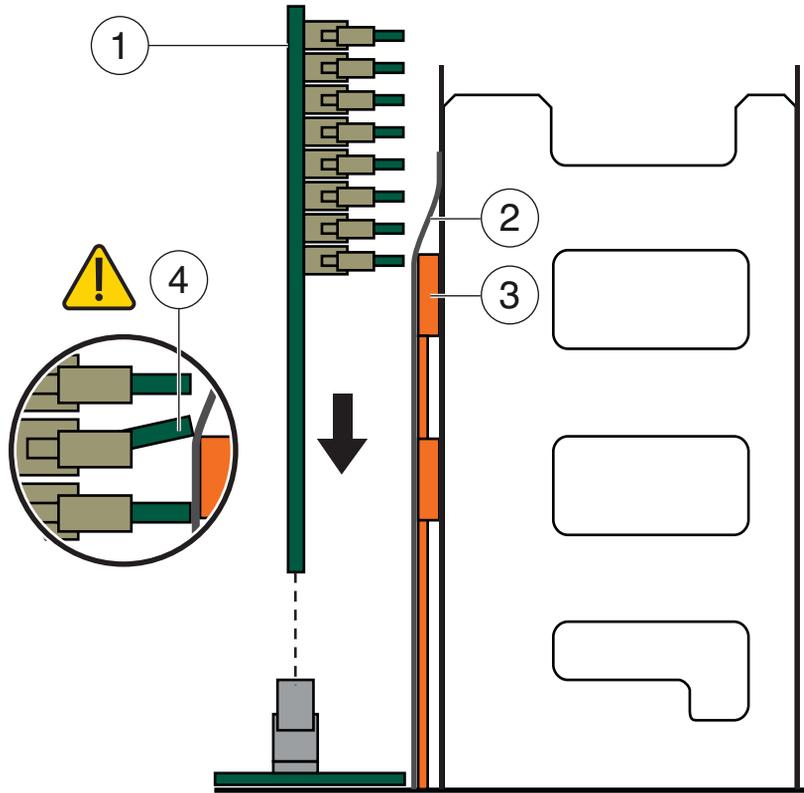
To check the clearance between the DIMMs on a CPU module and the bus bars use a shim.



Legend

- 1 Shim stock
- 2 Bus bars
- 3 Mylar covering

If the clearance is less than the minimum distance, a risk of damage to the DIMM modules exists when the CPU module is installed into its slot.



Legend

- 1 CPU module with DIMMs
 - 2 Mylar cover on the bus bars
 - 3 Bus bars
 - 4 DIMM contacting the mylar on the bus bars
-

Return to [Step 9](#) of the procedure, “[How to Install the Power Distribution Board](#)” on page 72.

Replacing the Fan Tray Carriage (FRU)

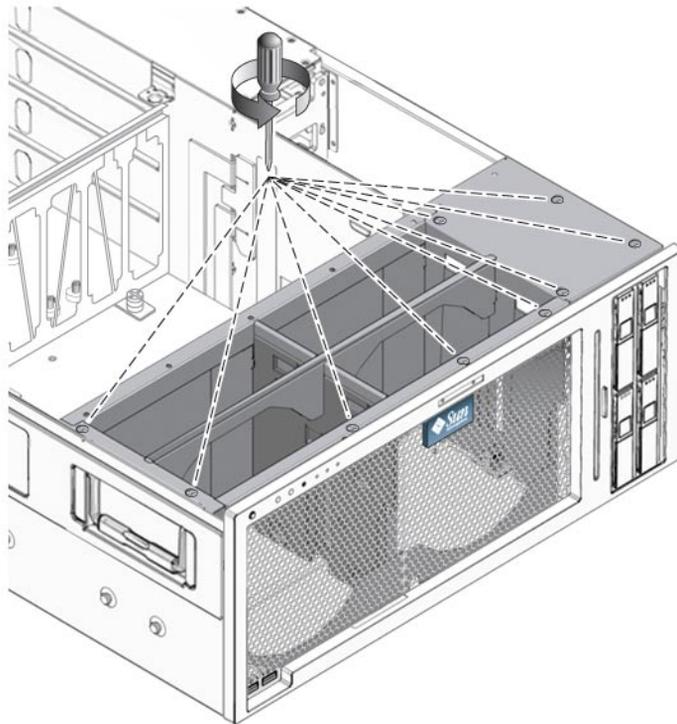
Note – This component is a FRU (field-replaceable unit). Use a qualified Sun trained service person to replace this component.

- “[How to Remove the Fan Tray Carriage](#)” on page 79

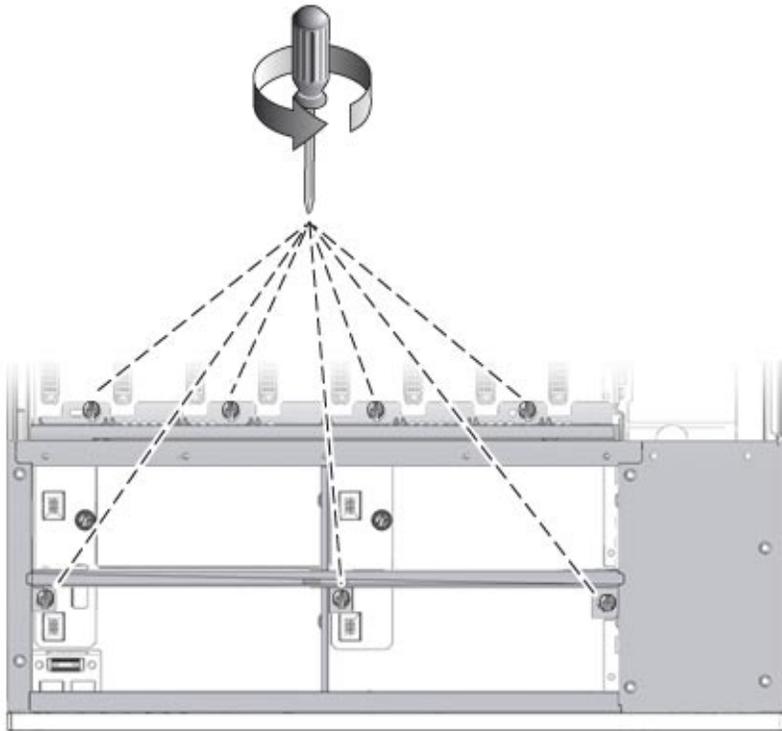
- “How to Install the Fan Tray Carriage” on page 81

▼ How to Remove the Fan Tray Carriage

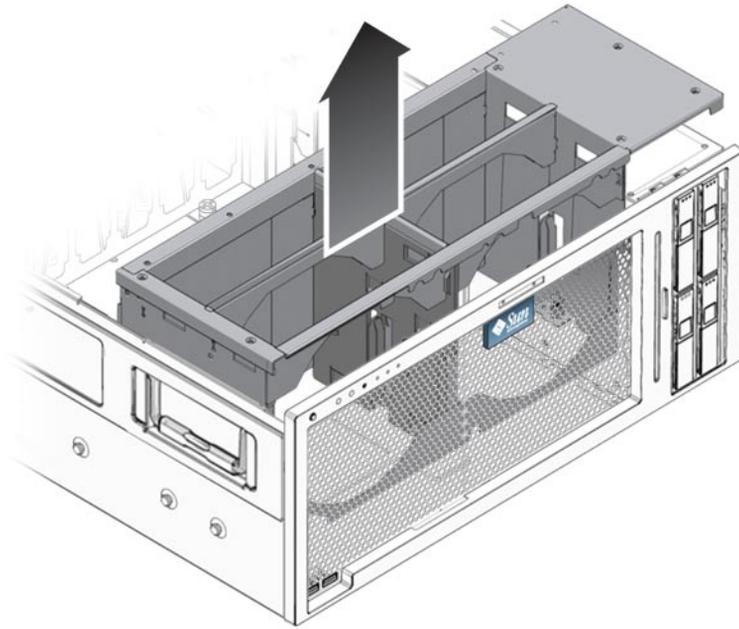
- 1 Prepare the server for service. See “How to Prepare the Server for Service” on page 22.
- 2 Remove all of the fan trays from the fan tray carriage. See “How to Remove the Fan Tray” on page 58.
- 3 Remove all of the CPU modules. See “How to Remove a CPU Module or Filler Card” on page 40.
- 4 Remove the nine screws from the top of the fan tray carriage.



- 5 Loosen the seven captive screws that secure the fan tray carriage to the chassis and the motherboard.



- 6 Lift the fan tray carriage out of the chassis.



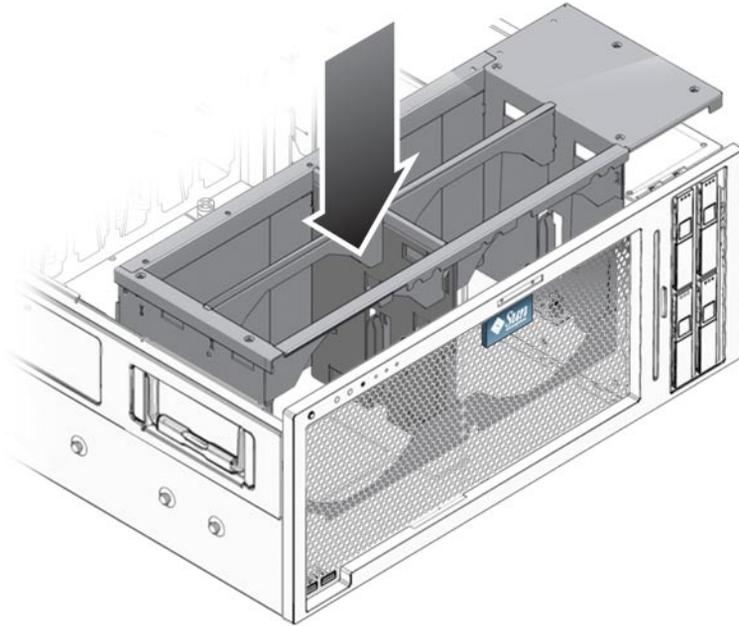
- See Also**
- “Replacing the Fan Tray (CRU)” on page 57
 - “How to Install the Fan Tray Carriage” on page 81

▼ How to Install the Fan Tray Carriage

- Before You Begin**
- You need a torque screwdriver to tighten the screws to correct specification.

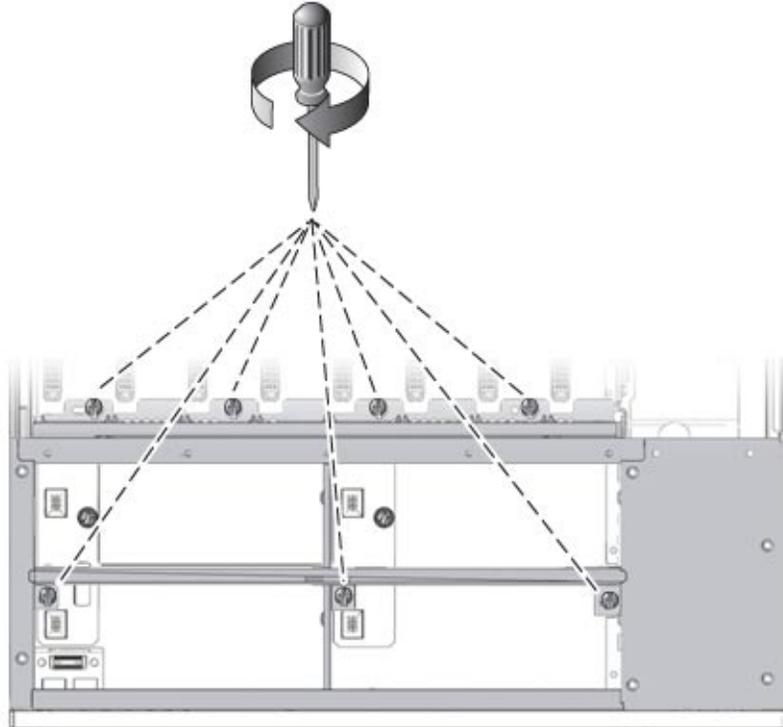
- 1 Lower the fan tray carriage into the chassis until it is seated firmly against the motherboard and the top of the chassis.**

There are two alignment pins on the motherboard that match the holes on the bottom of the fan tray carriage.

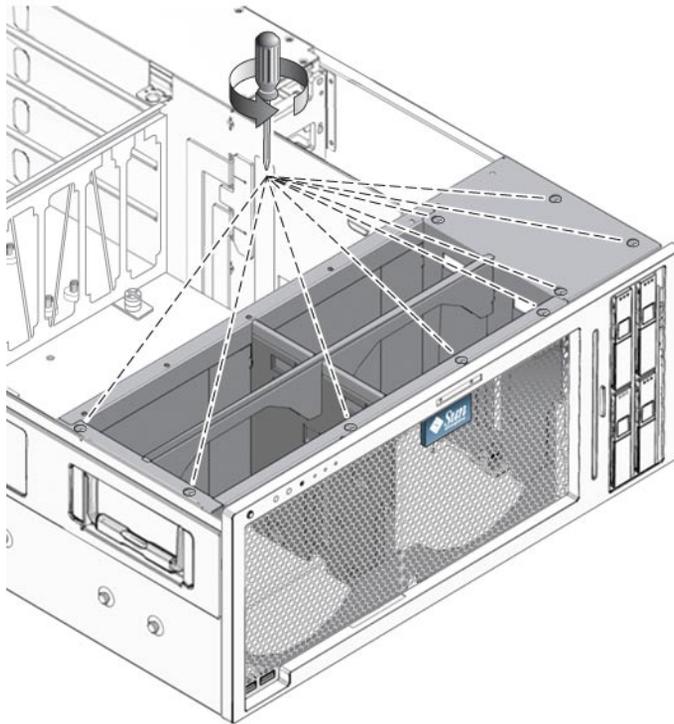


- 2 Tighten the seven captive screws that secure the fan tray carriage to the chassis and the motherboard.**

Torque the screws to 7 inch-pounds.



- 3 Secure the fan tray carriage to the top of the chassis using the nine screws.**
Torque the screws to 7 inch-pounds.



- 4 Install the fan trays. See “How to Install the Fan Tray” on page 59.**

See Also ■ “How to Remove the Fan Tray Carriage” on page 79

Replacing the Front Panel Indicator Board (FRU)

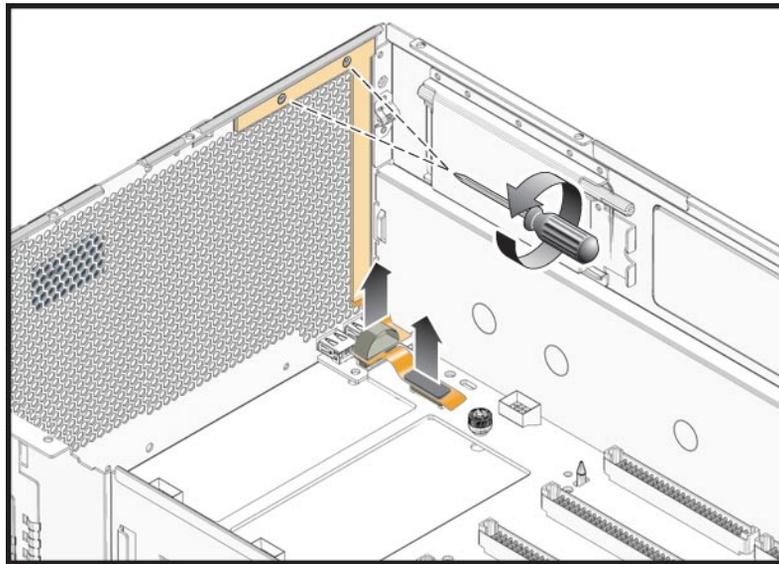
Note – This component is a FRU (field-replaceable unit). Use a qualified Sun trained service person to replace this component.

- “How to Remove the Front Panel Indicator Board ” on page 85
- “How to Install the Front Panel Indicator Board” on page 87

▼ How to Remove the Front Panel Indicator Board

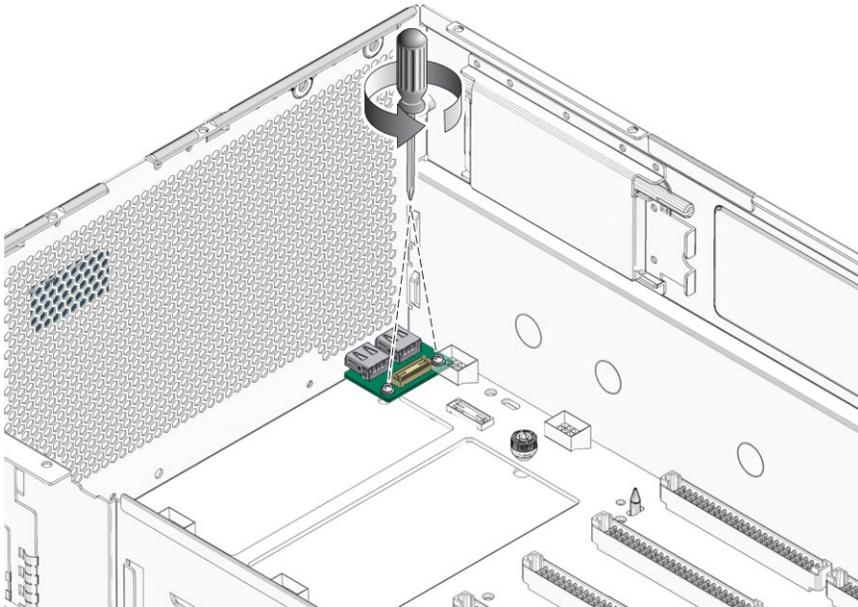
- 1 Prepare the server for service. See [“How to Prepare the Server for Service”](#) on page 22.
- 2 Remove all fan trays from the fan tray carriage. See [“How to Remove the Fan Tray”](#) on page 58.
- 3 Remove all CPU modules or CPU filler boards from the chassis. See [“How to Remove a CPU Module or Filler Card”](#) on page 40.
- 4 Remove the fan tray carriage from the chassis. See [“How to Remove the Fan Tray Carriage”](#) on page 79.
- 5 Disconnect the indicator board’s two flex cable connectors from the connectors on the front I/O board and the motherboard.

Use the plastic-strip handles to gently pull the connectors straight up.



- 6 Remove the two screws securing the flex cable to the front panel and remove the flex cable.

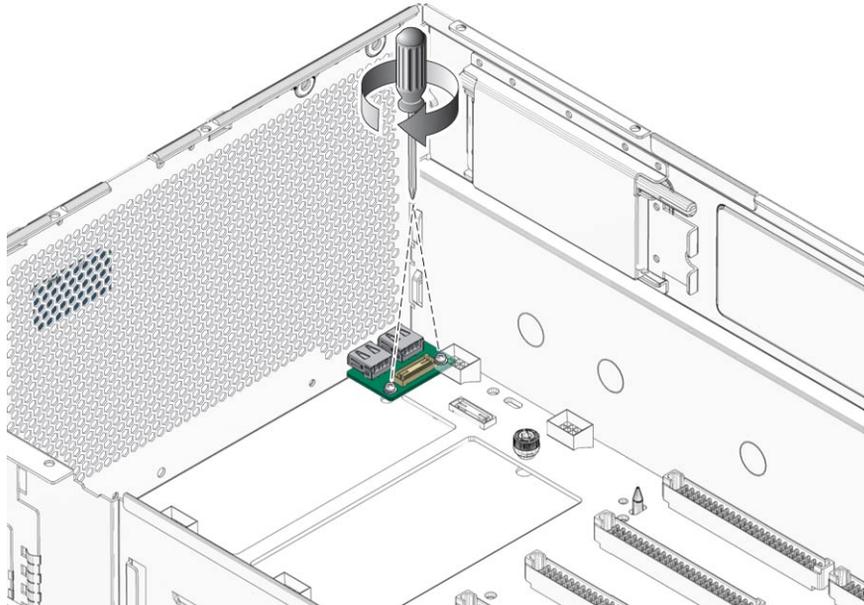
- 7 Remove the two screws that secure the indicator board to the inside-front of the chassis.



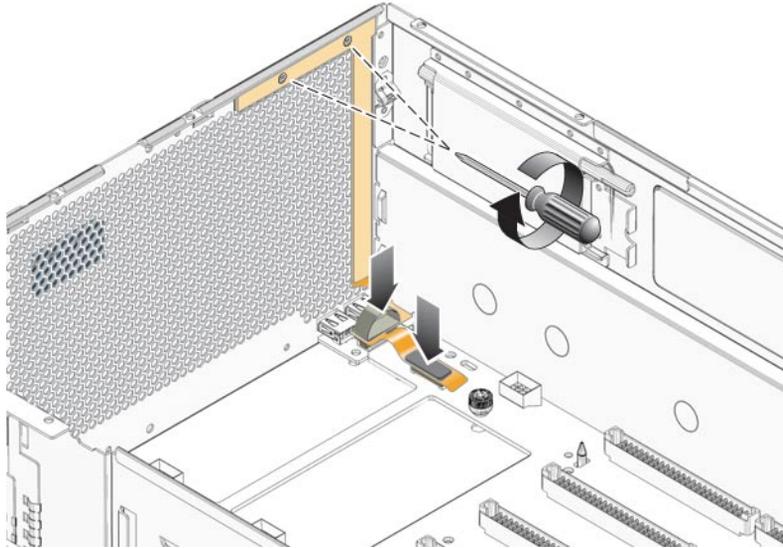
See Also ■ [“How to Install the Front Panel Indicator Board” on page 87](#)

▼ How to Install the Front Panel Indicator Board

- 1 Align the holes in the indicator board with the two screw holes in the inside front of the chassis.
- 2 Secure the indicator board to the chassis using the two screws.
Torque screws to 7 inch-pounds (0.8 newton-meters).



- 3 Connect the two flex cable connectors to the connectors on the front I/O board and the motherboard. Carefully align the connectors, then gently push down on the top of the flex cable connectors.



- 4 Secure the flex cable to the front panel using the two screws.
- 5 Install the fan tray carriage. See [“How to Install the Fan Tray Carriage” on page 81](#).
- 6 Install all CPU modules or CPU filler boards. See [“How to Install a CPU Module or Filler Card” on page 44](#).
- 7 Install all fan trays. See [“How to Install the Fan Tray” on page 59](#).
- 8 Prepare the server for operation. See [“How to Prepare the Server for Operation” on page 27](#).

Replacing the Front I/O Board (FRU)

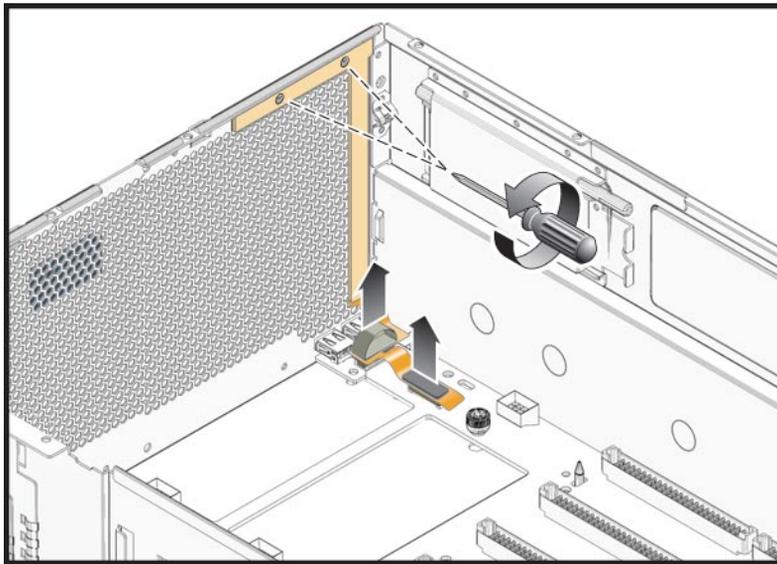
Note – This component is a FRU (field-replaceable unit). Use a qualified Sun trained service person to replace this component.

- [“How to Remove the Front I/O Board” on page 89](#)
- [“How to Install the Front I/O Board” on page 90](#)

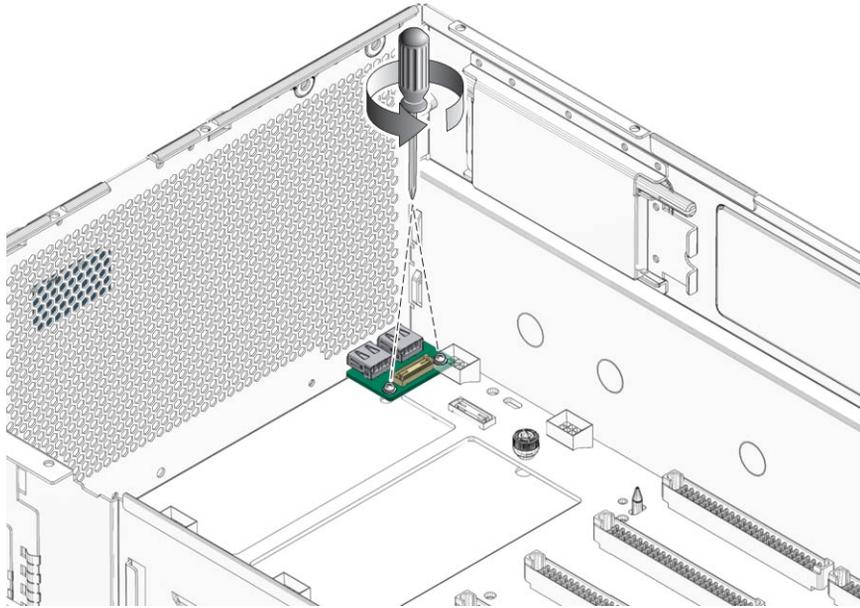
▼ How to Remove the Front I/O Board

- 1 Prepare the server for service. See [“How to Prepare the Server for Service”](#) on page 22.
- 2 Remove all fan trays from the fan tray carriage. See [“How to Remove the Fan Tray”](#) on page 58.
- 3 Remove all CPU modules or CPU filler boards from the chassis. See [“How to Remove a CPU Module or Filler Card”](#) on page 40.
- 4 Remove the fan tray carriage from the chassis. See [“How to Remove the Fan Tray Carriage”](#) on page 79.
- 5 Disconnect the two flex cable connectors that come from the front panel indicator board from the front I/O board and the motherboard.

It is not necessary to remove the front panel indicator board.



- 6 Remove the two screws that secure the front I/O board to the chassis floor.



- 7 Remove the board from the chassis.

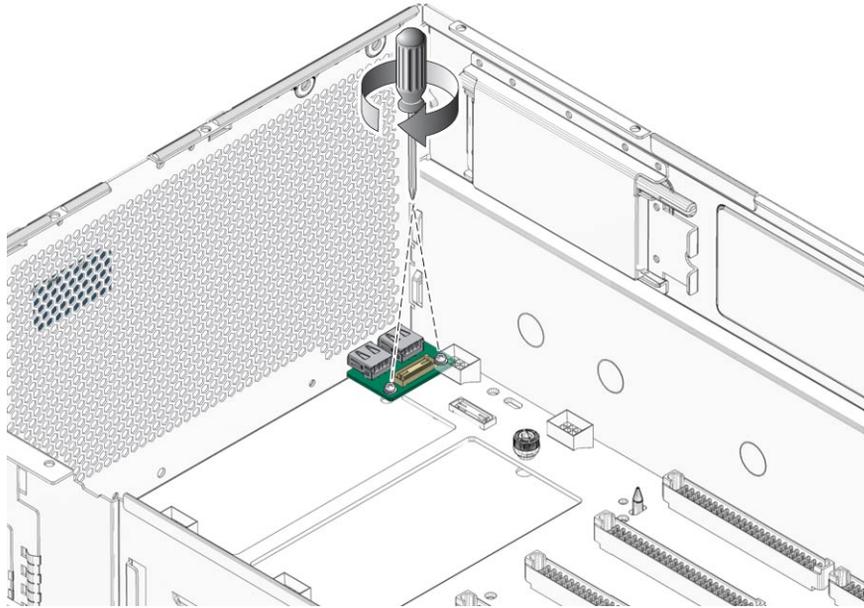
See Also ■ [“How to Install the Front I/O Board” on page 90](#)

▼ How to Install the Front I/O Board

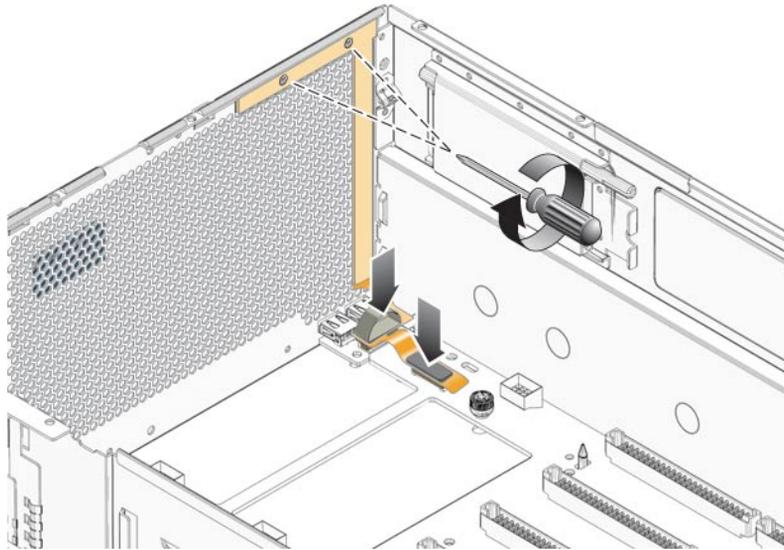
- 1 Perform the steps to remove the old front I/O board. See [“How to Remove the Front I/O Board” on page 89](#).
- 2 Align the new I/O board so that the holes in the board are aligned with the screw holes in the chassis floor.

Ensure that the two USB connectors on the board are pressed squarely against the openings in the chassis front.

- 3 Secure the I/O board to the chassis floor using the two screws. Torque screws to 7 inch-pounds (0.8 newton-meters).



- 4 Reconnect the two flex cable connectors that come from the front panel indicator board to the front I/O board and the motherboard.



- 5 Install the fan tray carriage to the chassis. See [“How to Install the Fan Tray Carriage”](#) on page 81.
- 6 Install all CPU modules or CPU filler boards. See [“How to Install a CPU Module or Filler Card”](#) on page 44.
- 7 Install all fan trays. See [“How to Install the Fan Tray”](#) on page 59.
- 8 Prepare the server for operation. See [“How to Prepare the Server for Operation”](#) on page 27.

See Also ▪ [“How to Remove the Front I/O Board”](#) on page 89

Replacing a Hard Disk Backplane (FRU)

Note – This component is a FRU (field-replaceable unit). Use a qualified Sun trained service person to replace this component.

- [“How to Remove the Hard Disk Backplane”](#) on page 93
- [“How to Install the Hard Disk Backplane”](#) on page 95

Note – Label any hard drives that you remove. Hard drives must be reinstalled in the original slot.

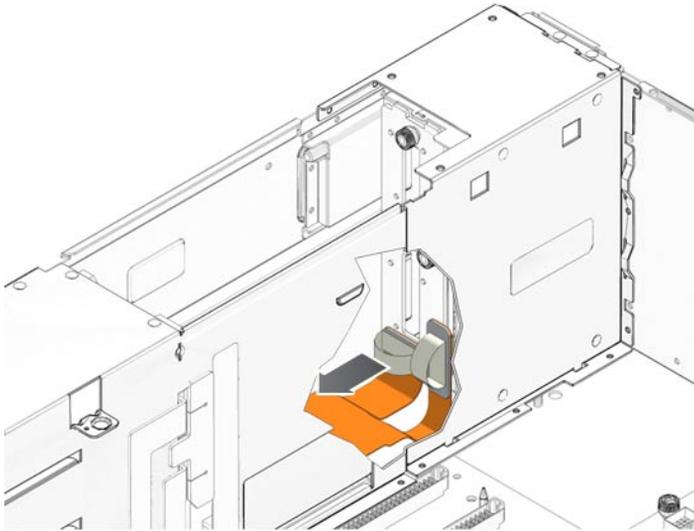
▼ How to Remove the Hard Disk Backplane

- 1 Prepare the server for service. See [“How to Prepare the Server for Service” on page 22.](#)
- 2 Before removing the hard drives and hard drive fillers, label each one to designate the slot from which you removed it.
Use tape, adhesive notes, or another method to label the drives so you can install them in their original slots at the end of the procedure. For information about hard drive designations, see [“Hard Drive Designation” on page 37.](#)

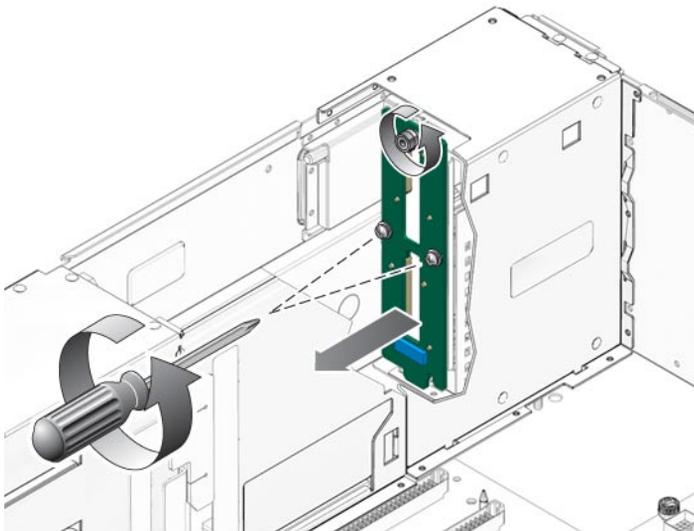
Note – Always return the hard drive to the same slot from which you removed it.

- 3 Remove all hard drives and hard drive fillers from the drive bays. See [“How to Remove a Hard Drive” on page 35.](#)
- 4 Remove all fan trays from the fan tray carriage. See [“How to Remove the Fan Tray” on page 58.](#)
- 5 Before removing the CPU modules, label each one to designate the slot from which you removed it.
- 6 Remove all CPU modules or CPU filler boards from the chassis. See [“How to Remove a CPU Module or Filler Card” on page 40.](#)
- 7 Remove the fan tray carriage from the chassis. See [“How to Remove the Fan Tray Carriage” on page 79.](#)

- 8 Disconnect the flex cable connector from the rear of the hard drive backplane.



- 9 Remove the two screws that secure the hard drive backplane to the rear of the drive bays.
- 10 Loosen the single captive screw that secures the hard drive backplane.



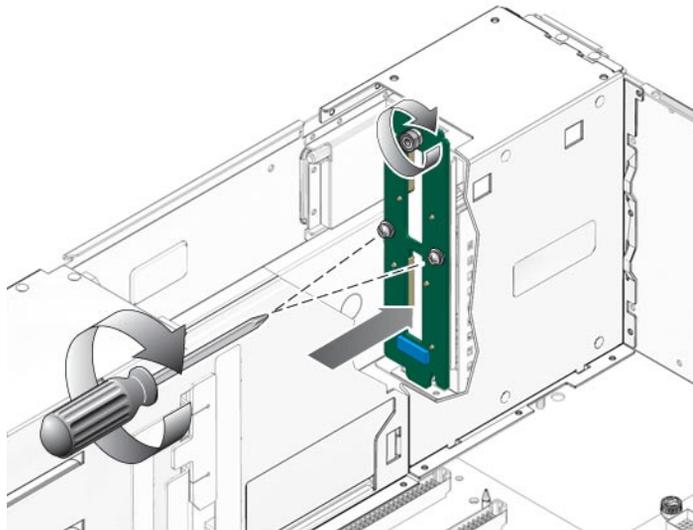
- 11 Remove the backplane from the chassis.

- See Also**
- “How to Install the Hard Disk Backplane” on page 95
 - “Hard Drive Designation” on page 37

▼ How to Install the Hard Disk Backplane

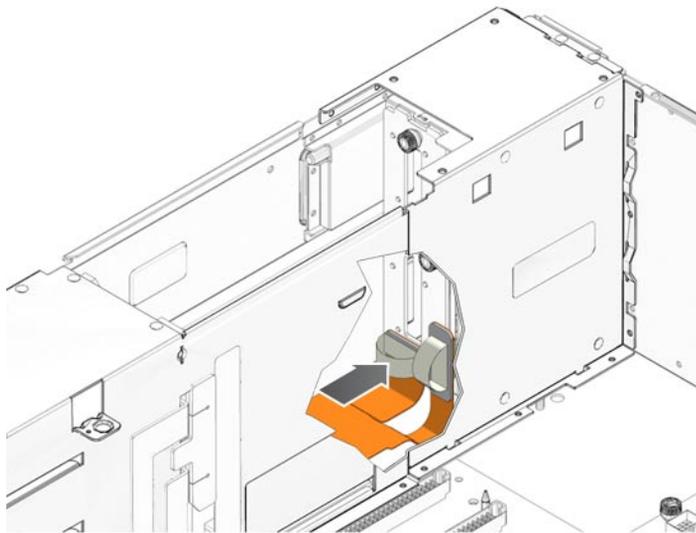
- 1 If necessary, perform the steps to remove the hard drive backplane. See “[How to Remove the Hard Disk Backplane](#)” on page 93.
- 2 Position the new hard drive backplane against the rear of the hard drive bay so that the holes in the backplane align with the screw holes in the chassis.
- 3 Replace and tighten the two screws that secure the hard drive backplane to the rear of the drive bays.

Torque screws to 7 inch pounds (0.8 newton meters).



- 4 Tighten the single captive screw that secures the hard drive backplane. Torque screw to 7 inch-pounds (0.8 newton-meters).

- 5 Reconnect the flex cable connector to the rear of the hard drive backplane.



- 6 Reinstall all hard drives or hard drive fillers that you removed. See [“How to Install a Hard Drive” on page 38.](#)

Note – Install the hard drives and hard drive fillers in the same slot from which you removed them.

- 7 Prepare the server for operation. See [“How to Prepare the Server for Operation” on page 27.](#)

See Also ■ [“How to Remove the Hard Disk Backplane” on page 93](#)

Replacing the Motherboard (FRU)

Note – This component is a FRU (field-replaceable unit). Use a qualified Sun trained service person to replace this component.

- [“Motherboard Connectors and Fasteners” on page 97](#)
- [“How to Remove the Motherboard” on page 98](#)
- [“How to Install the Motherboard” on page 102](#)

Motherboard Connectors and Fasteners

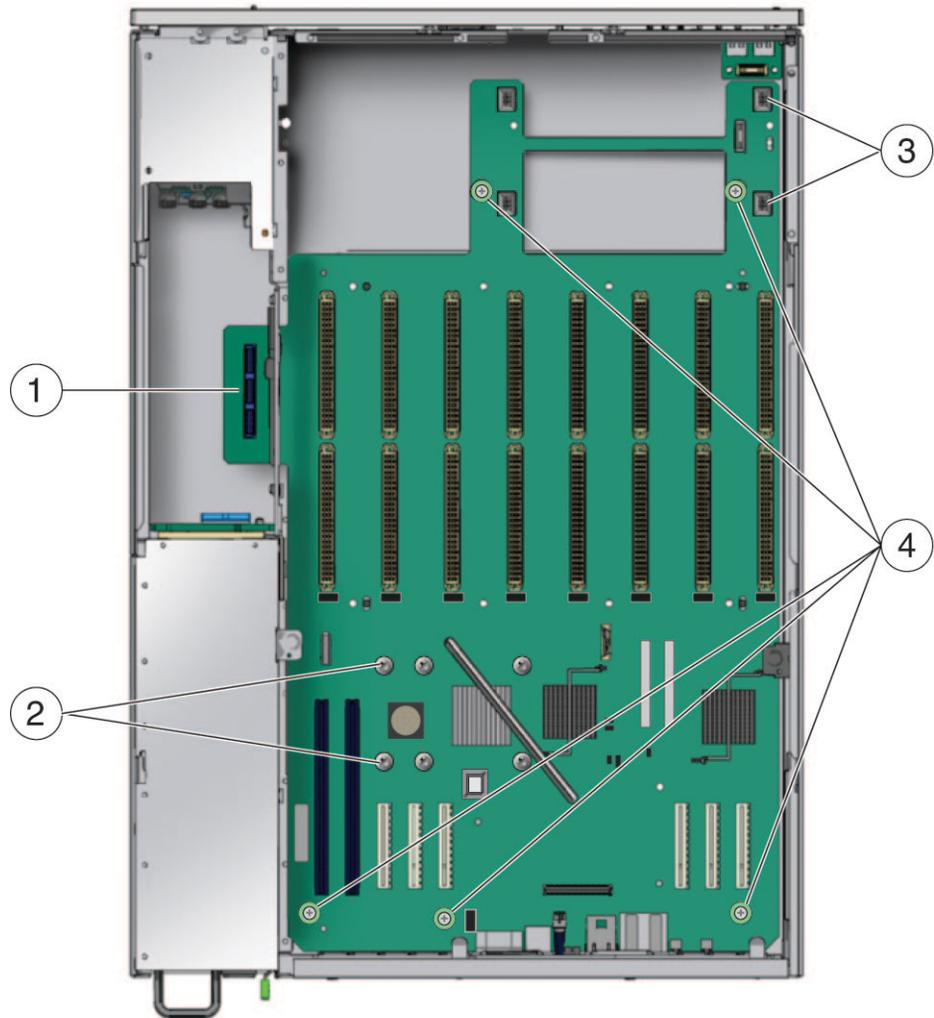


Figure Legend

- 1 Main flex cable connector
 - 2 Bus bar screws (6)
 - 3 Front flex cable connector
-

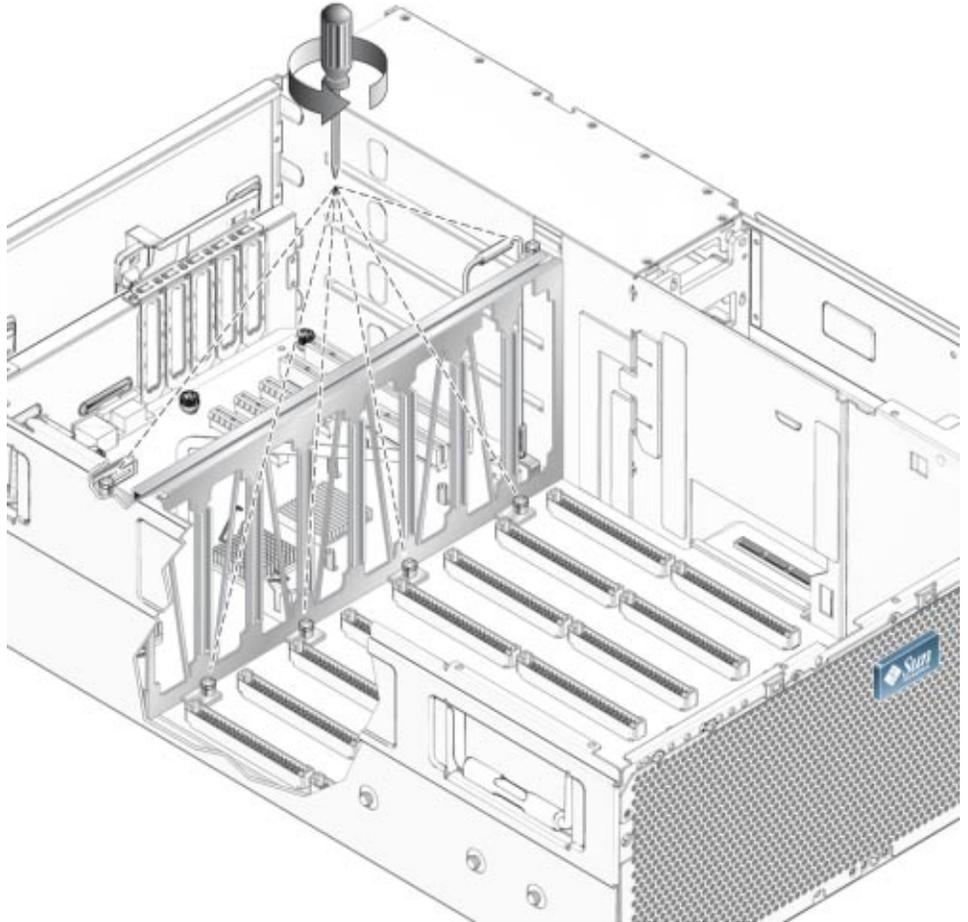
Figure Legend

4 Captive screws (5)

▼ How to Remove the Motherboard

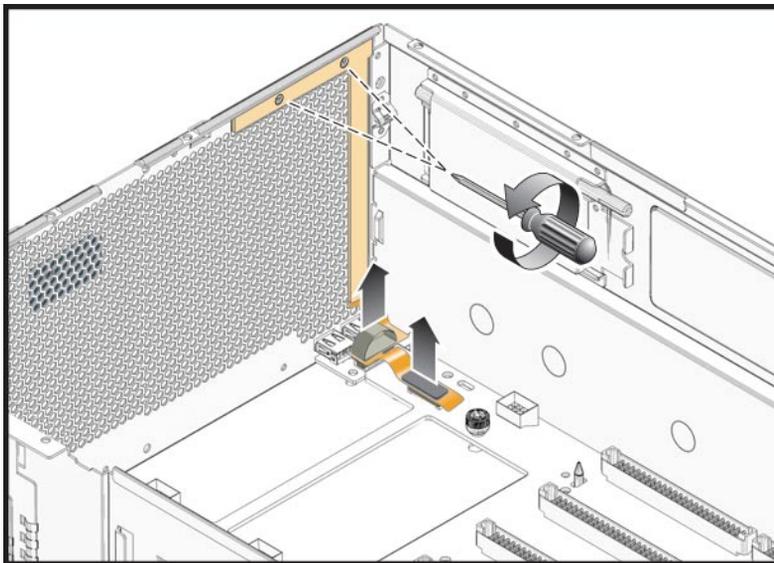
- Before You Begin**
- If you are replacing a motherboard that is not dead, obtain the BIOS and ILOM versions and download the system software release package (combined BIOS/ILOM) that incorporates those versions. A system software release package can be downloaded from: <http://support.oracle.com>.
 - If you are replacing a dead motherboard, obtain the ILOM version and download the system software release package (combined BIOS/ILOM) that incorporates that version. A system software release package can be downloaded from: <http://support.oracle.com>.
 - Copy down the motherboard serial number information.
- 1 **Prepare the server for service.** See [“How to Prepare the Server for Service” on page 22](#).
 - 2 **Remove the fan tray carriage from the chassis.** See [“How to Remove the Fan Tray Carriage” on page 79](#).

- 3 To remove the rear CPU module guide from the chassis, loosen the six captive screws that secure the guide to the motherboard and chassis.



- 4 Lift up evenly on both sides of the guide to remove it from the edge-guides in the chassis.
- 5 Disconnect the main flex cable from the motherboard connector. See [“Motherboard Connectors and Fasteners” on page 97](#).

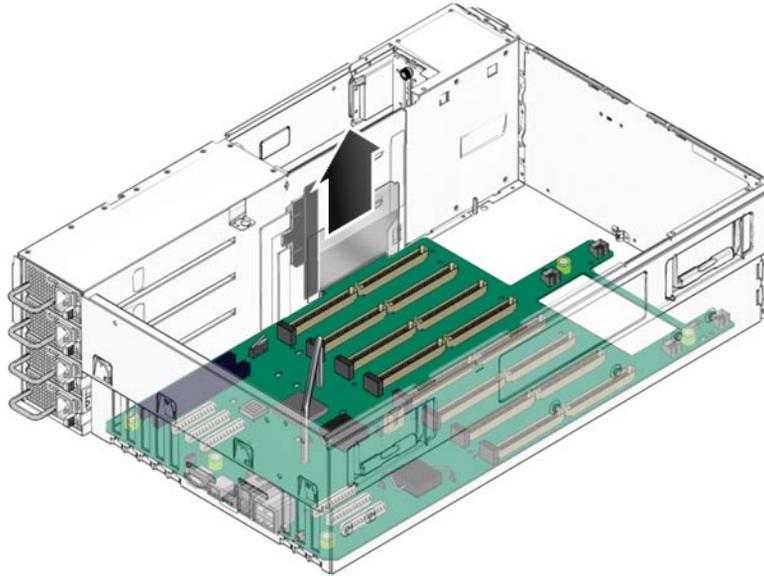
- 6 Disconnect the front panel flex cable from the motherboard connector.



- 7 Remove the six bus bar screws that secure the motherboard to the power bus bars. See ["Motherboard Connectors and Fasteners" on page 97.](#)
- 8 Loosen the five captive screws that secure the motherboard to the chassis. See ["Motherboard Connectors and Fasteners" on page 97.](#)

- 9 Slide up the small metal door in the chassis midwall (near the flex-cable connector) to provide clearance for the power tab of the motherboard.

The metal door stays open when you slide it up into the retaining clips.

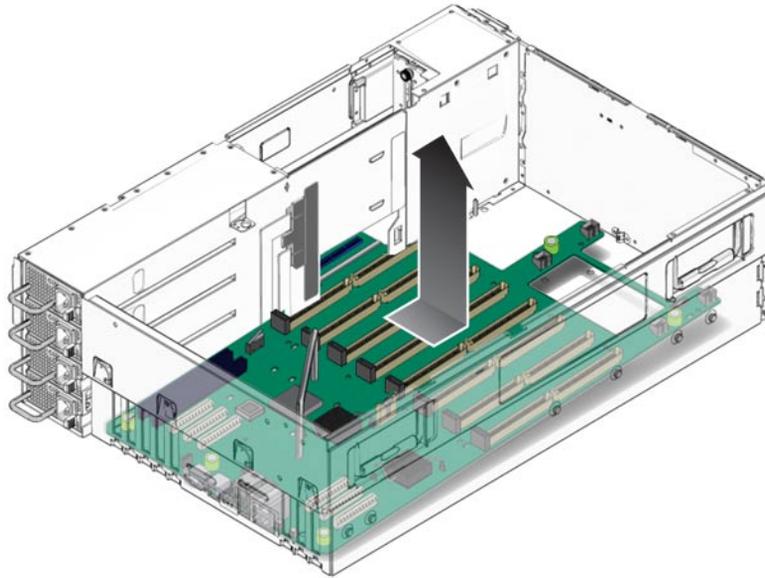


- 10 Use the motherboard lifting handle to raise the forward edge of the board until it has cleared the bus bar studs.



Caution – When lifting the board, avoid damaging the light pipes and connectors on the rear edge of the motherboard.

- 11 **Slide the board toward the front of the chassis until the connectors and light pipes are clear of the chassis back panel.**



- 12 **Lift the motherboard and remove it from the chassis.**
Underneath the motherboard is a sheet of mylar insulation. This insulation must stay with the chassis. Do *not* remove it with the motherboard.
- 13 **Ensure that the mylar insulation remains in the chassis and is correctly installed.**
The mylar insulation should lie flat. It is stamped to fit within the chassis and uses the standoff and support pegs for alignment.

Next Steps ■ [“How to Install the Motherboard” on page 102](#)

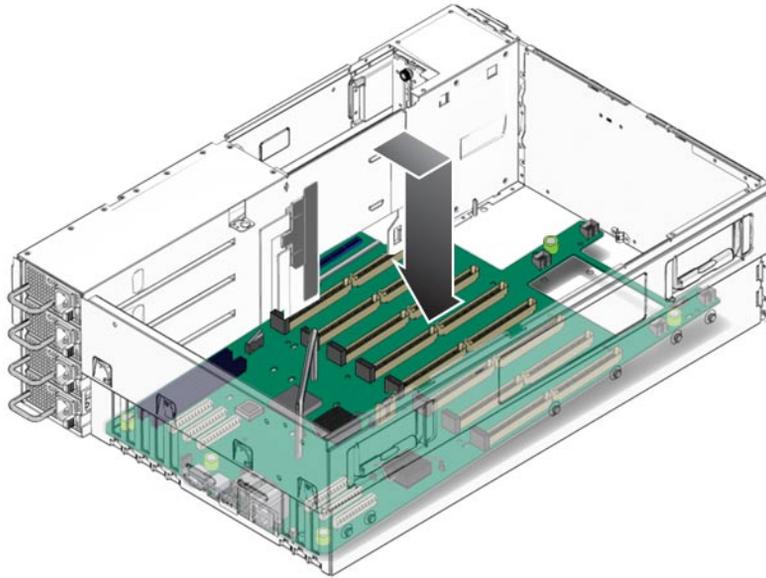
▼ **How to Install the Motherboard**

- 1 **If necessary, perform the steps to remove the old motherboard. See [“How to Remove the Motherboard” on page 98](#).**
- 2 **Ensure that the mylar insulation is in the chassis and that it is correctly installed.**
The mylar insulation should lie flat. It is stamped to fit within the chassis and uses the standoff and support pegs for alignment.

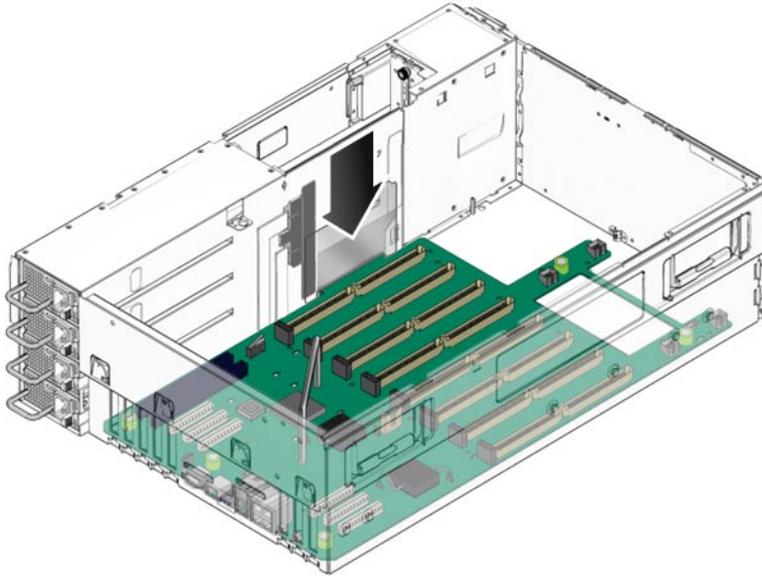


Caution – Potential for component damage. Do *not* install the motherboard without the mylar insulation in place.

- 3 Carefully lower the new motherboard into the chassis with the rear of the motherboard tilted downward.
- 4 Insert the motherboard power tab into the opening in the chassis midwall.
- 5 Insert the light pipes and connectors on the motherboard into the corresponding holes in the chassis back panel.
- 6 Lower the front of the motherboard, using care to align the corresponding holes in the motherboard over the six bus-bar bolts.

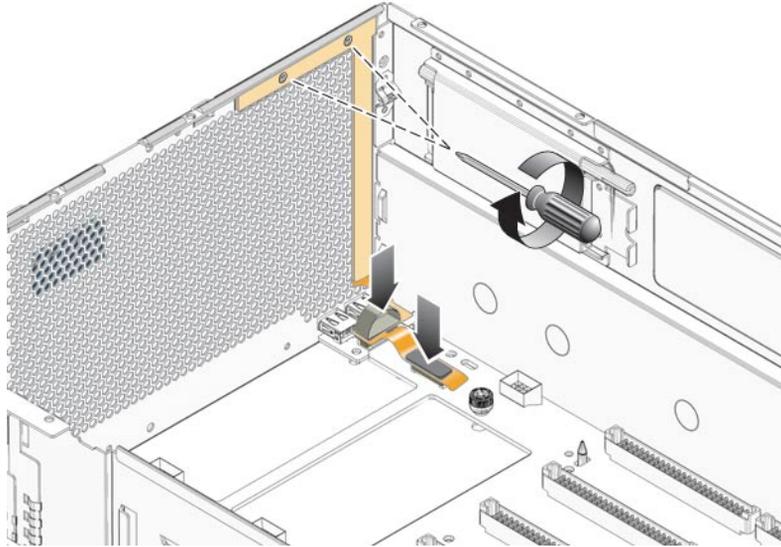


- 7 Lower the small metal door in the chassis midwall that closes over the motherboard power tab.**
When you slide the door down, first push outward on the door's handle to free it from the tab in the chassis midwall. This door must be closed to ensure proper air circulation and cooling.



- 8 Secure the motherboard to the power bus bars using the six screws.**
Torque screws to 7 inch-pounds (0.8 newton meters).
- 9 Tighten the five captive screws that secure the motherboard to the chassis.**
Torque screws to 7 inch-pounds (0.8 newton meters).
- 10 Connect the flex cable to the motherboard connector.**

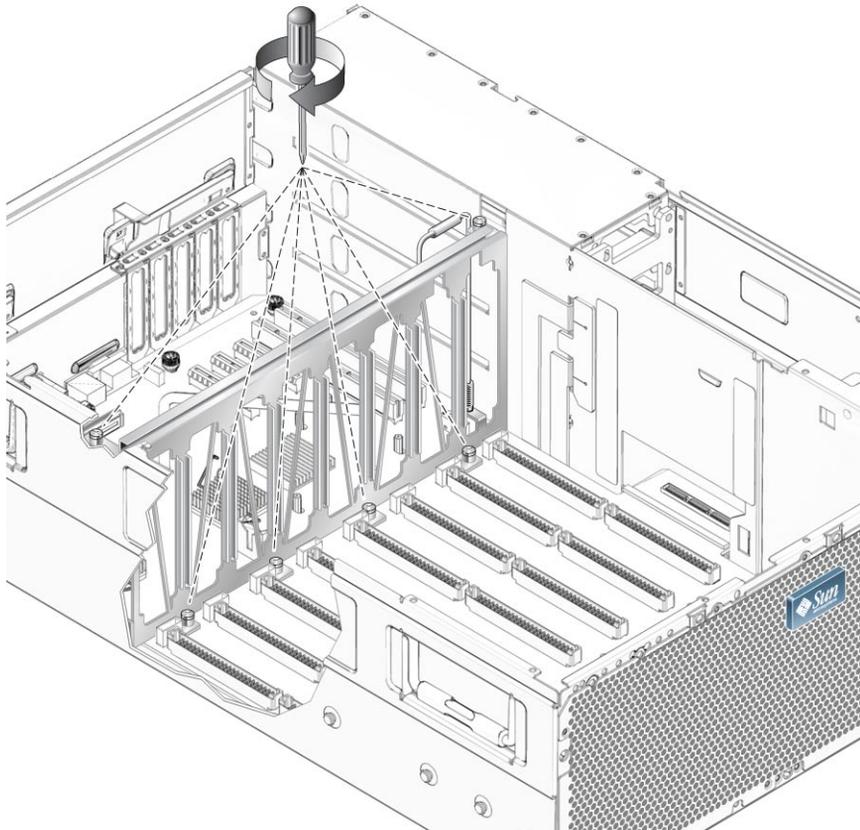
- 11 Connect the front indicator board flex cable to the motherboard flex cable connector.



- 12 To install the rear CPU module guide, align the edges of the guide with the metal edge-guides in the chassis, then lower the guide until it is seated firmly against the motherboard.

When you install the guide, be sure to align it so that the interlock switch lever is over the interlock switch on the motherboard.

- 13 To secure the guide to the motherboard and chassis, tighten the six captive screws.



- 14 Install the fan tray carriage. See [“How to Install the Fan Tray Carriage”](#) on page 81.
- 15 Install any PCI cards. See [“How to Install a PCI Card”](#) on page 52.
- 16 Install the CPU modules and filler cards. See [“How to Install a CPU Module or Filler Card”](#) on page 44.
- 17 Prepare the server for operation. See [“How to Prepare the Server for Operation”](#) on page 27.
- 18 Update the motherboard FRU information. See [“Updating Field-Replaceable Unit Information”](#) on page 107.

- 19 **Update the system with the BIOS/ILOM firmware package you downloaded earlier. See the “Before You Begin” section in “How to Remove the Motherboard” on page 98.**

This will ensure that both the BIOS and ILOM firmware (which are packaged and tested together) are at a supported level.

For information about updating firmware, see “Updating Firmware” in *Sun ILOM 3.0 Supplement for the Sun Fire X4640 Server*.

Updating Field-Replaceable Unit Information

After you replace a motherboard or a CPU module, you need to update field-replaceable unit (FRU) system information.

- “How To Update Motherboard FRU Information” on page 107
- “How to Update CPU Module FRU Information” on page 108

▼ How To Update Motherboard FRU Information

When replacing a motherboard, you need to update the FRU serial number information on the replacement motherboard for warranty tracking.

Note – This procedure must be performed by an Oracle service technician using the ILOM 'sunservice' account enabled in Escalation mode.

- Before You Begin**
- You must have network access the server's service processor (SP) including the SP IP address.
 - You must have the correct motherboard serial number to be transferred to the replacement motherboard.

1 Open a terminal window.

The command prompt appears.

2 Using an SSH connection, log in to the sunservice account of the server's ILOM service processor.

```
$ ssh sunservice@SP_IP_address
```

Where *SP_IP_address* is the IP address of the server's SP.

3 Enter the escalation password when prompted.

4 At the ILOM command prompt, export the replacement motherboard's product information file to shared memory using frutool:

```
-> frutool -t mb --read_cmm_product_area > /dev/shm/product.info
```

5 Open the `product.info` file (under `/dev/shm/`) in a command-line text editor and update the serial number to the correct version.

6 Import the updated `product.info` file back to the motherboard:

```
-> frutool -t mb --write_cmm_product_area < /dev/shm/product.info
```

7 Confirm that the motherboard FRU information has been successfully updated:

```
-> frutool -t mb --read_cmm_product_area
```

If the serial number matches the correct version, the FRU has been successfully updated.

8 Remove the temporary `product.info` file from shared memory:

```
-> rm /dev/shm/product.info
```

9 Reboot the server's SP.

```
-> reset /SP
```

A reboot enables the SP to re-read the FRUID data.

See Also ■ [“Replacing the Motherboard \(FRU\)” on page 96](#)

▼ How to Update CPU Module FRU Information

Use this procedure to update the FRU information for the CPU modules installed in the server. Each CPU module must be updated individually. That is, you must enter the FRU command for each module installed in the server.

1 Open a terminal window.

The command-line prompt appears.

2 Use the secure copy command to copy the motherboard-specific `.bin` file to the service processor's `SunService/coredump` directory:

```
$ scp 885-1568-03.bin sunservice@SP_IP:/coredump
```

where `SP_IP` is the IP address of the server's service processor (SP).

3 Access the SP.

```
ssh sunservice@SP_IP
```

where `SP_IP` is the IP address of the server's SP.

The command-line interface prompt appears.

```
->
```

4 Use the `cd` command to navigate to the `coredump` directory.

```
-> cd /coredump
```

5 Update CPU module FRU information for each CPU module that you installed or removed. To update the FRU information, enter the command and target the specific module by specifying the module's slot number (`pb:#`):

```
-> frutool -w pb:slot_# < 885-1568-03.bin
```

where `slot_#` is the slot number of the CPU module.

For example:

- To update the FRU information for the CPU module installed in slot 0:

```
-> frutool -w pb:0 < 885-1568-03.bin
```

When the prompt returns the update is complete.

- To update the FRU information for the CPU module installed in slot 7 (the last slot):

```
-> frutool -w pb:7 < 885-1568-03.bin
```

When the prompt returns the update is complete.

6 To exit the CLI, enter the command:

```
-> exit
```

See Also ▪ [“Replacing a CPU Module and Filler Card \(CRU\)” on page 39](#)

▼ How to Update the Server CPLDs

Note – This procedure is for Oracle Service personnel only. A Sunservice account or Escalation mode access is required. Do not perform this procedure unless assisted or instructed by an Oracle Service person.

After a CPLD update, a server AC power cycle is required. The server AC power cables must be disconnected and reconnected.

Before You Begin Verify that a system with ILOM SW1.3 (3.0.3.31.d r58804) is installed.

1 Ensure the server is in standby power mode.

For more information about power modes, see [“About Power Modes” on page 11](#).

2 Access a Sunservice account or Escalation mode.

A command line appears.

3 Extract the CPLD firmware package bundled in Oracle ILOM:**a. Determine and verify the version number:**

```
+ [(flash)root@xxx:/dev/shm]# find_blob_in_flash -v cpld /dev/mtd0
```

The command reports the CPLD firmware version:

```
# 9
```

Verify the version number.

b. Extract the package:

```
+ [(flash)root@xxx:/dev/shm]# find_blob_in_flash -e /dev/shm/cpld.xsvf cpld /dev/mtd0
```

```
# 3407936 90050
```

4 Program CPLD firmware:

```
+ [(flash)root@xxx:/dev/shm]# prog_cpld /dev/shm/cpld.xsvf
```

The command returns the following:

```
# Switch JTAG chain to CPLD
```

```
# Done
```

```
# Switch JTAG chain to host CPU
```

```
# Done
```

5 Update the /conf/progparts.conf file:

```
+ [(flash)root@xxx:/dev/shm]# sed -i '/cpld/d' /conf/progparts.version
```

```
+ [(flash)root@xxx:/dev/shm]# echo "cpld: 9" >> /conf/progparts.version
```

6 Cycle the AC power for the server.

Disconnect and reconnect the server AC power cords.

7 Allow the server to enter standby power mode.

Wait approximately three minutes.

8 Boot the server.

The server is ready for operation.

Configuring the System Using the BIOS Setup Utilities

When you power on the server to full-power mode, the server boots and displays POST and boot messages and prompts. If you have a console connected to the server you can see and interact with these messages and prompts. By responding to key-based prompts, you can halt the boot process and access the setup and configuration utilities for the system BIOS and the on-board disk controller. These sections describe the BIOS Setup and the LSI BIOS configuration utilities.

Description	Link
Overview of the system BIOS and the BIOS Setup Utility	“BIOS and the BIOS Setup Utility” on page 111
Accessing and configuring the system BIOS using the BIOS Setup Utility	“How to Configure the System BIOS” on page 112
Screen shots of the BIOS Setup Utility screens and menus	“BIOS Setup Utility Screens” on page 113
Overview of the BIOS and SP update process	“BIOS and Service Processor Updates” on page 144
Overview of the LSI BIOS setup utility and	“LSI BIOS Configuration Utility” on page 145
Accessing and configuring the LSI BIOS using the configuration utility	“How to Configure the LSI BIOS” on page 145

BIOS and the BIOS Setup Utility

The Basic Input and Output System (BIOS) is a firmware-based boot program that verifies and initializes the server's input and output hardware. The BIOS prepares the server for operation and allows the server to boot into a known state and function successfully once the operating system takes control of the server. The BIOS is vitally important to the operation of your server, because it contains the necessary server-specific information required for your server to function properly. For example, the BIOS contains information about components installed in the server, the networking environment, and the operating preferences. Without a proper functioning BIOS, your server might not boot or operate properly.

The BIOS has a setup utility stored in the BIOS flash memory. The setup utility reports and stores system information, some of which the utility allows you to configure and customize. The system information is stored in the system's battery-backed CMOS RAM. If a configuration setting is invalid or if the battery power is removed or sufficiently diminished, the BIOS setting or settings (in the case of a complete loss of battery power) will revert to the factory default. The system BIOS default settings are the optimized settings for your server. Be careful when changing the default settings. An incorrect setting can negatively impact server performance or render the server inoperable and unable to boot. When you customize your BIOS you should record the values, so you can enter them into the BIOS setup utility if the system information becomes corrupted or lost.

- For information about configuring the system BIOS using the BIOS Setup Utility, see [“How to Configure the System BIOS”](#) on page 112.
- For screen shots of the BIOS Setup Utility, see [“BIOS Setup Utility Screens”](#) on page 113.
- For information about updating the system BIOS, see [“BIOS and Service Processor Updates”](#) on page 144.

▼ How to Configure the System BIOS



Caution – System performance impact. The default system BIOS settings are the optimized settings for your server. Changes to the default settings might negatively impact the performance of your server and render your server inoperable.

- 1 Connect to the system console using one of the methods described in [“Connecting to the System Console”](#) in *Sun ILOM 3.0 Supplement for the Sun Fire X4640 Server*.**
Connecting to the system console allows you to see and respond to POST and boot messages.
- 2 Reboot the server.**
To reboot the server see [“Controlling Power and Performing Hardware Reset”](#) on page 11.
- 3 Watch the console for the prompt to press F2 to access the BIOS Setup utility.**
- 4 When the prompt appears, press F2.**
The BIOS Setup utility main menu appears.
- 5 Use the left and right arrow keys to navigate the menu screens.**
For a description of the BIOS Setup utility menu screens, see [“BIOS Setup Utility Screens”](#) on page 113.
- 6 Use the down and up arrow keys to highlight the configurable settings within each screen.**

- 7 To view the options for each configurable setting, press Enter.
- 8 To change a setting, scroll through options, highlight one, and press Enter to select it.
- 9 To save your changes, press F10 to save and exit the utility or press Esc to exit the utility without saving.

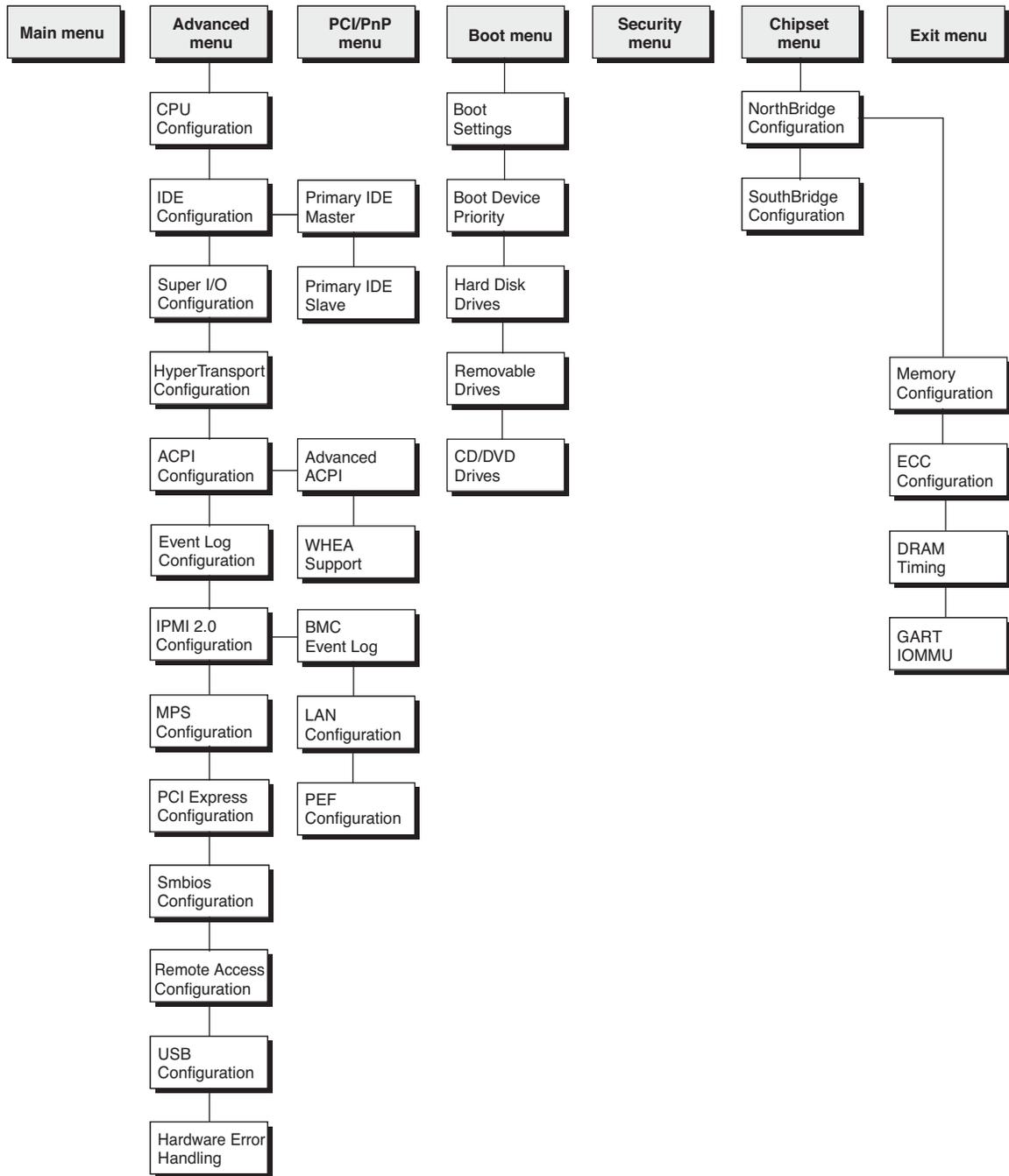
When you exit the BIOS Setup utility, the server performs a hard reset and then boots to the OS.

- See Also**
- “BIOS Setup Utility Screens” on page 113
 - “BIOS and Service Processor Updates” on page 144

BIOS Setup Utility Screens

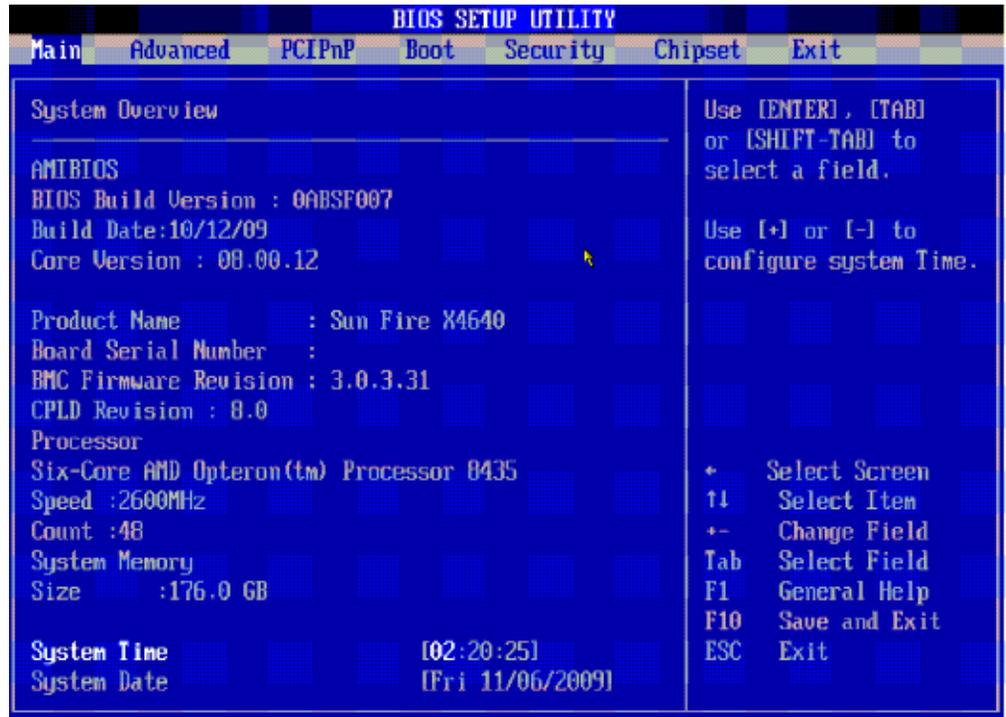
The following table describes the functions of the seven top-level BIOS Setup screens.

Screen	Description
Main	General system information.
Advanced	Submenu level configuration information for the CPUs, IDE, SuperIO, HyperTransport, ACPI, Event Log, IPMI 2.0, MPS, PCI Express, Remote Access, USB, and Hardware Error Handling.
PCI/PnP	Plug-and-Play (PnP) devices can be configured by the BIOS (default) or by the operating system (if applicable).
Boot	Configure the boot device priority (hard disk drives and the ATAPI DVD-ROM drive).
Security	Install or change the user and supervisor passwords.
Chipset	Configuration options for the NorthBridge, SouthBridge, and PCI-X devices. Six separate screens can be accessed from the Chipset menu. Note that the Memory Chipkill option is enabled by default. Enabling Chipkill improves system reliability but might degrade system performance under some applications.
Exit	Save or discard changes.



Main Screen

The following screen capture shows the Main screen for the BIOS Setup utility.



Advanced Screen

The following screen capture shows the Advanced menu screen. The Advanced screen has 13 submenu screens.

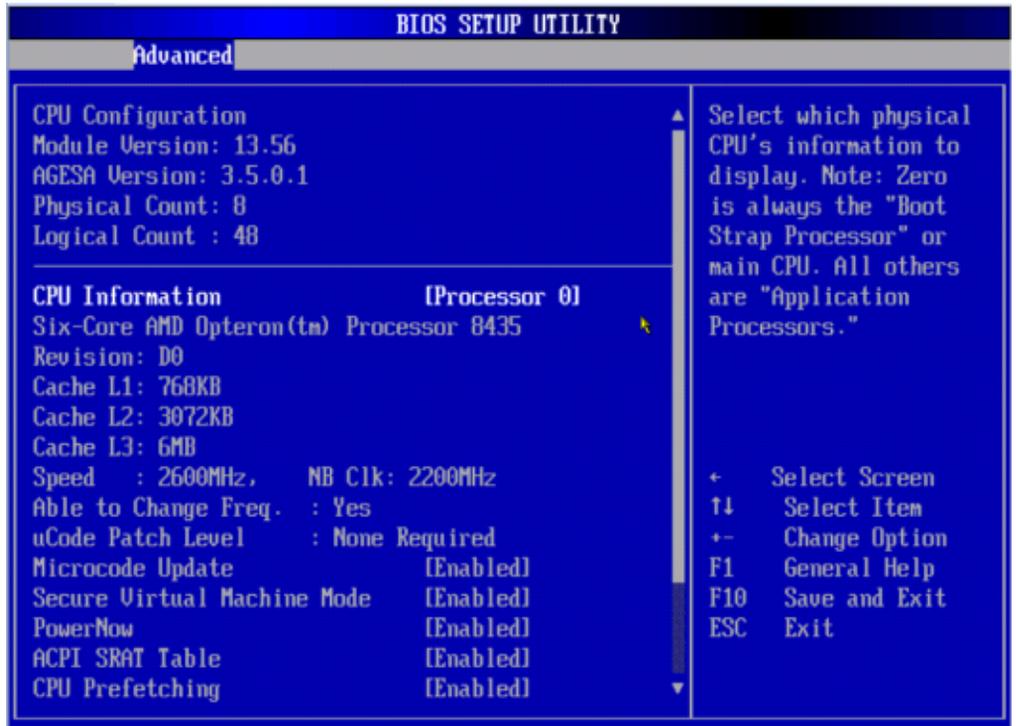


The Advanced screen has the following submenu screens:

- “Advanced>IDE Configuration” on page 117
- “Advanced>Super IO Configuration” on page 118
- “Advanced>Hyper Transport Configuration” on page 119
- “Advanced>ACPI Configuration” on page 120
- “Advanced>Event Log Configuration” on page 121
- “Advanced>IPMI 2.0 Configuration” on page 122
- “Advanced>MPS Configuration” on page 123
- “Advanced>PCI Express Configuration” on page 124
- “Advanced>SMBIOS Configuration” on page 125
- “Advanced>Remote Access Configuration” on page 126
- “Advanced>USB Configuration” on page 127
- “Advanced>Hardware Error Handling” on page 128

Advanced>CPU Configuration

A screen capture showing the CPU Configuration submenu for the Advanced menu.



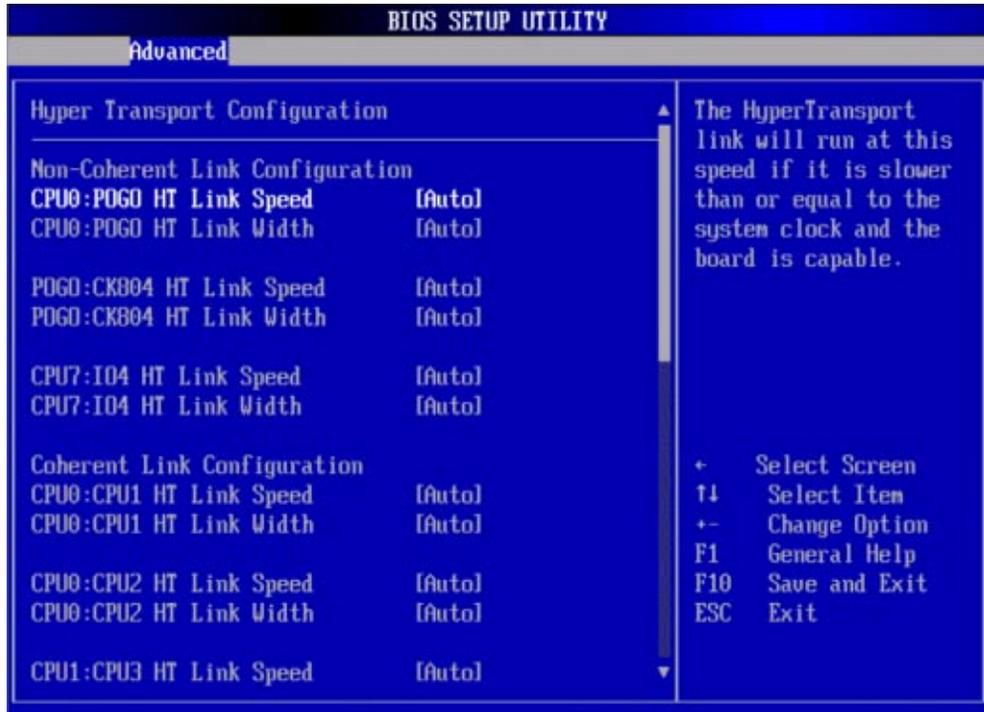
Advanced>IDE Configuration



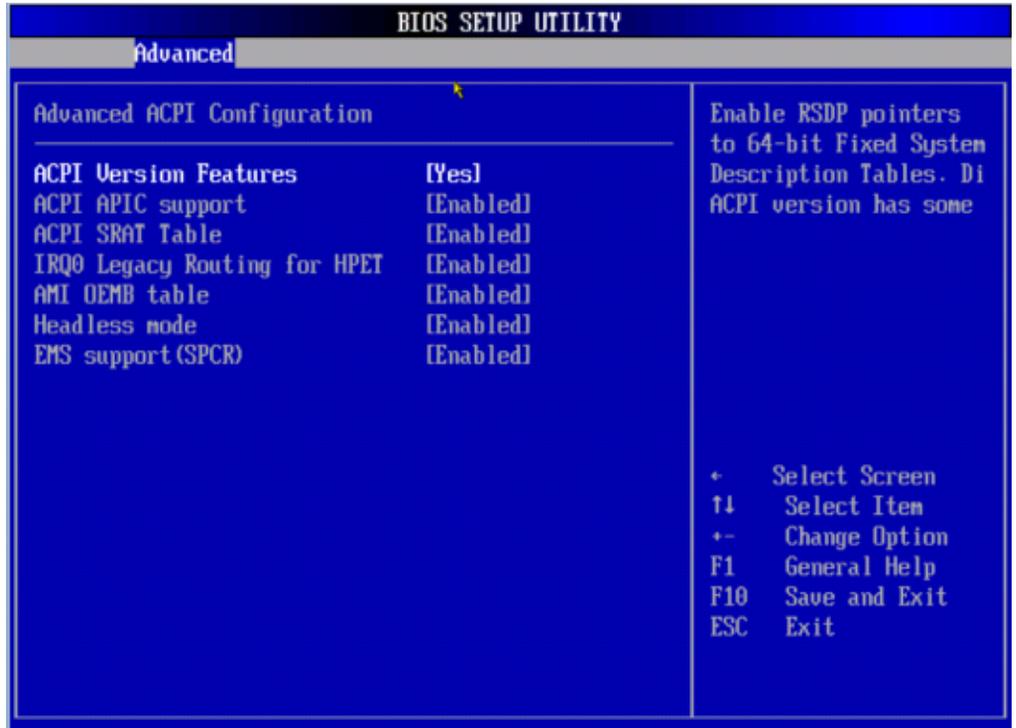
Advanced>Super IO Configuration



Advanced>Hyper Transport Configuration



Advanced>ACPI Configuration



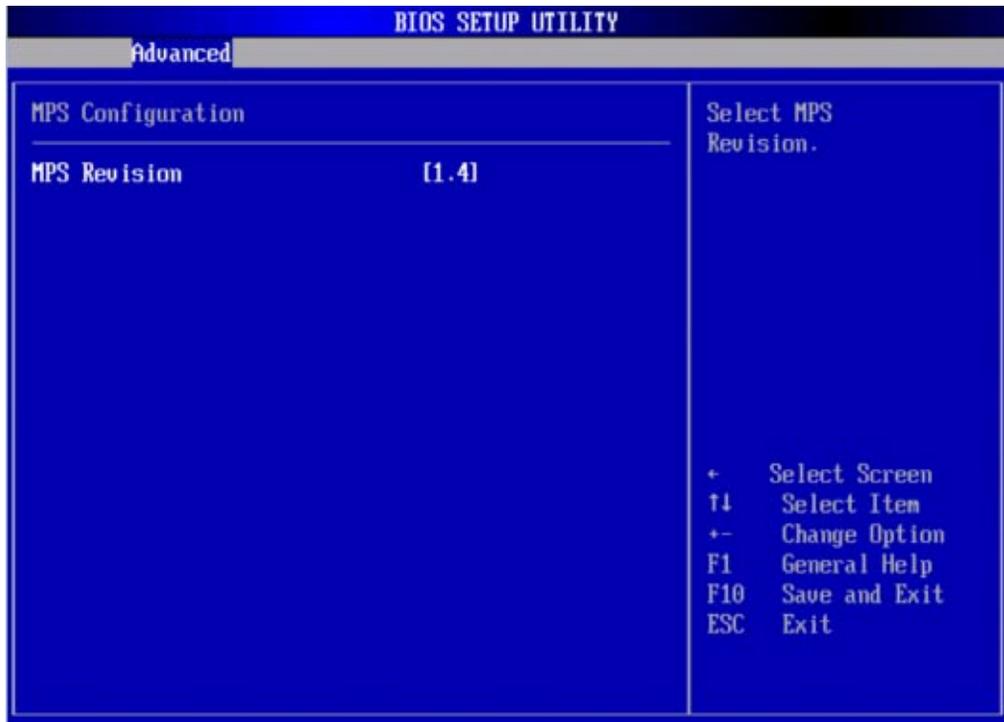
Advanced>Event Log Configuration



Advanced>IPMI 2.0 Configuration



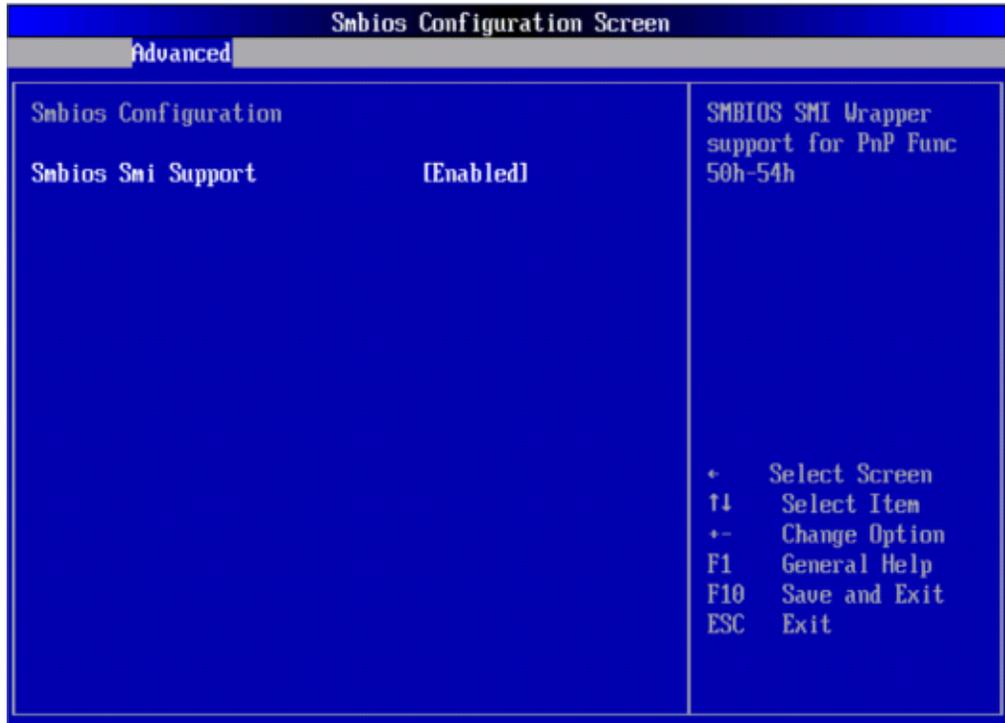
Advanced>MPS Configuration



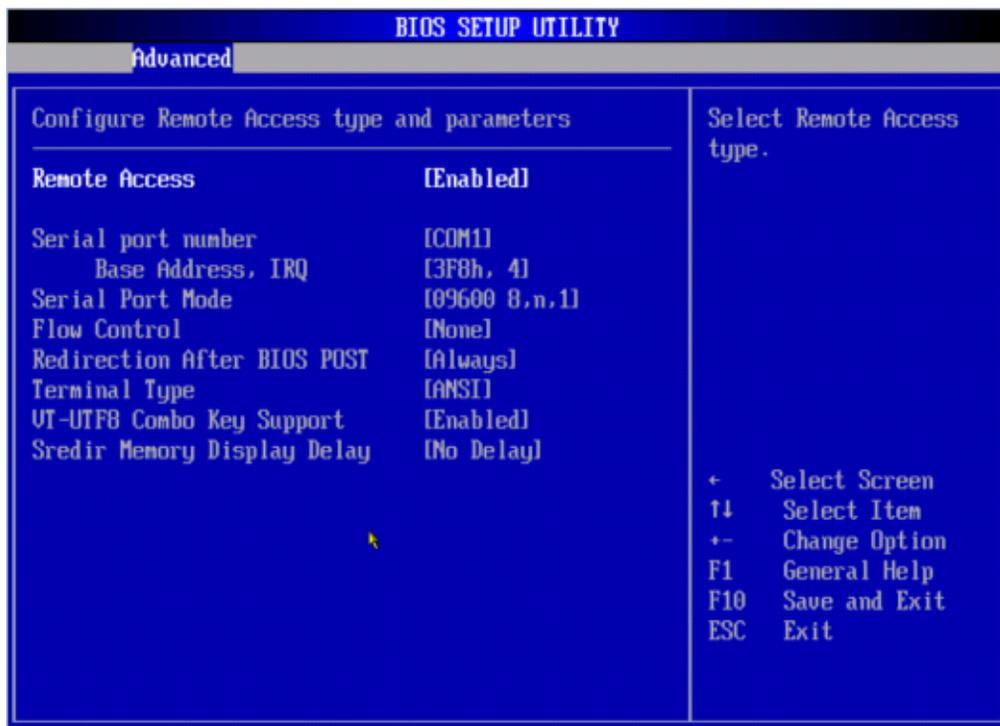
Advanced>PCI Express Configuration



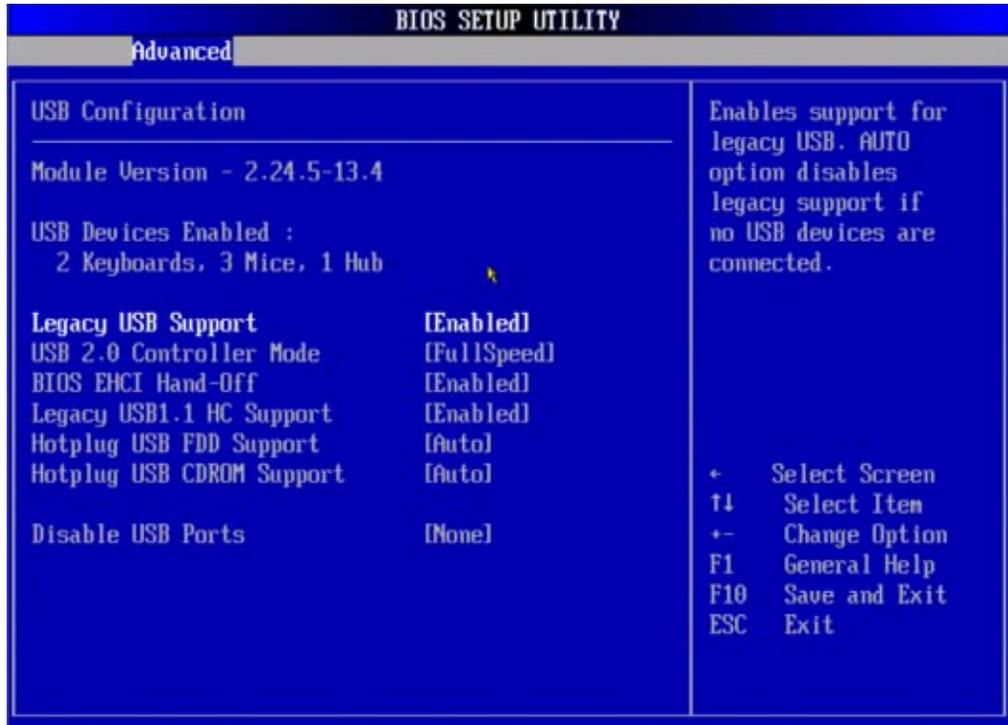
Advanced>SMBIOS Configuration



Advanced>Remote Access Configuration



Advanced>USB Configuration



Advanced>Hardware Error Handling

BIOS SETUP UTILITY	
Advanced	
Hardware Error Handling Configuration	
Reporting Verbosity level	[Maximum]
ShutDown on Hardware Errors	[Disabled]
PROCHOT_L	[Enabled]
HTC Temp Limit	[80c]
HTC Power-State	[PSTATE 2]
ILOM-based Diagnostics	[Disabled]
Log Diagnostics on all Resets	[Disabled]
Sync Flood Errors	[Enabled]
WatchDog Timer Count	[4095]
WatchDog Timer Base	[1 millisecl]
HT Tracing on CPU0	[Disabled]
SFlood on PCI-E Errors	[Fatal]
PCIE Slots with Error	[Keep]
Unused PCIE Root Ports	[Disable]

Adjusts amount of Logs reported in ILOM SEL
 Maximum = Log All
 Medium = Log Err+Warn
 Minimum = Log Err only
 None = No Logs
 Debug = DCT, Rsud.

← Select Screen
 ↑↓ Select Item
 +- Change Option
 F1 General Help
 F10 Save and Exit
 ESC Exit

PCI/PnP Screen

BIOS SETUP UTILITY

Main Advanced **PCI/PnP** Boot Security Chipset Exit

Advanced PCI/PnP Settings

WARNING: Setting wrong values in below sections may cause system to malfunction.

Clear NVRAM	[No]
Plug & Play D/S	[No]
PCI Latency Timer	[64]
Allocate IRQ to PCI UGA	[Yes]
Palette Snooping	[Disabled]
PCI IDE BusMaster	[Disabled]
OffBoard PCI/ISA IDE Card	[Auto]
PCI Option ROM control	[Enabled]
Scanning onboard SAS/SATA ROM	[Enabled]
Scanning onboard NIC OPROM	[Enabled]
Scanning OPROM on PCIx SLOT0	[Enabled]
Scanning OPROM on PCIx SLOT1	[Enabled]
Scanning OPROM on PCIe SLOT2	[Enabled]
Scanning OPROM on PCIe SLOT3	[Enabled]
Scanning OPROM on PCIe SLOT5	[Enabled]
Scanning OPROM on PCIe SLOT6	[Enabled]
Scanning OPROM on PCIe SLOT7	[Enabled]
Onboard PCI NIC MAC Address	
GE NIC 0 :	00 21 28 27 1D F0
GE NIC 1 :	00 21 28 27 1D F1
GE NIC 2 :	00 21 28 27 1D F2
GE NIC 3 :	00 21 28 27 1D F3
IRQ3	[Available]
IRQ4	[Reserved]
IRQ5	[Available]
IRQ7	[Available]
IRQ9	[Available]
IRQ10	[Available]
IRQ11	[Available]
IRQ14	[Available]
IRQ15	[Available]
DMA Channel 0	[Available]
DMA Channel 1	[Available]
DMA Channel 3	[Available]
DMA Channel 5	[Available]
DMA Channel 6	[Available]
DMA Channel 7	[Available]
Reserved Memory Size	[Disabled]

Clear NVRAM during System Boot.

+ Select Screen
 T1 Select Item
 +- Change Option
 F1 General Help
 F10 Save and Exit
 ESC Exit

Available: Specified DMA is available to be used by PCI/PnP devices.
 Reserved: Specified DMA is reserved for use by legacy ISA devices.

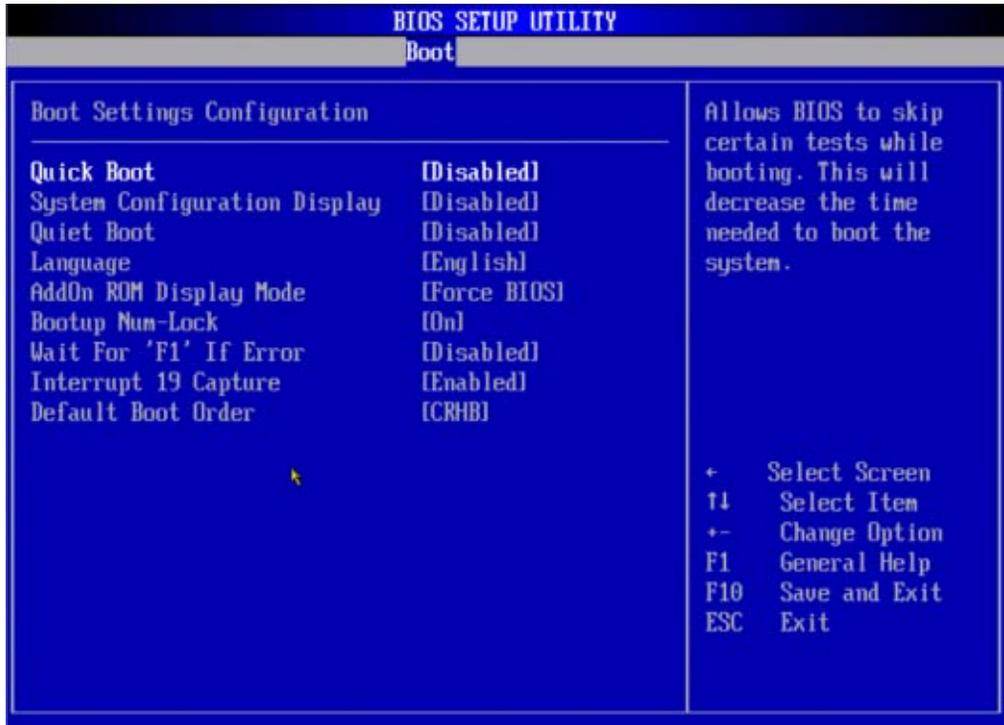
Boot Screen

The following screen capture shows the Boot menu screen. The Boot screen has four submenu screens.

- “Boot>Boot Settings Configuration” on page 131
- “Boot>Boot Device Priority” on page 132
- “Boot>Hard Disk Drives” on page 133
- “Boot>CD/DVD Drives” on page 134



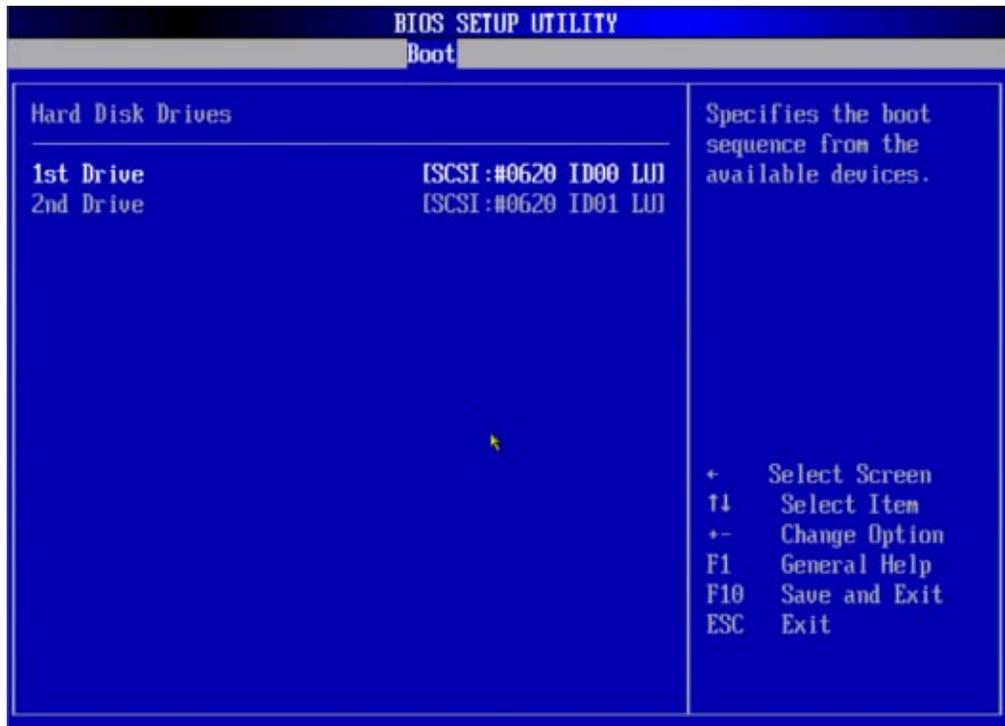
Boot>Boot Settings Configuration



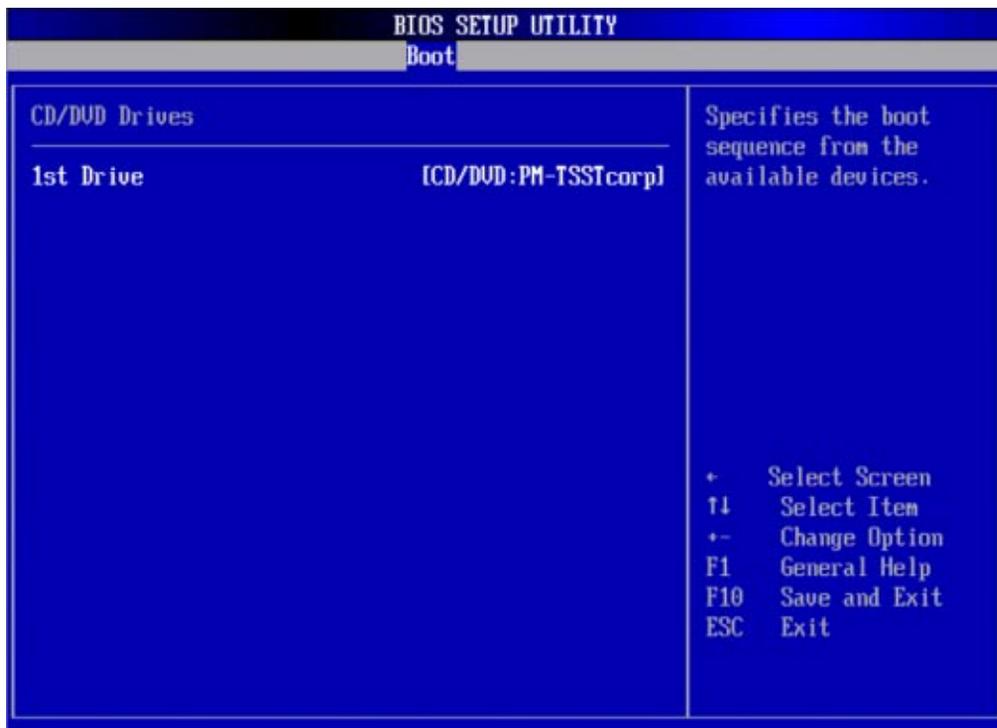
Boot>Boot Device Priority

BIOS SETUP UTILITY	
Boot	
Boot Device Priority	
1st Boot Device	[CD/DVD]
2nd Boot Device	[Removable Dev. (Not)]
3rd Boot Device	[Hard Drive]
4th Boot Device	[Network:IBA GE SLo]
5th Boot Device	[Network:IBA GE SLo]
6th Boot Device	[Network:IBA GE SLo]
7th Boot Device	[Network:IBA GE SLo]
<p>Specifies the boot sequence from the available devices.</p> <p>A device enclosed in parenthesis has been disabled in the corresponding type menu.</p> <p>+ Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit</p>	

Boot>Hard Disk Drives



Boot>CD/DVD Drives

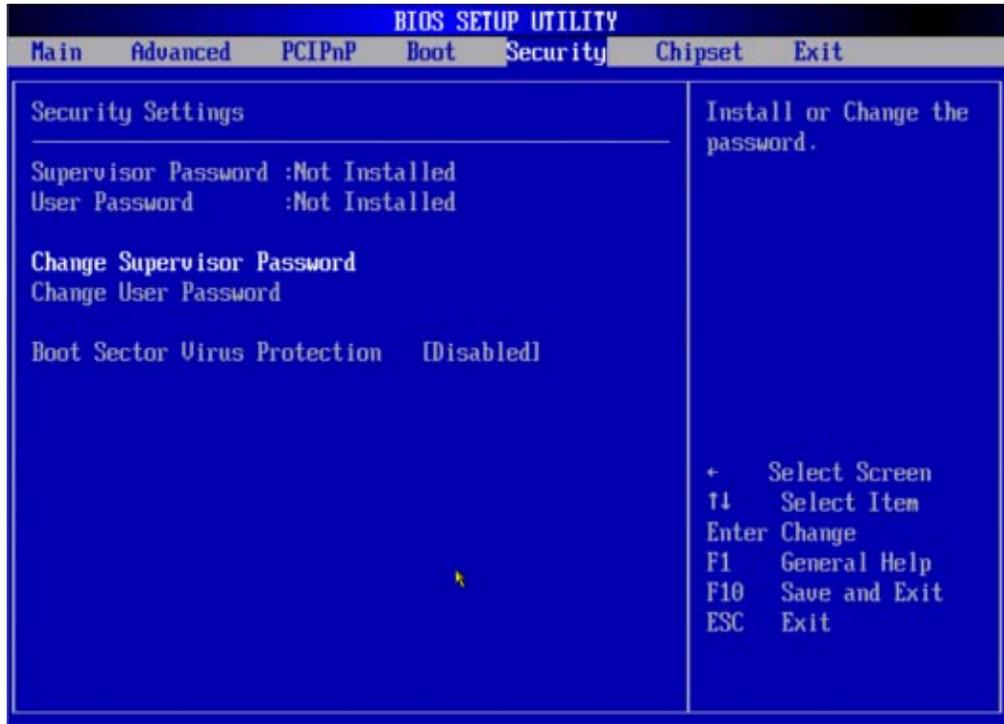


Boot Device Detection and Priority

The devices and PCI slots are detected by the BIOS during startup in this order:

1. PCIe slot 2
2. PCIe slot 3
3. PCIe slot 4
4. On-board Intel NIC
5. PCI-X slot 0
6. PCI-X slot 1
7. On-board LSI SCSI controller
8. PCIe slot 5
9. PCIe slot 6
10. PCIe slot 7

Security Screen

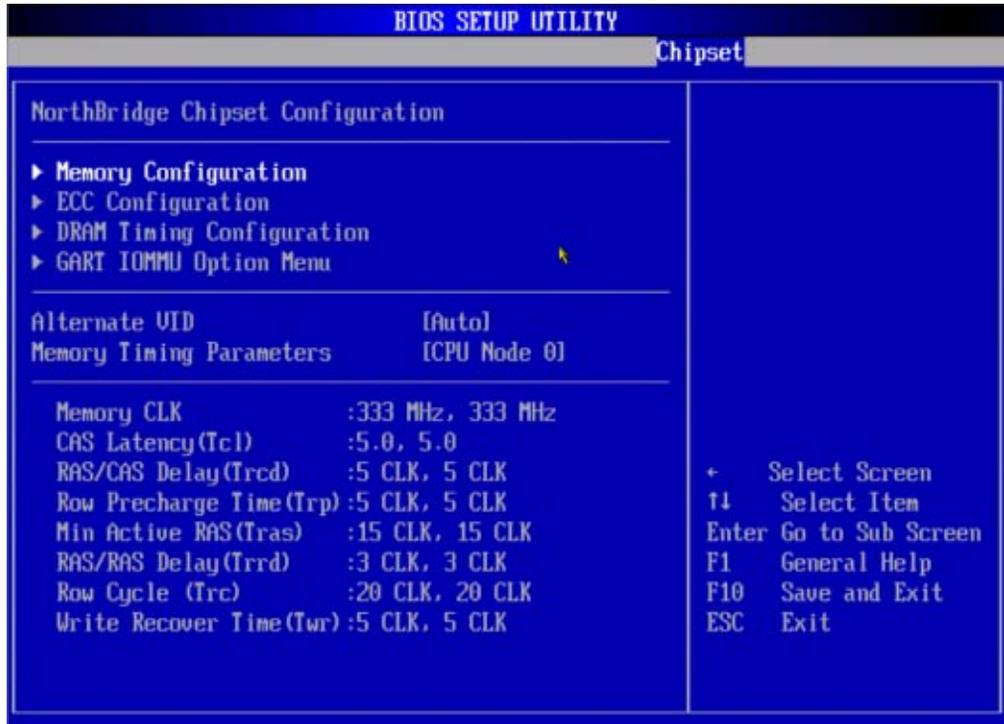


Chipset Screen

The following screen capture shows the Chipset menu screen. The Chipset screen has two submenu screens Northbridge Chipset Configuration and Southbridge Chipset Configuration.

- “Chipset>Northbridge>Memory Configuration” on page 138
- “Chipset>Southbridge Configuration” on page 142

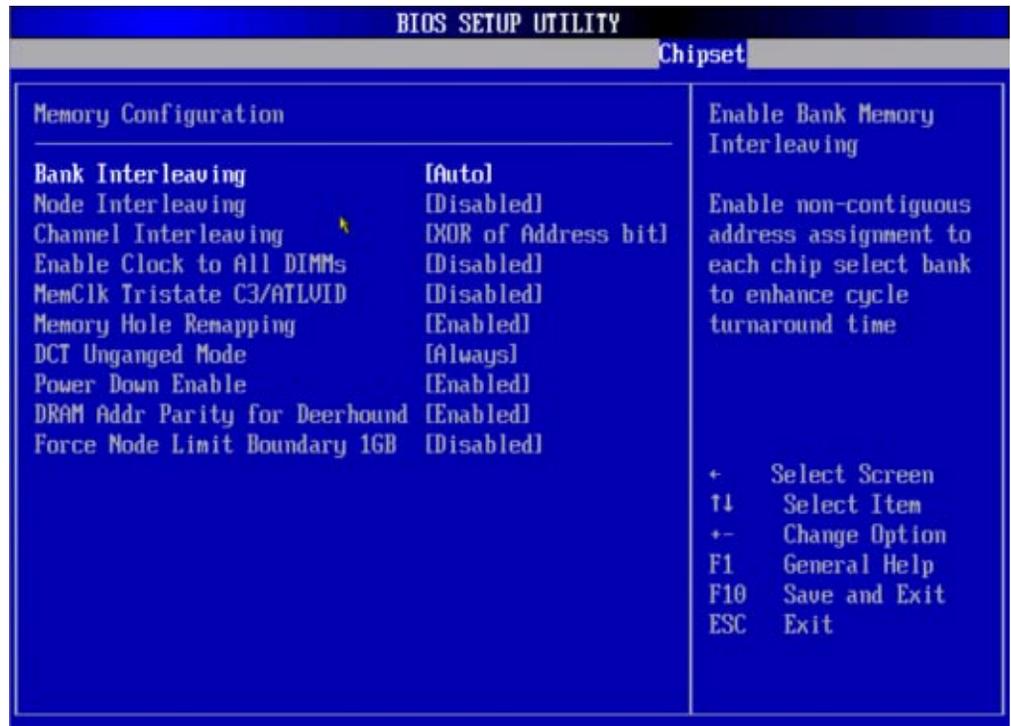




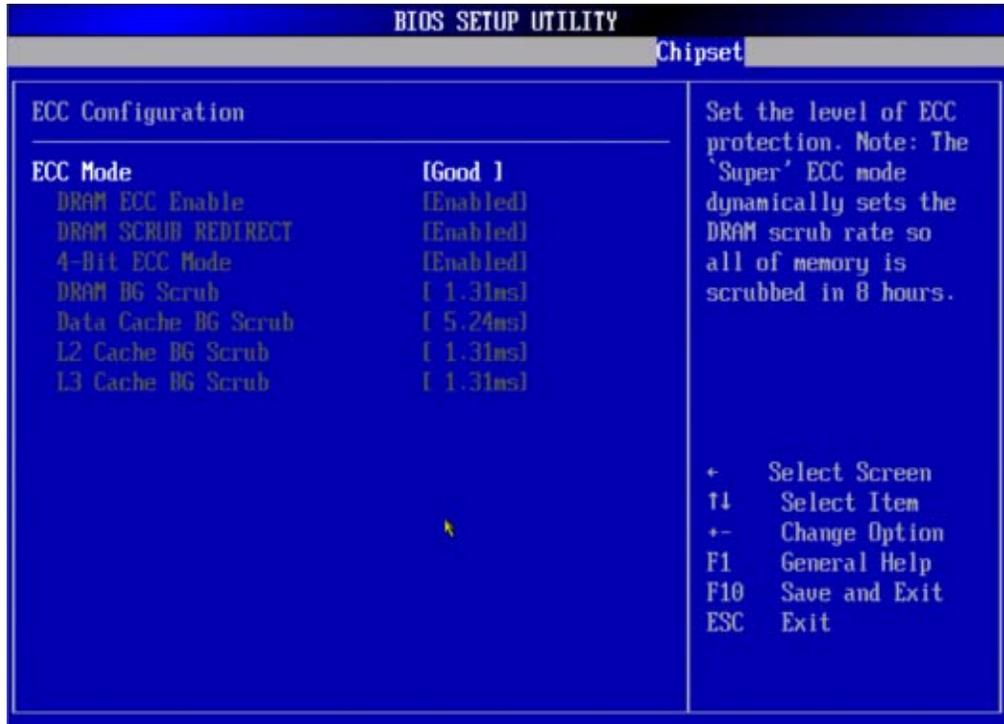
The Northbridge Chipset has four submenu screens:

- “Chipset>Northbridge>Memory Configuration” on page 138
- “Chipset>Northbridge>ECC Configuration” on page 139
- “Chipset>Northbridge>DRAM Timing Configuration” on page 140
- “Chipset>Northbridge>GART IOMMU Configuration” on page 141

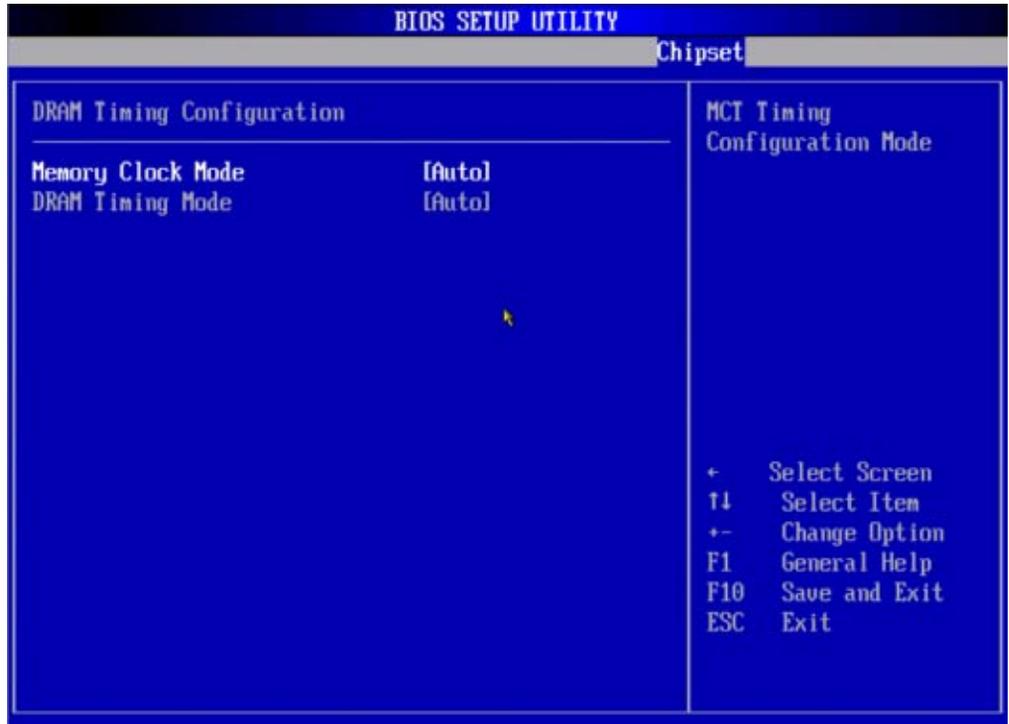
Chipset>Northbridge>Memory Configuration



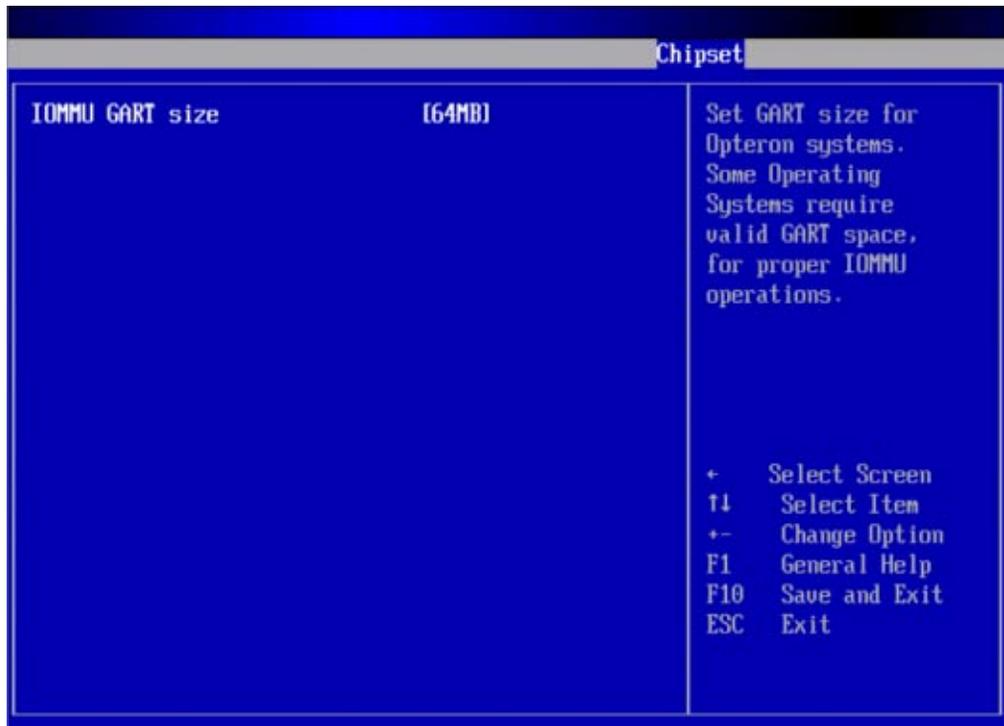
Chipset>Northbridge>ECC Configuration



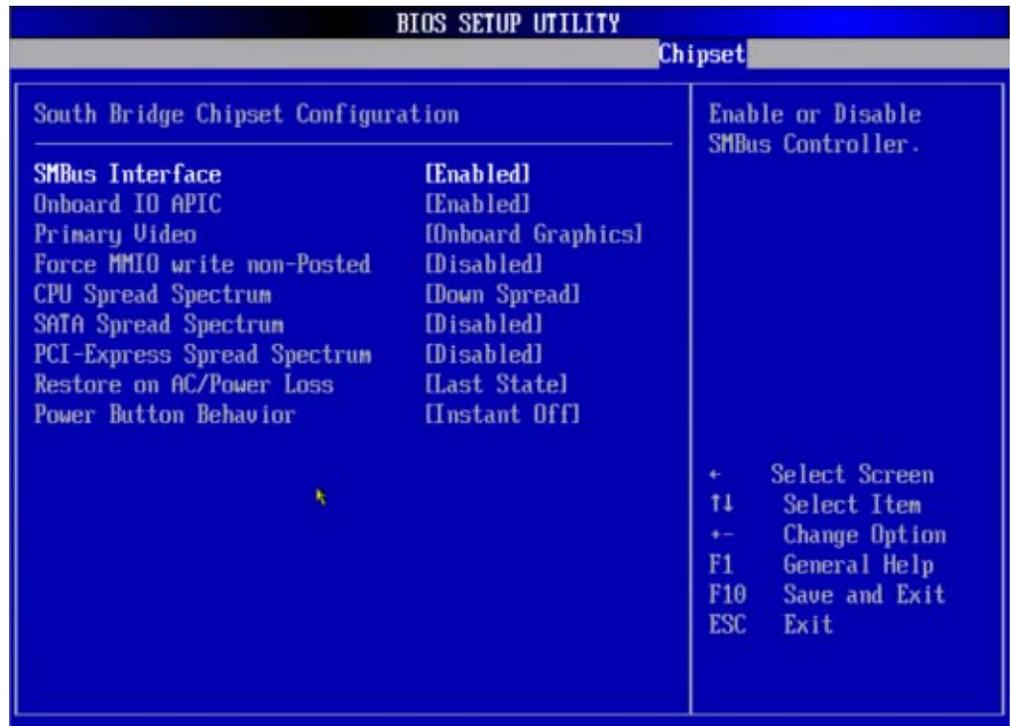
Chipset>Northbridge>DRAM Timing Configuration



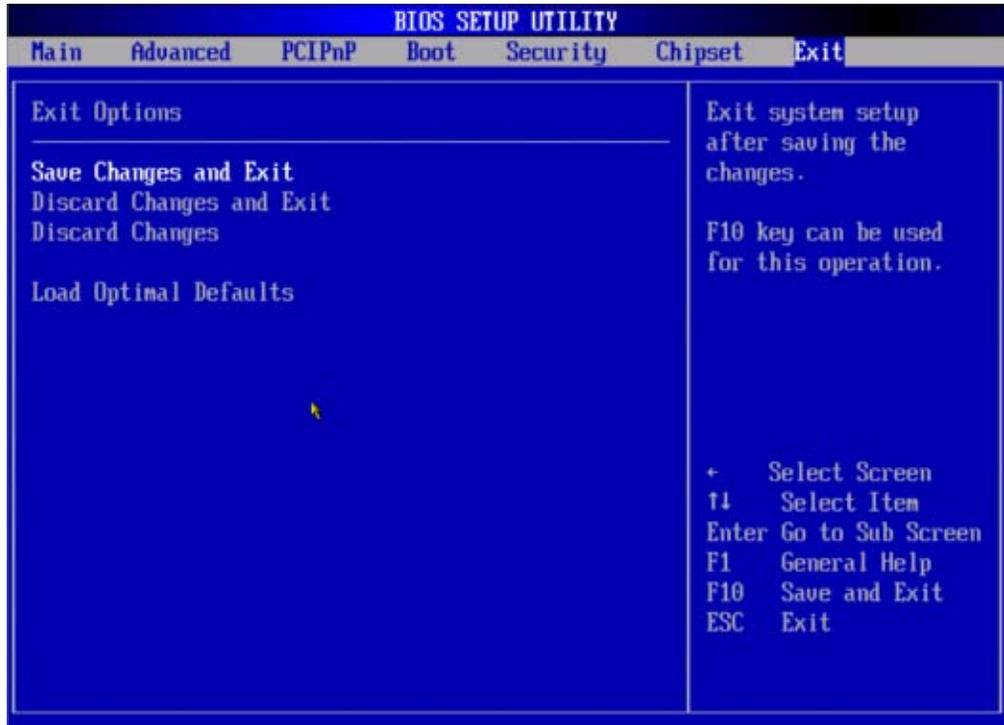
Chipset>Northbridge>GART IOMMU Configuration



Chipset>Southbridge Configuration



Exit Screen



BIOS and Service Processor Updates

Sun releases periodic updates for the system BIOS. These updates contain fixes, patches, drivers, and other enhancements. The releases usually contain new firmware for both the BIOS and service processor (SP). The BIOS and SP are dependent upon one another for optimum server operation. When you perform an update, you *must* use the BIOS designed for your server, and you should always update both the BIOS and the SP together.

Note – Sun recommends that you always update and maintain your servers to the latest firmware release.

- Announcements and information about firmware releases are available in the Product Notes documentation for your server. See *Sun Fire X4640 Server Product Notes*.
- Information about how to update firmware is available in “Updating Firmware” in *Sun ILOM 3.0 Supplement for the Sun Fire X4640 Server*

LSI BIOS Configuration Utility

The Sun Fire X4640 server uses an on-board LSI 1064E SAS disk controller chip. The 1064E chip supports integrated RAID (IR). Therefore, the 1064E chip allows integrated mirroring (IM), integrated mirroring enhanced (IME), and integrated striping (IS). A disk and RAID configuration utility resides in the 1064E BIOS. You can access this utility during the server power on self test (POST) sequence and use it to configure the 1064E chip for RAID.

Note – You can also use an OS-level application, such as MegaRAID Storage Manager (MSM), to manage and configure RAID on your server.

- For an overview of disk management on Sun servers, see the *Sun Disk Management Overview* document (820–6350) at <http://www.oracle.com/technetwork/indexes/documentation/index.html>.
- For information about configuring RAID using LSI-based controllers that support integrated RAID, see the *Sun LSI 106x RAID User's Guide* (820–4933) at <http://www.oracle.com/technetwork/indexes/documentation/index.html>.
- For instructions about how to access the configuration utility that resides in the LSI 1064E's BIOS, see “How to Configure the LSI BIOS” on page 145.

▼ How to Configure the LSI BIOS

- 1 **Set up your server so that you can respond to boot and POST messages. See “Connecting to the System Console” in *Sun ILOM 3.0 Supplement for the Sun Fire X4640 Server*.**
- 2 **Power on or reboot the server.**
- 3 **Watch the display for the prompt that instructs you to press Ctrl-C to start the LSI configuration utility.**
Press Ctrl-C to start LSI Logic Configuration Utility...
- 4 **When the prompt appears, press Ctrl-C.**

The LSI Configuration Utility main menu appears. For information about configuring RAID using LSI-based controllers that support integrated RAID, see the *Sun LSI 106x RAID User's Guide* (820–4933) at <http://www.oracle.com/technetwork/indexes/documentation/index.html>

See Also ▪ “LSI BIOS Configuration Utility” on page 145

Sun Fire X4640 Server References and Specifications

This section contains system reference and server specification information for the Sun Fire X4640 server.

Section	Link
Description of the features and components of the Sun Fire X4640 server	“Sun Fire X4640 Server Features and Components” on page 147
Specifications for the Sun Fire X4640 server	“Physical Specifications For the Sun Fire X4640 Server” on page 151
External front-panel connections, switches, and LEDs of the Sun Fire X4640 server	“Sun Fire X4640 Server Front Panel Features and Components” on page 149
External back-panel connections, switches, and LEDs of the Sun Fire X4640 server	“Sun Fire X4640 Server Back Panel Features and Components” on page 150
Front panel and back panel LED locations and meanings	“Sun Fire X4640 Server External LED Locations and Meanings” on page 156
Location of the system serial number	“Locating the Sun Fire X4640 Server System Serial Number” on page 158

Sun Fire X4640 Server Features and Components

The Sun Fire X4640 server takes full advantage of the exceptional power and performance of the AMD Opteron processor. The server is a four rack-unit chassis capable of supporting up to eight vertically-mounted customer-replaceable (CRU) CPU modules. Each CPU module is a single-board unit containing a CPU, eight DIMM slots, and on-board diagnostics.

This server provides the following *maximum* system configurations:

- Eight CPUs (six-core)
- 64 DIMMs (maximum 512 GB)
- Four 2.5-inch (63.5-mm) SAS hard disk drives
- Eight PCI Expansion slots (two PCI-X slots and six PCI-Express (PCIe) slots)

This server is 24 inches (610-mm) deep and is compatible with all data center 28-inch (711.2-mm) racks. Airflow is strictly front-to-back and supports the highest-performance Opteron CPUs at 95° F (35° C) ambient temperature.

Standard I/O includes four 10/100/1000BASE-T Gigabit Ethernet ports, VGA video, serial, four USB ports, and one 10/100BASE-T Ethernet management port. An SAS on-board disk controller supports up to four SAS disk drives.

The Sun Fire X4640 server includes an extensive set of Reliability, Availability, and Serviceability (RAS) features, such as hot-swappable and redundant hard disk drives (when RAID1 is used), fans, and power supplies. The servers also provide an integrated lights out management (ILOM) service processor function, which includes remote boot and remote software upgrades.

Feature or Component	Sun Fire X4640 Server
CPU	Four or Eight CPU modules, each with an AMD Opteron six-core processor (6 Mbyte L3 cache)
Dual Dynamic Power Management	(Split-plane CPU modules only.) Per-processor power management that can reduce idle power consumption.
Processor BIOS	8 Mbit flash EEPROM with LPC interface
Memory	Up to 64 DIMMs of DDR2
Hard Drives (HDDs)	Up to four Serial-Attached SCSI (SAS) HDDs (2.5 inch or 63.5 mm)
Service Processor (SP)	Motorola MPC8248 @ 266 MHz
RAID Options	Four-channel SAS RAID disk controller
Network I/O	<ul style="list-style-type: none"> ■ Four 10/100/1000BASE-T Gigabit Ethernet ports (RJ-45 connectors) ■ One 10/100BASE-T Ethernet net management port (RJ-45 connector) ■ One RS-232 serial port (RJ-45 connector)
PCI I/O	<ul style="list-style-type: none"> ■ Two 100-MHz low-profile PCI-X slots ■ Four 8-lane low-profile PCIe slots ■ Two 4-lane low-profile PCIe slots
Other I/O	<ul style="list-style-type: none"> ■ Five USB 2.0 ports (4 external, 1 internal) ■ One VGA video port
Removable media devices	Internal slim DVD-ROM drive
Power	Four power supplies, 1133W each

Feature or Component	Sun Fire X4640 Server
Fans	Four front fan modules; also one fan in each power supply Cooling is front-to-back forced air.

Sun Fire X4640 Server Front and Back Panel Features and Components

- [“Sun Fire X4640 Server Front Panel Features and Components”](#) on page 149
- [“Sun Fire X4640 Server Back Panel Features and Components”](#) on page 150

Sun Fire X4640 Server Front Panel Features and Components

For back panel features and components, see [“Sun Fire X4640 Server Back Panel Features and Components”](#) on page 150.

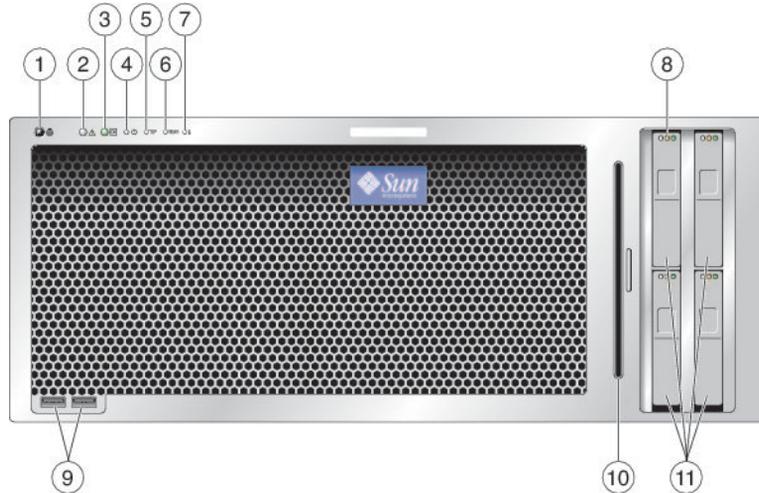


Figure Legend

1 Locate button/LED (white)	7 System overheat fault LED
2 Service action required LED (amber)	8 Hard drive status LEDs

Figure Legend

- | | |
|-------------------------------|----------------------------|
| 3 Power/OK LED (green) | 9 USB ports (2) |
| 4 Power button | 10 DVD module |
| 5 Top fan fault LED | 11 Hard drives (4 maximum) |
| 6 Rear power supply fault LED | |

Sun Fire X4640 Server Back Panel Features and Components

For front panel features and components, see [“Sun Fire X4640 Server Front Panel Features and Components”](#) on page 149.

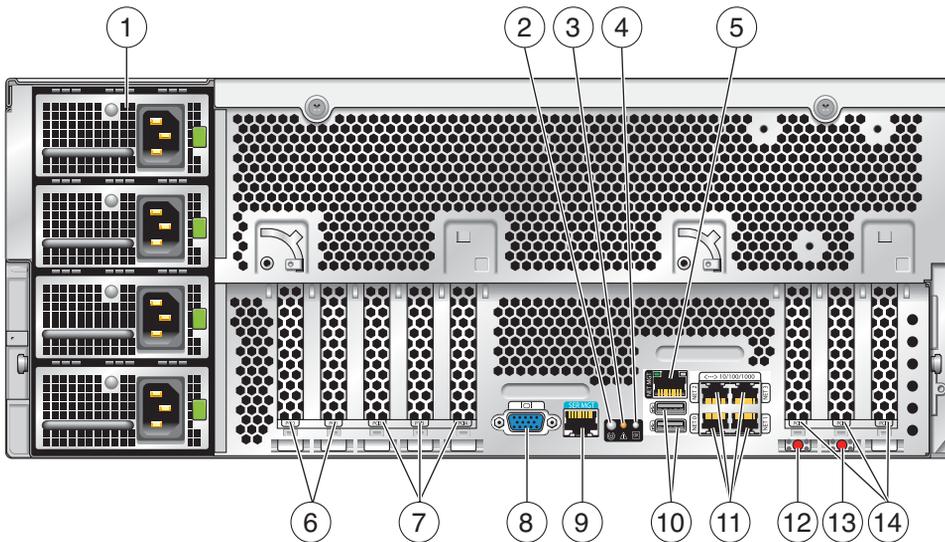


Figure Legend

- | | |
|---------------------------------------|--|
| 1 Power supplies (4) | 8 Video connector |
| 2 Locate button/LED (white) | 9 Serial management port |
| 3 Service Action required LED (amber) | 10 USB ports (2 external, 1 internal on motherboard) |
| 4 Power /OK LED (green) | 11 10/100/1000 GigabitEthernet ports (4) |

Figure Legend

5	10/100 Ethernet port (for net management)	12	NMI dump switch (SW3)
6	PCI-X card slots (2)	13	Reset switch (SW2)
7	PCIe card slots (3)	14	PCIe card slots (3)

Sun Fire X4640 Server Specifications

- [“Physical Specifications For the Sun Fire X4640 Server” on page 151](#)
- [“Power Specifications For the Sun Fire X4640 Server” on page 151](#)
- [“Environmental Specifications” on page 152](#)
- [“Acoustic Specifications” on page 152](#)

Physical Specifications For the Sun Fire X4640 Server

This section contains specifications for the Sun Fire X4640 Server.

Specification	Value
Width	17.5 inches (445 mm)
Height	6.9 inches (176 mm)
Depth	With bezel: 24.75 inches (629 mm) With bezel and rear power supply latches: 25.25 inches (642 mm)
Weight	Maximum standalone server: 88 pounds (40 kg) Maximum with rack-mount kit and cable management arm assembly: 106 pounds (48 kg)

Power Specifications For the Sun Fire X4640 Server

Specification	Value
Universal AC input	110 – 240 VAC 50/60 Hz
Maximum input current at 200 VAC	13 A
Maximum input current at 100 VAC	22 A

Specification	Value
Maximum power available	1975 W
Maximum power consumed	1715 W

Environmental Specifications

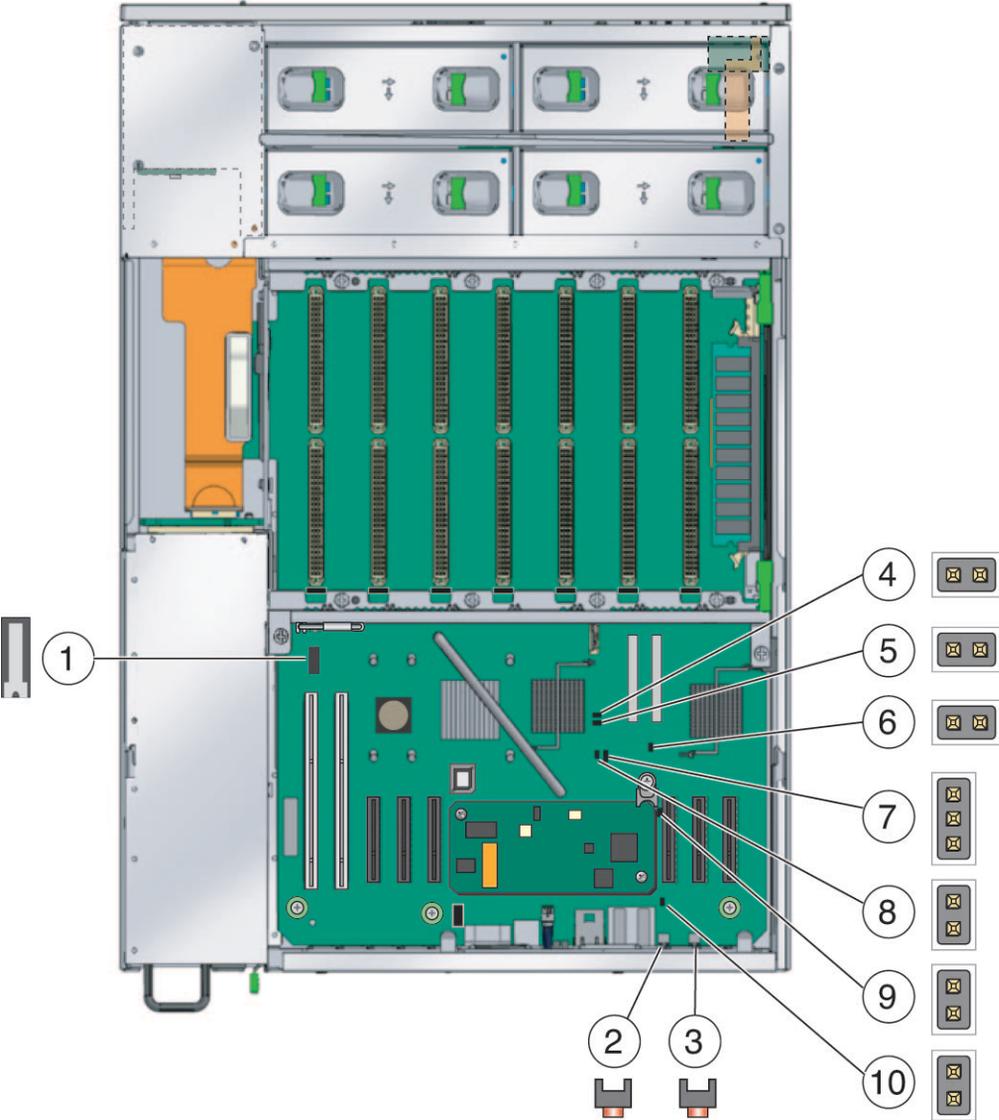
Specification	Value
Temperature (operating)	41° - 90° F (5° - 32.2° C)
Temperature (storage)	-40° - 149° F
Humidity	20% - 90% non-condensing
Operating altitude	0 - 10,000 feet (0 - 3048 m) maximum Decrease operating temperature 1.8° F (1° C) per 985 feet (300 m) above 2955 feet (900 m) altitude
Airflow	Airflow typical (for room temperatures 73° F and below (23° C and below): 200 CFM Airflow max possible: 400 CFM.

Acoustic Specifications

Specification	Value
L_{wAd} (sound power):	
at or below 25 °C	8.2 dB
above 25 °C	9.0 dB
L_{pAm} (average bystander sound pressure):	
at or below 25 °C	67 dB
above 25 °C	75 dB

Sun Fire X4640 Server Motherboard Jumpers and Switches

This illustration shows the locations of the jumpers and switches found on the Sun Fire X4640 server motherboard.



Number	Name	Description	Procedure
1	Intrusion switch (SW1)	Top cover interlock switch. Removes power to the server when the top cover is removed.	
2	NMI Dump switch (SW2)	Non-Maskable Interrupt switch. Performs a system information status dump.	“Accessing System Status Information Using the NMI Dump Switch (SW2)” on page 156
3	Reset switch (SW3)	Performs an immediate hard reset of the server.	“Resetting the Server Using the Reset Switch (SW2)” on page 16
4	Force recovery (P19)		
5	Clear password (P20)		
6	Kill switch disable (P23)		
7	Clear CMOS (P25)	Clears the CMOS variables and restores values to the default settings.	“Clearing the Sun Fire X4640 Server CMOS Settings” on page 154
8	Init switch disable (J32)		
9	Hard reset (P21)		

Clearing the Sun Fire X4640 Server CMOS Settings

These procedures describe hardware-level methods for clearing the CMOS chip and resetting the BIOS settings to the factory defaults. Use these procedures when troubleshooting, when instructed by service personnel, or when called out in a procedure. Clearing the CMOS chip deletes all customized BIOS settings. Loss of customized BIOS settings might render your server incapable of operating correctly in your environment. If you customized your BIOS settings, you need to access the BIOS Setup utility (after you clear the CMOS chip) and enter the settings into the BIOS again.

- [“How to Clear the Sun Fire X4640 Server CMOS Settings” on page 155](#)
- [“How to Clear the CMOS Settings Using the Battery” on page 155](#)

▼ How to Clear the Sun Fire X4640 Server CMOS Settings



Caution – Loss of customized information. Removing the battery erases customized settings stored in the battery-backed CMOS. Erasing custom settings might render your server inoperable within your environment.

Before You Begin

- You need a jumper cap to short the pins of the jumper.
- Make a note of any customized settings in the BIOS Setup utility, so you can enter the values into the utility after clearing the CMOS.

- 1 **Prepare the server for service using the steps described in the section, “How to Prepare the Server for Service” on page 22.**
- 2 **Install the jumper cap across the Clear CMOS jumper (P25) header pins. See “Sun Fire X4640 Server Motherboard Jumpers and Switches” on page 153.**
- 3 **Wait 10 seconds, then remove the jumper cap.**
Shorting the jumper removes battery power from the SouthBridge chipset where the CMOS settings are stored. This action clears the CMOS and restores the settings to the default values.
- 4 **Prepare the server for operation using the steps described in the section, “How to Prepare the Server for Operation” on page 27.**

Next Steps

- If necessary, access the BIOS Setup utility to customize the settings for your environment. See “Configuring the System Using the BIOS Setup Utilities” on page 111.

See Also

- “Sun Fire X4640 Server Motherboard Jumpers and Switches” on page 153
- “Configuring the System Using the BIOS Setup Utilities” on page 111
- “How to Power On the Server” on page 12

▼ How to Clear the CMOS Settings Using the Battery



Caution – Loss of customized information. Removing the battery erases customized settings stored in the battery-backed CMOS. Erasing custom settings might render your server inoperable within your environment.

- 1 **Prepare the server for service. See “How to Prepare the Server for Service” on page 22.**
- 2 **Use the battery replacement procedure to temporarily remove the battery from the server. See “Replacing the CMOS Battery (CRU)” on page 33.**

- 3 To clear the battery-backed CMOS settings, remove the system battery for approximately 10 seconds. See [“Replacing the CMOS Battery \(CRU\)” on page 33](#).
- 4 After 10 seconds install the battery.
- 5 Prepare the server for operation. See [“How to Prepare the Server for Operation” on page 27](#).

Next Steps ■ If necessary, access the BIOS Setup utility to customize the settings for your environment. See [“Configuring the System Using the BIOS Setup Utilities” on page 111](#).

See Also ■ [“List of Customer Replaceable Units and Field Replaceable Units” on page 30](#)

Accessing System Status Information Using the NMI Dump Switch (SW3)

The Non-Maskable Interrupt (NMI) Dump switch (SW3 on the motherboard) sends an NMI order to the CPUs initiating a dump of system status information for debugging purposes. The NMI dump information is used for troubleshooting by service personnel and engineers. Do not press the NMI Dump switch unless instructed by service personnel.

▼ How to Access System Status Information Using the NMI Dump Switch

Before You Begin You need a stylus or some other thin pointed nonconducting object to press the recessed NMI Dump switch.

- 1 Access the rear panel of the server.
- 2 To activate an NMI dump, use a stylus to press the recessed NMI dump switch.

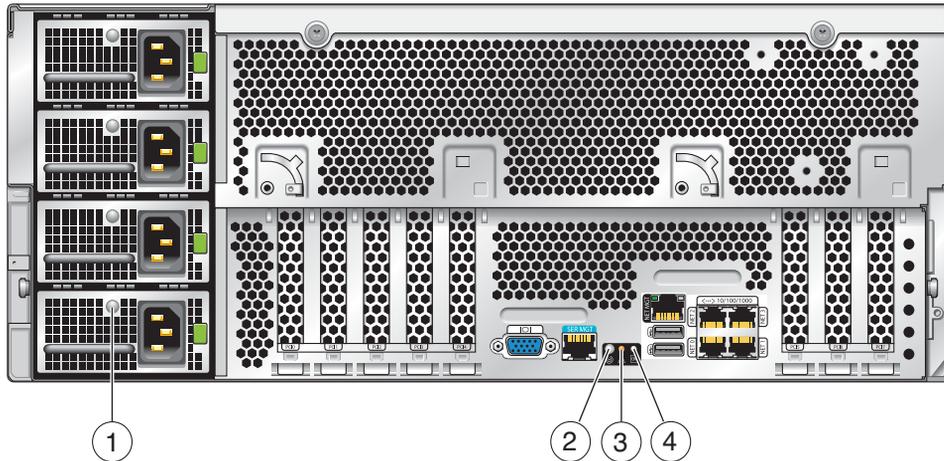
Sun Fire X4640 Server External LED Locations and Meanings

Front Panel LEDs



Header	Header	Header
1	Locate button/LED (white)	Normal state is off. Blinks when activated locally or remotely. Used to identify a server.
2	Service action required LED (amber)	Normal state is off. Blinks when an internal component is in a fault state. Used to indicate that service is required. Integral part of server troubleshooting.
3	Power/OK LED (green)	Normal state is on steady (the server is functioning in properly in full-power mode). Blinks when the server is in stand-by power mode.
4	Power button	Used to power the server on and off. Press once for graceful shutdown. Press and hold for four seconds to perform and immediate shutdown. Use a stylus or other thin pointed object.
5	Front fan fault LED (amber)	Normal state is off. Blinks when one of the internal fan trays is in a fault state. Used to indicate that service is required. Integral part of server troubleshooting.
6	Rear Power supply fault (amber)	Normal state is off. Blinks when one of the power supplies is in a fault state. Used to indicate that service is required. Integral part of server troubleshooting.
7	System overheat fault (amber)	Normal state is off. Blinks when the ambient temperature within the server chassis exceeds safe operational level. Used to indicate that service is required. Integral part of server troubleshooting.
8	Hard drive status LEDs (3)	Normal state: the right (green) LED is lit (the hard drive is operating properly). If the middle (amber) LED is lit, the drive has a fault and should be replaced. The left LED is not functional and does not light.

Sun Fire X4640 Server Back Panel LEDs



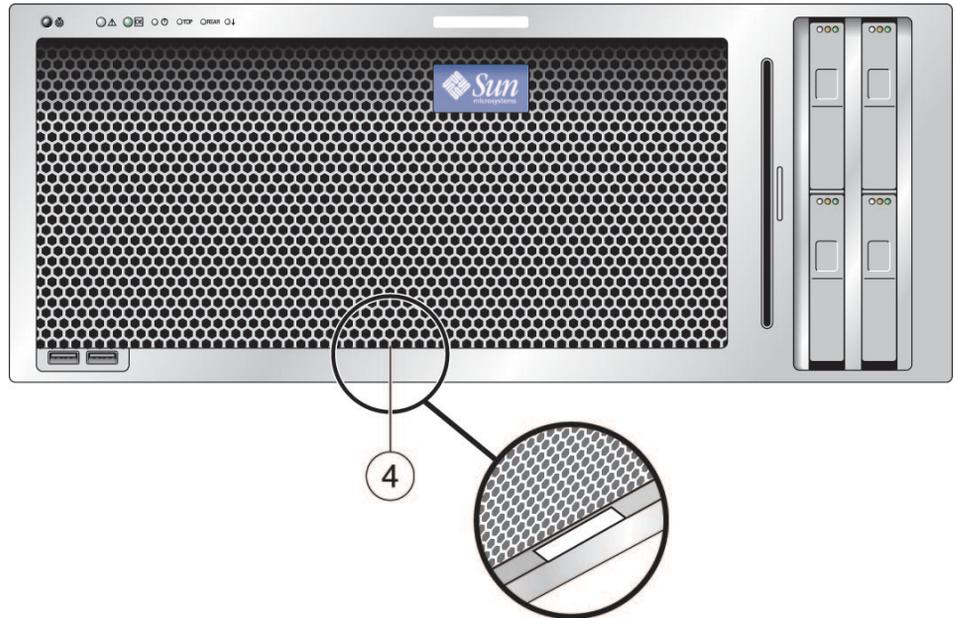
Number	LED Name	Action and Purpose
1	PSU fault LED (amber)	Normal state is off. Steady on when the PSU is in a fault state. Used to indicate that service is required. Integral part of server troubleshooting.
2	Locate LED (white)	Normal state is off. Blinks when activated locally or remotely. Used to identify a server.
3	Service action required LED (amber)	Normal state is off. Blinks when an internal component is in a fault state. Used to indicate that service is required. Integral part of server troubleshooting.
4	Power/OK LED (green)	Blinks when the system is in standby power mode. Blinks slowly when system is in POST. On steady when the system finishes POST and is functioning properly in full-power mode.

Locating the Sun Fire X4640 Server System Serial Number

You can find the system serial number at one of these locations:

- The Customer Information Sheet (CIS) that was affixed to the side of the server's shipping carton.
- The ILOM System Information tab. See [Sun ILOM 3.0 Supplement for the Sun Fire X4640 Server](#).

- The front panel of the server. The server serial number is located on the edge of the front bezel near the center. See the illustration below.



Index

B

- battery (type: CR2032), replacing, 33–34
- BIOS
 - boot device detection and priority, 135
 - configuring, system, 112–113
 - LSI BIOS configuration utility, 111–145
 - accessing, 145
 - system setup utility, 111–145
 - accessing, 112–113
 - system setup utility screens
 - Advanced screen, 115
 - Boot screen, 131
 - Chipset screen, 136
 - Exit screen, 143
 - Main screen, 115
 - overview, 113
 - PCI/PnP screen, 129
 - Security screen, 135
- BIOS and SP updates, 144
- boot device priority, 135

C

- command-line interface (CLI), 13–14
- cover, installing, 28
- CPLD, update, 109–110
- CPU module
 - features and component, 41
 - installing, 44–45
 - population rules, 44
 - removing, 40

CPU module (*Continued*)

- replacing, 39
- slot designations, 42
- slot designations and population rules, 42
- updating FRU information, 108–109
- CPU module filler card
 - installing, 44–45
 - removing, 40
 - replacing, 39
- CRU (customer-replaceable units), list of, 30

D

- designations and redundancy of power supplies, 55
- DIMM, population rules, 47
- DIMMs
 - installing, 48–49
 - removing, 46–47
- DVD module, removing, 65–67

E

- emergency shutdown, 12–13
- ESD procedures and precautions, 20

F

- fan tray
 - designations, 58
 - installing, 59–60

fan tray (Continued)

- removing, 58

fan tray carriage

- installing, 81–84
- removing, 79–81

finding your product on My Oracle Support

- (support.oracle.com), 5–6

front bezel

- installing, 28–29
- removal, 26–27

front I/O board

- installing, 90–92
- removing, 89–90

front panel indicator board

- installing, 87–88
- removing, 85–86

FRU (field-replaceable units)

- list of, 30
- updating, 107–108, 108–109

full-power mode, *See* power modes**G**

- graceful shutdown, 12–13

H**hard disk backplane**

- installing, 95–96
- removing, 93–95

hard drive

- designations, 37
- installing, 38–39
- RAID, 35
- removal, 35–37
- replacing or adding, 35

I

- ILOM, *See* Integrated Lights-Out Management (ILOM)

- important safety information, 20

installing

- cover, 28
- CPU module, 44–45
 - updating FRU information, 108–109
- CPU module filler card, 44–45
- DIMM rules, 47
- DIMMs, 48–49
- fan tray, 59–60
- fan tray carriage, 81–84
- fan tray designations, 58
- front bezel, 28–29
- front I/O board, 90–92
- front panel indicator board, 87–88
- hard disk backplane, 95–96
- hard drive, 38–39
- motherboard, 102–107
 - updating FRU information, 107–108
- PCI card, 52–53
- PCI cards
 - slot designations, 51
- power distribution board, 72–76
- power supply, 56–57
- power supply designations and redundancy, 55
- rules for CPU module, 42, 44
- service processor board, 63–65

Integrated Lights-Out Management (ILOM)

- command-line interface, 13–14
- controlling power
 - using the CLI, 13–14
 - using the web interface, 14–15
- powering, 11
- web interface, 14–15

L**LSI**

- 1064E SAS disk controller, 145
- BIOS configuration utility
 - accessing, 145
- MegaRAID Storage Manager, 145

M

- motherboard
 - installing, 102–107
 - removing, 98–102
 - updating FRU information, 107–108
- My Oracle Support, how to use, 5–6

O

- operation, preparing for, 27–28
- overview, service manual, 9

P

- PCI card
 - boot device detection and priority, 135
 - installing, 52–53
 - removing, 50
 - slot designation, 51
- power
 - availability, 11
 - controlling, 11–17
 - controlling remotely, 13
 - controlling using
 - CLI, 13–14
 - ILOM web interface, 14–15
 - resetting, 16
- power distribution board
 - installing, 72–76
 - removing, 70–72
- power modes
 - full-power mode, 11
 - standby power mode, 11
- power supplies, removing and installing, 53
- power supply
 - designations, 56
 - installing, 56–57
 - redundancy, 56
 - removing, 54–55
- powering, the server on and off, 12
- preparing
 - for operation, 27–28
 - for servicing, 22–23

R

- RAID, 35
 - configuration, 145
 - LSI MegaRAID Storage Manager, 145
- removal and replacement procedures, 29
- removing
 - CPU module, 40
 - CPU module filler card, 40
 - DIMMs, 46–47
 - DVD module, 65–67
 - fan tray, 58
 - fan tray carriage, 79–81
 - front bezel, 26–27
 - front I/O board, 89–90
 - front panel indicator board, 85–86
 - hard disk backplane, 93–95
 - hard drive, 35–37
 - motherboard, 98–102
 - PCI card, 50
 - power distribution board, 70–72
 - power supply, 54–55
 - service processor board, 61–63
- removing and installing
 - DIMMs, 46
 - identifying replaceable components, 31
- removing and installing components
 - CPU module and filler card, 39
 - DVD module, 65
 - fan tray, 57
 - fan tray carriage, 78
 - front I/O board, 88
 - front panel indicator board, 84
 - hard disk backplane, 92
 - hard drives, 35
 - motherboard, 96
 - overview, 19–110
 - PCI cards, 50
 - power distribution board, 70
 - power supplies, 53
 - procedures, 29
 - service processor board, 61
 - system (CMOS) battery, 33
 - updating FRU information, 107
- removing server, 23–26

replaceable components, identifying, 31

replacing

 CPU module, 39

 CPU module filler card, 39

reset switch (SW2), 16

resetting the server, 16

S

server, removing, 23–26

service processor (SP)

 powering, 11

 updates, 144

service processor board

 installing, 63–65

 removing, 61–63

servicing, preparing for, 22–23

SP, *See* service processor (SP)

standby power mode, *See* power modes

support.oracle.com, 5–6

T

tools, required for servicing, 21

U

Updating, BIOS and SP, 144

updating

 CPLD, 109–110

 FRU

 CPU module, 108–109

 motherboard, 107–108