



Sun Fire™ X2270 Server Service Manual

Sun Microsystems, Inc.
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Preface

The *Sun Fire X2270 Server Service Manual* provides a detailed description of the hardware and software applications that support the Sun Fire™ X2270 Server.

This book is intended for system administrators, network administrators, and service technicians who have an understanding of server hardware and software.

Product Updates

For product updates that you can download for the Sun Fire X2270 Server, visit the following web site:

<http://www.sun.com/download/index.jsp>.

Find the Hardware Drivers section and click x64 Servers & Workstations. The Sun Fire X2270 Server site contains updates for firmware and drivers, as well as CD-ROM .iso images.

Related Documentation

Refer to the following table to identify other documentation that is currently available for the Sun Fire X2270. You can access these documents online at:

<http://docs.sun.com/app/docs/prod/sf.2270>

Title	Content	Part Number	Format
<i>Sun Fire X2270 Server Product Notes</i>	Late-breaking information about the server.	820-5608	PDF HTML
<i>Sun Fire X2270 Server Getting Started Guide</i>	Basic installation information for setting up the server.	820-5610	PDF Print
<i>Sun Fire X2270 Server Installation Guide</i>	Detailed installation information for setting up the server.	820-5604	PDF HTML Print option
<i>Sun Fire X2270 Server Linux and Solaris Operating Systems Installation Guide</i>	Installation instructions for the Solaris and Linux operating systems.	820-5606	PDF HTML
<i>Sun Fire X2270 Server Windows Operating System Installation Guide</i>	Installation instructions for the Windows Server operating system.	820-7143	PDF HTML
<i>Sun Installation Assistant for Windows and Linux User's Guide</i>	Instructions for using the Sun Installation Assistant to install the Windows and Linux operating systems.	820-3357	PDF HTML
<i>Sun Fire X2270 Server Service Manual</i>	Information and procedures for maintaining and upgrading the server.	820-5607	PDF HTML
<i>Sun x64 Servers Diagnostics Guide</i>	Information for diagnosing and troubleshooting the server.	820-6750	PDF HTML
<i>x64 Servers Utilities Reference Manual</i>	Information for using applications and utilities common to x64 servers and server modules.	820-1120	PDF HTML
<i>Sun Integrated Lights Out Manager 2.0 User's Guide</i>	ILOM features and tasks that are common to servers and server modules that support ILOM.	820-1188	PDF HTML

Title	Content	Part Number	Format
<i>Sun Integrated Lights Out Manager (ILOM) 2.0 Supplement for Sun Fire X2270 Server</i>	ILOM information that is specific to the server.	820-5609	PDF HTML
<i>Sun Fire X2270 Server Safety and Compliance Manual</i>	Hardware safety and compliance information for the server.	820-5605	PDF
<i>Important Safety Information for Sun Hardware Systems</i>	Multilingual hardware safety and compliance information for all Sun hardware systems.	816-7190	Print
<i>Accessing Sun Product Documentation</i>	Multilingual information that provides the URL to Sun online documentation.	820-0541	Print

Translated versions of some of these documents are available at the web site described above in French, Japanese, and Simplified Chinese. English documentation is revised more frequently and might be more up-to-date than the translated documentation.

Documentation, Support, and Training

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Sun Documentation	http://docs.sun.com
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Using UNIX Commands

This document might not contain information about basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at:

<http://docs.sun.com>

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Typographic Conventions

Typeface*	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output	% su Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this. To delete a file, enter <code>rm filename</code> .

* The settings on your browser might differ from these settings.

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Sun Fire X2270 Server Service Manual, part number 820-5607-11

Sun Fire X2270 Server Overview

This chapter provides an overview of the Sun Fire X2270 Server, as well as power-on and power-off procedures, how to configure BIOS settings, and information about installing components.

The following sections are included in this chapter:

- [Section 1.1, “Features” on page 1-2](#)
- [Section 1.2, “Operating System and Software” on page 1-3](#)
- [Section 1.3, “Hardware System Overview” on page 1-4](#)
- [Section 1.4, “Powering On and Powering Off the Server” on page 1-9](#)
- [Section 1.5, “About the BIOS” on page 1-11](#)
- [Section 1.6, “Customer-Orderable Components” on page 1-17](#)

1.1 Features

TABLE 1-1 lists the system's key components.

TABLE 1-1 Sun Fire X2270 Server Features

Component	Description
CPUs	<ul style="list-style-type: none">• One or two quad-core Intel® Xeon processors• Processor frequencies: 2 GHz and faster• Up to 8 MB level 2 cache
Memory	<ul style="list-style-type: none">• Twelve DDR3-1333 capable DIMM slots (6 DIMM per CPU) that support up to 96 GB maximum using 8 GB DIMMs• Each DIMM socket can support a 2 GB, 4 GB, or 8 GB (1066 MHz or 1333 MHz) registered DIMM module
Hard disk drives (HDDs)	<ul style="list-style-type: none">• Up to four removable or fixed (optional) SATA hard disk drives: 500 GB or 1 TB @ 7200 rpm• Up to 4 TB maximum supported
Solid state drives (SSDs)	<ul style="list-style-type: none">• Up to four removable or fixed (optional) SATA solid state drives: 32 GB• Up to 128 GB maximum supported
Flash memory modules (F-MOD)	Two optional 24 GB flash memory modules located on the motherboard
Power supply	400W or 600W PSU, 80% high-efficiency
Network I/O	Two 10/100/1000BASE-T Gigabit Ethernet ports
PCI I/O	PCI Express riser card with one 16-lane slot
Other I/O	<ul style="list-style-type: none">• Five USB 2.0 ports: two on the back panel, two on the front panel, and one internal• One serial RS-232 port with RJ-45 connector
System management	Optional service processor (SP) module containing an IPMI 2.1-compliant service processor with Integrated Lights Out Manager (ILOM) and an onboard 2D/3D graphics controller with an HD15 connector

1.2 Operating System and Software

This section describes the operating system and additional software that is supported for the Sun Fire X2270 Server.

1.2.1 Preinstalled Software

If you ordered the preinstalled Solaris™ 10 Operating System on the Sun Fire X2270 Server, it will be installed on HDD0.

Note – The preinstalled Solaris 10 Operating System is a customer-orderable option.

For information on configuring a preinstalled operating system for the Sun Fire X2270 Server, refer to the *Sun Fire X2270 Server Installation Guide* (820-5604).

For further information on the Solaris 10 OS, see the Solaris 10 OS documentation at:

<http://docs.sun.com>

1.2.2 Supported Operating Systems

The following operating systems are supported for the Sun Fire X2270 Server:

- Solaris 10 Operating System (10/08) with Sun Java Enterprise System (Java ES)
- Red Hat Enterprise Linux 4.7 and 5.3, 32-bit and 64-bit (Enterprise Server and Advanced Server)
- SUSE Linux Enterprise Server 10, SP2, 64-bit (SUSE-certified)
- Windows Server 2003 R2, 32-bit and 64-bit (WHQL-certified)
- Windows Server 2008, 32-bit and 64-bit (Standard, Enterprise, and Datacenter)

See the *Sun Fire X2270 Linux and Solaris Operating Systems Installation Guide* (820-5606), and the *Sun Fire X2270 Windows Operating System Installation Guide* (820-7143) for instructions on installing these operating systems.

1.2.3 Tools & Drivers CD Software

The Sun Fire X2270 Server Tools & Drivers CD, which is available separately with the optional Sun Fire X2270 media and documentation kit, contains drivers for operating system installation, Intel NIC and Intel RAID/AHCI drivers, BIOS/BMC flash utilities, diagnostics software, and Windows Remote Installation Service (RIS) files.

For more information on using the Tools & Drivers CD software, see [Appendix B](#).

1.2.4 System Management

An IPMI 2.1-compatible service processor with Integrated Lights Out Manager is located on the optional Sun Fire X2270 SP module. See the *Sun Integrated Lights Out Manager 2.0 User's Guide* (820-1188) and the *Sun Integrated Lights Out Manager (ILOM) Supplement for Sun Fire X2270 Server* (820-5609) for more information on system management.

1.3 Hardware System Overview

The following sections describe the hardware orientation and features of your Sun Fire X2270 Server.

1.3.1 Front and Rear Panels

[FIGURE 1-1](#) shows the front panel of the Sun Fire X2270 Server with removable hard disk drives/SSDs. [FIGURE 1-2](#) shows the front panel of the Sun Fire X2270 Server with fixed hard disk drives/SSDs.

FIGURE 1-1 Front Panel With Removable Hard Disk Drives or Solid State Drives

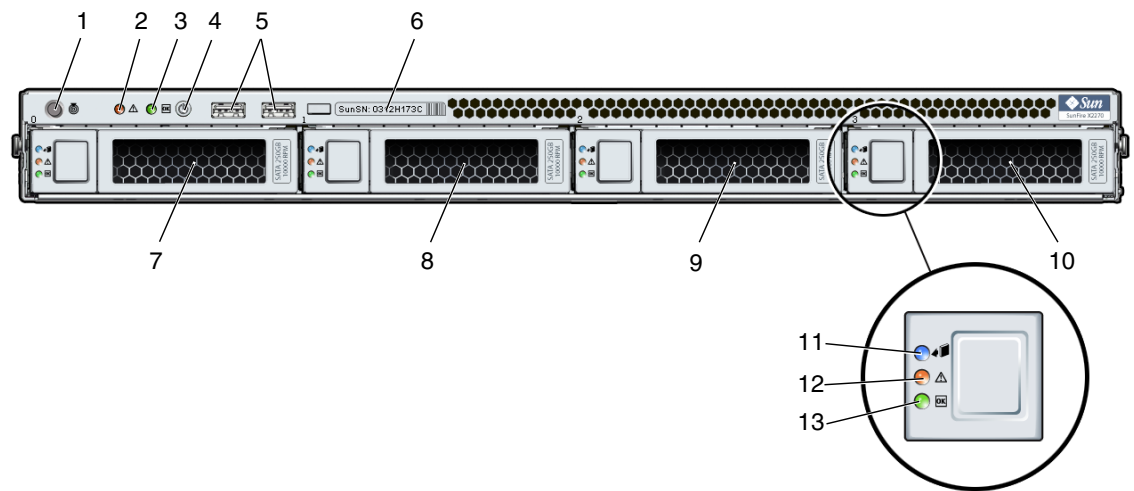


TABLE 1-2 Front Panel With Removable Hard Disk Drives or Solid State Drives

Label	Button/LED/Port	Label	Button/LED/Port
1	White Locate LED/Switch	8	Optional removable SATA HDD/SSD 1
2	Amber Fault LED	9	Optional removable SATA HDD/SSD 2
3	Green Power/OK LED	10	Optional removable SATA HDD/SSD 3
4	Power button	11	Disk Ready-to-Remove LED—non-operational
5	USB 2.0 ports (2)	12	Disk Service Action Required LED—non-operational
6	System Serial Number label	13	Green Disk OK LED—indicates that data is being read from or written to the HDD/SSD
7	Optional removable SATA HDD/SSD 0		

FIGURE 1-2 Front Panel With Fixed Hard Disk Drives or Fixed Solid State Drives

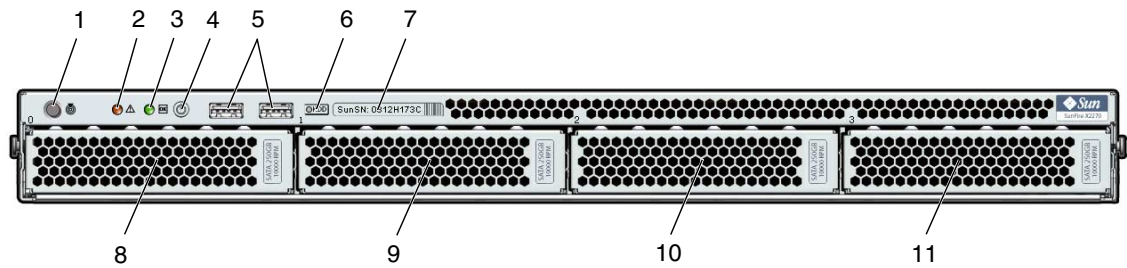


TABLE 1-3 Front Panel With Fixed Hard Disk Drives or Fixed Solid State Drives

Label	Button/LED/Port	Label	Button/LED/Port
1	White Locate LED/Switch	7	System Serial Number label
2	Amber Fault LED	8	Optional fixed SATA HDD/SSD 0
3	Green Power/OK LED	9	Optional fixed SATA HDD/SSD 1
4	Power button	10	Optional fixed SATA HDD/SSD 2
5	USB 2.0 ports (2)	11	Optional fixed SATA HDD/SSD 3
6	HDD/SSD Activity LED		

[FIGURE 1-3](#) shows the back panel of the Sun Fire X2270 Server.

FIGURE 1-3 Back Panel

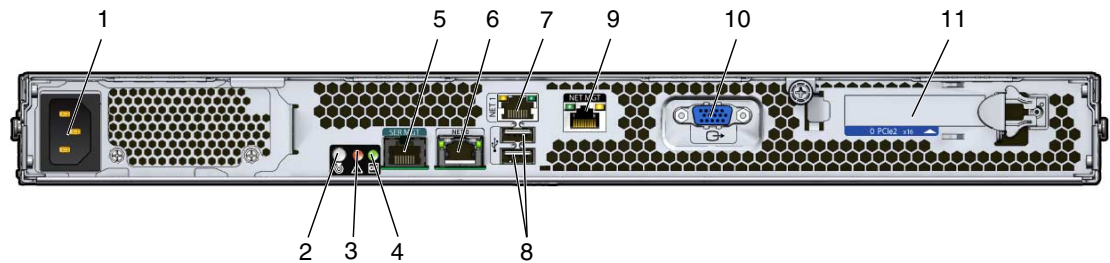


TABLE 1-4 Back Panel

Label	Connector/Slot	Label	Connector/Slot
1	AC Power connector	7	Gigabit Ethernet port (NET-1)
2	White Locate LED	8	USB 2.0 ports (2)
3	Amber Fault LED	9	Network Management (NET MGT) Ethernet port (available only in systems that contain an SP module)
4	Green Power/OK LED	10	HD15 video connector (available only in systems that contain an SP module)
5	Serial Management (SER MGT) / RS-232-F RJ-45 serial port	11	PCI Express slot (Gen 2, x16)
6	Gigabit Ethernet port (NET-0)		

1.3.2 Internal Components

FIGURE 1-4 shows the locations of the components inside the Sun Fire X2270 Server.

FIGURE 1-4 Sun Fire X2270 Server System Components

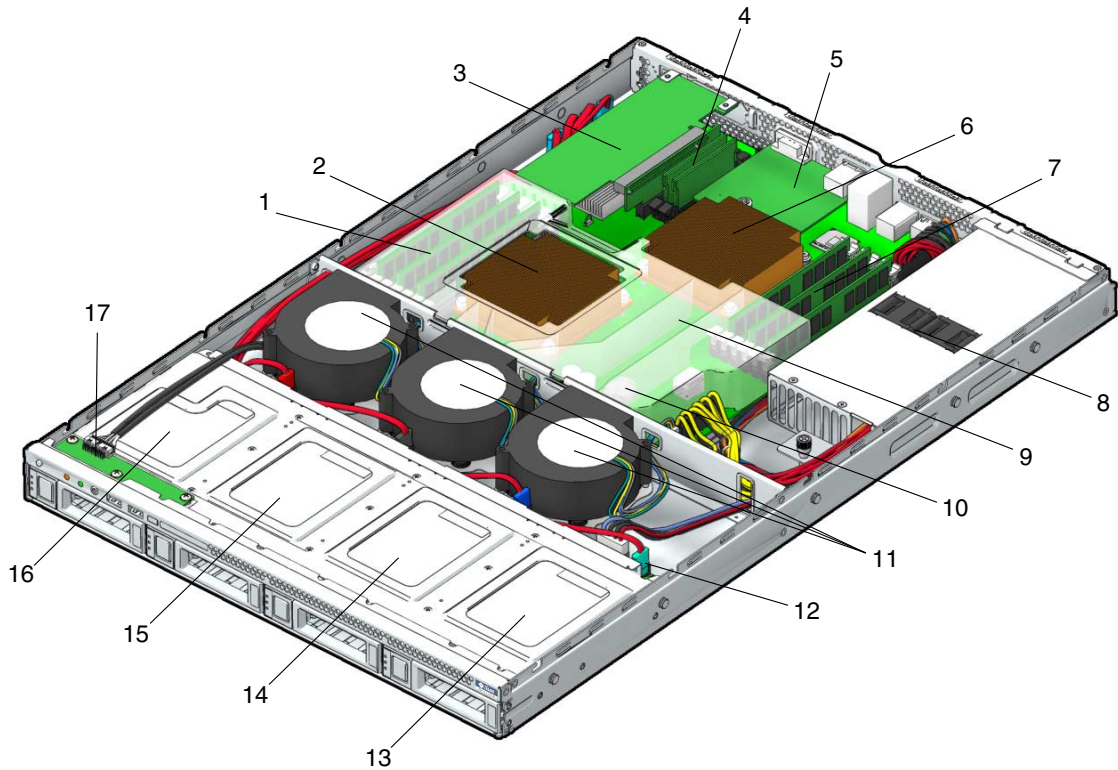


TABLE 1-5 Sun Fire X2270 Server Internal Components

Label	Component	Label	Component
1	DIMM slots (6) for CPU 1	10	System battery (located under the air duct)
2	CPU 1	11	Blower modules (3)
3	PCI Express riser and card	12	HDD/SSD backplane
4	F-MOD slots (2)	13	Optional fixed/removable SATA HDD/SSD 3
5	Optional service processor (SP) module	14	Optional fixed/removable SATA HDD/SSD 2

TABLE 1-5 Sun Fire X2270 Server Internal Components (Continued)

Label	Component	Label	Component
6	CPU 0	15	Optional fixed/removable SATA HDD/SSD 1
7	DIMM slots (6) for CPU 0	16	Optional fixed/removable SATA HDD/SSD 0
8	Power supply	17	I/O board
9	Air duct		

1.4 Powering On and Powering Off the Server

You only need to apply standby power to the server at this point so that you can perform initial configuration of the service processor (SP). Procedures for powering on to main power mode and for shutting down from main power mode are also included in this section, for your reference.

Note – The procedures for applying standby power for initial service processor configuration are applicable only to systems that contain a service processor. If your system *does not* contain a service processor, continue with the instructions [Section 1.4.2, “Powering On Main Power Mode” on page 1-10](#).

1.4.1 Applying Standby Power for Initial Service Processor Configuration

Use this procedure to apply standby power to the service processor before initial configuration.



Caution – Do not operate the server without all fans, component heatsinks, air baffles, and the cover installed. Severe damage to server components can occur if operated without adequate cooling mechanisms.

1. **Connect grounded AC power cord to the AC power connector on the back panel of the server and to a grounded AC power outlet.**

Note – At this point, standby power is supplied only to the service processor and power supply fans. Do not apply main power to the rest of the server until you are ready to install a platform operating system.

2. **Continue with initial software setup tasks, as described in the *Sun Fire X2270 Server Installation Guide* (820-5604).**

1.4.2 Powering On Main Power Mode

To power on main power for all server components:

1. **Verify that the power cord has been connected to the server. If your server contains an SP module, verify that standby power is on.**

For servers with an SP module, in standby power mode, the Power/OK LED on the front panel flashes. If your server does not contain the SP module, the LED does not illuminate. See [FIGURE 1-1](#).

2. **Press and release the Power button on the server front panel.**

When main power is applied to the full server, the Power/OK LED next to the Power button lights and remains lit.

Note – The first time the server powers on, the power-on self-test (POST) can take up to one minute to complete.

1.4.3 Shutting Down Main Power Mode

- **To power off the server from main power mode, use one of the following two methods:**
 - **Graceful shutdown:** Press and release the Power button on the front panel. This causes Advanced Configuration and Power Interface (ACPI) enabled operating systems to perform an orderly shutdown of the operating system. Servers not running ACPI-enabled operating systems will shut down to standby power mode immediately.
 - **Emergency shutdown:** Press and hold the Power button for at least four seconds to force the main power off and enter standby power mode. When the main power is off, the Power/OK LED on the front panel will begin flashing (only in systems that contain an SP module), indicating that the server is in standby power mode.



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

1.4.4 Clearing the CMOS

You can use this procedure to clear the server's CMOS settings in the case of a system hang.

For example, if the server hangs because of incorrect settings and will not boot, use this procedure to invalidate the settings and reboot with the default settings.

1. **Remove the AC power cord.**

See [FIGURE 1-3](#) for the location of the power cord connection.

2. **Remove the battery for 30 seconds, then reinsert it.**

See [Chapter 3](#) for instructions on removing and replacing the battery.

3. **Reinsert the AC power cord.**

1.5 About the BIOS

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

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

For information and instructions for updating or recovering BIOS firmware, see [Appendix B](#).

1.5.1 BIOS Booting and Setup Considerations

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

- [“Default BIOS Power-On Self-Test \(POST\) Events” on page 12](#)
- [“BIOS POST F1 and F2 Errors” on page 14](#)
- [“How BIOS POST Memory Testing Works” on page 17](#)

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

At system startup, the BIOS performs a power-on self-test that checks the hardware on your server to ensure that all components are present and functioning properly. [TABLE 1-6](#) identifies the events that can occur during BIOS POST, as well as specifies whether these event can prevent the host from powering-on.

TABLE 1-6 BIOS POST Events

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

TABLE 1-6 BIOS POST Events (*Continued*)

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

1.5.1.2 BIOS POST F1 and F2 Errors

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

- Type of error detected
- When or where the error occurred

[TABLE 1-7](#) lists some of the F1 and F2 error messages that could appear during the POST diagnostics along with instructions for how to possibly resolve the error reported.

TABLE 1-7 BIOS POST F1 and F2 Error Messages

BIOS POST Error Message	Error Type	Resolution
Uncorrectable Error Detected on Last Boot:IOH(0) Protocol Error (Please Check SP Log for more Details)	IOH error	<ul style="list-style-type: none">• Press F1 to continue.• Check the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) QPI [x] Error (Please Check SP Log for more Details) Note - Where QPI [x] equals 0 for QPI Link 0 or 1 for QPI Link 1.	IOH error	<ul style="list-style-type: none">• Press F1 to continue.• Check the fault management function and the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) PCI-E [x] Error (Please Check SP Log for more Details) Note - Where PCI-E [x] port number can range from 1 to 10 depending on the PCI root port on IOH.	IOH error	<ul style="list-style-type: none">• Press F1 to continue.• Check the fault management function and the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) ESI Error (Please Check SP Log for more Details)	IOH error	<ul style="list-style-type: none">• Press F1 to continue.• Check the fault management function and the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) Thermal Error (Please Check SP Log for more Details)	IOH error	<ul style="list-style-type: none">• Press F1 to continue.• Check the fault management function and the SP event log in ILOM for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) DMA Error (Please Check SP Log for more Details)	IOH error	<ul style="list-style-type: none">• Press F1 to continue.• Check the SP event log for more details.
Uncorrectable Error Detected on Last Boot:IOH(0) Miscellaneous Error (Please Check SP Log for more Details)	IOH error	<ul style="list-style-type: none">• Press F1 to continue.• Check the fault management function and the SP event log in ILOM for more details.

TABLE 1-7 BIOS POST F1 and F2 Error Messages (*Continued*)

BIOS POST Error Message	Error Type	Resolution
Uncorrectable Error Detected on Last Boot:IOH(0) VT-d Error (Please Check SP Log for more Details)	IOH error	<ul style="list-style-type: none"> Press F1 to continue. Check the SP event log in ILOM for more details.
BMC Not Responding	ILOM error	<ul style="list-style-type: none"> Press F1 to continue. <p>Note - This error message might display if an internal error occurs during the SP/BIOS communication. This error might require you to restart the SP.</p>
<ul style="list-style-type: none"> Primary Master Hard Disk Error Primary Slave Hard Disk Error Secondary Master Hard Disk Error Secondary Slave Hard Disk Error 	IDE/ATAPI error	<ul style="list-style-type: none"> Press F1 to continue. Check the SP event log in ILOM for more details. <p>Note - These error messages display when the BIOS is attempting to configure IDE/ATAPI devices in POST.</p>
Timer Error	8254 timer error	<ul style="list-style-type: none"> Press F1 to continue. Check the SP event log in ILOM for more details. <p>Note - This type of error typically indicates an error while programming the count register of channel 2 of the 8254 timer. This could indicate a problem with system hardware.</p>
RAM R/W test failed	Memory test failure	<ul style="list-style-type: none"> Press F1 to continue. Check the SP event log in ILOM for more details. <p>Note - This type of error typically indicates that the RAM read/write test failed.</p>
KBC BAT Test failed	Keyboard controller basic assurance test error	<ul style="list-style-type: none"> Press F1 to continue. Check the SP event log in ILOM for more details. <p>Note - Keyboard controller BAT test failed. This error might indicate a problem with keyboard controller initialization.</p>
Display memory test failed	Video display error	<ul style="list-style-type: none"> Press F1 to continue. Check the SP event log in ILOM for more details.
CMOS Battery Low	CMOS battery error	<ul style="list-style-type: none"> Press F2 to enter BIOS Setup utility to load system defaults. Check the SP event log in ILOM for more details. If necessary, replace CMOS battery.

TABLE 1-7 BIOS POST F1 and F2 Error Messages (*Continued*)

BIOS POST Error Message	Error Type	Resolution
<ul style="list-style-type: none">• CMOS Checksum Bad• CMOS Date/Time Not Set	CMOS error	<ul style="list-style-type: none">• Press F2 to enter BIOS Setup utility to load system defaults.• Check the SP event log in ILOM for more details.
Password check failed	Password check error	<ul style="list-style-type: none">• Press F1 to continue.• Check the SP event log in ILOM for more details. <p>Note - This type of error indicates that the password entered does not match the password specified in the BIOS Setup utility. This condition might occur for both Supervisor and User password verification.</p>
Keyboard/Interface Error	Keyboard controller error	<ul style="list-style-type: none">• Press F1 to continue.• Check the SP event log in ILOM for more details. <p>Note - This type of error indicates that the Keyboard Controller failure. This error might indicate a problem with system hardware.</p>
S.M.A.R.T error on the drive	S.M.A.R.T device error	<ul style="list-style-type: none">• Press F1 to continue.• Check the SP event log in ILOM for more details. <p>Note - S.M.A.R.T. failure messages might indicate the need to replace the storage device.</p>

1.5.1.3 How BIOS POST Memory Testing Works

The BIOS POST memory testing is performed as follows:

1. The first megabyte of DRAM is tested by the BIOS before the BIOS code is shadowed (that is, copied from ROM to DRAM).
2. After executing out of DRAM, the BIOS performs a simple memory test (where a write/read of every location with the pattern 55aa55aa is performed).

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

3. The BIOS polls the memory controllers for both correctable and non-correctable memory errors and logs those errors into the SP.
4. The message, BMC Responding appears at the end of the POST.

1.6 Customer-Orderable Components

You can order additional components and replacement parts for the Sun Fire X2270 Server.

Contact your local Sun sales representative for more information. For the most up-to-date component information, see the components list on the following web site:

http://sunsolve.sun.com/handbook_pub/Systems/

Troubleshooting the Server and Restoring ILOM Defaults

This chapter introduces the diagnostic tools you can use to troubleshoot or monitor the performance of your server. It also includes information about how to restore the SP password and serial connection defaults in ILOM, as well as how to restore your ILOM SP firmware.

Note – ILOM can be used only in systems that contain an optional service processor (SP) module.

- [Section 2.1, “Troubleshooting The Server” on page 2-1](#)
 - [Section 2.1.1, “Sun Diagnostic Tools” on page 2-2](#)
 - [Section 2.1.2, “Diagnostic Tool Documentation” on page 2-4](#)
- [Section 2.2, “Restoring ILOM Defaults” on page 2-6](#)
 - [Section 2.2.1, “Accessing the Preboot Menu” on page 2-6](#)
 - [Section 2.2.2, “Restoring the Factory Default ILOM Root Password” on page 2-12](#)
 - [Section 2.2.3, “Restoring ILOM Access to the Serial Console” on page 2-12](#)
 - [Section 2.2.4, “Restoring the SP Firmware Image” on page 2-14](#)
 - [Section 2.2.5, “Preboot Menu Command Summary” on page 2-17](#)
- [Section 2.3, “Getting Technical Assistance” on page 2-20](#)

2.1 Troubleshooting The Server

The Sun Fire X2270 Server and its accompanying software and firmware contain many diagnostic tools and features that can help you perform the following tasks:

- Isolate problems when a failure occurs on a customer-replaceable unit (CRU)
- Monitor the status of a functioning system
- Exercise the system to disclose more subtle problems that might be hardware related

Sun provides a suite of diagnostic tools, each of which has its own specific strengths and applications. For more information about which tool might be best to use for your purpose, and where to locate information about these tools, see:

- [Section 2.1.1, “Sun Diagnostic Tools” on page 2-2](#)
- [Section 2.1.2, “Diagnostic Tool Documentation” on page 2-4](#)

If you are not able to resolve the problem, contact Sun technical support. Support contact information is provided in [Section 2.3, “Getting Technical Assistance” on page 2-20](#).

2.1.1 Sun Diagnostic Tools

Sun provides a wide selection of diagnostic tools for use with your server. These tools range from the SunVTS software, a comprehensive validation test suite, to log files in ILOM that might contain clues helpful in identifying the possible sources of a problem, and the fault management function in ILOM that enables you to identify a faulted component as soon as the fault occurs.

The diagnostic tools also include stand-alone software packages, to firmware-based tests like power-on self-test (POST), U-Boot tests, or Pc-Check tests, to hardware LEDs that tell you when the system components are operating.

Note – If your server contains an SP, the Pc-Check diagnostics utility is integrated with the service processor (SP) firmware. If your server *does not* contain an SP, see Appendix B in the *Sun x64 Servers Diagnostics Guide* for information and instructions for running the Pc-Check utility.

Note – DIMM and CPU LEDs do not illuminate to indicate an error condition in servers that *do not* contain an SP. DIMM and CPU error LEDs require the optional service processor module to operate correctly.

[TABLE 2-1](#) summarizes the diagnostic tools that you can use when troubleshooting or monitoring your server.

TABLE 2-1 Summary of Sun Diagnostic Tools

Diagnostic Tool	Type	What It Does	Accessibility	Remote Capability
Integrated Lights Out Manager (ILOM)	SP firmware	Monitors environmental conditions, generates alerts, performs fault isolation, and provides remote console access.	Can function on standby power and when the operating system is not running.	Designed for remote and local access.
Preboot Menu	SP firmware	Enables you to restore some of ILOM defaults (including firmware) when ILOM is not accessible.	Can function on standby power and when operating system is not running.	Local access, but remote serial access is possible if the SP serial port is connected to a network-accessible terminal server.
LEDs	Hardware and SP firmware	Indicate status of overall system and particular components.	Available when system power is available.	Local, but sensors and indicators are accessible from ILOM web interface or command-line interface (CLI).
POST	Host firmware	Tests core components of system: CPUs, memory, and motherboard I/O bridge integrated circuits.	Runs on startup. Available when the operating system is not running.	Local, but can be accessed through ILOM Remote Console.
U-Boot	SP firmware	Initializes and tests aspects of the service processor (SP) prior to booting the ILOM SP operating system. Tests SP memory, SP, network devices and I/O devices.	Can function on standby power and when operating system is not running.	Local access, but remote serial access is possible if the SP serial port is connected to a network-accessible terminal server.

TABLE 2-1 Summary of Sun Diagnostic Tools (*Continued*)

Diagnostic Tool	Type	What It Does	Accessibility	Remote Capability
Pc-Check	SP firmware (or on Tools & Drivers CD for systems without SP)	DOS-based utility that tests all motherboard components (CPU, memory, and I/O), ports, and slots.	Runs on startup. Available when the operating system is not running.	Remote access through ILOM Remote Console for servers shipped with SP. <i>or</i> Local access for servers shipped without an SP (via Tools & Drivers CD).
Solaris commands	Operating system software	Displays system information.		Local, and over network.
SunVTS	Diagnostic tool stand-alone software	Exercises and stresses the system, running tests in parallel.	Requires operating system. Install SunVTS software separately.	View and control over network.

2.1.2 Diagnostic Tool Documentation

TABLE 2-2 identifies where you can find more information about Sun diagnostic tools.

TABLE 2-2 Summary of Documentation for Sun Diagnostic Tools

Diagnostic Tool	Where to Find Information
ILOM	<ul style="list-style-type: none"> • <i>Sun Integrated Lights Out Manager 2.0 User's Guide</i> • <i>Addendum to the Sun Integrated Lights Out Manager 2.0 User's Guide</i> • <i>Sun Integrated Lights Out Manager (ILOM) 2.0 Supplement for Sun Fire X2270 Server</i> <p>Locate the latest version of these guides at:</p> <ul style="list-style-type: none"> • http://docs.sun.com/app/docs/prod/sf.x2270
Preboot Menu	<ul style="list-style-type: none"> • Section 2.2, "Restoring ILOM Defaults" on page 2-6
LEDs or System indicators and sensors	<ul style="list-style-type: none"> • <i>Sun Fire X2270 Server Service Manual</i> • <i>Sun Integrated Lights Out Manager 2.0 User's Guide</i> • <i>Sun Integrated Lights Out Manager (ILOM) 2.0 Supplement for Sun Fire X2270 Server</i> <p>Locate the latest version of these guides at:</p> <ul style="list-style-type: none"> • http://docs.sun.com/app/docs/prod/sf.x2270

TABLE 2-2 Summary of Documentation for Sun Diagnostic Tools (*Continued*)

Diagnostic Tool	Where to Find Information
POST	<ul style="list-style-type: none">• Section 1.5, “About the BIOS” on page 1-11• Section 1.5.1.1, “Default BIOS Power-On Self-Test (POST) Events” on page 1-12• Section 1.5.1.2, “BIOS POST F1 and F2 Errors” on page 1-14• Section 1.5.1.3, “How BIOS POST Memory Testing Works” on page 1-17
U-Boot or Pc-Check	<ul style="list-style-type: none">• <i>Sun x64 Servers Diagnostics Guide</i> <p>Locate the latest version of this guide at:</p> <ul style="list-style-type: none">• http://docs.sun.com/app/docs/prod/sf.x2270
Solaris commands	<p>Locate the latest Solaris command information for Solaris 10 at:</p> <ul style="list-style-type: none">• http://docs.sun.com/app/docs/doc/817-0550/eqxqt?a=view
Sun VTS	<p>Download the Sun VTS software at:</p> <ul style="list-style-type: none">• http://sunsolve.com <p>Locate the latest documentation for SunVTS at:</p> <ul style="list-style-type: none">• http://www.sun.com/oem/products/vts/index.html

2.2 Restoring ILOM Defaults

You can restore the factory defaults for the following ILOM features:

- ILOM root password
- Serial port connection

To restore these factory defaults, you must use the Preboot Menu utility that is shipped installed on your server. The Preboot Menu enables you to address changes to some of ILOM's settings while ILOM is not currently running. In addition to restoring factory defaults for the root password and serial connection settings, the Preboot Menu enables you to restore the SP firmware image on your system.

For more information about how to use the Preboot Menu to restore settings in ILOM, see these sections:

- [Section 2.2.1, "Accessing the Preboot Menu" on page 2-6](#)
- [Section 2.2.2, "Restoring the Factory Default ILOM Root Password" on page 2-12](#)
- [Section 2.2.3, "Restoring ILOM Access to the Serial Console" on page 2-12](#)
- [Section 2.2.4, "Restoring the SP Firmware Image" on page 2-14](#)
- [Section 2.2.5, "Preboot Menu Command Summary" on page 2-17](#)

2.2.1 Accessing the Preboot Menu

To access the Preboot Menu, you must reset the SP and interrupt the boot process. You can interrupt the ILOM boot process by either:

- Using the Locate button on the local server.

For details about the requirements for this local access method, see [Prerequisites for Accessing the Preboot Menu](#).

Or

- Typing **xyzzy** during a pause in the bootstrap process from a remote console (terminal or computer).

For details about the requirements for this remote serial access method, see [Prerequisites for Accessing the Preboot Menu](#).

Some Preboot Menu settings must be configured first, and until they are, you must use the Locate button method to access the Preboot Menu.

For detailed instructions for accessing the Preboot Menu from a local or remote connection, see the following sections:

- [Section 2.2.1.1, “Accessing the Preboot Menu” on page 2-7](#)
- [Section 2.2.1.2, “Editing the Preboot Menu for Remote Serial Access” on page 2-9](#)

Prerequisites for Accessing the Preboot Menu

Ensure that the applicable requirements are met prior to accessing the Preboot menu from either a local or remote connection.

- For local access to the Preboot Menu (using Locate button)

You must connect a terminal or console capable of running terminal emulation software to the serial port on the server.

For instructions for accessing the Preboot Menu by using the Locate button, see [Section 2.2.1.1, “Accessing the Preboot Menu” on page 2-7](#).

- For remote serial access to the Preboot Menu (typing **xyzzy** during bootstrap)

Prior to accessing the Preboot Menu remotely, you must set the `bootdelay` and `check_physical_presence` settings in the Preboot Menu to enable remote serial access. To configure these settings for the first time, follow these steps:

- a. Access the Preboot Menu using the Locate button on the local server as described in [Section 2.2.1.1, “Accessing the Preboot Menu” on page 2-7](#).
- b. Edit the settings in the Preboot Menu to enable remote access as described in [Section 2.2.1.2, “Editing the Preboot Menu for Remote Serial Access” on page 2-9](#).
- c. Use a remote serial terminal or console running terminal emulation software to access the Preboot Menu remotely.

Note – You cannot use an SSH, or a remote KVMs session to access the Preboot Menu remotely.

2.2.1.1 Accessing the Preboot Menu

1. Ensure that the requirements in [Prerequisites for Accessing the Preboot Menu](#) are met.

2. Reset ILOM.

For example:

- From the server SP ILOM, enter the command:
 -> **reset /SP**

- Press the Power button (approximately, 1 second) on the front panel of the server to turn the server off, then press the Power button again to turn the server on.

ILOM reboots and messages begin scrolling on the screen.

3. To interrupt the ILOM boot process, perform one of the following actions when the SP is resetting:

- Press and hold the Locate button on the server front panel, until the Preboot Menu appears.

Or

- Type in **xyzzy** when you see the message:

Booting linux in *n* seconds...

Note – You cannot interrupt the ILOM boot process by typing **xyzzy** until you have configured the settings as described in [Section 2.2.1.2, “Editing the Preboot Menu for Remote Serial Access”](#) on page 2-9.

The ILOM Preboot Menu appears.

```
Booting linux in 10 seconds...

                                ILOM Pre-boot Menu
                                -----
Type "h" and [Enter] for a list of commands, or "?" [Enter] for
command-line key bindings.  Type "h cmd" for summary of 'cmd'
command.

Warning: SP will warm-reset after 300 seconds of idle time.
        Set 'bootretry' to -1 to disable the time-out.

Preboot>
```

4. You can perform any of the following tasks or type `boot` to exit the Preboot Menu.

- Enable remote access to the Preboot Menu.

For instructions, see [Section 2.2.1.2, “Editing the Preboot Menu for Remote Serial Access”](#) on page 2-9.

- Restore the factory default to the ILOM root password.

For instructions, see [Section 2.2.2.1, “Restoring ILOM Root Password to Factory Default Using the Preboot Menu”](#) on page 2-12.

- Restore the serial connection between ILOM and a host console.

For instructions, see [Section 2.2.3.1, “Restoring Access to the Serial Console Using the Preboot Menu”](#) on page 2-13.

- Restore the SP firmware image.

For instructions, see [Section 2.2.4.3, “Restoring the SP Firmware Image Using the Preboot Menu”](#) on page 2-16.

- Review the commands supported in the Preboot Menu.

For command details, see [Section 2.2.5, “Preboot Menu Command Summary”](#) on page 2-17.

2.2.1.2 Editing the Preboot Menu for Remote Serial Access

1. **Access the Preboot Menu as described in [Section 2.2.1.1, “Accessing the Preboot Menu”](#) on page 2-7.**

2. **At the `Preboot>` prompt, type `edit`.**

The Preboot Menu enters edit mode.

In edit mode, the Preboot Menu displays its selections one-by-one, offering you a chance to change each one.

- To change a setting, type the new value, then press Enter.
- To skip to the next setting, press Enter.

3. **Press Enter to move through the settings until the `bootdelay` setting appears.**

4. **To change the `bootdelay` setting, type 3, 10, or 30, then press Enter.**

This value (3, 10, or 30) specifies the number of seconds the SP boot process delays while waiting for your input.

The Preboot Menu re-displays the `bootdelay` setting with the new value.

5. **Press Enter to return to Preboot Menu selections.**

The Preboot Menu selections appear.

6. **Press Enter to move through the settings until the `check_physical_presence` setting appears.**

To change the `check_physical_presence` setting, type `no`, then press Enter.

The Preboot Menu displays the `check_physical_presence` setting with the new value.

7. **Press Enter for the new value to take effect.**

The Preboot Menu asks you to confirm your changes.

Enter `'y[es]'` to commit changes: `[no]`

8. Type **y** to save your changes and exit the edit session.

If you want to exit the edit session without saving your changes, type **n**.

The following example shows an edit session where the `bootdelay` and `check_physical_presence` settings are changed.

Note – For a list of other settings you can edit in the Preboot Menu, see [Editing Mode Settings in the Preboot Menu](#).

```
Preboot> edit

Press Enter by itself to reach the next question.
Press control-C to discard changes and quit.

Values for baudrate are {[ 9600 ] | 19200 | 38400 | 57600 | 115200
}.
Set baudrate? [9600]
Values for serial_is_host are {[ 0 ] | 1 }.
Set serial_is_host? [0]
Values for bootdelay are { -1 | 3 | 10 | 30 }.
Set bootdelay? [30] 10
Set bootdelay? [10]
Values for bootretry are { -1 | 30 | 300 | 3000 }.
Set bootretry? [<not set>]
Values for preferred are {[ 0 ] | 1 }.
Set preferred? [<not set>]
Values for preserve_conf are {[ yes ] | no }.
Set preserve_conf? [yes]
Values for preserve_users are {[ yes ] | no }.
Set preserve_users? [no]
Values for preserve_password are {[ yes ] | no }.
Set preserve_password? [yes]
Values for check_physical_presence are {[ yes ] | no }.
Set check_physical_presence? [no] no
Set check_physical_presence? [no]
Enter 'y[es]' to commit changes: [no] y
Summary: Changed 2 settings.
Preboot>
```

Editing Mode Settings in the Preboot Menu

In addition to changing the settings required in the Preboot Menu to enable remote access, you can also change other edit mode settings in the Preboot Menu. For a list of these settings, see [TABLE 2-3](#):

TABLE 2-3 Edit Mode Preboot Menu Command Settings

Setting	Description
baudrate	Sets the baudrate of the serial port. Selections include 9600, 19200, 38400, 57600, and 115200.
serial_is_host	If this is set to 0, the serial port connects to ILOM. If this is set to 1, the serial port connects to the host. For more details, see Section 2.2.3, “Restoring ILOM Access to the Serial Console” on page 2-12.
bootdelay	The number of seconds the bootstrap process waits for the user to enter xyzy before booting the SP. Selections include 3, 10, and 30.
bootretry	The number of seconds the Preboot Menu waits for user input before timing out and starting the SP. Set to -1 to disable the timeout.
preferred	Unused.
preserve_conf	Setting this to no duplicates the function of the <code>unconfig ilom_conf</code> command, which resets many ILOM configuration settings, but preserves SP network, baudrate, and <code>check_physical_presence</code> the next time the SP is booted.
preserve_users	Setting this to no duplicates the function of the <code>unconfig users</code> command, which resets user information to the default values the next time the SP is booted.
preserve_password	Setting this to no duplicates the function of the <code>unconfig password</code> command, which resets the root password to the default value the next time the SP is booted.
check_physical_presence	If this is set to Yes, you must press and hold the Locate button to interrupt the SP boot process. If it is set to No, the boot process prompts you to interrupt it. See Section 2.2.1.2, “Editing the Preboot Menu for Remote Serial Access” on page 2-9 for details.

2.2.2 Restoring the Factory Default ILOM Root Password

The ILOM root password grants you access to the ILOM web or command-line (CLI) interfaces on the SP or chassis monitoring module (CMM). If you forget the root password, you can use the Preboot Menu to restore the password to the factory default, changeme.

2.2.2.1 Restoring ILOM Root Password to Factory Default Using the Preboot Menu

1. **Access the Preboot Menu** as described in [“Accessing the Preboot Menu” on page 2-6](#).
2. **In Preboot Menu, type:**

```
Preboot> unconfig password
```

Setting 'preserve_password' to 'no' for the next boot of ILOM.
3. **Reset the SP by typing:**

```
Preboot> boot
```

The Preboot Menu exits and the SP restarts.

After restarting the ILOM SP, the value for the root password is set to changeme when the SP is finished booting.

2.2.3 Restoring ILOM Access to the Serial Console

In the event that the serial connection between ILOM and a host becomes unavailable, you can restore access to the serial port connection by reconfiguring the host as the external serial port owner in either the ILOM web interface or command-line interface (CLI), or in the Preboot Menu.

To determine which interface to use when restoring the serial connection between ILOM and a host console, consider the following:

- If a network connection is available, you should use the ILOM web interface or CLI to restore ILOM's access to the serial console.

For instructions, see the procedure for “Switch Serial Port Output Between SP and Host Console” in the *Sun Integrated Lights Out Manager (ILOM) 2.0 Supplement for Sun Fire X2270 Server*.

- If a network connection is unavailable, you should use the procedure in [“Restoring Access to the Serial Console Using the Preboot Menu” on page 2-13](#) to restore ILOM access to the serial console.

2.2.3.1 Restoring Access to the Serial Console Using the Preboot Menu

1. **Access the Preboot Menu as described in [“Accessing the Preboot Menu” on page 2-6](#).**
2. **At the `Preboot>` prompt, type `edit`.**

The Preboot Menu enters edit mode.

In edit mode, the Preboot Menu displays its selections one-by-one, offering you a chance to change each one.

 - To change a setting, type the new value, then press Enter.
 - To skip to the next setting, press Enter.
3. **Press Enter to move through the settings until the `serial_is_host` setting appears.**

To change the `serial_is_host` setting, type `0`, and then press Enter.

The Preboot Menu redisplay the `serial_is_host` setting with the new value.
4. **Press Enter to display the Preboot Menu selections.**

The Preboot Menu settings appear.
5. **Press Enter to scroll through the settings until the Preboot Menu asks you to confirm your changes.**

Enter 'y[es]' to commit changes: [no]
6. **Type `y` to confirm your change and exit the edit session.**

The preboot menu displays this message

```
Summary: Changed 1 settings
Preboot>
```
7. **To exit the Preboot Menu, type: `boot`.**

2.2.4 Restoring the SP Firmware Image

If ILOM is available, you should always use the ILOM web interface or CLI to restore (update) the SP firmware image. For instructions about how to restore the firmware image using either the ILOM web interface or CLI, see the *Sun Integrated Lights Out Manager 2.0 User Guide* (820-1188).

If ILOM is unavailable, you can use the Preboot Menu or IPMIflash to restore the SP firmware image. To restore the SP firmware image using IPMIflash, see the *Addendum to the Sun Integrated Lights Out Manager 2.0 User's Guide* (820-4198) for more for details.

Note – If you are unable to access ILOM to update the SP firmware image using either the ILOM interfaces or IPMIflash, you should contact a Sun service representative for assistance.

To restore the SP firmware image using the Preboot Menu, you must be a Sun qualified service technician to perform the procedure.

To use the Preboot Menu to restore the SP firmware image on the server, see the following sections:

- [“Prerequisites for Restoring SP Firmware Using Preboot Menu” on page 2-14](#)
- [“Special Recovery Considerations for Systems Running ILOM Firmware 2.0.2.18 or Later” on page 2-15](#)
- [“Restoring the SP Firmware Image Using the Preboot Menu” on page 2-16](#)

2.2.4.1 Prerequisites for Restoring SP Firmware Using Preboot Menu

The following requirements must be met prior to restoring the SP firmware on your server using the Preboot Menu.

- If your system is running ILOM firmware 2.0.2.18 or later, you must enable the Preboot Menu to support the ability to restore the SP firmware. For more information on how to enable support in the Preboot Menu to restore the SP firmware, see [“Special Recovery Considerations for Systems Running ILOM Firmware 2.0.2.18 or Later” on page 2-15](#).
- You must be a Sun qualified service technician to perform this procedure.
- You must have a valid `.flash` firmware image file on a TFTP server.

Note – Restoring the SP firmware using the Preboot Menu requires a `.flash` file instead of a `.pkg` file that is typically used to update the SP using the ILOM interfaces.

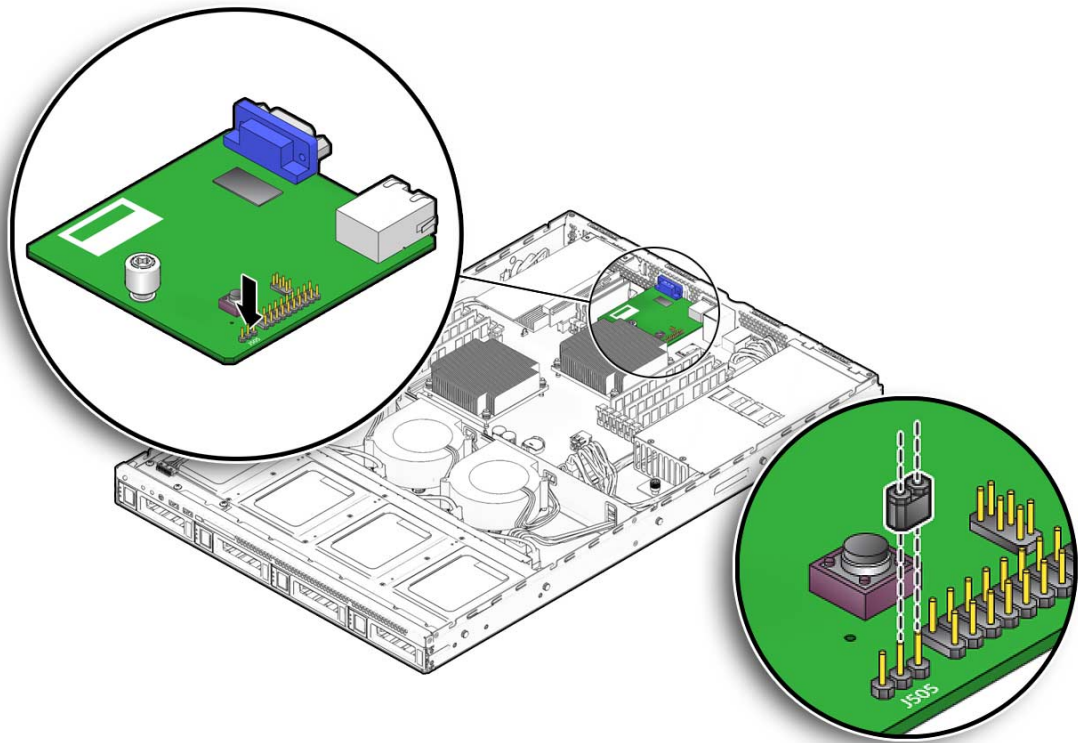
2.2.4.2 Special Recovery Considerations for Systems Running ILOM Firmware 2.0.2.18 or Later

As of ILOM 2.0.2.18, you must enable support in the Preboot Menu to restore the SP firmware image prior to performing the steps described in [“Restoring the SP Firmware Image Using the Preboot Menu”](#) on page 2-16.

To enable support in the Preboot Menu to recover SP firmware 2.0.2.18 or later, follow these steps.

1. **Prepare the server for service by powering down the server, unplugging the AC cord, then removing the server cover.**
For instructions, see [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.
2. **Locate the J505 pins on the optional service processor module then place a jumper on pins 2 and 3.**

FIGURE 2-1 Placing a Jumper on the Pins



3. **Replace the top cover and power on the server.**

For instructions, see [Section 1.4, “Powering On and Powering Off the Server”](#) on page 1-9.

4. **Follow the instructions for recovering the SP firmware using the Preboot Menu in “Restoring the SP Firmware Image Using the Preboot Menu” on page 2-16.**

Note – The Preboot Menu firmware recovery process must be performed by a Sun qualified service technician and you must have a valid `.flash` file to perform the procedure.

5. **After you restore the SP firmware using the Preboot Menu, perform the following steps to return the server to normal operation.**

a. **Power off the server and remove the top cover.**

For instructions, see [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.

b. **Remove the jumper from J505 pins 2 and 3.**

c. **Replace the top cover and power on the server.**

For instructions, see [Section 1.4, “Powering On and Powering Off the Server”](#) on page 1-9.

2.2.4.3 Restoring the SP Firmware Image Using the Preboot Menu

1. **Access the Preboot Menu as described in “Accessing the Preboot Menu” on page 2-6.**

2. **At the `Preboot>` prompt, type:**

Caution – The use of the `net flash` command is reserved for use by Sun service personnel only.

`net flash` *IPaddress path/name.flash*

where:

- *IPaddress* is the IP address of a TFTP server
- *path* is the path to the file relative to `/tftpboot`

- *name* is the first part of the .flash file filename

For example:

```
Preboot> net flash 10.8.173.25 images/system-rom.flash
```

After a series of messages, the Preboot Menu prompt appears.

```
Preboot>
```

3. At the Preboot> prompt, type the reset command to restart the SP.

For example:

```
Preboot> reset
```

The Preboot Menu exits and ILOM restarts.

2.2.5 Preboot Menu Command Summary

TABLE 2-4 identifies the Preboot Menu commands.

TABLE 2-4 Preboot Menu Commands

Command	Description
boot	Boots ILOM. The Preboot Menu exits and ILOM restarts. Note - This command executes a modified boot sequence that does not offer the choice to select the diagnostic level, or to interrupt the boot sequence and return to the Preboot Menu. To execute the normal boot sequence, use the <code>reset warm</code> command instead.
vers	Displays version information including the hardware type, board revision, ILOM revision, revisions of PBSW and recovery U-Boot. Shows the checksum integrity of the images, and the preference between redundant images.
help	Displays a list of commands and parameters.
show	Displays a list of SP settings.
edit	Starts an interactive dialog that prompts and changes settings one-by-one. See Section 2.2.1.2, “Editing the Preboot Menu for Remote Serial Access” on page 2-9 for details.
diag	Runs the U-Boot diagnostic tests in manual mode. See the <i>Sun X64 Servers Diagnostics Guide</i> for more on U-Boot diagnostic tests.

TABLE 2-4 Preboot Menu Commands (*Continued*)

Command	Description
host	<p>Initiates various activities related to the host.</p> <p>{ clearcmos console show enable-on hard-off }</p> <ul style="list-style-type: none">• clearcmos – Clears CMOS and BIOS passwords.• console – Connects SP console to host serial console. <p>Note - Type Ctrl \ q to quit.</p> <ul style="list-style-type: none">• show – Shows information about the host state.• enable-on – Enables the front-panel Power button, which is usually disabled unless ILOM is running. <p>Caution - If you start the host when ILOM is off, the BIOS does not send error events, or power messages to the SP. This can cause all server modules to lose power.</p> <ul style="list-style-type: none">• hard-off – Turns the host off.
net	<p>{ config dhcp ping flash }</p> <ul style="list-style-type: none">• config – Starts a dialog that enables you to change the ILOM network settings.• dhcp – Changes the network addressing from static to DHCP. <p>Note - You must set ipdiscovery = dhcp using the net config command first.</p> <ul style="list-style-type: none">• ping – Sends a ping.• flash – Downloads an ILOM firmware image. See Section 2.2.4, “Restoring the SP Firmware Image” on page 2-14 for details. <p>Type help net command for more details on these commands.</p>

TABLE 2-4 Preboot Menu Commands (*Continued*)

Command	Description
reset	<p>{ [warm] cold }. Resets the SP and the host.</p> <ul style="list-style-type: none">• warm – Resets the SP without affecting a running host.• cold – Resets the SP and the host. It has the effect of powering off the server module.
unconfig	<p>{ users ilom_conf most all }</p> <p>Causes ILOM to erase any configuration information and returns the values to defaults the next time ILOM boots.</p> <ul style="list-style-type: none">• users – Resets all configured user information.• password – Resets the ILOM root password to the default. See Section 2.2.2, “Restoring the Factory Default ILOM Root Password” on page 2-12 for more details.• ilom_conf – Resets configuration settings but preserves SP network and baudrate, preferred, and check_physical_presence.• most – Resets the SP data storage, but preserves network and baud rate, preferred, and check_physical_presence settings.• all – Resets all SP data storage and settings. <p>Booting ILOM restores other defaults.</p> <p>Note - None of these options erases the dynamic FRU PROMs.</p>

2.3 Getting Technical Assistance

If the troubleshooting procedures in this chapter fail to solve your problem, see [TABLE 2-5](#), which lists the Sun web sites and telephone numbers for additional technical support.

TABLE 2-5 Sun Web Sites and Telephone Numbers

Server Documents and Support Resources	URL or Telephone Number
Discussion and troubleshooting forums.	http://supportforum.sun.com/
Support, diagnostic tools, and alerts for all Sun products.	http://www.sun.com/bigadmin/
SunSolve SM web site. Contains links to software patches. Lists some system specifications, troubleshooting and maintenance information, and other tools.	http://www.sunsolve.sun.com/handbook_pub/
Service support phone numbers.	1-800-872-4786 (1-800-USA-4Sun), Select Option 1
International telephone numbers for Sun support.	http://www.sun.com/service/contacting/solution.html
Warranty and contract support contacts. Links to other service tools.	http://www.sun.com/service/online/
Warranties for every Sun product.	http://www.sun.com/service/support/warranty

Maintaining the Sun Fire X2270 Server

This chapter describes how to add, replace, and configure components in the Sun Fire X2270 Server after it has been set up.

This chapter contains the following sections:

- [Section 3.1, “Tools and Supplies Needed” on page 3-1](#)
- [Section 3.3, “Powering Off the Server and Removing the Cover” on page 3-3](#)
- [Section 3.4, “Locations of Server Components” on page 3-5](#)
- [Section 3.5, “Component Replacement Procedures” on page 3-6](#)

To determine and isolate a faulty component, refer to the *Sun x64 Servers Diagnostics Guide*, 820-6750.

Note – System cooling might be affected by dust and contaminant build-up. It is recommended that systems be opened and checked approximately every six months or more often in dirty operating environments. Check system heatsinks, fans, and air openings. If necessary, clean systems by brushing or blowing contaminants from the system or by carefully vacuuming contaminants from the system.

3.1 Tools and Supplies Needed

You need the following tools and supplies for performing Sun Fire X2270 Server maintenance procedures.

- #2 Phillips screwdriver
- Antistatic wrist strap
- Alcohol pads (for CPU replacement by service personnel only)

3.2 Installation Precautions

Before removing the system's top cover, read the following sections. These sections contain important electrostatic discharge (ESD) precautions, along with preinstallation and postinstallation instructions.

3.2.1 ESD Precautions

ESD can damage your processor, disk drives, expansion boards, and other components. Always observe the following precautions before you install a system component.

- 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.
- Press the Power button on the front of the chassis to turn off power before removing or replacing any of the system components.

3.2.2 Preinstallation Instructions

Always perform the following steps before you install any component:

1. **Turn off the system and all of the peripherals connected to it.**



Caution – Failure to properly turn off the system before you start installing components can cause serious component damage.



Caution – Follow the ESD precautions described in [Section 3.2.1, “ESD Precautions” on page 3-2](#) when handling a system component.

2. **Remove the server cover.**

See [Section 3.3, “Powering Off the Server and Removing the Cover” on page 3-3](#) for the appropriate procedure for removing the cover from the server.

3.2.3 Postinstallation Instructions

Perform the following steps after installing a server component.

1. **Ensure that all of the components are installed as described in the component replacement instructions.**

See [Section 3.5, “Component Replacement Procedures”](#) on page 3-6.

2. **Reinstall any PCI Express (PCIe) cards or peripherals that you had previously removed.**

See [Section 3.5, “Component Replacement Procedures”](#) on page 3-6.

3. **Reinstall the system’s cover.**

See [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.

4. **Connect all external cables to the system.**

5. **Power on the system.**

See [Section 1.4, “Powering On and Powering Off the Server”](#) on page 1-9.



Caution – If the cover has been removed or hard drive bays do not have a drive or filler panel installed, do not operate the server for more than ten minutes. Improper cooling airflow might damage the system’s components.

3.3 Powering Off the Server and Removing the Cover

For your safety, perform this procedure when you are powering off the system and removing the cover for a maintenance procedure in this chapter.

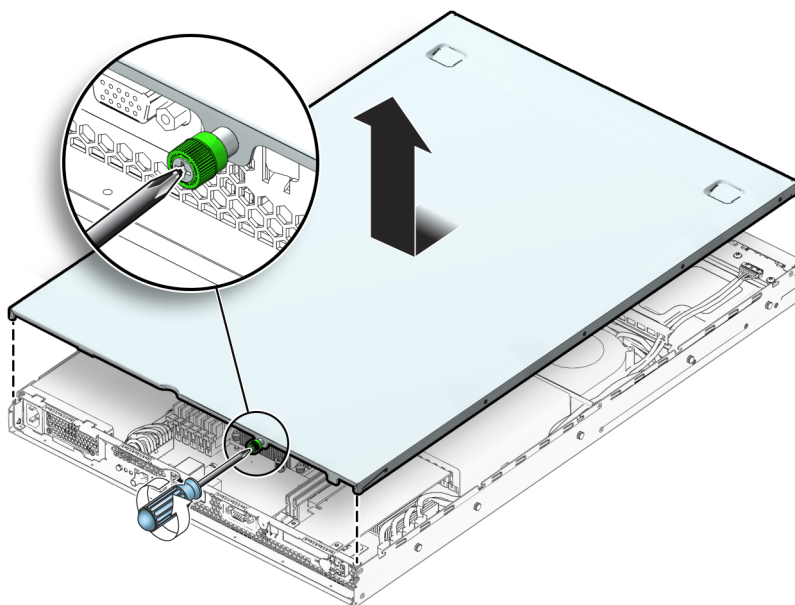
1. **If the operating system (OS) is running, perform a shutdown of the OS, and then press and release the platform Power button on the front panel.**
2. **Turn off all peripheral devices connected to the system.**
3. **Disconnect the AC power on the back panel of the server (see [FIGURE 1-3](#)).**
4. **Label and disconnect all peripheral cables and all telecommunication lines connected to I/O connectors or ports on the back panel of the system.**



Caution – The system's printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

5. Before handling components, attach a wrist strap to a chassis ground (any unpainted metal surface).
6. Loosen the captive screw securing the cover to the chassis (see [FIGURE 3-1](#)).
7. Pull the cover slightly toward the back of the server and then straight up to remove it.
8. Lift the cover and remove it.

FIGURE 3-1 Removing the Server Cover



Note – Perform the reverse of these procedures to reinstall the server cover.

3.4 Locations of Server Components

FIGURE 3-2 Sun Fire X2270 Server System Components

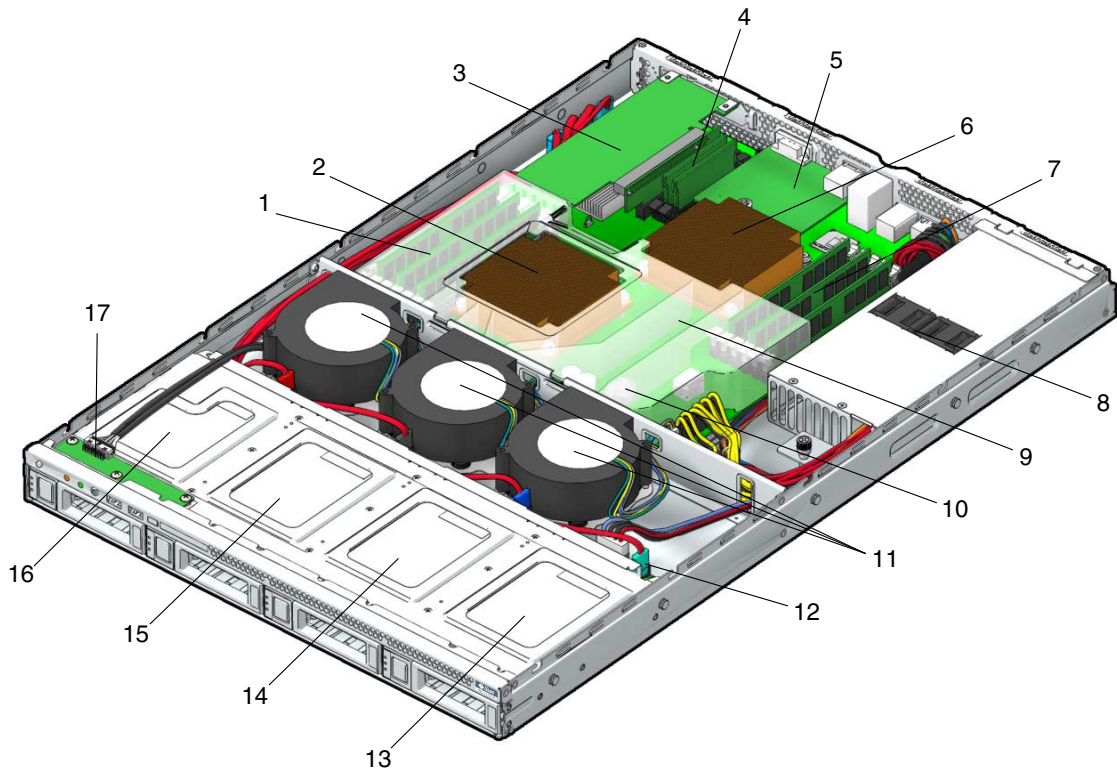


TABLE 3-1 Sun Fire X2270 Server Internal Components

Label	Component	Label	Component
1	DIMM slots (6) for CPU 1	10	System battery (located under the air duct)
2	CPU 1	11	Blower modules (3)
3	PCI Express riser and card	12	HDD/SSD backplane
4	F-MOD slots (2)	13	Optional fixed/removable SATA HDD/SSD 3
5	Optional service processor (SP) module	14	Optional fixed/removable SATA HDD/SSD 2

TABLE 3-1 Sun Fire X2270 Server Internal Components *(Continued)*

Label	Component	Label	Component
6	CPU 0	15	Optional fixed/removable SATA HDD/SSD 1
7	DIMM slots (6) for CPU 0	16	Optional fixed/removable SATA HDD/SSD 0
8	Power supply	17	I/O board
9	Air duct		

3.5 Component Replacement Procedures

The following components are customer-replaceable units (CRUs):

- I/O board (see [Section 3.5.1, “Replacing the I/O Board”](#) on page 3-7)
- PCIe card (see [Section 3.5.3, “Replacing the PCIe Card”](#) on page 3-11)
- PCIe riser (see [Section 3.5.2, “Replacing the PCIe Riser”](#) on page 3-9)
- Hard disk drives or solid state drives and carriers (see [Section 3.5.4, “Replacing a Removable Disk Drive and Carrier”](#) on page 3-14)
- Hard disk drive and solid state drive backplane (see [Section 3.5.5, “Replacing the Disk Drive Backplane Assembly”](#) on page 3-17)
- Fixed disk drives and carriers (see [Section 3.5.6, “Replacing a Fixed Disk Drive and Carrier”](#) on page 3-18)
- Air duct (see [Section 3.5.7, “Replacing the Air Duct”](#) on page 3-22)
- Power supply (see [Section 3.5.8, “Replacing the Power Supply”](#) on page 3-24)
- Blower module (see [Section 3.5.9, “Replacing a Blower Module”](#) on page 3-27)
- Memory modules (DIMMs) (see [Section 3.5.10, “Replacing Memory Modules”](#) on page 3-29)
- Flash memory modules (see [Section 3.5.11, “Replacing Flash Memory Modules”](#) on page 3-34)
- Battery (see [Section 3.5.12, “Replacing the System Battery”](#) on page 3-36)
- Service processor module (see [Section 3.5.13, “Removing and Replacing the SP Module”](#) on page 3-38)
- CPU - new installation (see [Section 3.5.15, “Installing a New CPU”](#) on page 3-45)
- SATA cable, I/O board cable, and disk power harness (see [Section 3.5.16, “Replacing Cables”](#) on page 3-47)

The following components should be replaced only by trained field service technicians:

- CPU - replacement (see [Section 3.5.14, “Replacing a CPU and Heatsink” on page 3-40](#))
- Motherboard (see [Section 3.5.17, “Motherboard” on page 3-51](#))

3.5.1 Replacing the I/O Board

The following procedures describe how to remove and replace an I/O board.

3.5.1.1 Removing the I/O Board

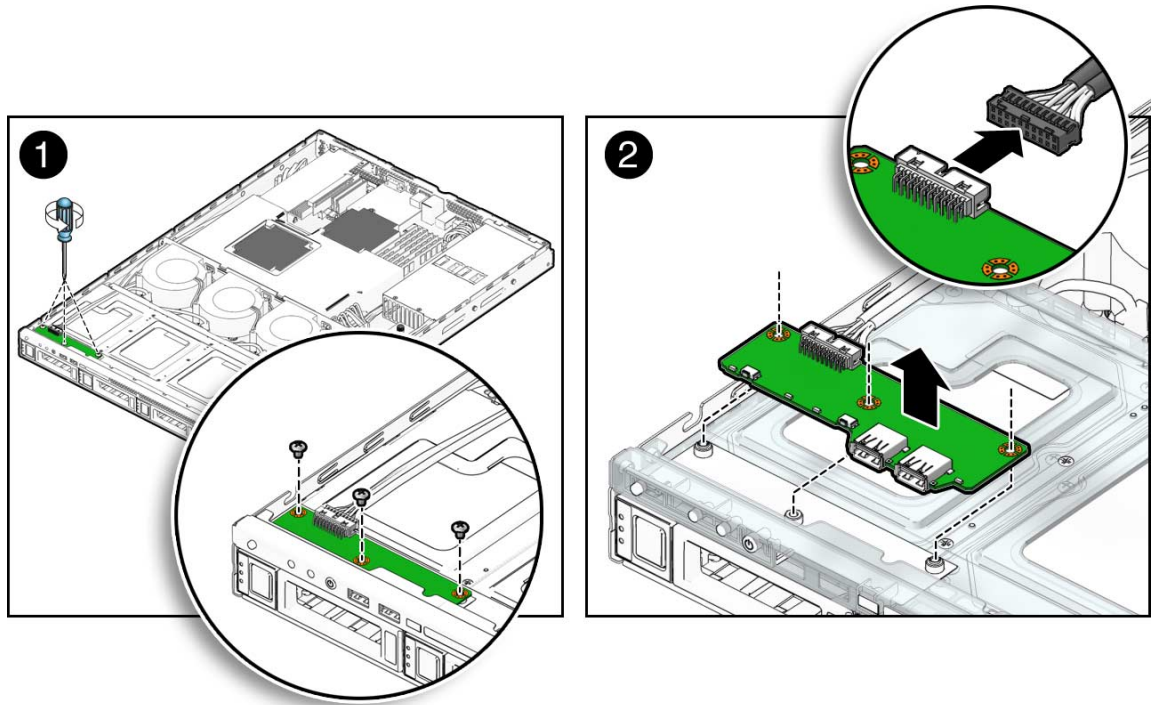
To remove the I/O board:

- 1. Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

Refer to [Section 3.3, “Powering Off the Server and Removing the Cover” on page 3-3](#).

- 2. Remove the screws securing the I/O board to the hard disk drive (HDD) cage.**

FIGURE 3-3 Removing the I/O Board



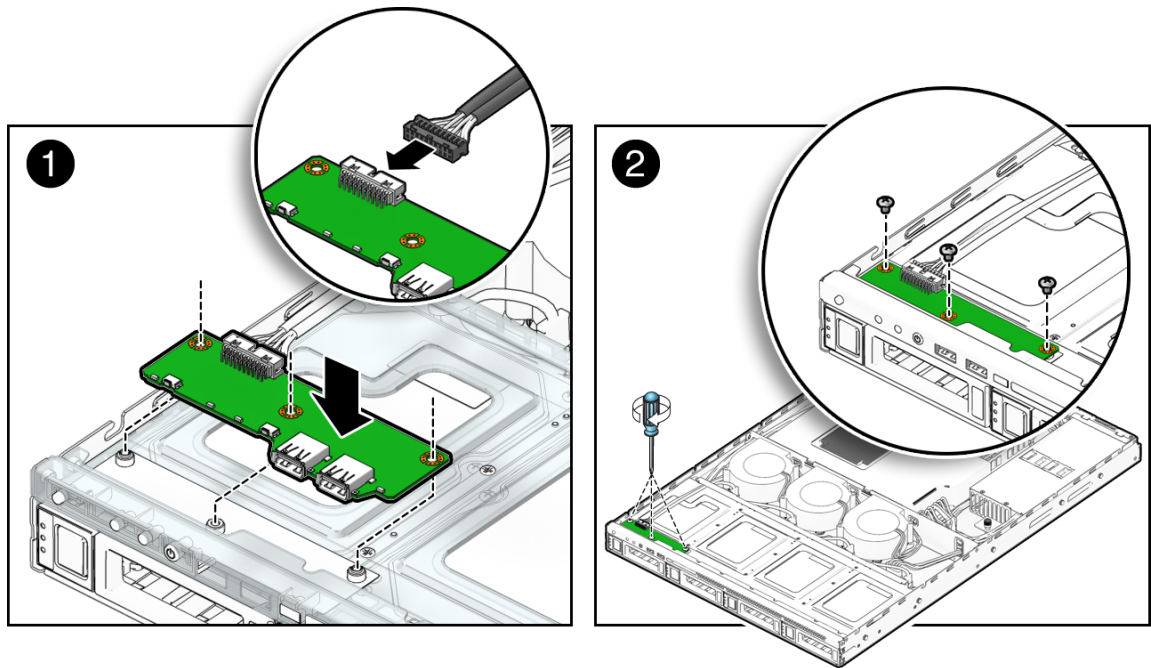
3. Lift the I/O board up slightly to clear the shoulder standoffs, then pull back to remove the I/O board from the system.
4. Remove the cable connected to the I/O board.

3.5.1.2 Installing the I/O Board

To install the I/O board:

1. Position the I/O board on top of the HDD cage so the openings on the board line up with the guides on top of the HDD cage.

FIGURE 3-4 Installing the I/O Board



2. Reconnect the cable.
3. Gently push the I/O board forward, then down on to the shoulder standoffs to secure it.
4. Fasten the screws to secure the I/O board to the mounting bracket.
5. Check the routing of all cables for obstructions, and then reinstall the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on [page 3-3](#).

3.5.2 Replacing the PCIe Riser

The PCIe riser installed in the server is a low-profile, half-length x16 connector card, supporting up to 35W cards.

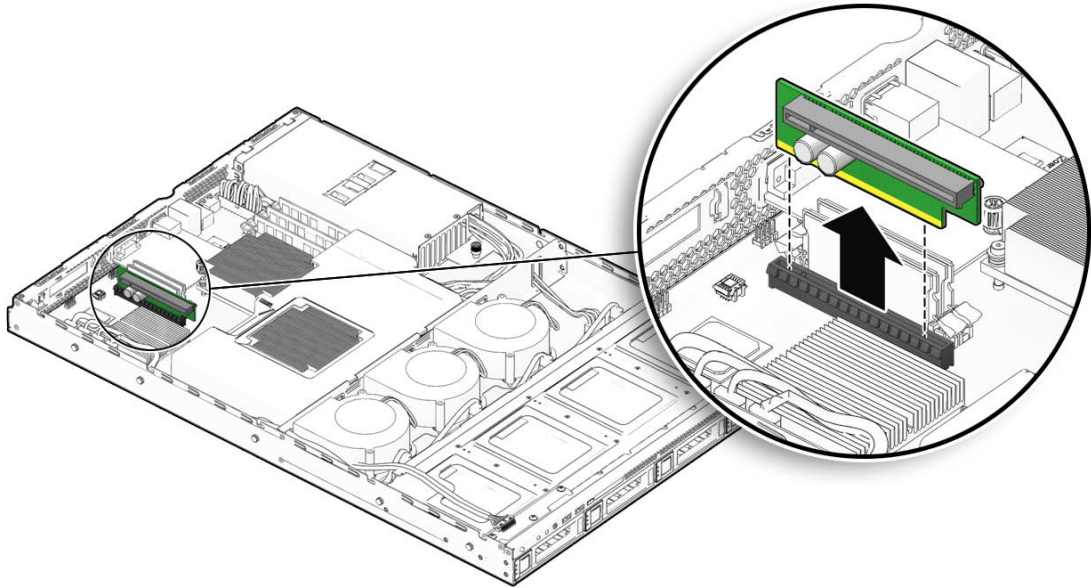
The following sections describe how to remove or install a PCIe riser.

3.5.2.1 Removing the PCIe Riser

To remove the PCIe riser:

1. **Power off the system and remove the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.**

FIGURE 3-5 Removing the PCIe Riser



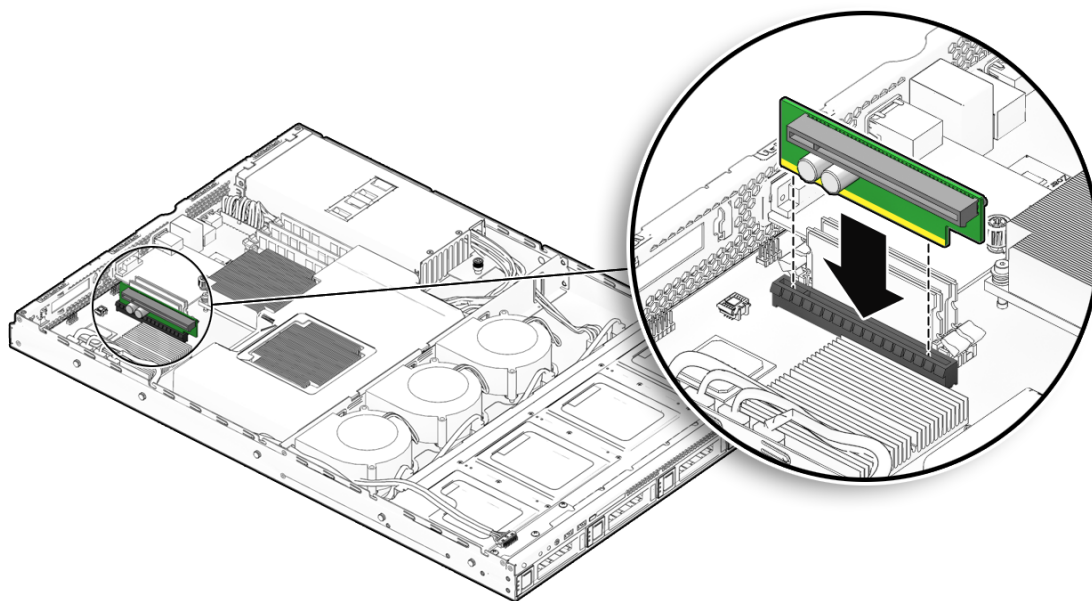
2. If a PCIe card is connected to the PCIe riser, remove the PCIe card as described in [Section 3.5.3.1, “Removing the PCIe Card”](#) on page 3-11.
3. Using your fingers, pull the PCIe riser upward to disengage the riser card from the connector on the motherboard.
4. If you are not replacing the PCIe riser, check the routing of all cables for obstructions, and then reinstall the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.

3.5.2.2 Installing the PCIe Riser

To install the PCIe riser:

1. Using your fingers, gently push down on the PCIe riser to engage the card to the connector on the motherboard. See [FIGURE 3-6](#).

FIGURE 3-6 Installing the PCIe Riser



2. If you are installing a PCIe card, install the card as described in [Section 3.5.3.2, “Installing the PCIe Card”](#) on page 3-12.
3. Check the routing of all cables for obstructions, and then reinstall the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.

3.5.3 Replacing the PCIe Card

The following sections describe how to remove or install a PCIe card.

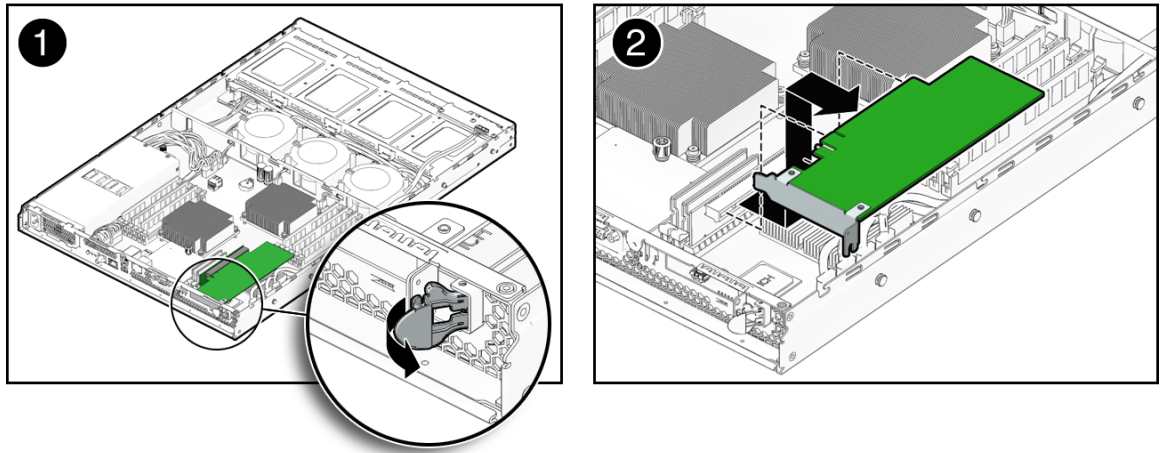
3.5.3.1 Removing the PCIe Card

To remove the PCIe card:

1. Power off the system and remove the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.
2. Unlatch the PCIe card and slide the card from PCIe slot in the back panel of the server chassis, then disengage the PCIe card from the connector on the riser card.

See [FIGURE 3-7](#).

FIGURE 3-7 Removing a PCIe Card



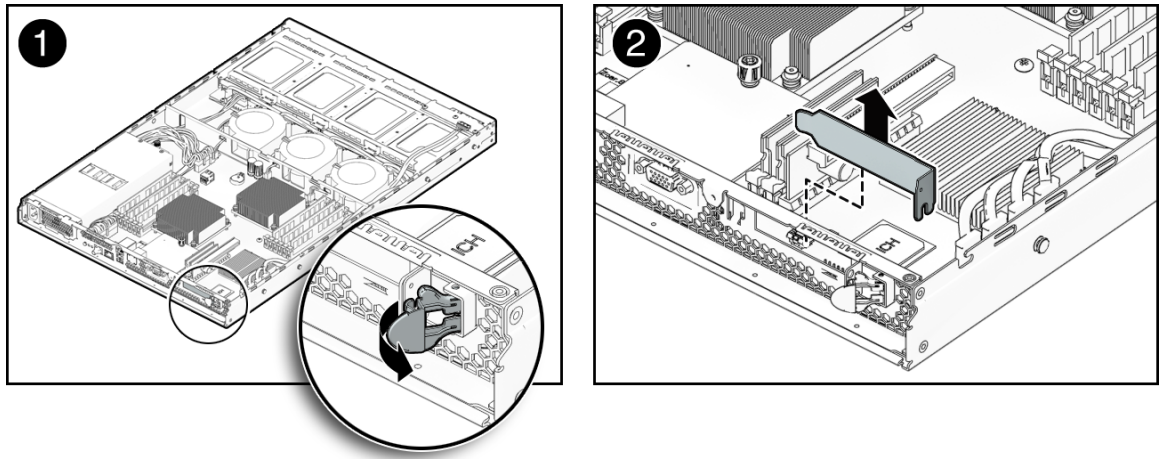
3. If you are replacing a PCIe card, install the card as described in [Section 3.5.3.2, “Installing the PCIe Card” on page 3-12](#); if you are not replacing the PCIe card, install a filler panel in the back panel of the server chassis.
4. Check the routing of all cables for obstructions, and then reinstall the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover” on page 3-3](#).

3.5.3.2 Installing the PCIe Card

To install the PCIe card:

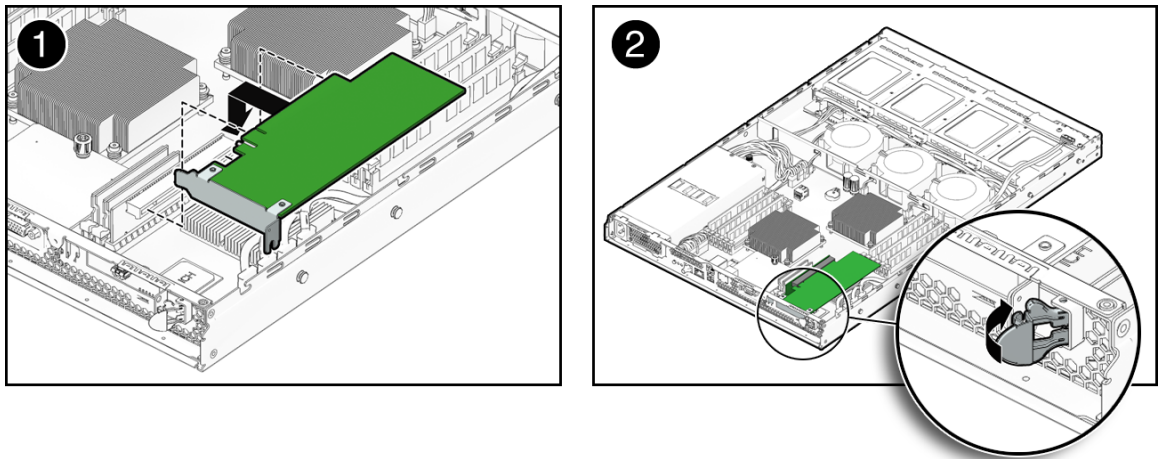
1. If necessary, remove the filler panel from the back panel of the server chassis.
See [FIGURE 3-8](#).

FIGURE 3-8 Removing the PCIe Filler Panel



2. If a PCIe riser is not already installed in the server, install a PCIe riser as described in [Section 3.5.2.2, “Installing the PCIe Riser”](#) on page 3-10.
3. Slide the new PCIe card into the PCIe slot on the back panel of the server chassis and engage the PCIe card to the connector on the PCIe riser.
See [FIGURE 3-9](#).

FIGURE 3-9 Installing the PCIe Card



4. Fasten the latch to secure the card.

5. Check the routing of all cables for obstructions, and then reinstall the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.

3.5.4 Replacing a Removable Disk Drive and Carrier

The following procedures describe how to remove and replace a removable disk drive and carrier. Use these procedures if your server contains optional removable SATA hard disk drives (HDDs) or solid state drives (SSDs).

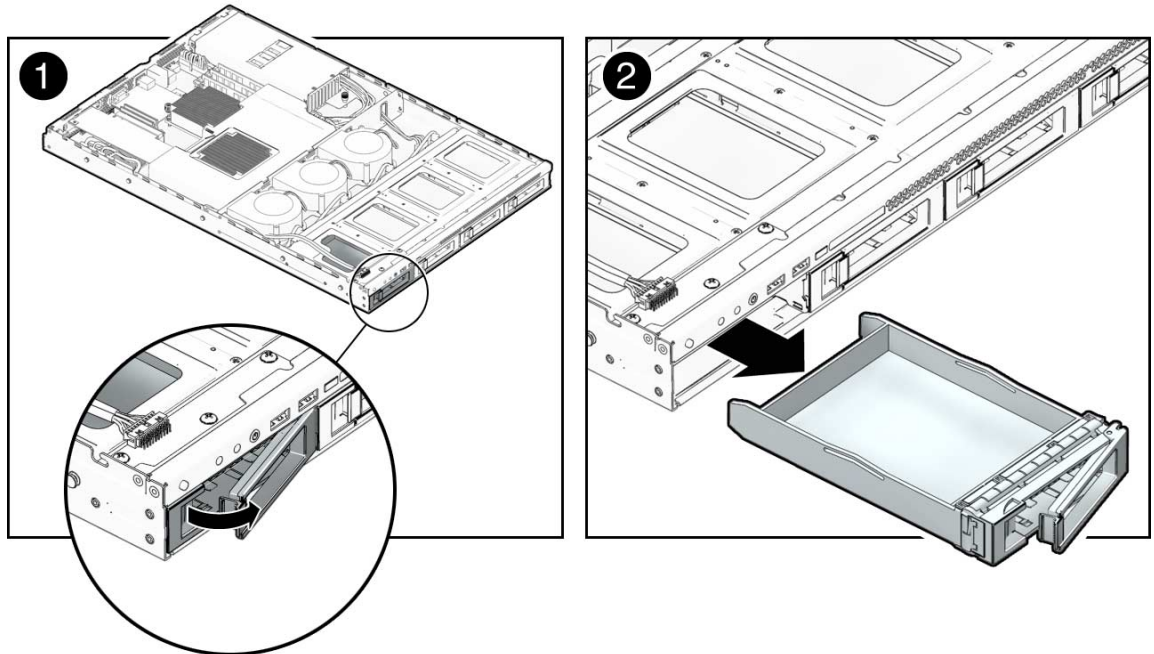
3.5.4.1 Removing a Filler Panel

If your server contains a filler panel, you must remove the filler panel before installing a disk drive.

To remove the filler panel:

1. On the drive you want to install, rotate the lever to disengage the hook, then pull the filler panel from the server.

FIGURE 3-10 Removing a Removable Disk Drive Filler Panel



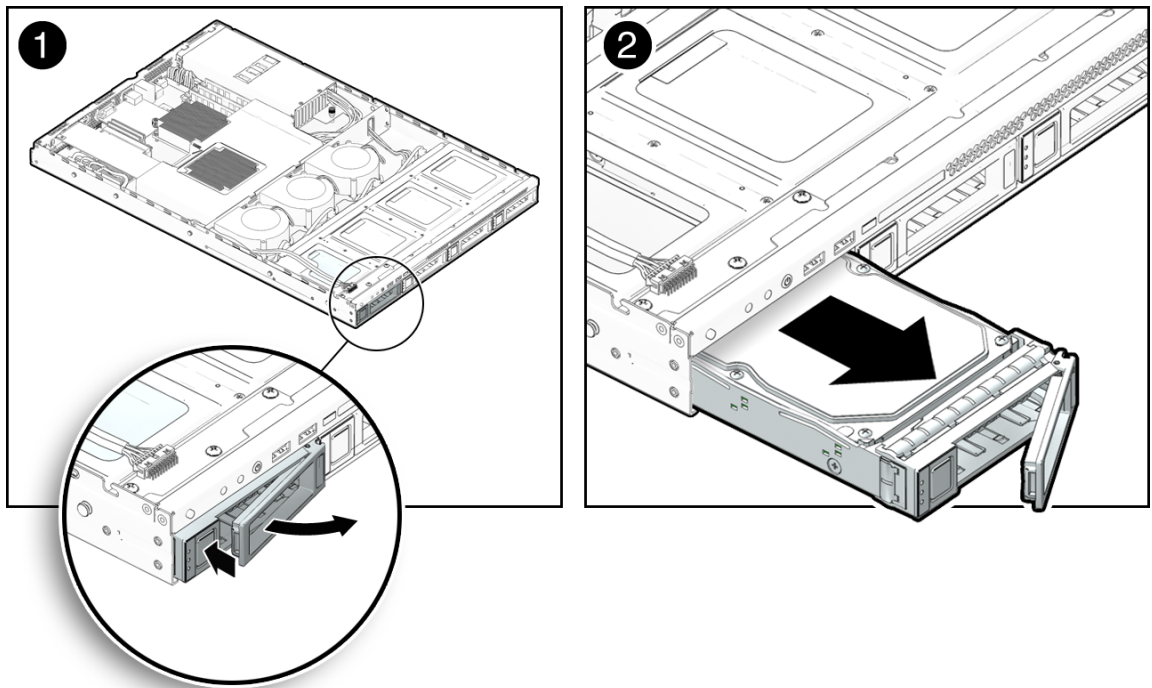
2. Continue with the instructions for installing a removable disk drive and carrier as described in [Section 3.5.4.3, “Installing a Removable Disk Drive and Carrier”](#) on page 3-16.

3.5.4.2 Removing a Removable Disk Drive and Carrier

To remove the removable disk drive and carrier:

1. If you are *not* using an integrated-mirroring (IM) configuration, you must power off the server before removing a disk drive; it is not necessary to remove the cover. Power off the system as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.
If you are using an IM configuration, start with [Step 2](#).
2. On the drive you want to remove, push the release button to open the latch.

FIGURE 3-11 Removing a Removable Disk Drive



3. Grasp the latch and pull the drive out of the drive slot.

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

4. Reinsert the disk drive and carrier into the server as described in [Section 3.5.4.3, “Installing a Removable Disk Drive and Carrier”](#) on page 3-16.

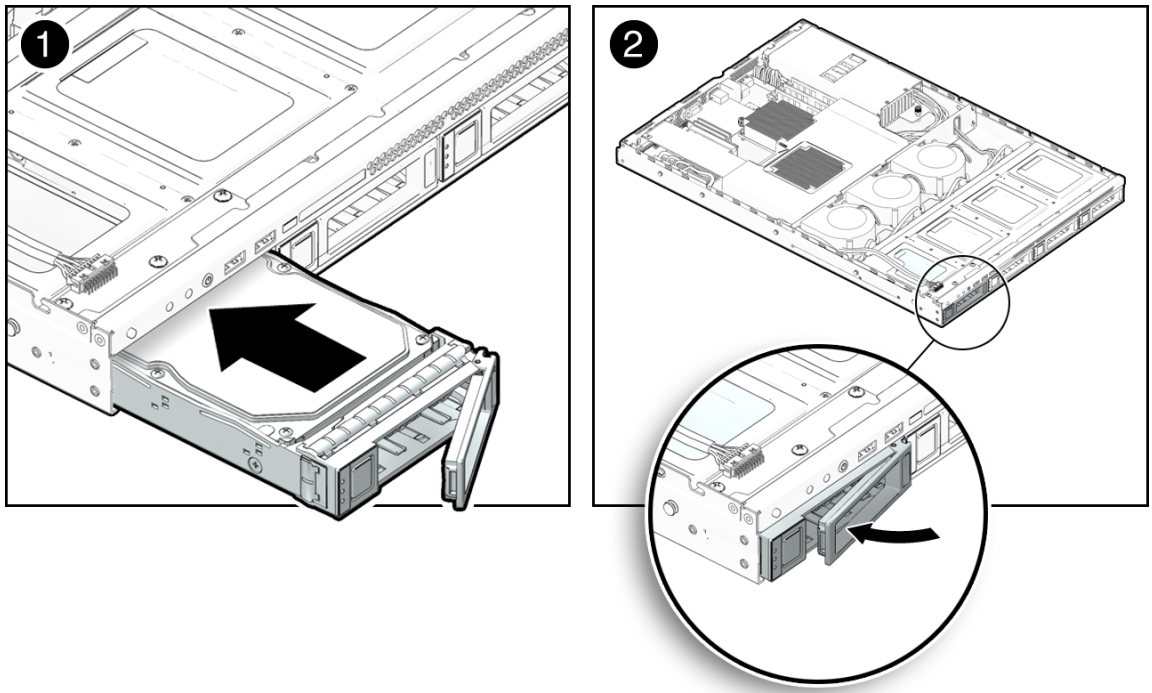
3.5.4.3 Installing a Removable Disk Drive and Carrier

Note – If you are installing a new disk drive, rather than replacing an already installed drive, you will need to remove the filler panel from the drive cage before installing the new disk drive. See [Section 3.5.4.1, “Removing a Filler Panel”](#) on page 3-14.

To install the removable disk drive and carrier:

1. Slide the drive into the drive slot until it is fully seated.

FIGURE 3-12 Installing a Removable Disk Drive



2. Close the latch to lock the drive in place.

3.5.5 Replacing the Disk Drive Backplane Assembly

The following procedure describes how to replace the disk drive backplane assembly. The disk drive backplane is used in server configurations that contain optional removable SATA HDDs or SSDs.

3.5.5.1 Removing the Disk Drive Backplane

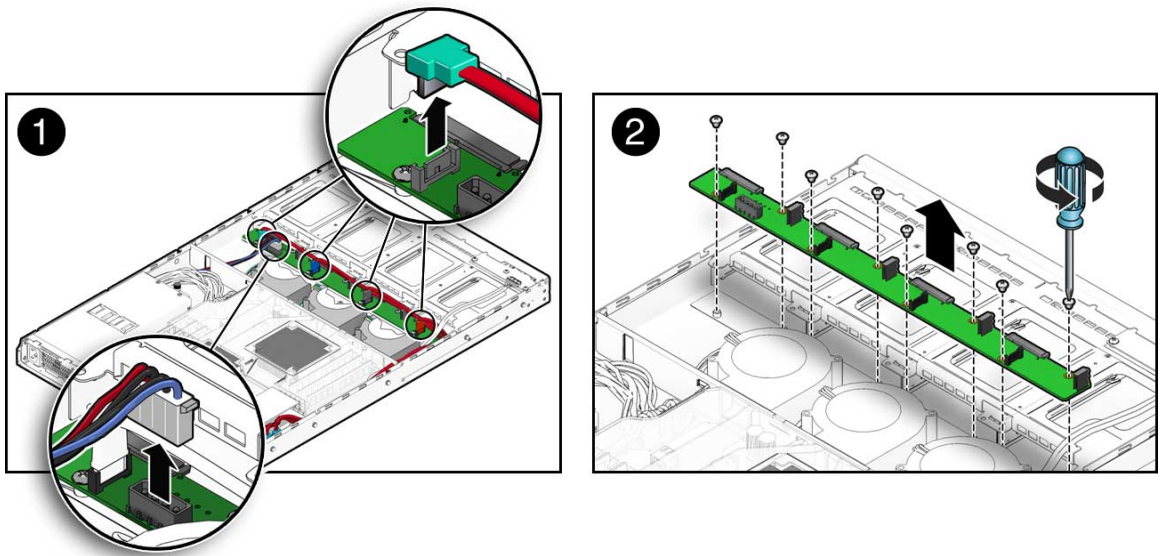
To remove the disk drive backplane:

1. **Remove all disk drives as described in [Section 3.5.4.2, “Removing a Removable Disk Drive and Carrier”](#) on page 3-15.**

This ensures that HDD/SSDs are detached from the backplane assembly.

2. **Disconnect the HDD/SSD power cable (1) and SATA cables (4) from the backplane assembly.**
3. **Remove the screws (8) fastening the backplane assembly to the server chassis.**
4. **Carefully lift the backplane assembly from the server chassis.**

FIGURE 3-13 Removing the Disk Drive Backplane Assembly

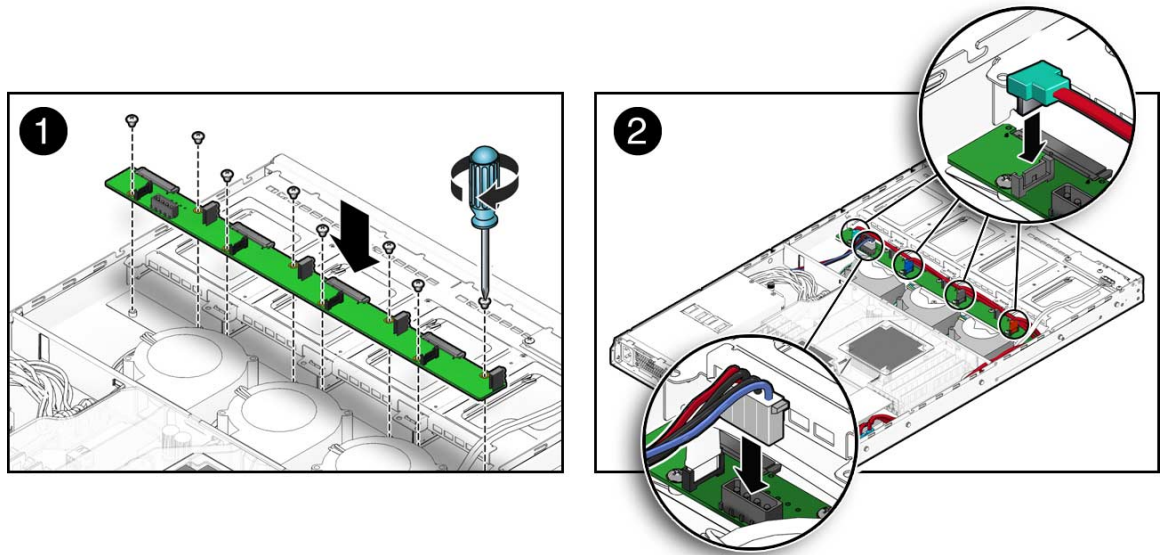


3.5.5.2 Replacing the Disk Drive Backplane

To install the disk drive backplane assembly:

1. **Reinsert the backplane assembly into the server chassis.**
2. **Fasten the screws (8) to secure the backplane assembly to the server chassis.**
3. **Reinstall the HDD/SSD power (1) and SATA cables (4) to the backplane assembly.**

FIGURE 3-14 Replacing the Disk Drive Backplane Assembly



4. **Reinsert all HDD/SSDs as described in [Section 3.5.4.3, “Installing a Removable Disk Drive and Carrier”](#) on page 3-16.**
5. **Check the routing of all cables for obstructions, and then reinstall the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.**

3.5.6 Replacing a Fixed Disk Drive and Carrier

The following procedures describe how to remove and replace a fixed hard disk drive and carrier. Use these procedures if your server contains optional fixed SATA hard disk drives (HDDs) or solid state drives (SSDs).

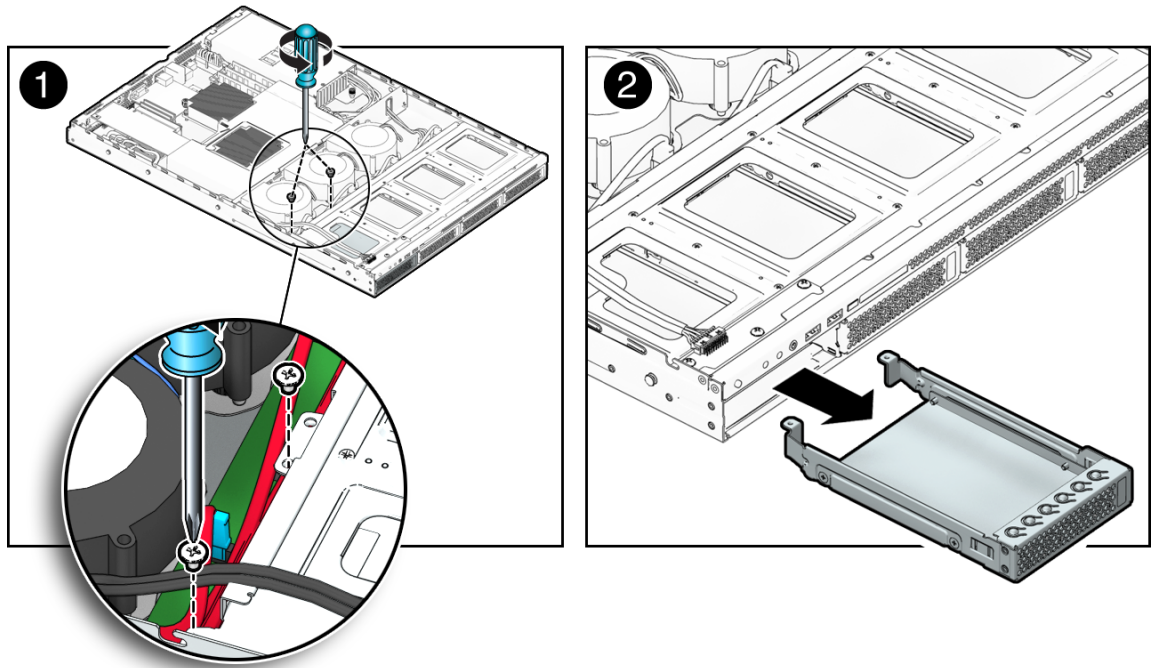
3.5.6.1 Removing a Filler Panel

If your server contains a filler panel, you must remove the filler panel before installing a fixed disk drive.

To remove the filler panel:

1. **Power off the system as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.**
2. **On the drive you want to install, remove the screws (2) that attach the filler panel to the back of the carrier.**

FIGURE 3-15 Removing a Fixed Disk Drive Filler Panel



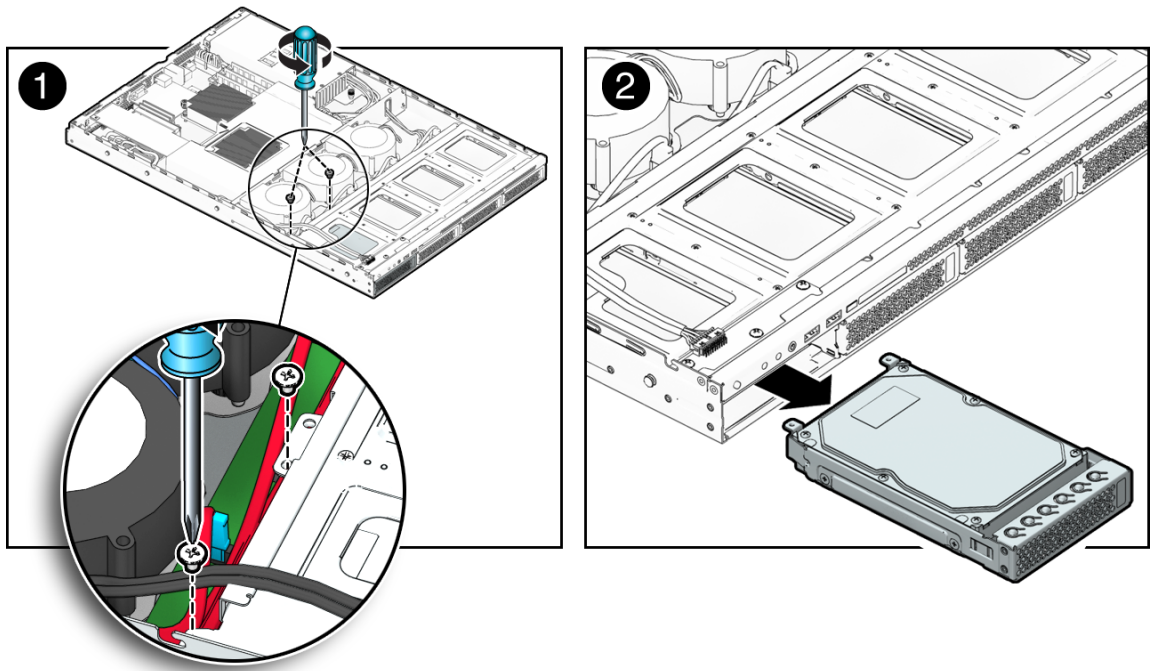
3. **Carefully slide the filler panel forward and out of the server.**
4. **Continue with the instructions for installing a fixed disk drive and carrier as described in [Section 3.5.6.3, “Installing a Fixed Disk Drive and Carrier”](#) on page 3-21.**

3.5.6.2 Removing a Fixed Disk Drive and Carrier

To remove the fixed disk drive and carrier:

1. Power off the system as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.
2. Disconnect the SATA cable from the disk drive.
3. Disconnect the power harness.
4. Remove the screws (2) that attach the disk drive to the back of the carrier.

FIGURE 3-16 Removing a Fixed Disk Drive and Carrier



5. Carefully slide the drive forward and out of the server, pushing the unit out using the legs.
6. Reinsert the carrier into the server as described in [Section 3.5.6.3, “Installing a Fixed Disk Drive and Carrier”](#) on page 3-21.

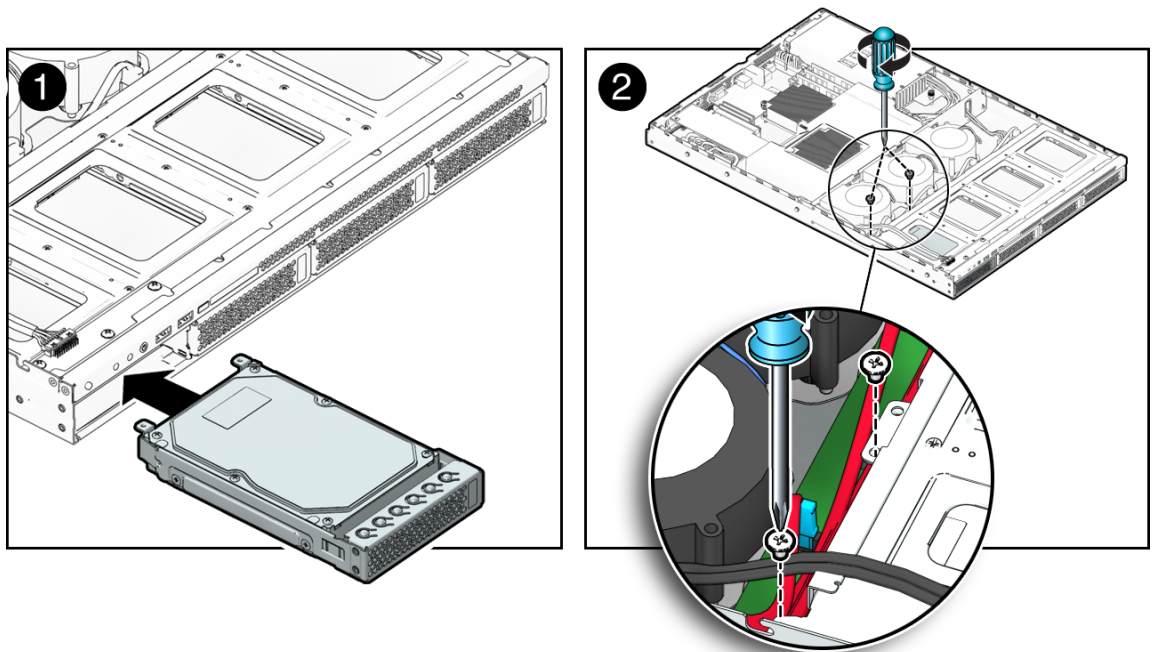
3.5.6.3 Installing a Fixed Disk Drive and Carrier

Note – If you are installing a new fixed disk drive, rather than replacing an already installed drive, you will need to remove the empty filler panel from the drive cage before installing the new drive. See [Section 3.5.6.1, “Removing a Filler Panel” on page 3-19](#).

To install the fixed disk drive and carrier:

1. **Power off the system as described in [Section 3.3, “Powering Off the Server and Removing the Cover” on page 3-3](#).**
2. **Remove the screws (2) from the back of the carrier and push it out of the front of the server.**

FIGURE 3-17 Installing a Fixed Disk Drive and Carrier



3. **Grasping the body of the drive in both hands, carefully insert the connector end of the drive into the front of the server, sliding it into the server until it reaches the back of the drive bay.**
4. **Fasten the screws (2) that attach the disk drive to the back of the carrier.**

5. Reattach the SATA cable to the disk drive.
6. Connect the power harness.
7. Check the routing of all cables for obstructions, and then reinstall the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.
8. Reapply power to the server as described in [Section 1.4, “Powering On and Powering Off the Server”](#) on page 1-9 and test the drive to determine if it is working correctly.

3.5.7 Replacing the Air Duct

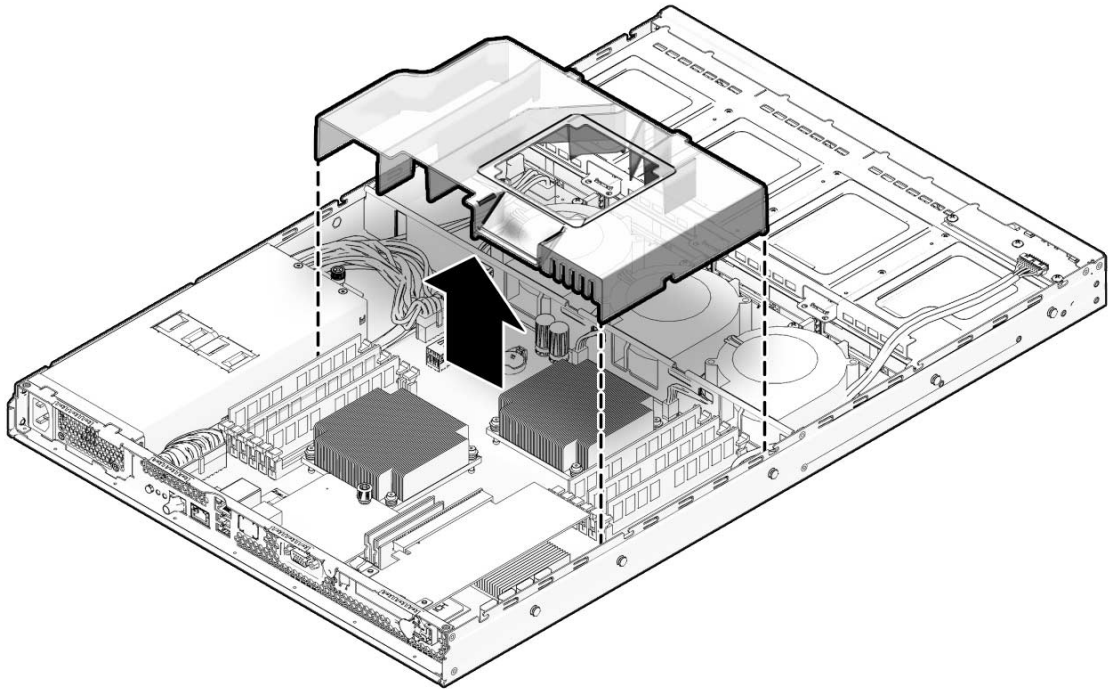
The following procedures describe how to replace the system air duct.

3.5.7.1 Removing the Air Duct

To remove the air duct:

1. Power off the system and remove the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.
2. Pull the air duct up and out of the chassis.

FIGURE 3-18 Removing the Air Duct

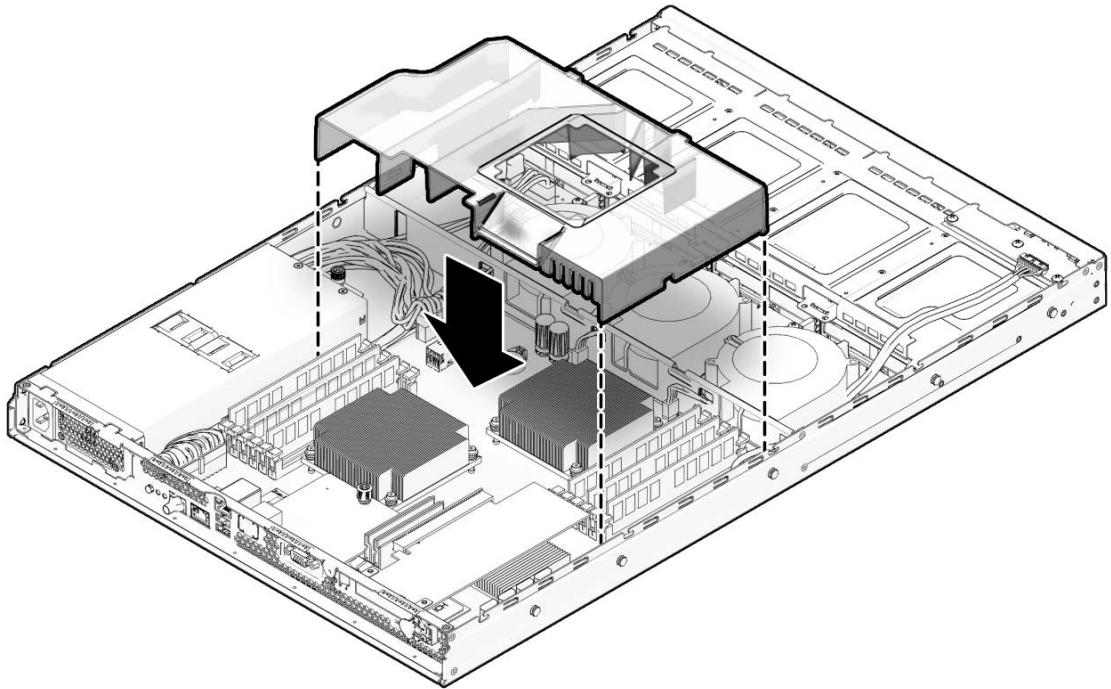


3.5.7.2 Installing the Air Duct

To install the air duct:

- Position the air duct into the chassis as shown in [FIGURE 3-19](#), aligning the baffle with the indents and opening in the chassis divider.

FIGURE 3-19 Installing the Air Duct



3.5.8 Replacing the Power Supply

The following procedures describe how to replace the power supply. Your chassis may contain either a 400 watt or 600 watt power supply. The removal and installation procedures are the same for both power supplies.

3.5.8.1 Removing the Power Supply

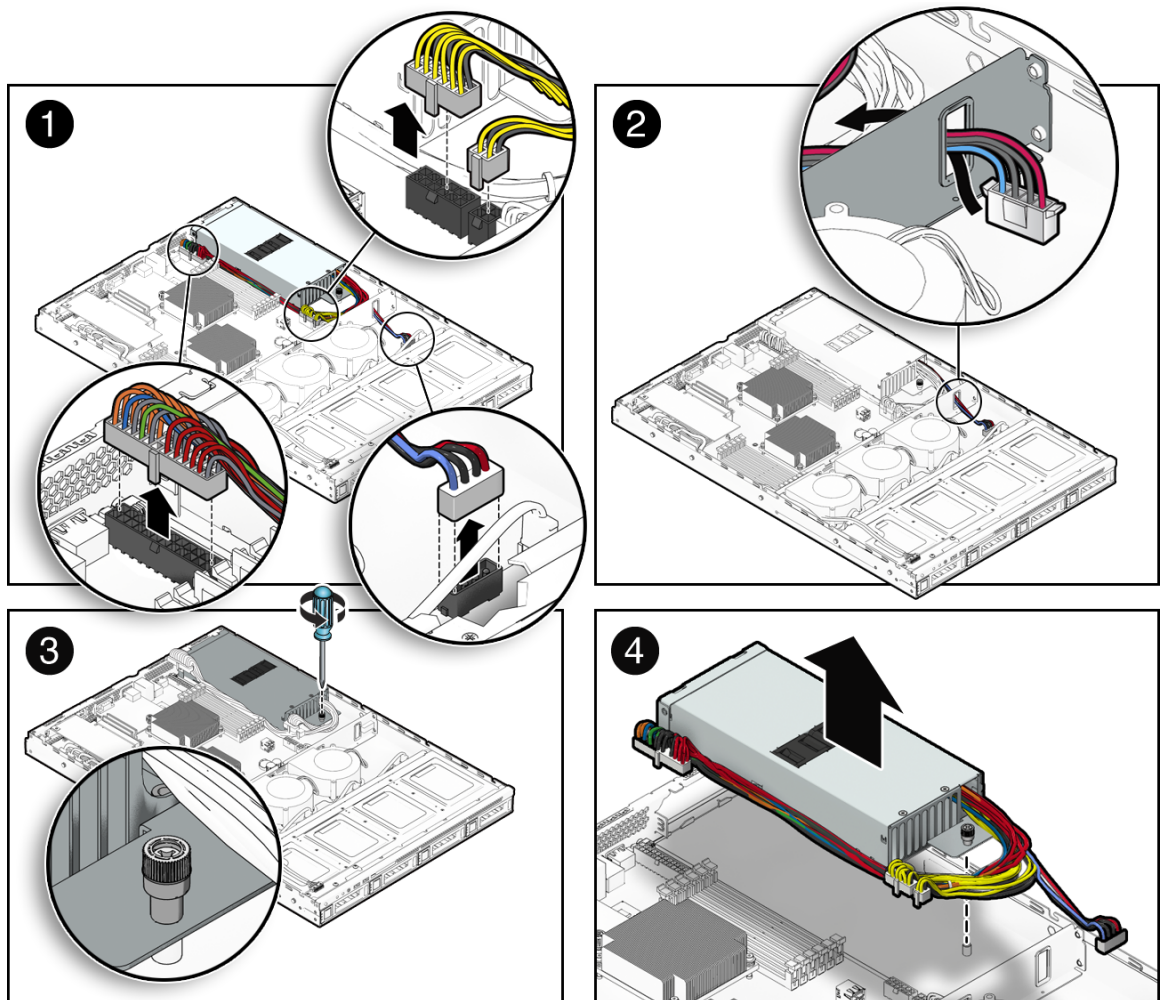
To remove the power supply:

1. **Power off the system and remove the cover as described in [Section 3.3](#), “Powering Off the Server and Removing the Cover” on page 3-3.**
2. **Disconnect the three power supply cables from the motherboard.**
3. **Disconnect the power supply from the disk drives.**

- If your server contains an HDD/SSD backplane assembly, disconnect the power supply connection from the backplane assembly. Push the power supply cable through the cutout in the chassis divider.
- If your server contains fixed disk drives that do not use a backplane assembly, disconnect the power supply connection from the power harness. Push the power supply cable through the cutout in the chassis divider.

4. Loosen the captive screw.

FIGURE 3-20 Removing the Power Supply



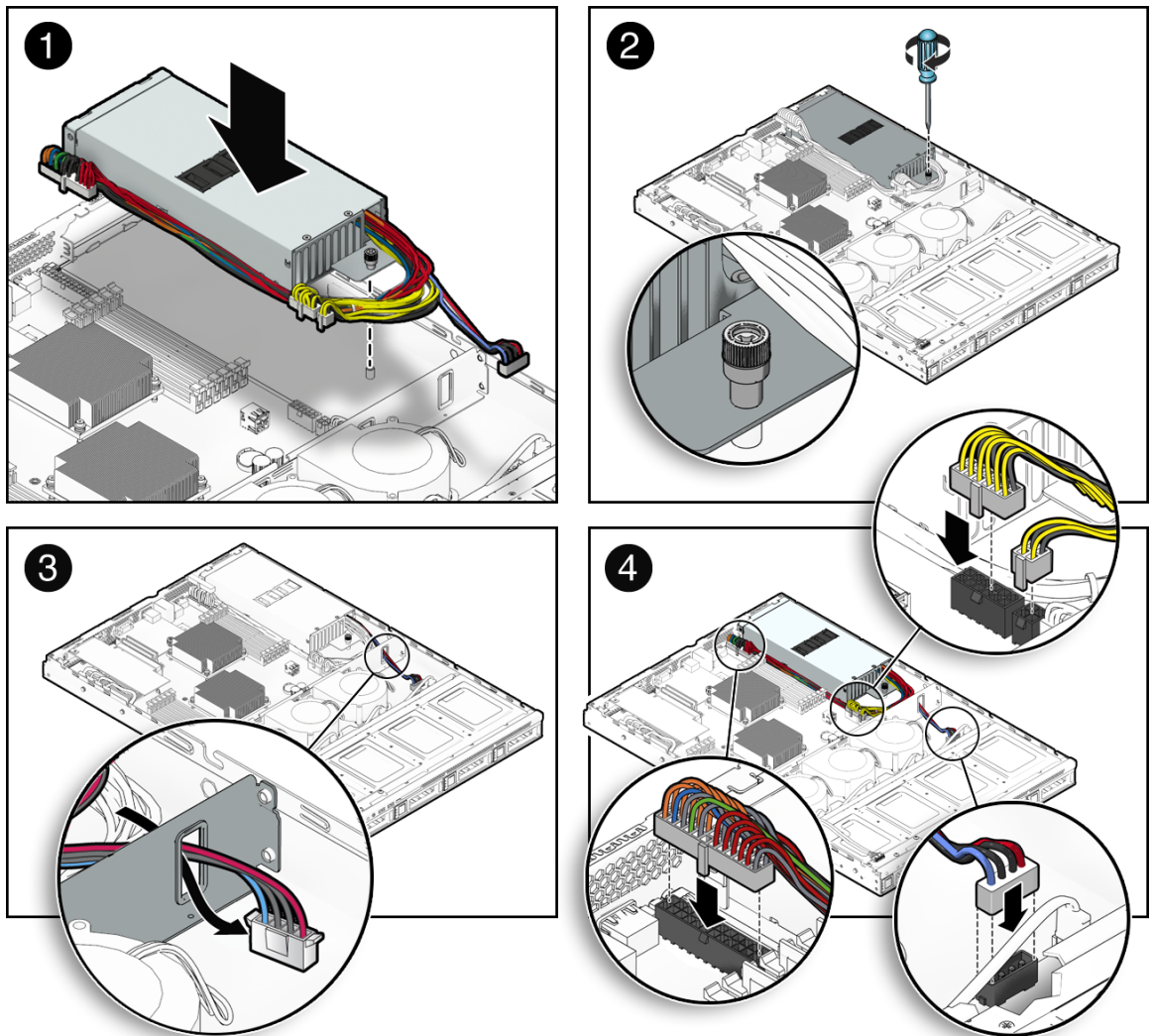
5. Lift the power supply out of the chassis.

3.5.8.2 Installing the Power Supply

To install the power supply:

1. Position the power supply over the chassis power-supply cage.
2. Insert the power supply into the chassis and push it forward so that it is flush with the back panel.
3. Install the power supply and fasten the captive screw.

FIGURE 3-21 Installing the Power Supply



4. **Connect three of the power supply cables to the motherboard.** See [FIGURE 3-41](#).
5. **Reconnect the power supply to the disk drives.**
 - If your server contains an HDD/SSD backplane assembly, push the power supply cable through the cutout in the chassis divider. Reconnect the power supply connection to the backplane assembly.
 - If your server contains fixed disk drives that do not use a backplane assembly, push the power supply cables through the cutout in the chassis divider. Reconnect the power supply connection to the power harness.
6. **Check the routing of all cables for obstructions, and then reinstall the cover.**

3.5.9 Replacing a Blower Module

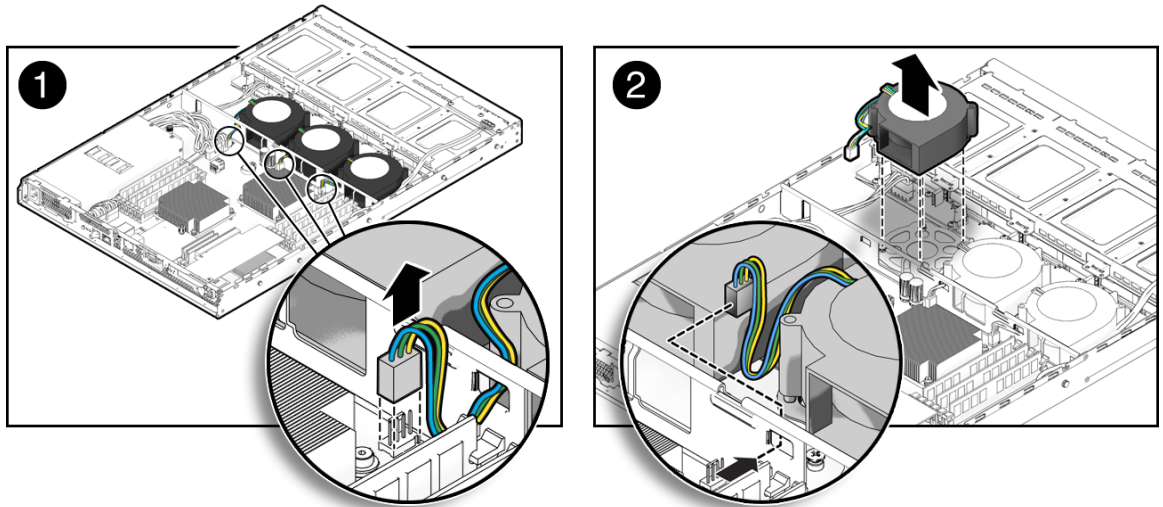
The following procedures describe how to replace a blower module. The X2270 server contains three blower modules.

3.5.9.1 Removing a Blower Module

To remove a blower module:

1. **Power off the system and remove the cover as described in [Section 3.3](#), “Powering Off the Server and Removing the Cover” on page 3-3.**
2. **Remove the air duct as described in [Section 3.5.7](#), “Replacing the Air Duct” on page 3-22.**
3. **Unplug the fan’s power connector from the motherboard.**

FIGURE 3-22 Removing a Blower Module



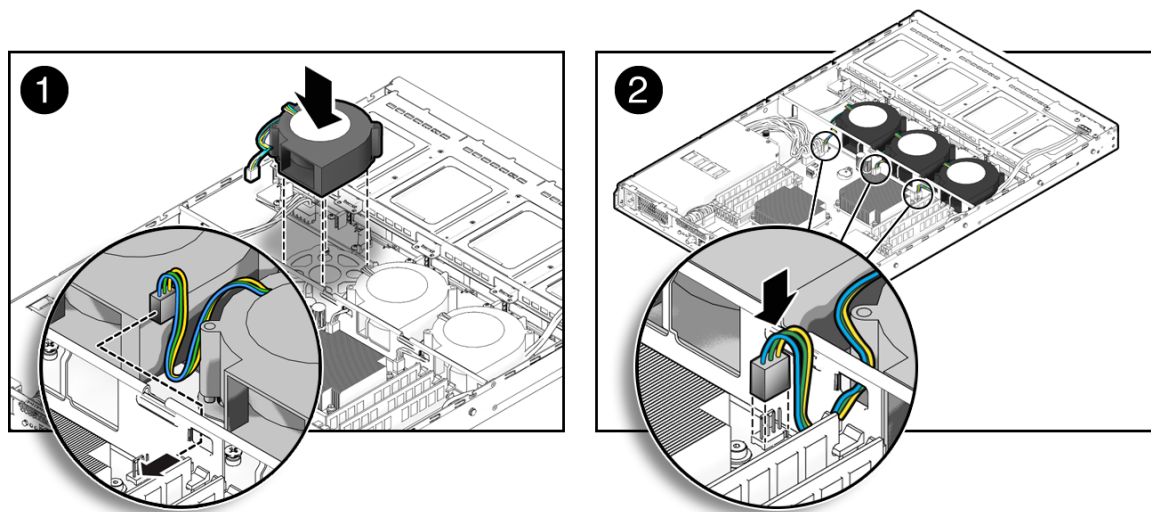
4. Pull the fan module upward while pushing the connector cable through the cutout in the chassis divider, taking care not to catch the connector on the metal, to remove it from the chassis.

3.5.9.2 Installing a Blower Module

To install a blower module:

1. Position the blower module so that it fits over the guideposts and the duct opening fits into the cutouts in the chassis divider.

FIGURE 3-23 Installing a Blower Module



2. Gently push the blower module down while directing the connector cable through the cutout in the chassis divider, until it is seated on the guideposts.

Note – Ensure that the connector cable has been directed through the connector opening in the chassis divider and not through the blower exhaust opening.

3. Connect the blower connector to the appropriate connector on the motherboard.
4. Check the routing of all cables for obstructions, and then reinstall the air duct and system cover.

3.5.10 Replacing Memory Modules

The Sun Fire X2270 Server supports a variety of DIMM configurations that can include dual-rank (DR) or single-rank (SR) DIMMs. When replacing or upgrading a DIMM on the server you should consider the following:

- Physical layout of the DIMMs and CPUs.
For details, see [FIGURE 3-24](#) and [FIGURE 3-25](#).
- DIMM population rules.
For details, see [Section 3.5.10.1, “DIMM Population Rules”](#) on page 3-30.
- Instructions for removing and installing a DIMM.

For details, see [Section 3.5.10.2, “Removing a DIMM”](#) on page 3-30 and [Section 3.5.10.3, “Installing a DIMM”](#) on page 3-32.

- Memory Error Correction and Parity.

For details, see [Section 3.5.10.4, “Error Correction and Parity”](#) on page 3-33.

3.5.10.1 DIMM Population Rules

Note – Keep in mind the following information and rules when you use the procedures in this section to replace or add DIMMs to the server.

- Do not populate any DIMM slot next to an empty CPU socket. Each CPU contains a separate memory controller.
- Each CPU can support a maximum of 6 DR or SR DIMMs.
- Populate DIMMs by location according to the following rules:
 - Populate the DIMM slots for each memory channel that are the farthest from the CPU first.
 - Blue DIMM slots are always populated first. For example, populate D5/D3/D1 first, then populate D4/D2/D0.
- For maximum performance, apply the following rules:
 - The best performance is assured by preserving symmetry; for example: adding 2 of the same kind DIMMs, one per memory channel; and ensuring that both CPUs have the same size of DIMMs populated in the same manner.
 - In certain configurations, DIMMs will run slower than their individual maximum speed; see [TABLE 3-2](#) for further details.

TABLE 3-2 Memory Considerations and Limitations

-
- | | |
|---|--|
| 1 | DIMMs are available in two speeds: 1066 MHz and 1333 MHz (some CPUs might not support 1333 MHz DIMMs) |
| 2 | DIMM speed rules are as follows: <ul style="list-style-type: none">• 2 x DIMM per channel = 1066 MHz• 1 x DIMM per channel = 1333 MHz (if using 1333 MHz DIMMs)• 1 x DIMM per channel = 1066 MHz (if using 1066 MHz DIMMs) |
| 3 | The system operates all memory only as fast as the slowest DIMM configuration. |
-

3.5.10.2 Removing a DIMM

To remove a DIMM:

1. Power off the system and remove the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.
2. Remove the air duct as described in [Section 3.5.7, “Replacing the Air Duct”](#) on page 3-22.
3. Locate the DIMM connector in which you will install or replace a memory module.
Bank 0 is the bank closest to CPU 0 and Bank 1 is the bank closest to CPU 1. See [FIGURE 3-24](#) and [FIGURE 3-25](#).

FIGURE 3-24 Bank 0 DIMM Slot Locations

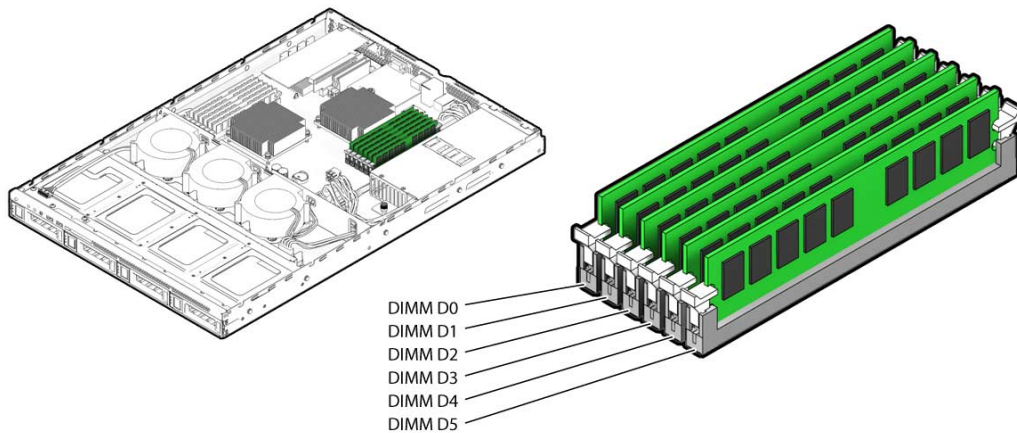
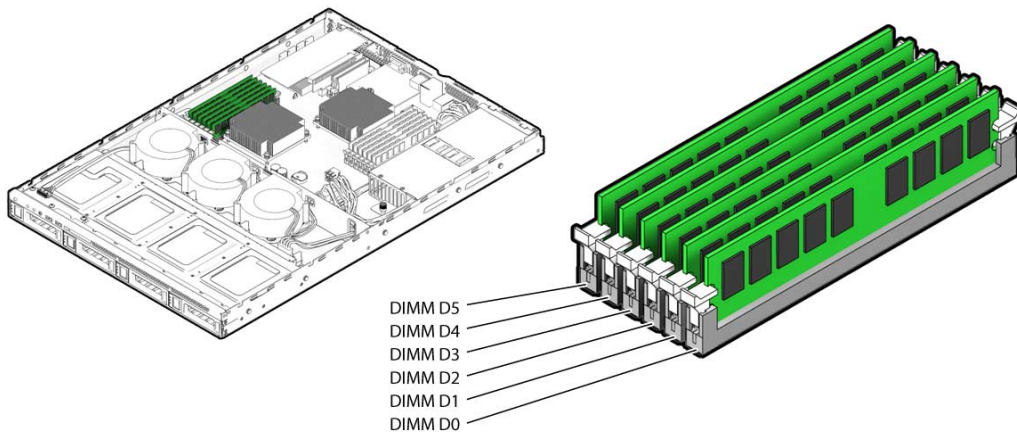
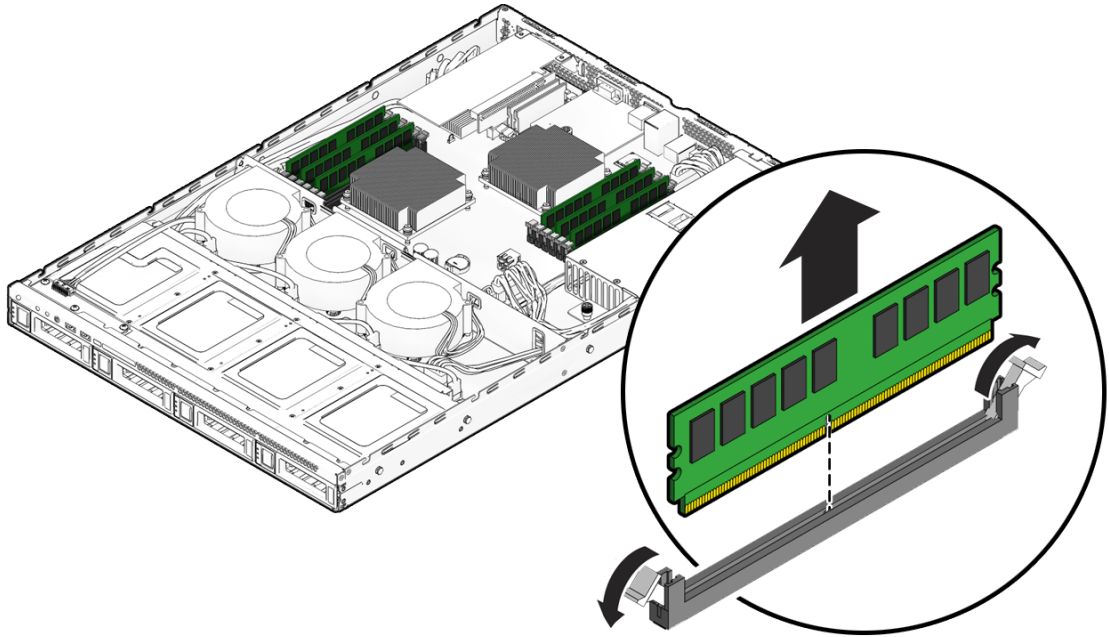


FIGURE 3-25 Bank 1 DIMM Slot Locations



4. Remove a DIMM by pressing down on the ejector levers at both ends of the memory module's socket (see [FIGURE 3-26](#)).
5. Pull the DIMM up and out of the socket.

FIGURE 3-26 Removing a DIMM

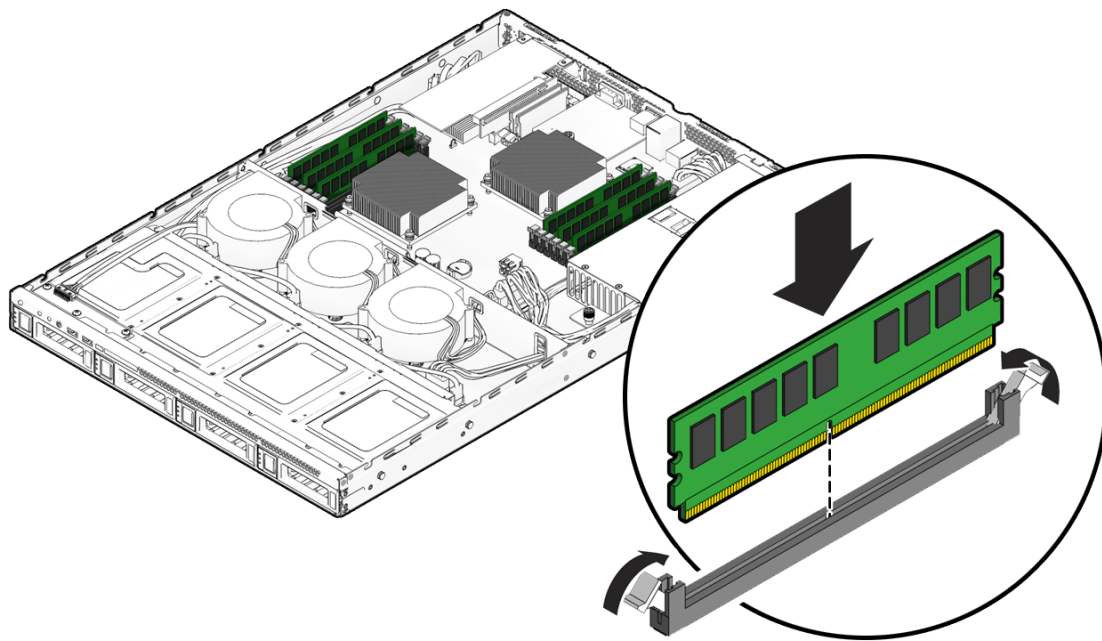


3.5.10.3 Installing a DIMM

To install a DIMM:

1. Refer to [Section 3.5.10.1, "DIMM Population Rules"](#) on page 3-30 before installing DIMMs.
2. Ensure that the DIMM socket ejector levers are open (rotated outward) to allow the new module to be inserted.
3. Align the DIMM's edge connector with the alignment key and insert the memory module into the connector.

FIGURE 3-27 Installing a DIMM



4. **Using both thumbs, press the DIMM straight down into the DIMM slot until both ejector levers click, locking the DIMM in the DIMM slot.**
 - The DIMMs must be inserted evenly, straight down along the DIMM slot until locked into place.
 - The DIMM is seated when you hear a click and the DIMM ejector levers are in the vertical position.
5. **Check the routing of all cables for obstructions, then reinstall the air duct and the system cover.**

3.5.10.4 Error Correction and Parity

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

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

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

Refer to the *Sun Integrated Lights Out Manager 2.0 User's Guide* (820-1188) for information on how to access the error log.

3.5.11 Replacing Flash Memory Modules

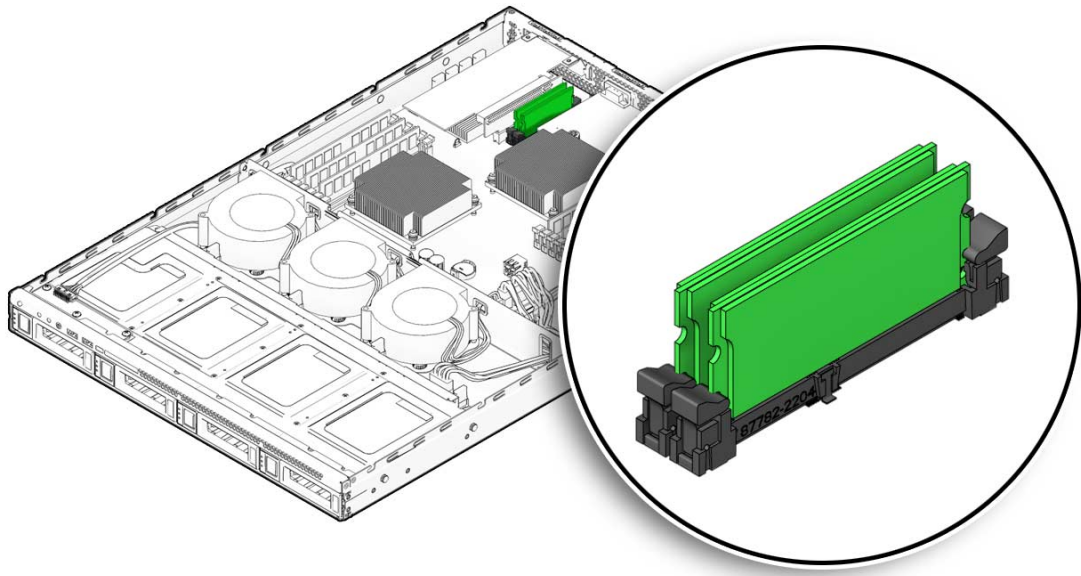
The following procedure describes how to remove and install flash memory modules (F-MODs).

3.5.11.1 Removing a Flash Memory Module

To remove a flash memory module:

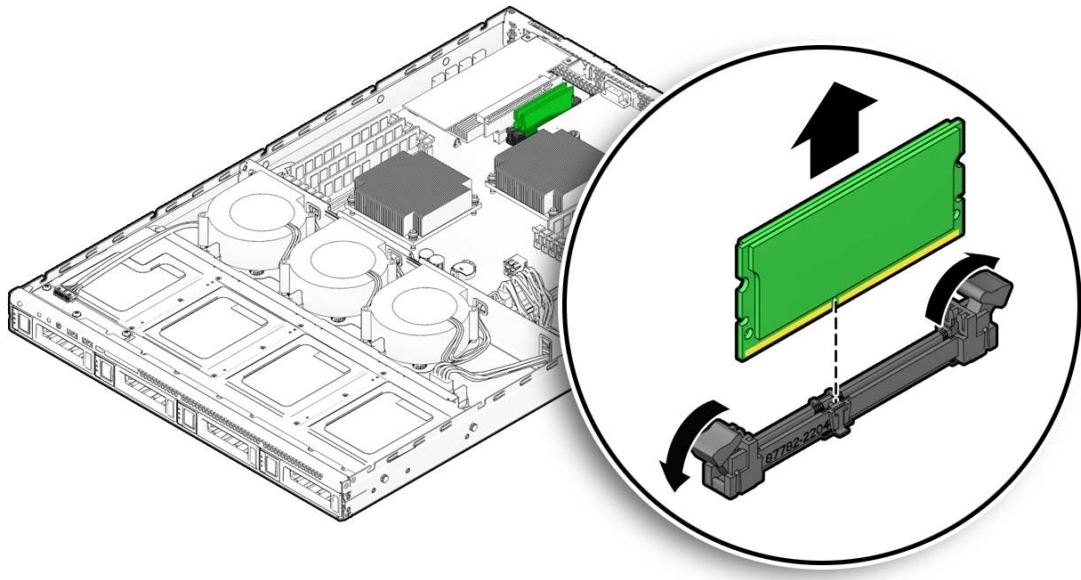
1. **Power off the system and remove the cover as described in [Section 3.3](#), “Powering Off the Server and Removing the Cover” on page 3-3.**
2. **Locate the F-MOD connector in which you will install or replace a memory module.**

FIGURE 3-28 Flash Memory Module Slot Locations



3. **Remove an F-MOD by pressing down on the ejector levers at both ends of the memory module's socket (see [FIGURE 3-29](#)).**
4. **Pull the F-MOD up and out of the socket.**

FIGURE 3-29 Removing a Flash Memory Module

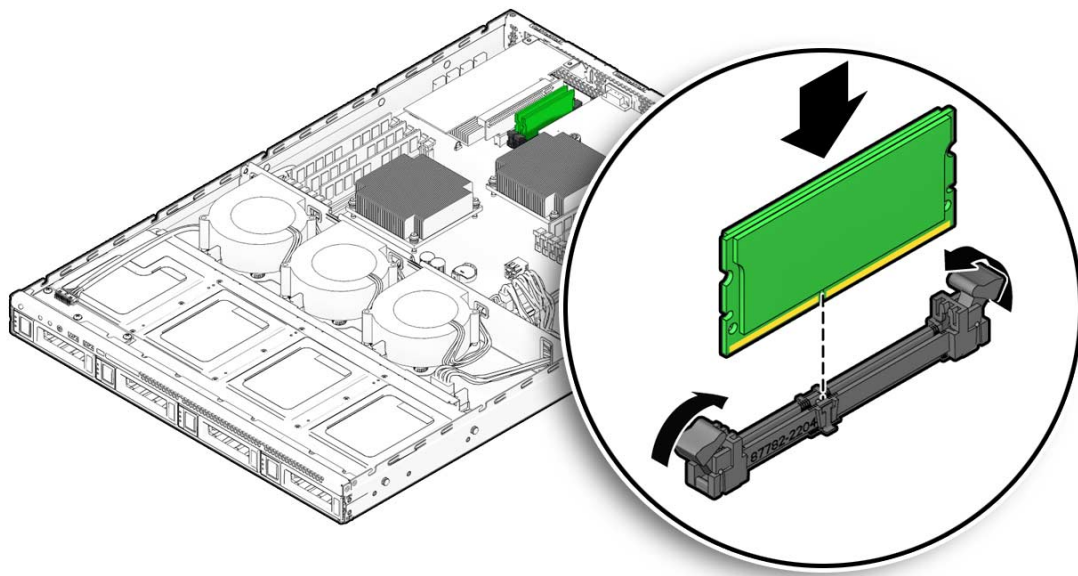


3.5.11.2 Installing a Flash Memory Module

To install a flash memory module:

1. Ensure that the F-MOD socket ejector levers are open (rotated outward) to allow the new memory module to be inserted.
2. Align the F-MOD's edge connector with the alignment key and insert the memory module into the connector.

FIGURE 3-30 Installing a Flash Memory Module



3. Using both thumbs, press the F-MOD straight down into the slot until both ejector levers click, locking the F-MOD into the slot.
 - The F-MODs must be inserted evenly, straight down along the slot until locked into place.
 - The F-MOD is seated when you hear a click and the ejector levers are in the vertical position.
4. Check the routing of all cables for obstructions, and then reinstall the cover.

3.5.12 Replacing the System Battery

The system battery is a common CR2032 calculator battery.

You might need to replace the system battery if you know it is weak or if after any period of AC power loss, the BIOS loses its CMOS settings, or if the time-of-day clock loses time.



Caution – Removing the battery causes the server to revert to the factory default BIOS settings, regardless of how the server boot options have been set up using the System Setup Utility or the BIOS Setup utility.



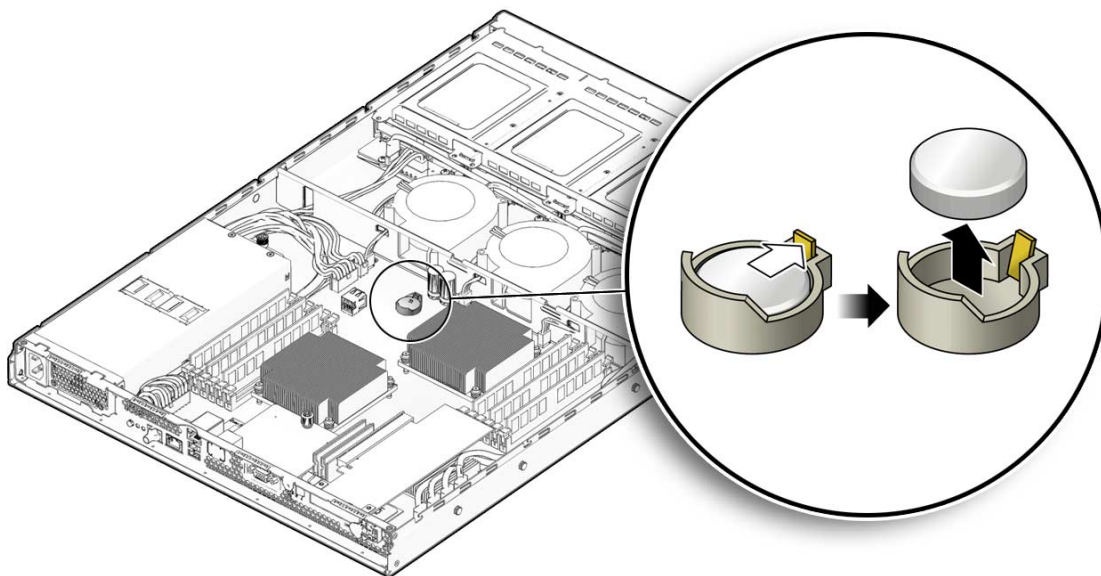
Caution – Do not attempt to open or service batteries. The battery contains lithium and can explode if not properly used, handled, or disposed of.

3.5.12.1 Removing the System Battery

To remove the system battery:

1. **Power off the system and remove the cover as described in [Section 3.3](#), “Powering Off the Server and Removing the Cover” on page 3-3.**
2. **Remove the air duct as described in [Section 3.5.7.1](#), “Removing the Air Duct” on page 3-22.**
3. **Remove the system battery by gently pulling the clip away from the side of the battery and sliding the battery out of the battery holder (see [FIGURE 3-31](#) for the location).**

FIGURE 3-31 Removing the System Battery



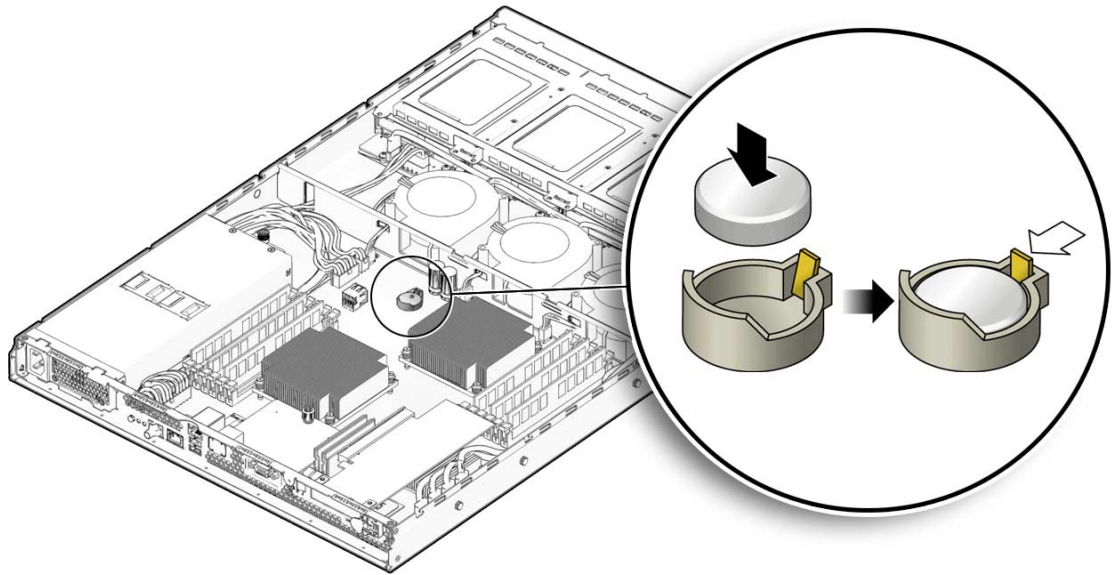
Caution – Do not dispose of the battery with regular waste. Discard used batteries according to the manufacturer’s instructions or contact your local waste-disposal agency for the location of the nearest battery deposit site.

3.5.12.2 Installing the System Battery

To install the system battery:

1. **Insert the new system battery into the battery holder with the side labeled “+” facing upward.**

FIGURE 3-32 Installing the System Battery



Note – Replace the battery only with the identical model.

2. Reinstall the air duct as described in [Section 3.5.7.2, “Installing the Air Duct”](#) on [page 3-23](#).
3. Check the routing of all cables for obstructions and then reinstall the cover.

3.5.13 Removing and Replacing the SP Module

The following procedures describe how to remove and replace the service processor (SP) module.

3.5.13.1 Removing the SP Module

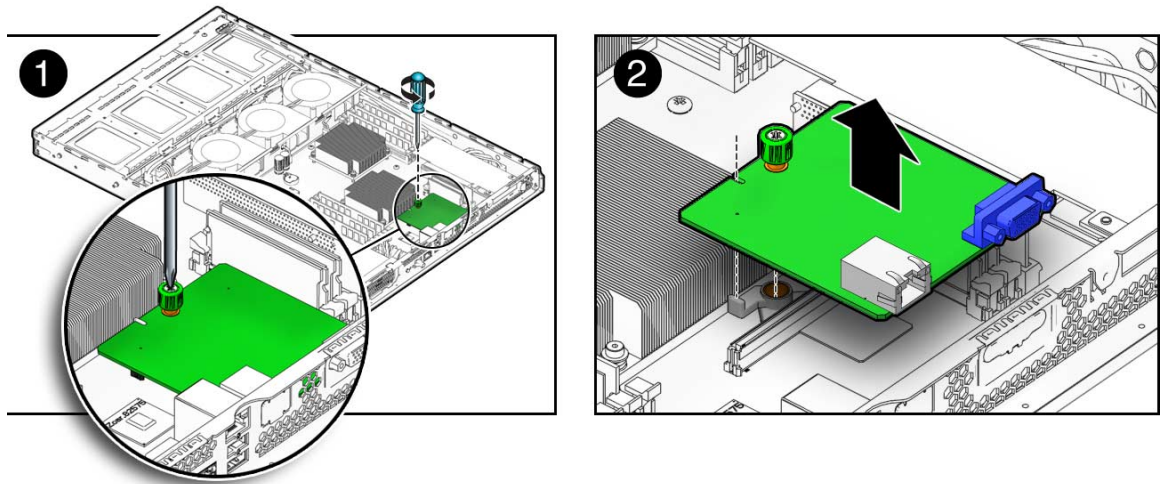
To remove the SP module:

1. Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.

Refer to [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.

2. Remove any Ethernet or video cables that are attached to the rear of the SP module. See [FIGURE 1-3](#) for the location of the connectors.
3. Remove the screw securing the SP module to the server motherboard.

FIGURE 3-33 Removing the SP Module



4. Pull the SP module upward to disengage the card from the SP motherboard connector and SP alignment pin, slide the board slightly forward to clear the rear wall of the server chassis, then lift the SP module from the chassis.

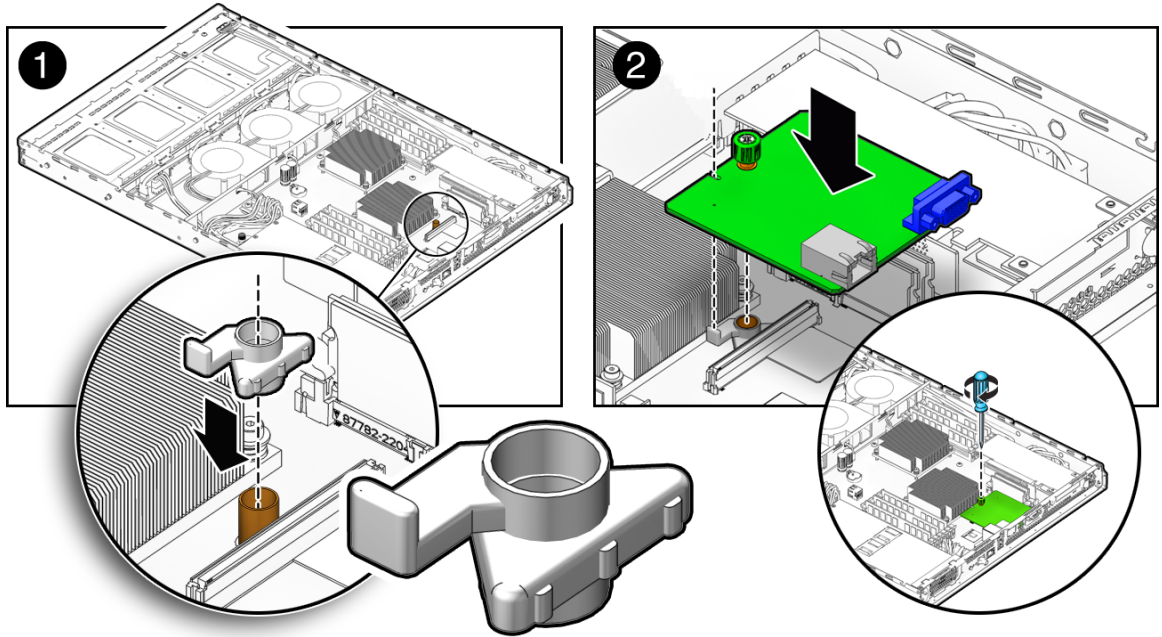
3.5.13.2 Installing the SP Module

Note – If you are installing the SP module for the first time, you should install the SP module alignment pin before installing the SP module. The SP module alignment pin is designed to help align the SP module with the card connector. Install the SP module alignment pin by sliding the alignment pin down over the screw post. (See [FIGURE 3-34](#).) The SP module alignment pin is shipped with the SP module.

To install the SP module:

1. Position the SP module so that the card's RJ-45 and HD15 connectors slide into the back panel of the server chassis and the card connector is aligned with the SP motherboard connector.

FIGURE 3-34 Installing the SP Module



2. Gently push the SP module down to engage the card connector to the SP motherboard connector and the SP alignment pin.
3. Fasten the screw to secure the SP module to the server motherboard.
4. Reattach any Ethernet or video cables to the rear of the SP module.
See [FIGURE 1-3](#) for the location of the connectors.
5. Check the routing of all cables for obstructions, and then reinstall the cover as described in [Section 3.3, "Powering Off the Server and Removing the Cover"](#) on [page 3-3](#).

3.5.14 Replacing a CPU and Heatsink

The following procedure describes how to replace a CPU. The Sun Fire X2270 Server supports both single-CPU and dual-CPU configurations.

Note – Replacement of a CPU and heatsink should only be done by trained service personnel. If you are adding a second CPU to a single CPU configuration, see [Section 3.5.15, “Installing a New CPU” on page 3-45](#).



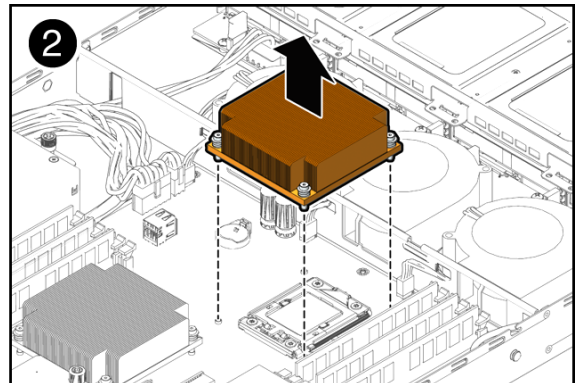
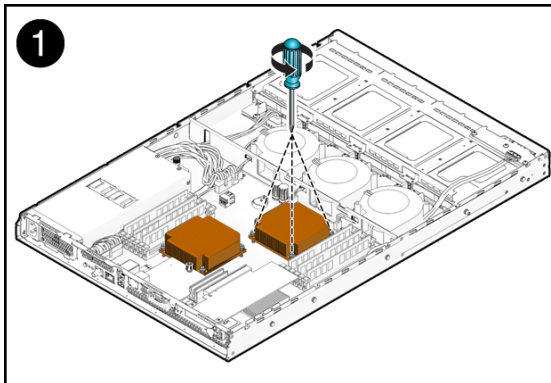
Caution – Observe the appropriate ESD precautions in [Section 3.2.1, “ESD Precautions” on page 3-2](#) when handling the CPU.

3.5.14.1 Removing a CPU and Heatsink

To remove a CPU and heatsink:

1. Power off the system and remove the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover” on page 3-3](#).
2. Remove the air duct as described in [Section 3.5.7, “Replacing the Air Duct” on page 3-22](#).
3. Remove the four screws securing the heatsink to the board (see [FIGURE 3-35](#)).

FIGURE 3-35 Removing a Heatsink

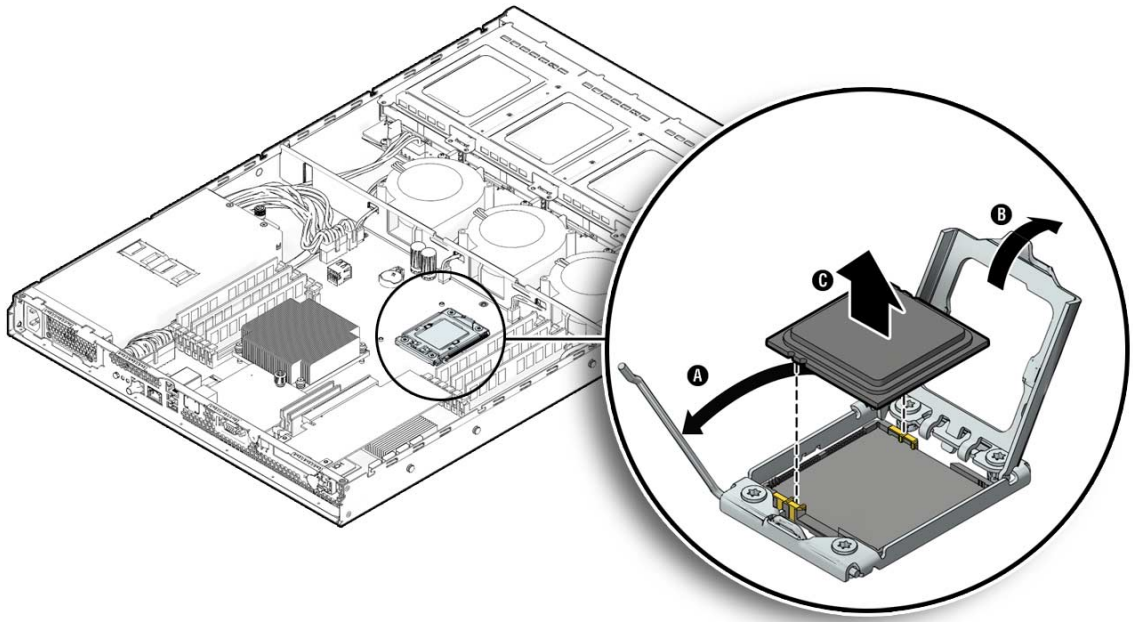


Caution – The heatsink can become extremely hot. Be sure it has had sufficient time to cool before handling.

4. Twist the heatsink slightly to the right or left to break the seal with the thermal grease.
5. Lift the heatsink away from the CPU.

6. Place the heatsink upside-down on a flat surface to prevent the thermal grease from contaminating other components.
7. Pull the socket release lever up to the fully open, perpendicular position.
8. Open the CPU cover.

FIGURE 3-36 Removing the CPU



9. Lift the CPU out of the socket, leaving the release lever in the open position.

Note – Ensure that no thermal grease that might be left from the heatsink comes into contact with the CPU socket or underside of the CPU chip.

3.5.14.2 Installing a Replacement CPU

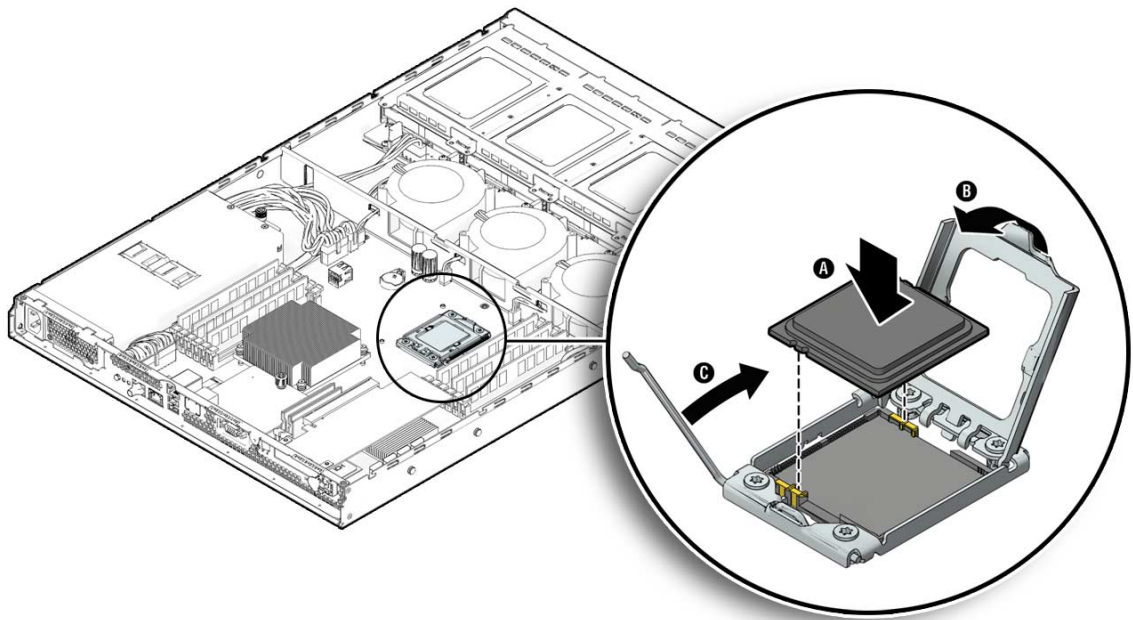
Follow these steps to install a CPU and heatsink if you are replacing a CPU. If you want to install a new CPU or install a second CPU into a formerly single-CPU system, see [Section 3.5.15, “Installing a New CPU”](#) on page 3-45.



Caution – Observe the appropriate ESD precautions in [Section 3.2.1, “ESD Precautions”](#) on page 3-2 when handling the CPU.

1. **Unpack the new CPU.**
2. **Ensure that the socket release lever is in the fully open, perpendicular position and the CPU cover is open (see [FIGURE 3-37](#)).**
3. **Align the small triangle on the upper-left corner of the CPU with the alignment triangle on the motherboard. In addition, ensure that the alignment post on the socket engages the semi-circular cutout on the CPU.**

FIGURE 3-37 Installing the CPU



4. **Insert the CPU into the socket.**



Caution – If the CPU is correctly aligned, you should be able to easily insert the CPU into the socket. If you feel more than minimal resistance, stop and recheck the alignment. Forcing a misaligned CPU into the socket can permanently damage the device.

5. **When the CPU is fully seated in the socket, close the CPU cover.**

Note – The CPU cover might not align correctly with the chip after it is installed. If this happens, open the cover and push the cover slightly to the side to better align it with the chip, then reclose the cover.

6. Rotate the socket release lever down until it snaps into place, securing the CPU in the socket.
7. Use the entire syringe contents to apply thermal grease in a star pattern to the top of the CPU.

Note – If you are replacing an existing heatsink with a new heatsink, you do not need to use the syringe to add additional thermal grease to the heatsink, as new heatsinks are pre-greased.

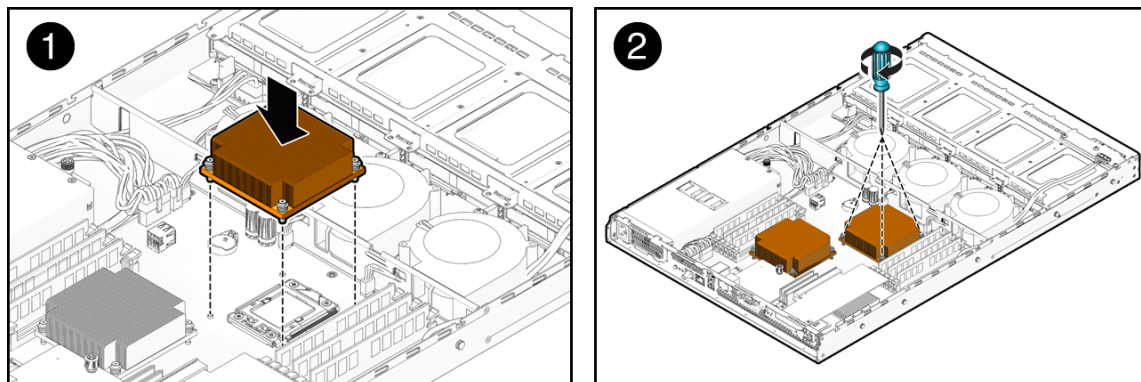
8. Gently distribute the thermal grease and remove any excess so that only an extremely thin, uniform layer remains. If any voids or crevices appear that could lead to air pockets, reapply the grease until you achieve a thin but compact consistency.
9. Use an alcohol pad to remove all thermal grease from the bottom of the previously used heatsink.
10. Inspect the heatsink for dust and lint. Clean if necessary.
11. Carefully position the heatsink on the CPU, aligning it with the mounting posts to reduce movement after it makes initial contact with the layer of thermal grease.



Caution – If the heatsink is moved too much during its installation, the layer of thermal grease may become uneven, leading to component damage.

12. Fasten the four screws attaching the heatsink to the motherboard. Alternate between the four screws, turning each screw two turns until all are securely fastened. See [FIGURE 3-38](#).

FIGURE 3-38 Installing the Heatsink



13. Reinstall the air duct and the system cover.

3.5.15 Installing a New CPU

Note – Replacement of a CPU and heatsink should only be done by trained service personnel. If you are replacing an already installed CPU, rather than adding a new one, follow the instructions in [Section 3.5.14, “Replacing a CPU and Heatsink”](#) on [page 3-40](#).

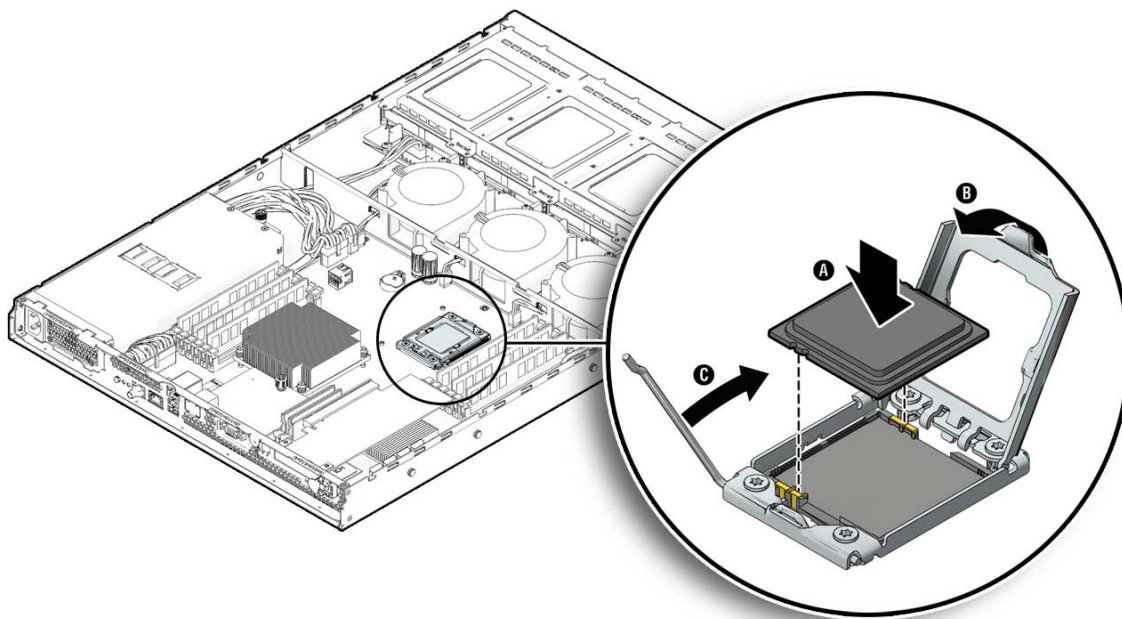


Caution – Observe the appropriate ESD precautions in [Section 3.2.1, “ESD Precautions”](#) on [page 3-2](#) when handling the CPU.

To install a new CPU and heatsink:

1. Unpack the new CPU.
2. If you are installing a second CPU into a formerly single-CPU system, you will need to remove the socket cover before installing the new CPU.
3. Ensure that the socket release lever is in the fully open, perpendicular position and the CPU cover is open (see [FIGURE 3-37](#)).
4. Align the small triangle on the upper-left corner of the CPU with the alignment triangle on the motherboard. In addition, ensure that the alignment post on the socket engages the semi-circular cutout on the CPU.

FIGURE 3-39 Installing the CPU



5. Insert the CPU into the socket.



Caution – If the CPU is correctly aligned, you should be able to easily insert the CPU into the socket. If you feel more than minimal resistance, stop and recheck the alignment. Forcing a misaligned CPU into the socket can permanently damage the device.

6. When the CPU is fully seated in the socket, close the CPU cover.

Note – The CPU cover might not align correctly with the chip, after it is installed. If this happens, open the cover and push the cover slightly to the side to better align it with the chip, and reclose the cover.

7. Rotate the socket release lever down until it snaps into place, securing the CPU in the socket.

8. Inspect the heatsink for dust and lint. Clean if necessary.

9. Remove the plastic protective cover from the bottom of the heatsink.

The plastic cover protects the grease on the bottom of the heatsink.

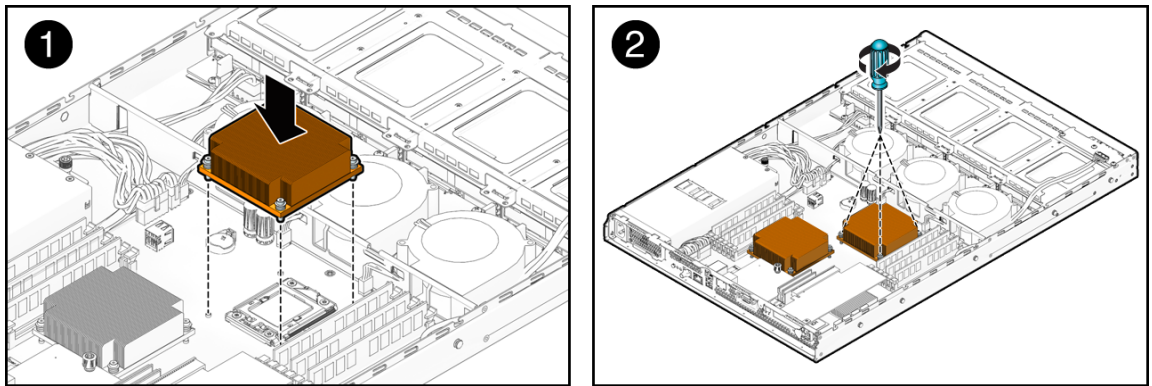
10. Carefully position the heatsink on the CPU, aligning it with the mounting posts to reduce movement after it makes initial contact with the layer of thermal grease.



Caution – If the heatsink is moved too much during its installation, the layer of thermal grease may become uneven, leading to component damage.

11. Fasten the four screws attaching the heatsink to the motherboard. Alternate between the four screws, turning each screw two turns until all are securely fastened. See [FIGURE 3-40](#).

FIGURE 3-40 Installing the Heatsink



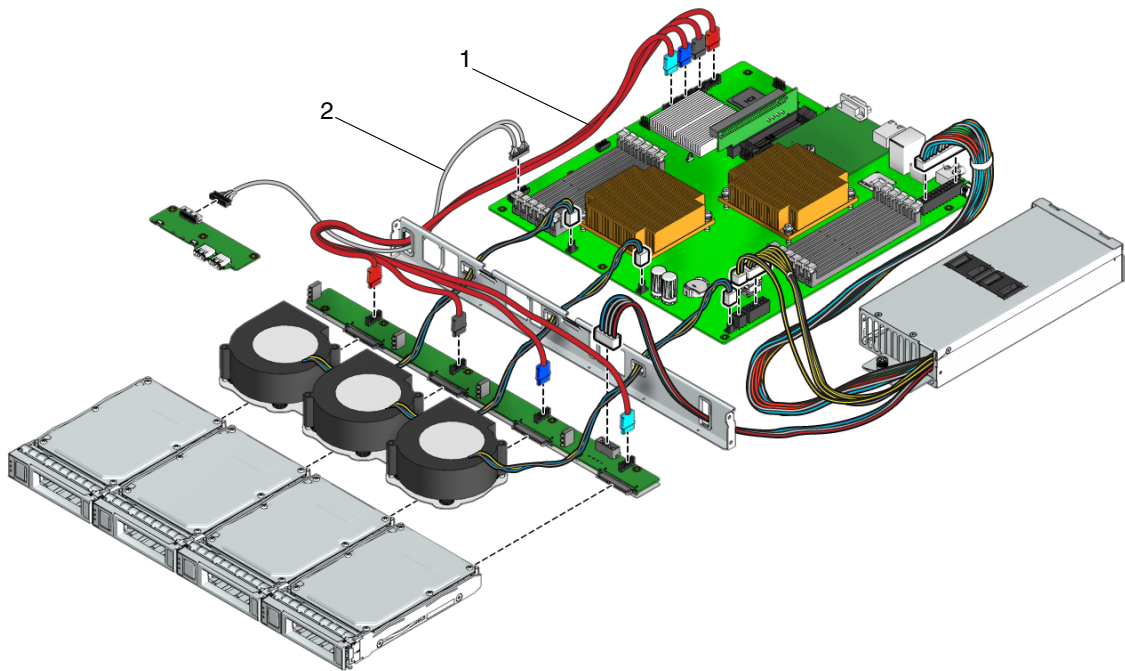
12. Reinstall the air duct and the system cover.

3.5.16 Replacing Cables

This section provides procedures for replacing the SATA cable, I/O board cable, and the disk power harness.

[FIGURE 3-41](#) shows the routing of the cables and motherboard connector locations.

FIGURE 3-41 Cable Routing and Motherboard Cable Connections



[TABLE 3-3](#) lists the cables that are included with the X2270 server.

TABLE 3-3 X2270 Server Cables

Label	Cable
1	SATA cable harness
2	I/O cable
	HDD power supply harness (not shown)

3.5.16.1 Removing the SATA Cable Harness

To remove the SATA cable harness:

1. **Power off the system and remove the cover as described in [Section 3.3](#), “Powering Off the Server and Removing the Cover” on page 3-3.**
2. **Disconnect the SATA cables from the HDDs.**
 - If your server contains removable HDDs, disconnect the SATA cables from the backplane.

- If your server contains fixed disks, disconnect the cables from each disk drive.
- 3. **Disconnect the SATA cables from the motherboard connections.**
- 4. **Release the SATA cable harness from its tie-down points.**
- 5. **Carefully pull the SATA cable through the cutout in the chassis divider and lift it from the chassis.**

3.5.16.2 Installing the SATA Cable Harness

To install the SATA cable harness:

1. **Match the color-coded SATA cables with their associated motherboard connections, and reconnect the SATA cables to the motherboard.**
2. **Carefully route the SATA cable through the cutout in the chassis divider.**
3. **Reconnect the SATA cables to the HDDs.**
 - If your server contains removable HDDs, reconnect the SATA cables to the backplane.
 - If your server contains fixed disks, reconnect the cables to each disk drive.
4. **Reattach the SATA cable to its tie-down points.**
5. **Check the routing of all cables for obstructions, and then reinstall the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on [page 3-3](#).**

3.5.16.3 Removing the I/O Cable

To remove the I/O cable:

1. **Power off the system and remove the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on [page 3-3](#).**
2. **Disconnect the I/O cable from the I/O board.**
3. **Disconnect the two I/O cable connections from the motherboard.**
4. **Carefully pull the I/O cable through the cutout in the chassis divider and lift it from the chassis.**

3.5.16.4 Installing the I/O Cable

To install the I/O cable:

1. Reconnect the two I/O cable connections to the motherboard.
2. Carefully route the I/O cable through the cutout in the chassis divider and over the top of the HDD partition.
3. Reconnect the I/O cable to the I/O board.
4. Check the routing of all cables for obstructions, and then reinstall the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.

3.5.16.5 Removing the HDD Power Harness (Fixed Disks Only)

To remove the HDD power harness:

1. Power off the system and remove the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.
2. Disconnect the power cables from the HDDs.
Starting with fixed disk 3 and working toward fixed disk 0, disconnect the power cables from each disk drive.
3. Release the HDD power harness from its tie-down points.
4. Disconnect the HDD power harness from the power supply unit.

3.5.16.6 Installing the HDD Power Harness

To install the HDD power harness:

1. Reconnect the HDD power harness to the power supply unit.
2. Reconnect the power cables to the HDDs.
Starting with fixed disk 3 and working toward fixed disk 0, reconnect the power cables to each disk drive.
3. Reattach the HDD power harness to its tie-down points.
4. Check the routing of all cables for obstructions, and then reinstall the cover as described in [Section 3.3, “Powering Off the Server and Removing the Cover”](#) on page 3-3.

3.5.17 Motherboard

The following procedures describe how to remove and install the Sun Fire X2270 Server system motherboard.

Note – The motherboard is not a CRU and should be replaced only by trained field service technicians.

3.5.17.1 Removing the Motherboard

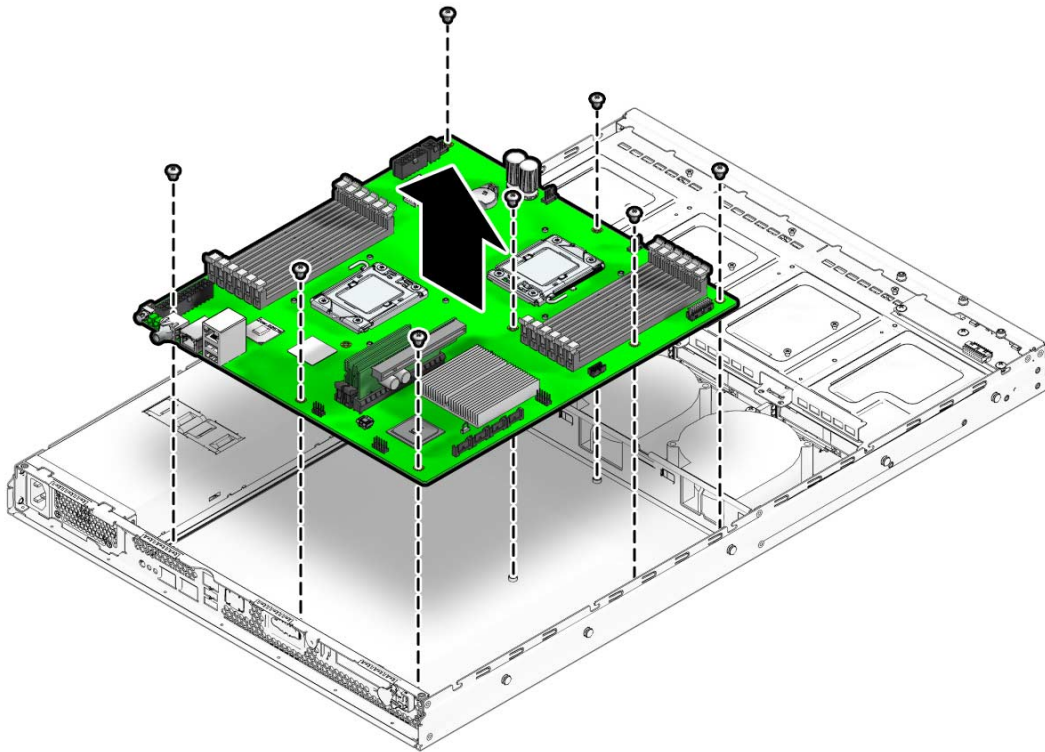
To remove the motherboard:

1. **Power off the system and remove the cover as described in [Section 3.3](#), “Powering Off the Server and Removing the Cover” on page 3-3.**
2. **Remove the PCIe card, the air duct, and if installed, the optional SP module.**
For more information, see [Section 3.5.3](#), “Replacing the PCIe Card” on page 3-11, [Section 3.5.7](#), “Replacing the Air Duct” on page 3-22), and [Section 3.5.13](#), “Removing and Replacing the SP Module” on page 3-38).
3. **Disconnect all cables attached to the motherboard.**
4. **Remove the four screws from the CPU heatsink (4 screws per heatsink installed).**

Note – If you are moving the motherboard to a new chassis, it is not necessary to remove the heatsinks, CPUs, and memory DIMMs. If you need to remove any of these components, it is recommended to remove them while the motherboard is in the server chassis, as this decreases strain on the motherboard.

5. **Using a Phillips screwdriver, remove the eight screws that fasten the motherboard to the chassis.**

FIGURE 3-42 Removing the Motherboard



6. Pull the motherboard away from the chassis.

7. Remove the CPU and memory modules.

Refer to the following sections for information on removing and replacing the CPU and memory:

- [Section 3.5.14, “Replacing a CPU and Heatsink” on page 3-40](#)
- [Section 3.5.10, “Replacing Memory Modules” on page 3-29](#)

3.5.17.2 Installing the Motherboard

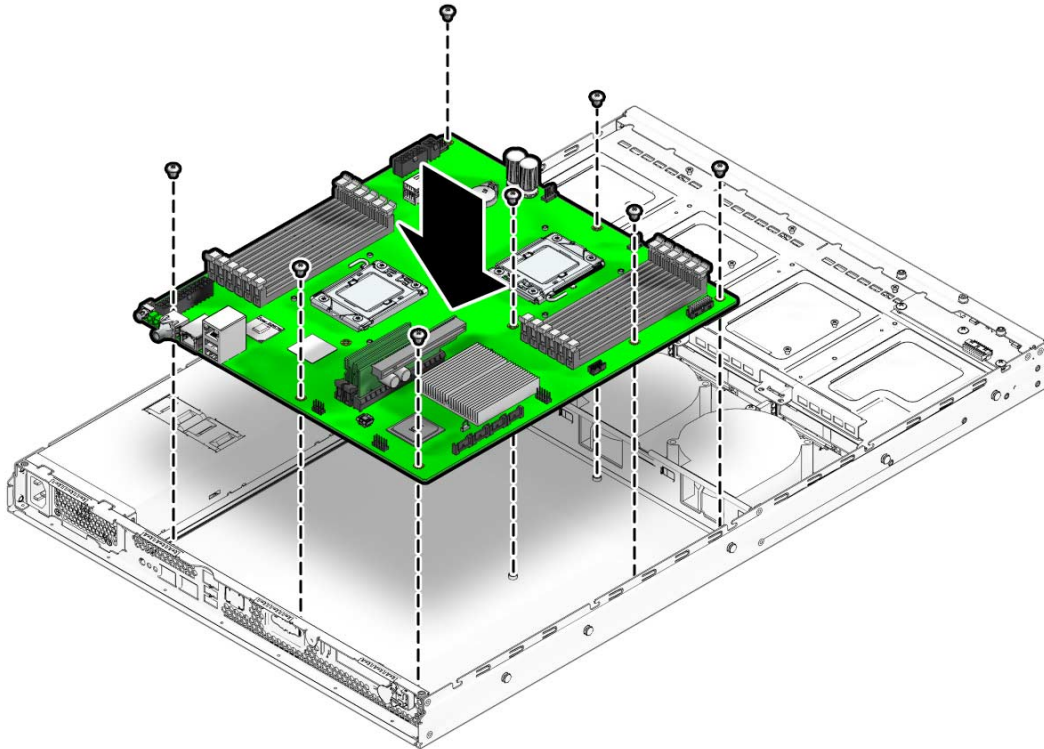
To install the motherboard:



Caution – Observe proper ESD precautions in [Section 3.2.1, “ESD Precautions” on page 3-2](#) when handling the new motherboard.

1. Center the motherboard on the chassis so that the screw holes in the motherboard align with the screw holes on the chassis.
2. Secure the eight Phillips screws that fasten the motherboard to the chassis. Torque screws to 8-9 inch-pounds.

FIGURE 3-43 Installing the Motherboard



3. Replace the CPU and DIMMs as necessary.
See the following sections for information:
 - [Section 3.5.14, “Replacing a CPU and Heatsink” on page 3-40](#)
 - [Section 3.5.10, “Replacing Memory Modules” on page 3-29](#)
4. Replace the PCIe card, air duct, and if installed, the optional SP module.
See the following sections for information:
 - [Section 3.5.3, “Replacing the PCIe Card” on page 3-11.](#)
 - [Section 3.5.7, “Replacing the Air Duct” on page 3-22](#)
 - [Section 3.5.13, “Removing and Replacing the SP Module” on page 3-38](#)

5. Reconnect all internal system cables.

See the following section for information:

[Section 3.5.16, “Replacing Cables” on page 3-47.](#)

6. Replace the air duct and system cover.

7. Replace any external cables and power on the server.

System Specifications

This Appendix contains the following specifications for the Sun Fire X2270 Server.

- [Section A.1, “Physical Specifications” on page A-1](#)
- [Section A.2, “Power Specifications” on page A-2](#)
- [Section A.3, “Environmental Specifications” on page A-3](#)
- [Section A.4, “Serial Connector Pin Assignments” on page A-4](#)

A.1 Physical Specifications

[TABLE A-1](#) lists the physical specifications for the Sun Fire X2270 Server.

TABLE A-1 Sun Fire X2270 Server Physical Specifications

Specification	British	Metric
Height	1.7 inches	43 mm
Width	17.2 inches	436 mm
Depth	25.6 inches	650 mm
Weight	27.28 lbs (minimum configuration options)	12.4 kg
	29.04 lbs (maximum configuration options)	13.2 kg

A.2 Power Specifications

Maximum continuous power is 600 W. Other power specifications are shown in the following tables.

TABLE A-2 AC Input Voltage Rating

Parameter	Minimum	Rated	Maximum
Voltage	90 Vrms	100–127/200–240 Vrms	264 Vrms
Frequency	47 Hz	50/60 Hz	63 Hz

TABLE A-3 Input Current

Current Type	Values
Maximum input current	8.6 Amps max @ 100 Vac; 4.3 Amps max @ 200 Vac, full load
Maximum inrush current	60 Amps

A.3 Environmental Specifications

Environmental specifications for the Sun Fire X2270 Server are shown in [TABLE A-4](#).

TABLE A-4 Sun Fire X2270 Server Environmental Specifications

Specification	State	British	Metric
Humidity	Operating	7%–93% RH non-condensing, 80.6° F max wet bulb	7%–93% RH non-condensing, 38° C max wet bulb
	Nonoperating	93% RH, non-condensing, 100.4° F max wet bulb	93% RH, non-condensing, 43° C max wet bulb
Vibration	Operating	0.12 G x-y, 0.17 G z; 5–500 Hz sine	
	Nonoperating	0.3 G x-y, 0.6 G z; 5–500 Hz sine	
Shock	Operating	3.5 G; 11 msec. half-sine	
Temperature	Operating	36° F to 100° F	2° C to 35° C
	Nonoperating	-40° F to 154° F	-40° C to 68° C
Maximum operating temperature derating		-1.8° F for every 985 ft. in altitude	-1° C for every 300 m in altitude
Altitude	Operating	max 9,843 ft	max 3,000 m

A.4 Serial Connector Pin Assignments

The serial management port connector is an RS-232-F RJ-45 type connector located on the server back panel.

FIGURE A-1 Serial Management Port Pin Configuration

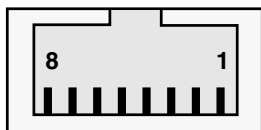


TABLE A-5 Serial Management Port Pin Assignments

Pin Number	Pin Name	Description
1	RTS	Ready to send
2	DTR	Data terminal ready
3	TXD	Transmit data
4	GND	Ground
5	GND	Ground
6	RXD	Receive data
7	DSR	Data send ready
8	CTS	Clear to send

Using the Tools & Drivers CD

This chapter contains information about the Sun Fire X2270 Server Tools & Drivers CD. It contains information on the following topics:

- [Section B.1, “Tools & Drivers CD Contents” on page B-1](#)
- [Section B.2, “Updating BIOS and SP Firmware on Servers With an SP” on page B-2](#)
- [Section B.3, “Updating BIOS on Servers Without an SP” on page B-5](#)
- [Section B.4, “Recovering the SP and BIOS Firmware” on page B-10](#)

B.1 Tools & Drivers CD Contents

The Tools & Drivers CD contains several software applications and utilities for use with your Sun Fire X2270 Server. [TABLE B-1](#) lists the contents of the CD and shows where to find more information on the contents.

TABLE B-1 Tools & Drivers CD Contents

Application	Document or Section in This Document
Drivers and installation scripts for supported operating systems	<i>Sun Fire X2270 Server Operating Systems Installation Guide</i>
BIOS and SP firmware	<ul style="list-style-type: none">• Section B.2, “Updating BIOS and SP Firmware on Servers With an SP” on page B-2• Section B.3, “Updating BIOS on Servers Without an SP” on page B-5• Section B.4, “Recovering the SP and BIOS Firmware” on page B-10• “Updating ILOM Firmware Using the IPMIflash Utility” in the <i>Sun ILOM Supplement for Sun Fire X2270 Server</i>
Diagnostics software	<i>Sun x64 Servers Diagnostics Guide</i>
Windows RIS/WDS files	<i>Sun Fire X2270 Server Windows Operating System Installation Guide</i>

B.2 Updating BIOS and SP Firmware on Servers With an SP

Note – The BIOS and SP firmware update procedures in this section are applicable only to systems that contain an optional service processor module. If your server *does not* contain an SP, follow the procedures in [Section B.3, “Updating BIOS on Servers Without an SP”](#) on page B-5 to update the BIOS.

If you want to use the Sun Installation Assistant to update the BIOS and SP firmware, see “System BIOS and ILOM Upgrade” in the *Sun Installation Assistant for Windows and Linux User’s Guide*.

You can update the BIOS and SP firmware from the Tools & Drivers CD using one of the following methods:

- [ILOM CLI](#)
- [ILOM Web Interface](#)

To recover a corrupt SP, see [Section B.4, “Recovering the SP and BIOS Firmware”](#) on page B-10.

B.2.1 ILOM CLI

You can update the BIOS and ILOM SP firmware using ILOM CLI.

B.2.1.1 Updating BIOS and ILOM SP Firmware Using the CLI

1. Set up a TFTP server to host the SP image.

Instructions for setting up the TFTP server can be found in the system administration guides for the appropriate Solaris or Linux version:

- Solaris 10 manual at:

<http://docs.sun.com/app/docs/doc/817-5504>

- Red Hat Enterprise Linux 3 manual at:

<http://www.redhat.com/docs/manuals/enterprise/RHEL-3-Manual/sysadmin-guide/>

- Red Hat Enterprise Linux 4 manual at:

<http://www.redhat.com/docs/manuals/enterprise/RHEL-4-Manual/sysadmin-guide/>

- SUSE Linux Enterprise Server 9 manual at:

http://www.novell.com/documentation/sles9/pdfdoc/sles_9_admin_guide/sles_9_admin_guide.pdf

2. Copy the SP image from the `/firmware/webgui_cli/version/SP_file` file on the Tools & Drivers CD to your TFTP server `/tftpboot` directory.

Where *version* is the version of the Tools & Drivers CD that you are using and *SP_file* is the name of the SP image.

For example: `/firmware/webgui_cli/1.0.0/X2270-2.0.1.1.pkg`

3. Ensure that the OS on the platform is shut down.

4. Log in to the Sun Fire X2270 ILOM CLI with Administrator privileges.

5. Type the following command to download the new ILOM SP firmware image:

```
-> load -source tftpURL
```

For example:

```
-> load -source tftp://<ipaddress>/X2270-xxx_xxxx.pkg
```

6. Type `y` to load the specified file.

7. Type `y` to preserve your ILOM configuration settings. If not, the settings will be overwritten by the firmware default.

The BIOS and ILOM SP firmware is updated.

Note – During the upgrade process, the login prompt will appear. Do not attempt to log in until the flash update has completed.

B.2.2 ILOM Web Interface

You can update BIOS and ILOM SP firmware using the ILOM web interface. See the *Sun Integrated Lights Out Manager 2.0 User's Guide* (820-1188) for more information on setting up and using the ILOM software.

B.2.2.1 Updating BIOS and SP Firmware

1. **Start the ILOM SP web interface by typing the IP address of the SP into a browser.**
2. **Copy the file `/firmware/webgui_cli/version/SP_file` from the `webgui_cli` directory located on the Tools & Drivers CD to the remote system that is running the ILOM web interface.**

Where *version* is the version of the Tools & Drivers CD that you are using and *SP_file* is the name of the SP image.

For example: `/firmware/webgui_cli/1.0.0/x2270-2.0.1.1.pkg`

3. **Ensure that the OS on the platform is shut down.**
4. **Log in to the SP ILOM web interface with Administrator privileges.**
5. **Select Maintenance --> Firmware Upgrade tabs.**

The Firmware Upgrade page appears.
6. **Click Enter Upgrade Mode.**

A dialog box appears asking you to confirm that you want to enter Upgrade mode.
7. **Click OK to enter Upgrade mode or Cancel to exit the process.**

ILOM stops its normal operation and prepares for a flash upgrade.
8. **Enter the path to the new ILOM flash image file in the Select Image File to Upload field or click Browse to locate and select the firmware update file.**

Files with `.pkg` extensions should be used.
9. **Click Upload to upload the file, or click Cancel to exit the process.**

The selected file is uploaded and verified as the correct image update for your SP.

This process takes about one minute with a fast network connection.

10. When the Verify Firmware Image page appears, click OK.
11. Select Preserve Configuration to keep your ILOM settings. If not, the settings will be overwritten by the firmware defaults.
12. Click Start Upgrade or click Cancel to exit the process.

When you click Start Upgrade, a progress screen indicates that the firmware image is being updated. Once the update progress reaches 100%, the firmware update is complete.

When the update is complete, the system *automatically* reboots.
13. After the SP finishes rebooting, use your browser to reconnect to ILOM.

B.3 Updating BIOS on Servers Without an SP

If your server *does not* contain an SP, use one of the following methods to update the BIOS:

- To use an externally attached CD/DVD drive, follow the procedures in [Section B.3.2, “Updating the BIOS Using a CD/DVD Drive” on page B-5](#).
- To use a USB flash drive, follow the procedures in [Section B.3.3, “Updating the BIOS Using a USB Flash Drive” on page B-6](#).
- To use a Preboot Execution Environment (PXE) server, follow the procedures in [Section B.3.4, “Updating the BIOS Using a PXE Server” on page B-7](#).

B.3.1 Before You Begin

Before performing these BIOS update procedures, you should have the following:

- A serial console attached to the Sun Fire X2270 Server
- The latest Sun Fire X2270 Server Tools & Drivers CD
- Depending on the method you have chosen to use, either:
 - An externally attached CD/DVD drive
 - A bootable USB flash drive

B.3.2 Updating the BIOS Using a CD/DVD Drive

To update the BIOS using an external CD/DVD drive attached to the Sun Fire X2270 Server:

1. **Insert the Tools & Drivers CD into the CD/DVD drive.**
2. **Reboot the server.**
3. **When the Tools & Drivers CD menu is displayed, select Upgrade System BIOS from the menu.**

The BIOS will be updated to the latest version and the system will automatically reboot. The BIOS will automatically load the optimized defaults.

4. **Verify the BIOS settings.**

Because the BIOS optimized defaults are automatically loaded when the BIOS is flashed, you might need to reset some of the BIOS settings.

For example, if the BIOS was previously modified to support RAID, you must re-enable RAID support in the BIOS after flashing it.

B.3.3 Updating the BIOS Using a USB Flash Drive

To update the BIOS using a USB flash drive attached to the Sun Fire X2270 Server:

1. **Create a bootable MS-DOS USB flash drive.**
You can create a bootable USB flash drive using a freeware application such as BootFlashDOS 1.0.
2. **Using a system that contains both a CD/DVD drive and a USB port, insert the Tools & Drivers CD into the CD/DVD drive and the bootable USB flash drive into an available USB port.**
3. **Copy the contents of the /firmware/USBFlash/BIOSFlash/* directory from the Tools & Drivers CD to a bootable MS-DOS USB flash drive.**
4. **Insert the USB flash drive containing the contents of the Tools & Drivers CD into an available USB port on the Sun Fire X2270 Server.**
5. **Power on (or reboot) the Sun Fire X2270 Server.**
The BIOS screen appears.
6. **In the BIOS screen, press F8 to specify a temporary boot device.**
The Select Boot Device menu appears.
7. **In the Boot Device menu, select the USB flash drive as the first boot device, then press Enter.**
8. **Save the changes and exit the system BIOS.**

The system automatically boots to the USB flash drive.

9. Navigate to the directory on the USB flash drive that contains the contents of the Tools & Drivers CD.
10. In the terminal window, type the following command to update the BIOS:
-> **run flash.bat**
The BIOS will be updated to the latest version and the system will automatically reboot. The BIOS will automatically load the optimized defaults.
11. **Verify the BIOS settings.**
Because the BIOS optimized defaults are automatically loaded when the BIOS is flashed, you might need to reset some of the BIOS settings.
For example, if the BIOS was previously modified to support RAID, you must re-enable RAID support in the BIOS after flashing it.

B.3.4 Updating the BIOS Using a PXE Server

You can update the BIOS from a Preboot Execution Environment (PXE) server.

The following topics are included in this section:

- [Section B.3.4.1, “Setting Up the Tools & Drivers CD Image on the PXE Server” on page B-7](#)
- [Section B.3.4.2, “Accessing the Tools & Drivers CD From the Target Sun Fire X2270 Server” on page B-9](#)

B.3.4.1 Setting Up the Tools & Drivers CD Image on the PXE Server

You will need the following to set up the PXE server:

- Red Hat KickStart server with a DVD drive
Instructions for setting up the Red Hat KickStart server can be found in the following administration/installation guides for Red Hat Enterprise Linux:
 - Red Hat Enterprise Linux 4 administration guide:
http://www.redhat.com/docs/manuals/enterprise/RHEL-4-Manual/pdf/System_Administration_Guide-450.pdf
 - Red Hat Enterprise Linux 5 installation guide:
http://www.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/5/pdf/Installation_Guide.pdf
- Sun Fire X2270 Server Tools & Drivers CD
- MEMDISK kernel from the SYSLINUX project. Access this kernel at <http://www.kernel.org/pub/linux/utils/boot/syslinux/>

Setting Up the PXE Server

1. Log in to the PXE server as root (superuser).
2. Determine the directory where the Red Hat image is installed on the PXE server.

The default directory for the PXE image is usually `/tftpboot/linux-install`. The remainder of this procedure assumes that the PXE files have been installed in this directory.

Note – If your PXE files are not installed in the `/tftpboot/linux-install` directory, modify the procedure as necessary.

3. Make a directory for the Sun Fire X2270 Server Tools & Drivers CD contents.

```
# mkdir /tftpboot/linux-install/suppl_ven
```

4. Insert the Sun Fire X2270 Server Tools & Drivers CD into the PXE server, and copy the `boot.img` file located in the root directory of the CD to the new Sun Fire X2270 Server supplemental directory created in [Step 3](#).

```
# cp /mnt/cdrom/boot.img /tftpboot/linux-install/suppl_ven
```

5. Download the MEMDISK kernel.

- a. Go to the latest SYSLINUX project web site at:

<http://www.kernel.org/pub/linux/utils/boot/syslinux/>

- b. Save the latest `syslinux-version.zip` file to your root directory.

Where *version* is the latest SYSLINUX project version.

Note – Version 3.09 was the latest version at the time of this writing.

6. Unzip the zip file.

For example:

```
# unzip syslinux-3.09.zip
```

7. Change to the `memdisk` directory.

For example:

```
# cd /syslinux-3.09/memdisk
```

8. Copy the `memdisk` kernel to the new Sun Fire X2270 Server Tools & Drivers Directory created in [Step 3](#).

For example:

```
# cp /syslinux-3.09/memdisk/memdisk /tftpboot/linux-install/suppl_ven
```

9. Edit the Boot Message Screen as follows.
 - a. Open the `boot.msg` file in a text editor.

```
# vi /tftpboot/linux-install/mgs/boot.msg
```
 - b. Type the following line after `0-Local Machine`.

```
suppl_tau - Sun Fire X2270 Server Tools & Drivers CD
```
 - c. Save and close the `boot.msg` file.
10. Edit the default PXE Configuration file as follows.
 - a. Open the default file in a text editor.

```
# vi /tftpboot/linux-install/pxelinux.cfg/default
```
 - b. Type the following lines after the `label0` section:

```
label suppl_ven
kernel suppl_tau/memdisk
append initrd=suppl_tau/boot.img
```
 - c. Save and close the default file.
11. Test the installation on the test machine.

B.3.4.2 Accessing the Tools & Drivers CD From the Target Sun Fire X2270 Server

You will need the following to update the BIOS on a target Sun Fire X2270 Server:

- PXE server configured as shown in [Section B.3.4.1, “Setting Up the Tools & Drivers CD Image on the PXE Server”](#) on page B-7.
- Sun Fire X2270 Server set up on the same network as the PXE server.

Accessing the Tools & Drivers CD From the Target Server

1. Connect the Sun Fire X2270 Server to the same network as the PXE server.
2. Power on (or reboot) the Sun Fire X2270 Server.
3. Press the F12 key during POST.
4. The Boot Message Screen located on your PXE server at `/tftpboot/linux-install/mgs/boot.msg` displays on the screen.

5. Type **suppl_ven** at the prompt and press Enter.

The MEMDISK kernel and the bootable portion of the Tools & Drivers CD are downloaded to the test machine over the network and into memory.

Once downloaded, the bootable portion of the Tools & Drivers CD will be booted.

6. The main menu of the bootable portion of the Tools & Drivers CD is displayed on the target Sun Fire X2270 Server.
7. You can now update the system BIOS.

B.4 Recovering the SP and BIOS Firmware

If your server has corrupted SP or BIOS firmware, you can use one of the following methods to recover the firmware:

- To use an externally attached CD/DVD drive, follow the procedures in [Section B.4.1, “Recovering the SP and BIOS Firmware Using a CD/DVD Drive”](#) on page B-10.
- To use a USB flash drive, follow the procedures in [Section B.4.2, “Recovering the SP and BIOS Firmware Using a USB Flash Drive”](#) on page B-11.

Note – You should only use the following procedures for system recovery, as these procedures will not preserve BIOS settings and ILOM configurations.

B.4.1 Recovering the SP and BIOS Firmware Using a CD/DVD Drive

To recover the SP and BIOS firmware using an external CD/DVD drive attached to the Sun Fire X2270 Server:

1. Insert the Tools & Drivers CD into the CD/DVD drive.
2. Reboot the server.
3. When the Tools & Drivers CD menu is displayed, select menu option 3, Exit to DOS.

4. From the DOS prompt, navigate to the directory on the Tools & Drivers CD that contains the recovery program.

For example:

```
-> cd firmware/BIOS
```

5. From the DOS prompt, type the following command to run the recovery program:

```
-> run flash.bat
```

6. When the Recovery menu is displayed, select menu option 1.

For example:

```
1) Flash System BIOS firmware - Clear BIOS CMOS and load defaults.
```

Note – If menu option 1 is selected, which loads the default ILOM and BIOS settings, you might need to reset some of the ILOM and BIOS settings.

7. When the recovery program is completed, disconnect the AC power connection from the server for 30 seconds, then reconnect the AC power.

B.4.2 Recovering the SP and BIOS Firmware Using a USB Flash Drive

To recover the SP and BIOS firmware using a USB flash drive attached to the Sun Fire X2270 Server:

1. Create a bootable MS-DOS USB flash drive.

You can create a bootable USB flash drive using a freeware application such as BootFlashDOS 1.0.

2. Using a system that contains both a CD/DVD drive and a USB port, insert the Tools & Drivers CD into the CD/DVD drive and the bootable USB flash drive into an available USB port.
3. Copy the contents of the `/firmware/USBFlash/SPRecovery/*` directory from the Tools & Drivers CD to a bootable MS-DOS USB flash drive.
4. Insert the USB flash drive containing the contents of the Tools & Drivers CD into an available USB port on the Sun Fire X2270 Server.
5. Power on (or reboot) the Sun Fire X2270 Server.

The BIOS screen appears.

6. In the BIOS screen, press F8 to specify a temporary boot device.

The Select Boot Device menu appears.

7. In the Boot Device menu, select the USB flash drive as the first boot device, then press Enter.

8. Save the changes and exit the system BIOS.

The system automatically boots to the USB flash drive.

9. Navigate to the directory on the USB flash drive that contains the contents of the Tools & Drivers CD.

10. In the terminal window, type the following command to run the recovery program:

-> **run recovery.bat**

11. When the recovery program is completed, disconnect the AC power connection from the server for 30 seconds, then reconnect the AC power.

Because the default ILOM and BIOS settings are automatically loaded when the SP and BIOS firmware is flashed, you might need to reset some of the ILOM and BIOS settings.

Installing the Server Into a Rack With Optional Slide Rails

Perform the procedures in this chapter to install your server into a four-post rack using the orderable slide rail option. These slide rails are compatible with a wide range of equipment racks that meet the following standards:

- Four-post structure (mounting at both front and rear). Two-post racks are not compatible.
- Rack horizontal opening and unit vertical pitch conforming to ANSI/EIA 310-D-1992 or IEC 60927 standards.
- Distance between front and rear mounting planes of 610 mm and 915 mm (24 inches to 36 inches).
- Clearance depth (to front cabinet door) in front of front rack mounting plane at least 25.4 mm (1 inch).
- Clearance depth (to rear cabinet door) behind front rack mounting plane at least 800 mm (31.5 inches) with the cable management arm, or 700 mm (27.5 inches) without the cable management arm.
- Clearance width (between structural supports and cable troughs) between front and rear mounting planes at least 456 mm (18 inches).



Caution – Always load equipment into a rack from the bottom up so that it will not become top-heavy and tip over. Deploy your rack’s anti-tilt bar to prevent the rack from tipping during equipment installation.



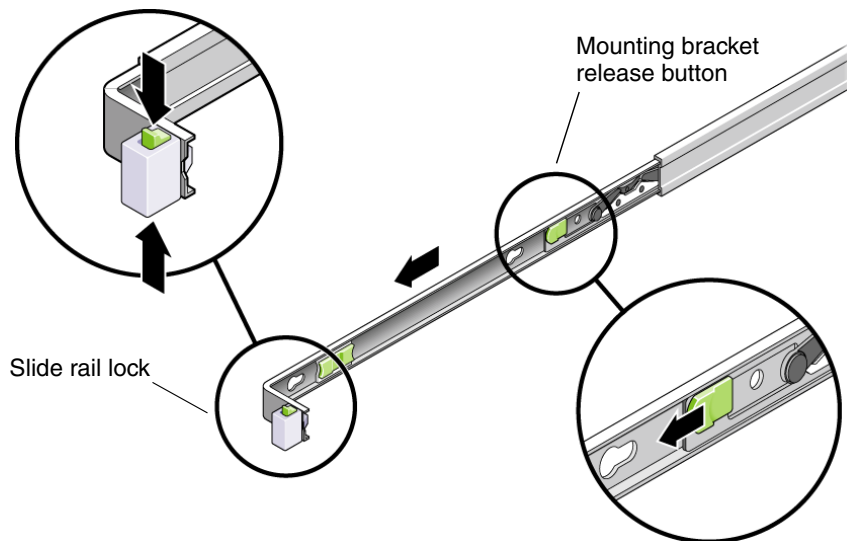
Caution – Ensure that the temperature in the rack does not exceed the server’s maximum ambient rated temperatures. Consider the total airflow requirements of all equipment installed in the rack, to ensure that the equipment is operated within its specified temperature range.

C.1 Disassembling the Slide Rails Before Installation

Use this procedure to remove the mounting brackets from the slide rail assemblies.

1. **Unpack the slide rails.**
2. **Locate the slide rail lock at the front of one of the slide rail assemblies, as shown in [FIGURE C-1](#).**
3. **Squeeze and hold the tabs at the top and bottom of the lock while you pull the mounting bracket out of the slide rail assembly until it reaches the stop.**
See [FIGURE C-1](#).
4. **Push the mounting bracket release button toward the front of the mounting bracket, as shown in [FIGURE C-1](#), and simultaneously withdraw the mounting bracket from the slide rail assembly.**
5. **Repeat for the remaining slide rail assembly.**

FIGURE C-1 Disassembling the Slide Rail Before Installation

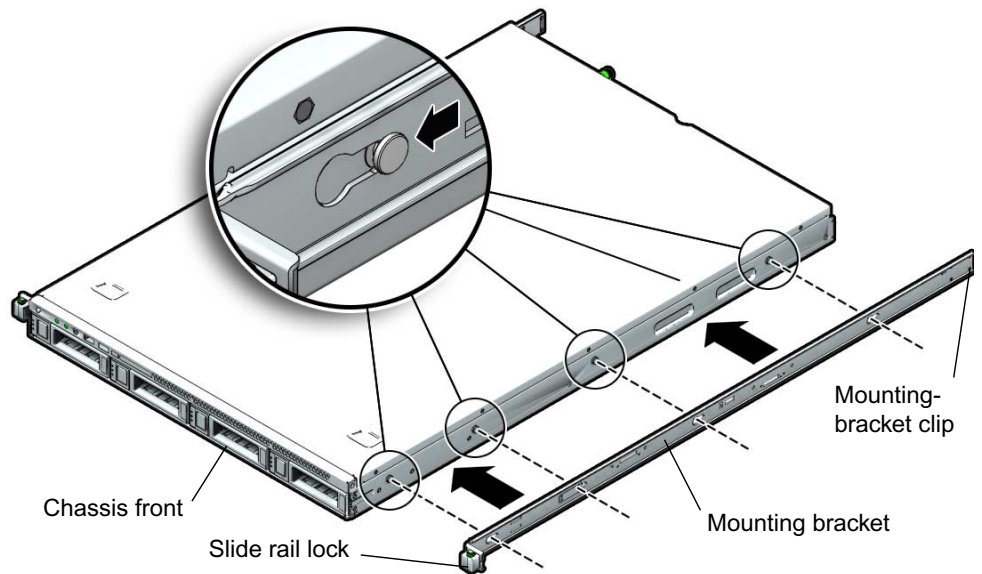


C.2 Installing the Mounting Brackets Onto the Server

Use this procedure to install the mounting brackets onto the sides of the server.

1. Position a mounting bracket against the chassis so that the slide rail lock is at the server front, and the four keyed openings on the mounting bracket are aligned with the four locating pins on the side of the chassis.

FIGURE C-2 Aligning the Mounting Bracket With the Server Chassis



2. With the heads of the four chassis locating pins protruding through the four keyed openings in the mounting bracket, push the mounting bracket toward the front of the chassis until the mounting-bracket clip locks into place with an audible click.

See [FIGURE C-2](#).

3. Verify that the rear locating pin has engaged the mounting-bracket clip.

See [FIGURE C-2](#).

4. Repeat Steps 1 through 3 to install the remaining mounting bracket on the other side of the server.

C.3 Attaching the Slide Rail Assemblies to the Rack

Use this procedure to install the slide rail assemblies to the rack.

1. **Position a slide rail assembly in your rack so that the brackets at each end of the slide rail assembly are on the outside of the front and rear rack posts.**

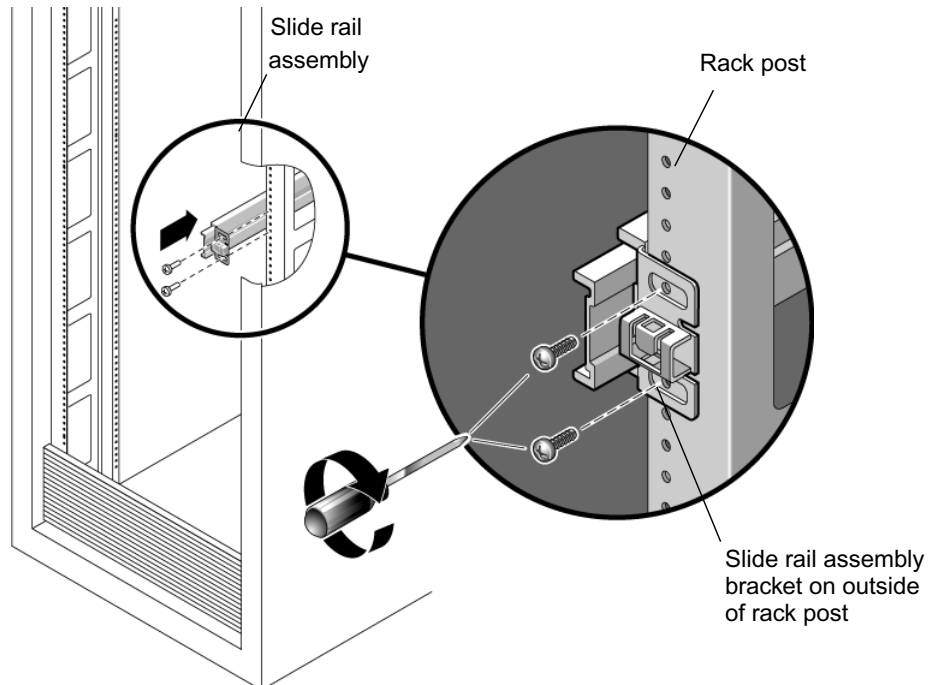
See [FIGURE C-3](#).

2. **Attach the slide rail assembly to the rack posts, but do *not* tighten the screws completely.**

The method used to attach the slide rails varies, depending on the type of rack:

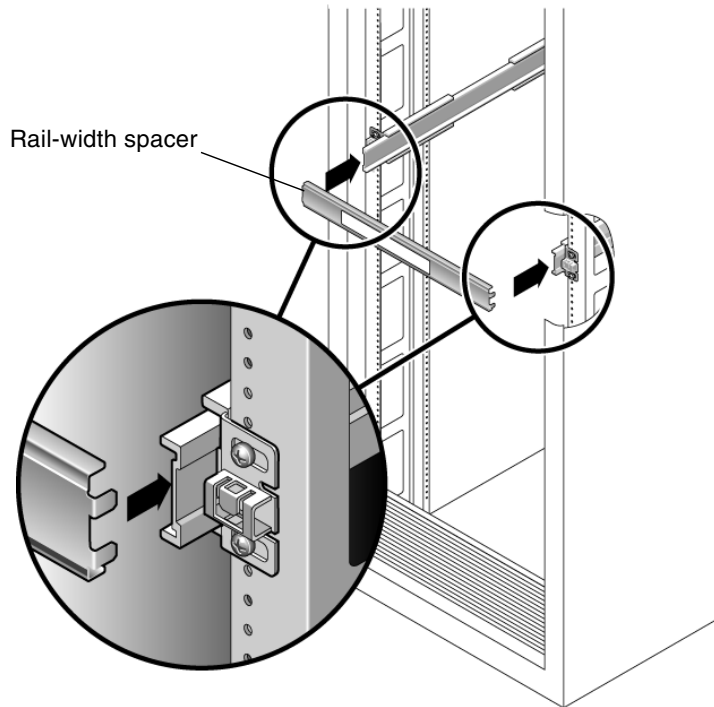
- If your rack has threaded mounting holes in the rack posts, first determine whether the threads are metric or standard, then insert the correct mounting screws through the slide rail brackets and into the threaded holes.
- If your rack does not have threaded mounting holes, insert the mounting screws through both the slide rail brackets and rack posts, then secure them with the caged nuts.

FIGURE C-3 Slide Rail Assembly Mounting to Rack Post



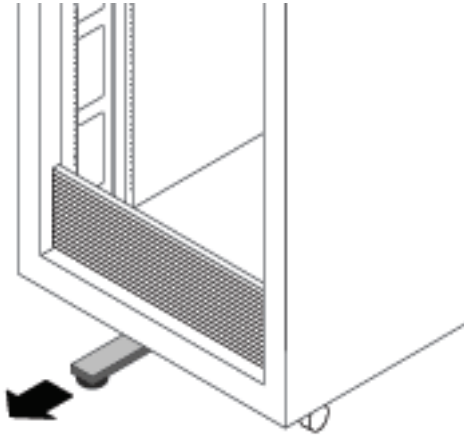
3. Repeat [Step 1](#) and [Step 2](#) for the remaining slide rail assembly.
4. From the front of the rack, set the proper width of the rails with the spacer.
See [FIGURE C-4](#).

FIGURE C-4 Setting the Rail Width



5. Tighten the screws on the brackets.
6. Remove the spacer and confirm that the rails are attached tightly to the rack.
7. Repeat [Step 4](#) through [Step 6](#) for rear of the rack.
8. If available, extend the anti-tilt bar at the bottom of the rack.
See [FIGURE C-5](#).

FIGURE C-5 Extending the Anti-tilt Bar



Caution – If your rack does not have an anti-tilt bar, there is some danger of the rack tipping.

C.4 Installing the Server Into the Slide Rail Assemblies

Use this procedure to install the server chassis, with mounting brackets, into the slide rail assemblies that are mounted to the rack.



Caution – This procedure requires a minimum of two people because of the weight of the server. Attempting this procedure alone could result in equipment damage or personal injury.



Caution – Always load equipment into a rack from the bottom up so that it will not become top-heavy and tip over. Deploy your rack's anti-tilt bar to prevent the rack from tipping during equipment installation.

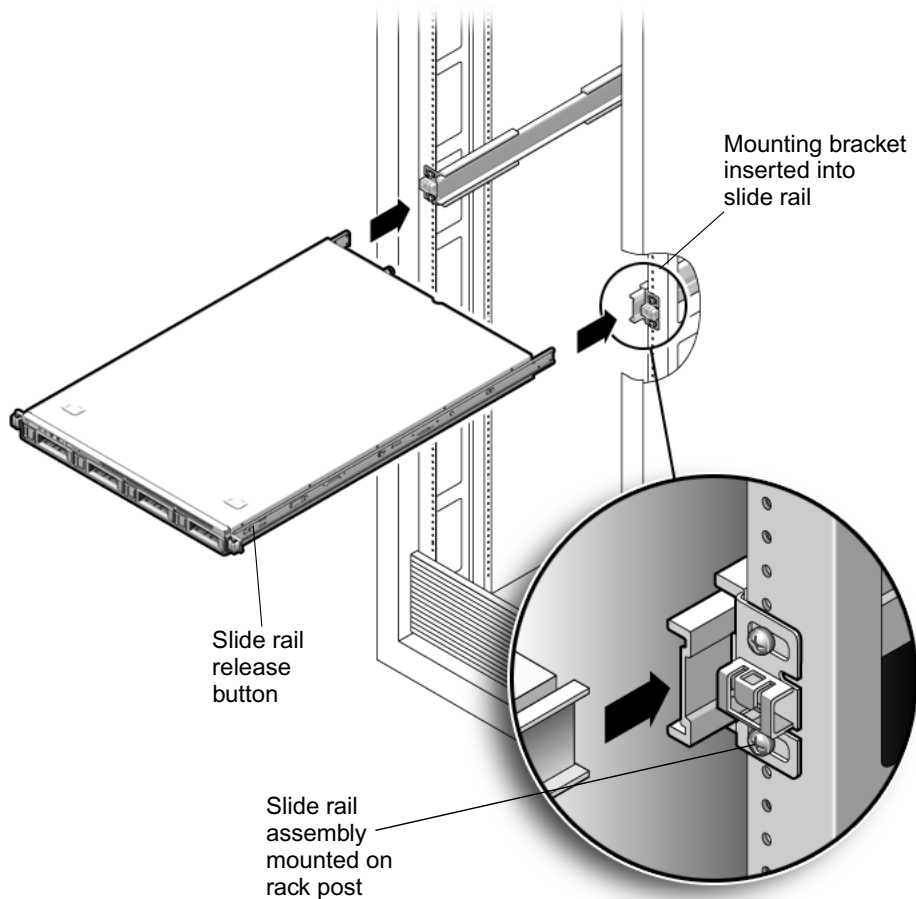
1. Push the slide rails into the slide rail assemblies in the rack as far as possible.

2. Raise the server so that the rear ends of the mounting brackets are aligned with the slide rail assemblies that are mounted in the equipment rack.

See [FIGURE C-6](#).

3. Insert the mounting brackets into the slide rails, then push the server into the rack until the mounting brackets encounter the slide rail stops (approximately 12 inches, or 30 cm).

FIGURE C-6 Inserting the Server With Mounting Brackets Into the Slide Rails



4. Simultaneously push and hold the slide rail release buttons on each mounting bracket while you push the server into the rack. (See [FIGURE C-6](#).) Continue pushing until the slide rail locks on the front of the mounting brackets engage the slide rail assemblies.

You will hear an audible click.



Caution – Verify that the server is securely mounted in the rack and that the slide rails locks are engaged with the mounting brackets before continuing.

C.5 Verifying Operation of the Slide Rails

Use this procedure to ensure that the slide rails are operating correctly.

Note – Two people are recommended for this procedure: one to move the server in and out of the rack, and one to observe the cables.

1. Slowly pull the server out of the rack until the slide rails reach their stops.
2. Inspect the attached cables for any binding or kinks.
3. Push the server back into the rack, as described below.

When the server is fully extended, you must release two sets of slide rail stops to return the server to the rack:

- a. The first set of stops are levers, located on the inside of each slide rail, just behind the back panel of the server. These levers are labeled “PUSH.” Push in both levers simultaneously and slide the server toward the rack.

The server will slide in approximately 38 cm (15 inches) and stop.

Verify that the cables retract without binding before continuing.

- b. The second set of stops are the slide rail release buttons, located near the front of each mounting bracket. (See [FIGURE C-6](#).) Simultaneously push or pull both of the slide rail release buttons and push the server completely into the rack until both slide rail locks engage.
4. Adjust the cable hangers as required.

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